THE SOCIAL AND POLITICAL EVOLUTION OF CHIAPA DE CORZO, CHIAPAS, MEXICO: AN ANALYSIS OF CHANGING STRATEGIES OF RULERSHIP IN A MIDDLE FORMATIVE THROUGH EARLY CLASSIC MESOAMERICAN POLITICAL CENTER

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This study investigates the evolution of the early polity of Chiapa de Corzo, Chiapas, Mexico, from its inception as a political center during the early Middle Formative Dili phase (100-750 B.C) through its apparent peak in political power during the early Terminal Formative Horcones phase (100 B.C.-100 A.D). I approach the evolution of this polity through an analysis of how eight different strategies were employed by rulers in governing the hinterland over the trajectory of Chiapa de Corzo as a political center. My evaluation of the evolution of these political strategies is based on my full coverage survey of 107 km² of Chiapa de Corzo and a portion of its southern hinterland, as well as the large body of research conducted by the New World Archaeological Foundation at Chiapa de Corzo proper. I focus on changes in the following strategies: projection of power into the hinterland; control over access to agricultural lands; control over access to obsidian; control over networks of communication; the use of warfare and coercion; the formation of elite identity, community identity and the use of feasting; and control over ritual and religion.

Changes in how rulers applied different strategies suggest that political power at Chiapa de Corzo did not evolve steadily towards stronger and more integrated authority over the hinterland. In some phases increases in markers of status differentiation between rulers and subjects were accompanied by the development and strengthening of mechanisms to project power into the hinterland. However, in other phases increases in status differentiation at the center appear to have been accompanied by the atrophy of aspects of the projection of power and control over economic activities in the hinterland.

While the general trend in the part of the Chiapa de Corzo trajectory covered in this study was towards greater political complexity and integration of the hinterland, a focus on the strategies utilized by rulers reveals that these processes did not proceed uniformly.

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I would also express my gratitude to Kenn Hirth and Christopher Pool, both of whom provided me with early exposure to Mesoamerican archaeology and opportunities for field work in this area. Finally I thank my parents for their unwavering support for this venture, Monica Orr, whose support has also been indispensable, and Laura, my wife, for her great patience and perseverance in seeing me though this process.

1. INTRODUCTION

The evolution of socio-political complexity has followed a wide variety of trajectories, resulting in the development of an assortment of forms of organization, which can broadly be considered chiefdoms and states (Bondarenko et al. 2002; Brumfiel and Fox 1994; Crumley 1987; Blanton et al. 1996; Drennan 1991; Nichols and Charlton 1997). Mesoamerica is no exception to this pattern, with the initial development of socio-political inequality in the Formative period taking on a variety of forms. This variation resulted from leaders and rulers adopting different strategies in consolidating, expanding and maintaining power over their followers within different social and environmental contexts (Cyphers 1997; 1999; Pool 2003; Michels 1979; Sanders 1974; Sullivan 2002). Some of the resulting socio-political formations followed trajectories that led to a variety of socially stratified, politically complex polities that controlled relatively large areas (states), while others followed trajectories that led to a variety smaller and generally less socially complex polities (chiefdoms). Studies of Formative Period Mesoamerican polities such as San Jose Mogote, San Lorenzo Tenochtitlan, Tres Zapotes, and La Venta (Borstein 2001; Cyphers 1994; Blanton et al. 1982; Drennan 1991; Gonzalez Lauck 1994; Marcus and Flannery 1996; Pool et al. 2003), among others, have begun to provide us with important information on differences in the developmental sequences of early Mesoamerican polities. The Chiapa de Corzo polity provides an exceptionally valuable case for this kind of study, given its relatively early development, its approximate 1500 year position as a dominant regional center, and its location between important regions of early political development such as the Valley of Oaxaca, and the Olmec Gulf Coast, and the Maya Lowlands.

This dissertation consists primarily of an analysis of the strategies utilized by rulers and leaders in the Chiapa de Corzo polity through five key phases of its development. In each chapter I provide an analysis of changes in eight strategies employed by elites in governing the subject population during key phases in the Chiapa de Corzo trajectory. This study is based on analysis of data collected in my full coverage survey of approximately 107 square km, in and around the site of Chiapa de Corzo (Figures 1.1 and 1.2), and the extensive excavation data collected from Chiapa de Corzo from the late 1950s to the mid 1990s (Agrinier 1964, 1975; Gonzales and Cuevas 1998; Hicks and Rozaire 1960;Lee n.d.; 1969; Lowe 1964; Lowe and Agrinier 1960; Martinez and Lowe n.d.; Mason 1960a, b; Navarrete 1975). The analysis is organized chronologically, following the political trajectory of Chiapa de Corzo through five key phases in its development as a political center.

Chapter 3 outlines changes in strategies from the Jobo phase to the Dili phase, a transition that marks the growth of Chiapa de Corzo from several small hamlets into a major population center and an important locus of civic-ceremonial activity. The Jobo and Dili phases are considered together in this chapter in order to provide a view of strategies used in the establishment of Chiapa de Corzo as a major population center and how these strategies contrasted to those employed by leaders prior to the foundation of Chiapa de Corzo.

Chapter 4 analyzes strategies used during the subsequent Escalera phase, when elites at Chiapa de Corzo appear to have consolidated rulership, at least in part, through a hypogamous marriage into a royal lineage from the Olmec site of La Venta Tabasco (Clark 2000a). I then leap forward, over the 200 year Francesa phase, in Chapter 5, to an examination of strategies employed during the Guanacaste and Horcones phases. While important changes did take place in the Francesa phase, it is primarily a period of consolidation of power over the polity, and due to considerations of time and space, I focus on periods of stronger change. The logic of considering the Guanacaste and Horcones phases in the same chapter is largely culture-historical, as the ceramics and architectural styles characteristic of these phases suggest a change in the affiliation of Chiapa de Corzo rulers, moving from affiliation with Gulf Coast polities to a polity from the Maya Lowlands. These phases are marked by the adoption of cut-stone and plaster faced architecture, two-room temples, and the Horcones phase construction of a palace. Nonetheless there are important differences between the strategies of governance utilized in the Guanacaste and Horcones phases.

The Terminal Formative and Early Classic Istmo and Jiquipilas phases, which appear to cover the decline of Chiapa de Corzo to the dissolution of the polity in the Middle Classic Laguna phase[1] are not considered in this study due primarily to limitations of time and space. The chronological position of phases and their relation to other Formative period trajectories is outlined in Table 1.1.

[1] But see Lowe 1998c for a view that this capital endured into the Middle Classic. Lowe's understanding of the Chiapa de Corzo ceramics was undoubtedly better than mine, but nonetheless, with the limited information available on Middle Classic ceramics, the survey data suggest that the study area, including Chiapa de Corzo, was very sparsely populated at this time (see Appendices A and E). Better understanding of the Protoclassic through Late Classic ceramic sequences may require that the notion of a strong decline during the Early Classic leading to dissolution of the polity by the Middle Classic be revised.

As the focus of this study is on the political development of Chiapa de Corzo, I concentrate primarily on strategies employed by elites at Chiapa de Corzo and hinterland leaders; groups and individuals that held power in the sense of the ability to make others do their will. While commoners at different phases in the development of the Chiapa de Corzo polity may have had more or less ability to influence decisions affecting their lives, the decisions that affected the settings in which they lived, and the range of opportunities available to them were ultimately made by a relatively limited group of individuals located within the capital of Chiapa de Corzo, at larger villages, and at second tier political centers. While I do not deny that commoners had agency and power in the sense of being able to do things and make decisions, their ability to influence the decisions of rulers and leaders became increasingly restricted with the evolution of greater social stratification.

I avoid the use of Service's bands-tribes-chiefdoms-states taxonomy through most of this study, as my goals are to elicit how rulers governed at different points on the trajectory, rather than fit the polity into a conventional framework. Nonetheless, in the conclusions I provide a brief overview of how the political organization of the Chiapa de Corzo polity does and does not fit into conventional understandings of these taxonomies at different points on its trajectory.

For each phase considered in this study I provide a description of the demographic setting of political action, starting with a description of the population densities, and the nature of the settlement hierarchy, followed by estimates of the scale of the polity, including population estimates extrapolated from densities within the survey area. While the focus of this study is primarily sub-regional in scale, primarily an analysis of internal political dynamics within the Chiapa de Corzo polity, I do not view Chiapa de Corzo in isolation. To this end I consider the role developments in the neighboring sub-regions of the Chiapas Central Depression (Figure 1.2) and the surrounding regions may have had on the choices made by rulers and leaders within the Chiapa de Corzo polity.

The strategies I consider in this analysis consist of 1) the projection of power into the hinterland by Chiapa de Corzo rulers and the power wielded by leaders at second tier centers; 2) elite control over labor; 3) control over access to prime agricultural land; 4) control over access to obsidian; 5) control over routes of trade and communication; 6) the use of warfare and violence in consolidating and maintaining power, 7) the development and use of elite political identity; and 8) the control over religion and public ceremony.

Table 1.1 Chronology of Chiapa de Corzo and Comparative Trajectories

Year	Periods	Chiapa	Chiapa de Corzo (Bryant, Clark, and Cheetham 2005)	Valley of Oaxaca (Blanton et al. 1999)	San Lorenzo Tenochtitlan (Symonds, Cyphers, and Lunagomez 2002)	La Venta (Rust and Leyden 1994)	Tuxtla Mountains (Santley, Arnold and Barret 1997)
400	Early Classic	VIII	Jiquipillas (A.D.300-450)	Monte Alban III (300-500 A.D.)	Early-Middle Classic (A.D. 200-600)	Hiatus	
300							Early Early Classic (A.D. 100-300)
200	Terminal Formative	VII	Istmo (A.D. 100-300)	Monte Alban II (100B.C.-300-A.D.)			
100 A.D.					Late Formative (600B.C.-A.D.200)	Late San Miguel (200 B.C-A.D 100)	Late Formative (400 B.C.-100 A.D.)
100 B.C.		VI	Horcones (100 B.C.-A.D. 100)				
200	Late Formative	V	Guanacaste (300-100 B.C.)	Monte Alban Late I (300-100 B.C.)		Early San Miguel (500-100 B.C.)	
300							
400	Middle Formative	IV	Francesa (500-300 B.C.)	Monte Alban Early I (500-300 B.C.)	Middle Formative (900-300 B.C.)		
500							Middle Formative (1000-400 B.C.)
600		III	Escalera (750-500 B.C)	Rosario phase (700-500 B.C.)		Late La Venta (800-500 B.C.)	
700							
800		II	Dili (1000-750 B.C.)	Guadalupe phase (950-700 B.C.)			
900						Early La Venta (1150-800 B.C.)	
1000	Early Formative			San Jose phase (1400-950 B.C.)	San Lorenzo phase (1200-900 B.C.)		
1100		Ib	Jobo (1150-1000 B.C.)				Early Formative (1400-1000 B.C.)
1150							
1200		Ia	Cotorra (1400-1150 B.C.)			Late Bari (1400-1150)	
1300					(Ocos-Bajio 1500-1200 B.C.)		
1400				Tierras Largas (1700-1400 B.C.)			

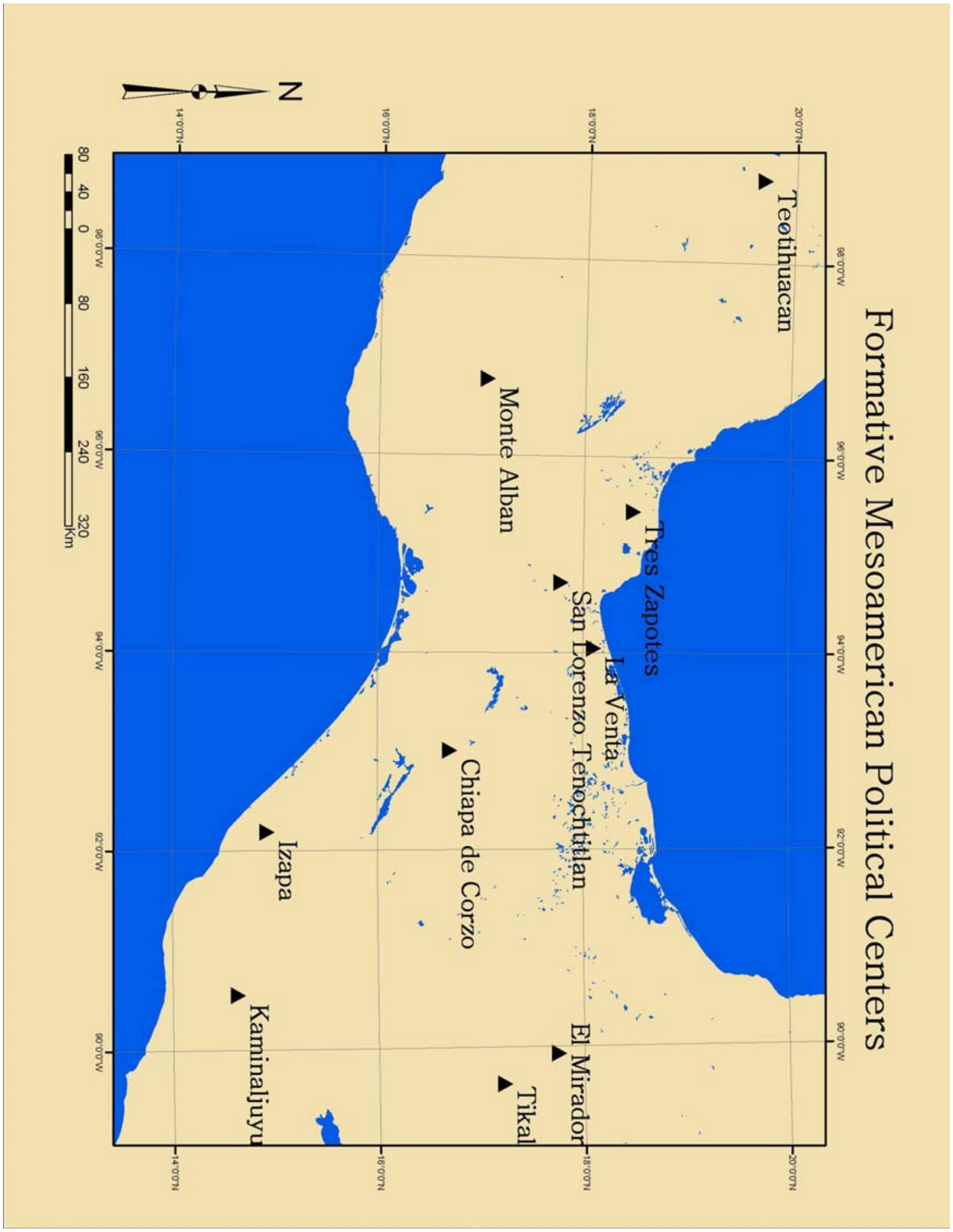


Figure 2.1. Formative Mesoamerican political centers

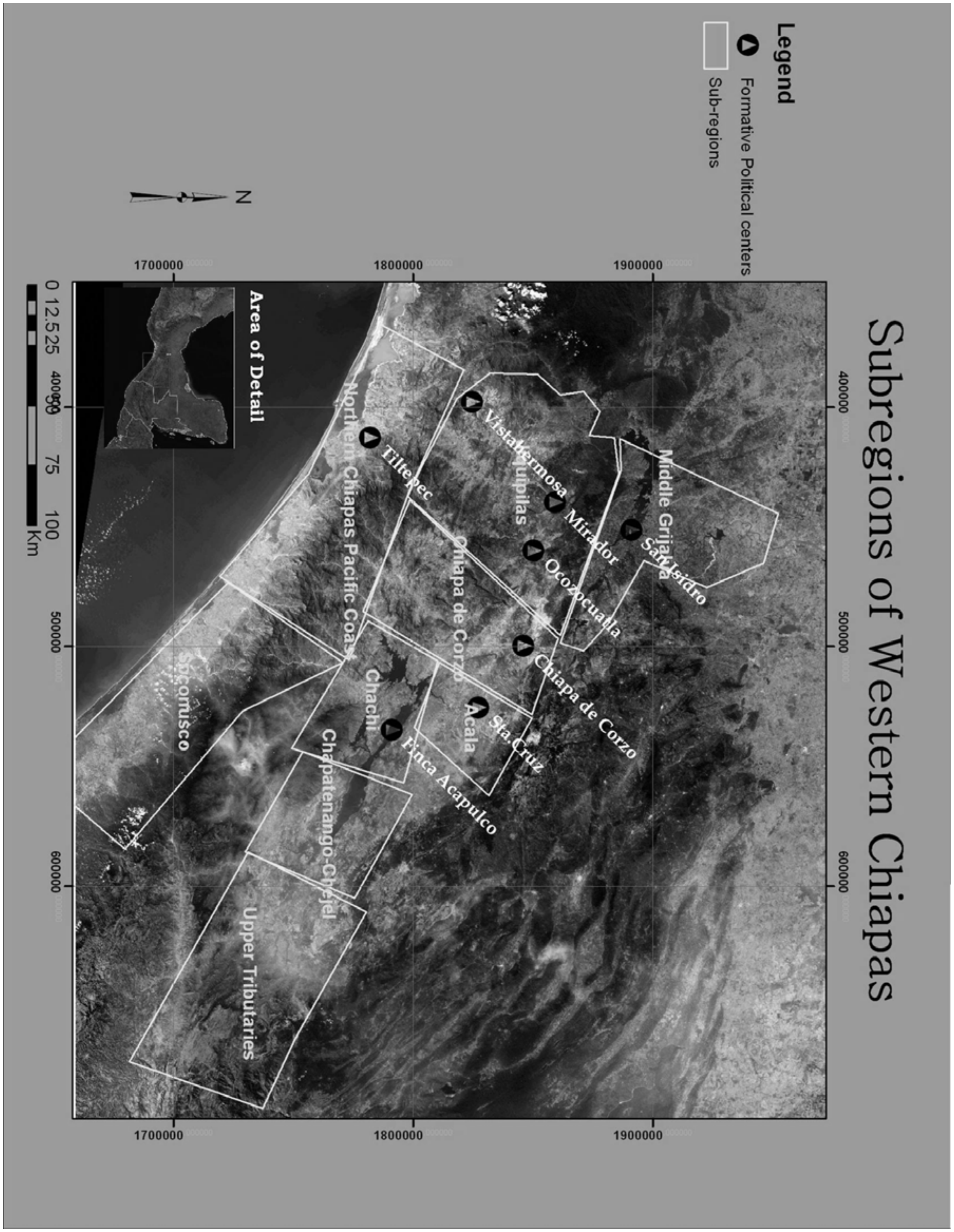


Figure 2.2 Sub-regions of Western Chiapas with Formative Period Political Centers (Sub-region boundaries based on Lowe 2005:Fig.5.5, 1959:Fig 64).

1.1 POLITICAL STRATEGIES IN THE CHIAPA DE CORZO POLITY

The full-coverage survey data utilized in this study allow for the evaluation of how the Chiapa de Corzo elite interacted with subject populations in the hinterlands and of how these populations responded to changes in political strategies at the center. Some of the drawbacks with utilizing surface data to address these problems are discussed in Chapter 2. The following outlines strategies that may have been of central importance during different phases in the development of the center.

1.1.1 The Projection of Political Power into the Hinterland

Differences in the structure of political hierarchies have figured prominently in the classification of different kinds of chiefdoms (e.g. simple vs. complex), and in distinguishing chiefdoms from states (Earle 1978; Sanders and Price 1967; Spencer 1990; Wright 1978, 1984). While these typologies, as Sanders and Price pointed out over 40 years ago, are arbitrary taxonomic pigeonholes (1967:39), the distinctions between different types of political organization and integration still provide a useful general framework for cross-cultural and cross-temporal comparisons. Putting aside, for the moment, the wide variety of ends to which political power can be applied, this section focuses on the extent to which Chiapa de Corzo elites meddled in the political structure of the hinterland, and the extent to which rulership was exercised directly from Chiapa de

Corzo versus through affiliated leaders in the hinterland. I also consider the power of hinterland leaders, as manifested in their ability to attract followers into their settlements, and their ability to mobilize labor into elite residential or civic-ceremonial constructions.

The division of levels of authority within a given political system has a strong bearing on how rulers project power through the hinterland, and correspondingly the number of these divisions has frequently been utilized to distinguish between categories of tribes, simple and complex chiefdoms, and states (Earle 1978; 1987; Spencer 1990; Wright 1977; 1984). While the identification of lower tier political centers is relatively straightforward (here second tier political centers are defined by the presence of mounded architecture, and ranked by the estimated labor investment in architecture), measuring the extent to which lower tier political centers were integrated into the polity is less straightforward. A three (or more) tiered political hierarchy can be reflected in the presence of civic-ceremonial or elite residential architecture at settlements in the hinterland, but by itself this presence does not necessarily reflect an integrated political system, as leaders at hinterland settlements may have conducted most of their affairs independently from rulers at the dominant political center.

I utilize the replication of mound arrangements found at Chiapa de Corzo at second tier centers as an indirect measure of the degree of political integration following DeMontmollin (1988a:363). I also employ a somewhat weaker line of evidence to evaluate the extent to which second tier centers were integrated into the polity, by comparing the orientation and alignment of mounds in the hinterland to the dominant alignment at Chiapa de Corzo, following Carmack and Weeks (1981:326). Where the orientation and alignment of mounds at second tier centers conform to that of the dominant center, the notion that leaders at these centers were affiliated with rulers at the dominant center is better supported than where this correspondence is absent. This is not to suggest that variation from the architectural canons of the center necessarily reflects resistance, as there is no inherent reason why rulers should be interested in controlling the layout of subsidiary centers, but variation from these canons does suggest a lower degree of interaction between rural leaders and rulers.

The 28º east of north orientation of the center of Chiapa de Corzo was common at centers throughout the Chiapas Central Depression, especially from the Middle Formative through Terminal Formative, but also present at many sites dating from the Late Classic through the Late Postclassic periods (Lowe 1959; Navarrete 1960; Sullivan 2006). It is likely that this orientation was part of a cosmology that emerged in the Middle Formative that was shared by many (but not all) ruling elites in the Central Depression. Where present at second tier settlements within Chiapa de Corzo polity, this orientation may have been followed in an attempt to reproduce the cosmological significance attached to Chiapa de Corzo and to the elites responsible for the construction of civic-ceremonial space and the direction of rituals that took place in these spaces.

I would also note that several of the second tier political centers identified in this study have very modest populations. I would also note that some of these centers have quantities of architectural investment that in other areas of Mesoamerica would be modest even in terms of undistinguished commoner households. Nonetheless, the scarcity of mounded architecture in the Formative period in this part of Chiapas makes these sites exceptional. This scarcity does not appear to be the result of long term plowing, which can obliterate traces of mounds, as most of the survey area has not been extensively plowed. The unusual architectural attributes at even the most modest of these sites suggest that individuals located at them performed uncommon roles in society. The nature of these roles is explored through other lines of evidence.

1.1.2 Elite Control over Labor

Another important aspect of the political hierarchy is in the power of elites to enlist the labor of commoners to their own ends. The most archaeologically visible and enduring result of this exercise of power is in the production of civic-ceremonial and elite residential architecture. Utilizing estimates of the volume of civic-ceremonial and elite residential buildings and labor estimates derived from ethnoarchaeological studies, I evaluate the ability of Chiapa de Corzo elites, and of hinterland leaders to mobilize labor during the five phases considered here. These calculations provide a sense of the changes in the ability of the Chiapa de Corzo rulers and hinterland leaders to mobilize public labor over the development of the polity.

1.1.3 Control over Access to Agricultural Resources

As the earliest phases considered in this study date to the end of the Early Formative and beginning of the Middle Formative, a time when increasingly productive strains of maize were developed in Mesoamerica and it began to be adopted as a staple (Arnold 2000:130; Clark and Blake 1994), I consider the evidence for changes in agricultural strategies from the Jobo to the Dili phases. For each phase I consider the evidence for centralized control over access to prime agricultural lands. The increasing importance of maize and other cultigens in the economy would have created opportunities for early leaders and rulers to establish and consolidate positions of power by establishing direct control over agricultural lands (Coe and Diehl 1989).

I measure the extent to which access to agricultural land was centrally controlled by the degree to which the population was concentrated into villages. Centralized control over agricultural lands, whether by elites at Chiapa de Corzo, by hinterland leaders, or community or kin-based organizations would discourage the foundation of hamlets on prime agricultural lands, as changes in the political fortunes of leaders or farmers could result in the loss of domestic improvements, such as houses, outbuildings, or field improvements (DeMontmollin 1989b; Kruger 1996:41-42: Netting 1993:160). While dispersed population, with settlement location favoring prime agricultural land is likely to reflect household level management of land tenure, nucleated settlement patterns may reflect a variety of extra-household (e.g. communal or centralized) modes of land tenure control (DeMontmollin 1989b:299-301).

1.1.4 Long Distance Prestige Goods Networks and Control over Obsidian Access

Control over the production, movement and consumption of prestige goods, exotic raw materials and the esoteric knowledge linked to this exchange has also been an important tool in the consolidation and maintenance of power in early polities (Blanton et al. 1996; Brumfiel and Earle 1987; D'Altroy and Earle 1985; Earle 1991; 1997; Helms 1979; Schortman, Urban, and Ausec 2001). Long distance exchange is evident for many phases of the site of Chiapa de Corzo in the form of prestige goods such as ornaments of Gulf and Pacific Coast shell, mica, jade, alabaster, and exotic ceramics. There is also evidence for the production of multiperforate ilmenite cubes that were exported to the Gulf Coast region prior to the emergence of Chiapa de Corzo as a population center.

Most exotic prestige goods are either scarce or absent in surface collections. Obsidian however, is relatively common. While obsidian was sometimes used as a raw material for utilitarian tools, the raw material itself had special cosmological and religious significance in Postclassic Mesoamerica (Saunders 2001), and it is likely that this significance has roots in the Formative period or earlier. Furthermore, there are abundant sources of chert and quartzite in the Chiapa de Corzo area that were utilized as material for flake cutting tools, making obsidian a luxury rather than a necessity in this area. There also evidence from the distribution of obsidian in burial populations at Chiapa de Corzo (Agrinier 1964) that supports the notion that it was a prestige good.

Clark and Lee observe that obsidian is present in lower densities at Chiapa de Corzo than at centers on the Upper Grijalva, which are nearer to the Guatemalan sources, but in greater densities than second and third tier settlements in the Upper Grijalva. This suggests that at least in some stages in the development of the Chiapa de Corzo polity the importation of obsidian may have been controlled by elites (Clark and Lee 1984:267). Elite control over the access of the hinterland population to obsidian should be reflected in higher ratios of obsidian in the artifact assemblages of Chiapa de Corzo. Control of access to obsidian by leaders at second tier political centers should be reflected in higher ratios of obsidian to artifact totals at these settlements.

Clark and Lee have suggested that El Chayal and San Martin Jilotepeque, the most common obsidians in the Central Depression, each moved along different trade routes (1984, 2007). This study explores the available evidence for the exercise of different kinds of control over access to obsidian from the two dominant obsidian sources through the development of the polity.

1.1.5 Control over Networks of Communication and Exchange

In addition to the control over access to prestige goods, control over regional trade and exchange networks has been proposed as an important strategy in the consolidation and expansion of political power and prestige (Carballo and Pluckhahn 2007; Clark and Lee 1984: 259-260; Cyphers 1997; Earle 1997; Symonds and Lunagomez 1997; Welch 1996; Wiessner 2002). The exercise of control over the movement of resources may be reflected in the presence of primary and secondary political centers on or near breaks and nodes in routes of communication and exchange (Cyphers 1997; Symonds and Lunagomez 1997). The location of Chiapa de Corzo three km. above the navigable terminus of the Grijalva River and about one km. below the confluence of the Grijalva and Santo Domingo rivers, suggests that control over regional trade was an important factor in the formation of political complexity at Chiapa de Corzo (Clark and Lee 1984: 259-260; Lee 1978; Navarrete 1978:86). Beyond the capital, I look for the occurrence of second tier centers on nodes between likely routes of trade and communication to address the extent to which Chiapa de Corzo rulers were exercising control over trade routes in the hinterland. Communication routes are defined by navigable rivers, modern roads, and least cost paths between neighboring political centers and Chiapa de Corzo.

1.1.6 The Use of Warfare and Coercion.

While there is little in the burial data or in the limited array of iconography from Chiapa de Corzo that suggests that warfare played a prominent role in the evolution of this polity, it should be noted that many societies with skeletal evidence for high incidence of warfare and interpersonal violence did not place a high symbolic or iconographic emphasis on the tools of war (Robb 1998; Keeley 1996). Given the evidence we have for the prevalence of warfare during the Middle Formative period elsewhere in Mesoamerica, such as the Valley of Oaxaca (Joyce 2003:196; Marcus and Flannery 1996:129-134), Central Mexico (Hassig 1992:35) and the Maya Lowlands (Brown and Garber 2003; Webster 1976; 2000), it would be premature to dismiss the potential role warfare played in the consolidation of power at Chiapa de Corzo without further evidence.

Throughout the trajectory of the Chiapa de Corzo polity there were a number of potential competitors present in and around the Central Depression (Agrinier 1970; 2000; Lowe 1959; Navarrete 1960; Warren 1978) (Fig. 2). Persistently high levels of conflict, and inter-polity disputes over territorial frontiers may have created dangerous conditions discouraging settlement in frontier areas, and resulting in vacant buffer zones between polities. This pattern has been documented for the Rosario Phase Valley of Oaxaca (Joyce 2003:196; Marcus and Flannery 1996:129-134), and in simple polities in many other areas of the world (Keeley 1996:111). Infrequent conflict between political centers may create conditions where settlement in frontier zones is a profitable strategy (either in economic, social, or political terms) for second tier elites from the center, or for rural leaders who were only loosely incorporated into the polity. The domination of neighboring centers may also have resulted in the foundation of secondary political centers in areas that were formerly vacant territorial frontiers. These secondary centers could serve as outposts facilitating the control and administration of conquered neighboring elites from the dominant center.

In addition to the defense of local territory and the conquest of neighboring centers, warfare can be used as a strategy for accumulating prestige, through the demonstration of valor in battle, favor from the gods, and in the extraction of booty or tribute from defeated enemies (Keeley 1996:115). Utilizing warfare as a strategy to accumulate or maintain power and prestige may also have the effect of generating public dependency on military leaders by creating or aggravating hostile conditions. These conditions would demand defensive organization, which the leaders would be able to provide (Hassig 1992; Hayden 1995; Keeley 1996; Spencer 1993: 40-43; Thorpe 2003; Webster 1975, 2000). Population growth in and around an emergent center increases the number of potential warriors, which may change the objectives of warfare by allowing a shift in the scale of warfare, and a change from strategies of raiding and looting to strategies of conquest and domination (Blanton 1978; Cowgill 1975: 517; Hassig 1992: 30; Redmond 1994).

The development of a class of elites may also shift the objectives of warfare away from those of raiding targeted at commoners, towards prestige oriented warfare, targeted at rulers and the physical manifestations of their power, including temples and palaces (Hassig 1992:75; Houston et al. 2006:201-203; Keeley 1996:115; Schele and Friedel 1990:145). Late Classic Lowland Maya warfare has been interpreted in this light, leading David Friedel, and others to conclude that inter-polity warfare had a relatively low impact on commoners (1986). More recent evidence suggests that many Late Classic Maya inter-elite conflicts did affect commoners (Demarest 2004:257; Webster 1998:233, 2000, 2002:338), but nonetheless, the contrast of the dispersed settlement pattern of the Early Classic and early Late Classic with the nucleated and fortified settlements that characterized the Terminal Classic (Barrett and Scherer 2005: Demarest et al 1997; Demarest 2004:527) suggests that whatever risk inter-polity warfare had placed on commoners during the early Late Classic, this risk became much more grave during the late Late Classic and Terminal Classic. This increased risk likely resulted from a change in nature of warfare, from attacks directed primarily at rulers, elites, and associated architecture, to more inclusive strategies that targeted rural settlements with equal vigor.

In this study I take the position that dispersed settlement patterns should correlate with the either the scarcity of warfare, or the presence of inter-elite warfare with relatively low impact on commoners. More nucleated settlement, especially with fortifications and preference to defendable locales, should correlate with more widespread predatory warfare and raiding targeted at commoners. Relatively peaceful regional conditions should be reflected in high incidence of settlements in frontier areas, and barring the effects of other strategies on settlement, a relatively dispersed population. While the survey area covered by this study does not extend deeply into what were likely frontier areas of the polity, it does cover areas that would have been the outer hinterland (defined as an area to which the leader would be less likely to visit with frequency than in the inner hinterland (The criteria for distinguishing these areas are discussed in Ch. 2.)). Reconnaissance and excavation data from secondary centers near the likely frontiers of the Chiapa de Corzo territory outside the survey area (Lowe 1959; Navarrete 1959; 1960; Sanders 1961) are brought to bear on the evaluation of the potential for inter-polity conflict at different points on the Chiapa de Corzo trajectory.

I also consider some indirect lines of evidence for the use or threat of violent force by rulers against hinterland populations. While the pattern of nucleated settlement described above may be a response to external threats, nucleated settlement may be the product of forced resettlement. In distinguishing between nucleation as a response to external threats or the use of violence by rulers I consider the presence or absence of vacant buffer zones in the outer hinterland of the polity, and the degree to which the location of villages and second tier centers changed between phases. The shift from a dispersed population to a nucleated population with an increase in the density of occupation in the outer hinterland is interpreted as support for the use or threat of coercion by rulers and hinterland leaders. I also consider a high degree of instability in the location of hinterland villages as supportive of the argument that Chiapa de Corzo rulers were employing coercive force in controlling hinterland populations, as this instability may have resulted from the suppression of emergent leaders in the hinterland. The potential for suppression of hinterland leaders leads us into a consideration of the formation of elite identity, polity integration and the means by which this was achieved.

1.1.7 Elite Identity, Community Identity, and Feasting

The development of an elite political identity is a central facet in the emergence of hereditary social inequality. While in some respects it is difficult to conceive of the development of an elite identity as a conscious strategy, the construction of the divide between elites and commoners, and the form this distinction takes is underlain by decisions made by early leaders with respect to their responsibilities and privileges. Likewise, the acceptance by commoners of an ideology that legitimated the position of elites as rulers and their own status as subjects is a facet of identity that would have facilitated political integration.

I examine the construction of elite identity through a consideration of the layout and architectural qualities of civic-ceremonial and elite residential architecture, and the content and context of elite and commoner burials at Chiapa de Corzo. The extent to which commoners accepted an ideology that legitimated the status divide between themselves and elites is examined through a comparison of the styles of fancy serving vessels at Chiapa de Corzo, second tier political centers and at ordinary villages and hamlets. I contend that differences between the decorative modes of serving vessels from Chiapa de Corzo and hinterland settlements may indicate differences in the acceptance of an ideology that legitimized the divide between elites and commoners, and the right of the former to rule. I also consider the similarities and differences of the architecture at second tier centers with the architecture of Chiapa de Corzo as a measure of the affiliation of hinterland leaders with the Chiapa de Corzo elite.

I examine evidence for differences between Chiapa de Corzo, second tier centers, and ordinary villages and hamlets in food serving and feasting practices. Food serving practices in general can be taken as part of the habitus of a population, an unconscious aspect of identity that only becomes obvious in the face of alternative practices. The maintenance of traditional food serving practices in second tier centers, despite changes at Chiapa de Corzo and elsewhere in the polity may indicate a rejection of changing ideologies and a lower degree of integration of hinterland leaders than where changes in serving practices at Chiapa de Corzo were universally adopted. The differences in serving practices would be most evident at feasts, where outsiders would be served in ways that contrasted to feasts at the capital.

1.1.8 Control over Ritual, Religion, and Ideology

Ritual, religion and ideology were tightly integrated into political power in Mesoamerica, as in many other areas of early political development in the world (Demarest 1992; 2004: Flannery 1972: 404; Friedel 1981; Lucero 2003). Consequently there is some overlap in the archaeological signatures of the strategic use of religious institutions and of instruments of political authority. I focus more on civic-ceremonial architecture, rather than special function ceramics (e.g. figurines, incense burners, etc.) in this analysis, partly because of the paucity of these artifacts in surface collection, but more importantly, for the central role formal civic-ceremonial complexes and their associated rituals played in the ideological legitimization of positions of authority.

The construction of large scale public spaces may have been a necessary prerequisite for the emergence of a division between elites and commoners. Correspondingly the development of large public spaces may have led to the formation of a public sense of community identity, which transcended the identities of its constituent groups (Clark 2004; Hill and Clark 2001; A. Joyce 2000, 2003; Pauketat 2000). The establishment of new religious ceremonies or the expansion of old ones can augment the status of groups or individuals who successfully sponsor them, by demonstrating the importance of their role in appeasing supernatural forces, which can eventually lead to the conception of a privileged relation between these groups or individuals and supernatural forces (Lucero 2003; Marcus 1989; A. Joyce 2000). Furthermore, local rulers may have adopted aspects of the religious practices from foreign polities to the end of enhancing their prestige and power (Drennan 1976; Flannery 1968; Helms 1988; Wilk 2004).

The creation of more restricted civic-ceremonial spaces, such as enclosed plazas and two room temples, implies important changes in the role of elites within society, and a growth in the divide between elites and commoners. An early example of the creation of a relatively restricted civic-ceremonial precinct can be found in the enclosed civic-ceremonial zone of Group A at La Venta, which has been interpreted by Reilly as a restricted access area for elite ritual (1999:25). At Monte Alban, Richard Blanton's mapping and traffic flow analysis found the least accessible area of the civic-ceremonial precinct to be a small sunken patio surrounded by three temples (1978), which may have been an area used exclusively by the royal family (Marcus and Flannery 1996:183). The adoption of two-room temples has been interpreted, based on ethnohistoric analogy, to reflect the emergence of a full-time specialized priesthood, which accompanied the formation of a state religion (Marcus and Flannery 1996:182; 2004:18259). The development of a specialized priesthood, in turn, suggests that access to important aspects of the supernatural was more restricted than in less specialized religious organizations.

The development of restricted access ceremonial spaces thus suggests an amplification of divisions between the ritual practices of elites and commoners. These developments would have increased the importance of elites as intermediaries with the supernatural. At Chiapa de Corzo increasingly restricted civic-ceremonial spaces developed over time, and I explore the implications for changes in the control over ritual and ceremonial activity in the organization of civic ceremonial and elite residential architecture within Chiapa de Corzo for each of the phases considered in this study.

I further explore architectural evidence for the organization of public rituals in the hinterland, and for changes in the structure of ritual over time. The replication of mound and plaza arrangements present at Chiapa de Corzo at hinterland settlements may represent either the performance of rituals and ceremonies associated with Chiapa de Corzo elites, while the construction of mound arrangements without correlates at the capital may reflect the performance of ceremonies that were unrelated or only loosely related to those at Chiapa de Corzo. As noted above, the Chiapa de Corzo alignment of 28º east of north is common in Formative period centers in the Central Depression (as well as Late Classic period) and this orientation likely held a cosmological significance (Sullivan 2007b). The presence of civic-ceremonial complexes or elite architecture in the hinterland that followed this alignment would suggest that leaders in these communities shared the religious and cosmological precepts held by the ruling elite. Deviation from this alignment may reflect less than full adherence to the religious and cosmological precepts held by the ruling elite. This deviation should not necessarily be viewed as resistance to the dominant ideology, as ritual and ceremony in the hinterland may have complemented rather than challenged the dominant ideology and may have been more attuned to local concerns.

1.1.9 Summary

The goal of this study is to arrive at a better understanding of early Mesoamerican political development through the exploration of changes in these eight fields of strategic action in the Chiapa de Corzo trajectory. The development of early Mesoamerican polities was characterized by change in a number of different strategies used by leaders and rulers and continuous changes in the relations between rulers at the center and the hinterland population. This study examines evidence for the ways in which eight fields of strategic action were utilized by rulers and the ways in which commoners responded to these strategies over the development of Chiapa de Corzo as a political center. Through a focus on the strategies that were employed by rulers in governing hinterland populations we can arrive at a better understanding of the development of rulership at Chiapa de Corzo specifically, and more generally the development of early rulership in Mesoamerica.

2. METHODOLOGY AND FIELD CONDITIONS

2.1 NATURAL ENVIRONMENT

The site of Chiapa de Corzo and the surrounding study area are located in the Central Depression of Chiapas, which lies between the Sierra de Chiapas to the North and the Sierra Madre to the south. Elevations within the study area range from 400 m to 625 m above sea level, with most of the study area located between 450 and 550 m above sea level. The presence of the Sierra Madre to the south creates a rain shadow effect in this area (Lowe 1959:22), resulting in a tropical sub-humid climate that contrasts strongly with the very humid environments of the Pacific Coast to the south, and the Chiapas plateau and the lowlands to the north. Following 15 year climactic data from Tuxtla Gutierrez (Wernstedt 1972), temperatures average 24ºC (75ºF) and annual rainfall averages 956 mm, with the rainy season lasting from June through November. The rainy season is occasionally interrupted by a brief dry season, known as the *canicula*, occurring between July and August. Local informants observe that rainfall is highly variable throughout the study area, with consistently less rainfall in the southern margins, especially around America Libre and along the road to the Angostura. Consequently this area suffers from droughts with slightly more frequency than areas to the north or south.

Rainfall levels are also higher at the base of the Sierra de Chiapas, on the northern limits of the survey area on the lands of the Ejido Nucatilí. Lowe interprets his observations of soil profiles along the Grijalva River to suggest episodes of extreme flooding and erosion along the tributaries flowing from the Sierra de Chiapas (1959:2) Lowe points to this evidence for irregular precipitation (droughts interspersed with episodes of flooding) as one of the main unfavorable aspects of the Central Depression for human occupation.

Two third order streams flow through the study area, the Grijalva River, which originates in the Upper Central Depression, and the smaller Santo Domingo, which flows out of the Sierra Madre. The modern construction of hydroelectric dams has substantially changed the character of the Grijalva River. Both the Grijalva and the Santo Domingo rivers would have been navigable by canoe within the study area, although the Grijalva had several portage points upstream in the Angostura Canyon, and about 5 km downstream from Chiapa de Corzo the Grijalva River ceased to be navigable as it dropped precipitously into the Sumidero Canyon. The Santo Domingo would have been navigable in small canoes up to its emergence from the Sierra Madre. The Suchiapa river, a second order stream that flows into the Santo Domingo near the southwestern limits of the study area would have been navigable during the rainy season, but less so during the dry season, as its water levels become very low (personal observation 2005).

The Grijalva River has been dammed both upstream from Chiapa de Corzo at the Angostura Dam, and downstream with the Chicoasen Dam filling the Sumidero Canyon. These dams have largely stabilized the water levels of the Grijalva River, reducing the occurrence of rainy season floods and keeping water levels relatively high during the dry season. Despite these controls of the Grijalva, seasonal floods still occasionally occur, especially downstream from the confluence of the Grijalva with the Santo Domingo, as exemplified by the destruction of the Chiapa de Corzo boardwalk during the rains that accompanied the entry of Hurricane Stan in October 2005. Local informants who farm the floodplains below Chiapa de Corzo observed that the Grijalva river floods were a mixed blessing, sometimes destroying crops but bringing in rich silty soils, and at other times destroying crops and leaving nothing but sand on the alluvial plain. The Santo Domingo River occasionally jumps its banks and alters its channels during the rainy season, creating risk for floodplain and first terrace cultivation on its margins.

There is limited use of pump and well irrigation in the area today, and no evidence for prehistoric irrigation systems has been found in the study area. Pot irrigation with river and spring water may have been utilized but would have been labor intensive for all but the fields closest to water sources. The Santo Domingo River would have been more amenable to pot irrigation than most of the Grijalva river area, as much of the latter is flanked by steep slopes through much of the study area. In contrast to the Upper Grijalva River area (DeMontmollin 1989b:296; Wheeler 2008), there is also no evidence for Prehispanic terracing of hillsides.

Soils vary widely in the study area, including various combinations of regosol, litosol,, luvisol, vertisol, phaeozem, and rendzina horizons. Locally, soils are referred to by color an/or chatacteristics (tierra negra, tierra roja, tierra blanca, tierra meca, and tierra barreal (clay)). Modern agriculture in the area is intensive, relying heavily on the use of fertilizers, and extending into soil zones that would otherwise be extremely marginal (personal observation 2005).

The site of Chiapa de Corzo proper is located on medium textured dark brown to black regosols and lithosols (INEGI), with abundant limestone cobbles. On the first terrace, and in the valley directly below (and south of) the site the soils are classified by INEGI as a mix of regosols, and vertisols, none of which are especially productive. While most of the INEGI soil classification map accords well with field observations, it appears to be in error for this important area, as these soils appear to be fine to medium cambisols or luvisols. Members of the field crew, professional farmers, commented that the soils of the first terrace below Chiapa de Corzo were of better quality than any of the others we had covered in the survey area.

Bedrock in the study area is primarily sedimentary, varying between limestone and sandstone conglomerates. Chert and quartzite cobble are present in a number of soils within the study area, especially on the lands of the Ejido Ampliación Zapata, to the west of the Grijalva River, and in the low hills to the east of Playa Grande, about four km to the east of Chiapa de Corzo, north of the Grijalva River. Igneous rock formations were noted at the site of Nucatilí, at the base of the Sierra de Chiapas, where there is evidence for Classic Period metate production. Andesite cobbles were also noted on the surface on parts of the Ejido E. Zapata, to the east of the Grijalva River.

Natural vegetation in the study area is variable, but generally corresponds to a tropical sub-humid environment, including short scrub savannah,, thorn forests, Nangaña (*Gymnopodium antigonoides*) forest, and mixed tropical deciduous forests. Bordering the rivers, and at the base of Cerro Hueco, are stands of tropical evergreen forests. Most of the study area has been cleared for cultivation, with a small percentage in pasture and a larger percentage under forest of varying ages. Surface visibility varied from the start of the survey season to the end, with the highest visibility present toward the end of May, when some farmers burn their fields and many fields are cleared for cultivation.

Agriculture in the municipality of Chiapa de Corzo is marginally more productive than the state average, and more productive than municipalities to its north, east, and west, but less productive than those to its south (SAGARPA data from 2003-2004). These data may not, however, be reflective of Prehispanic levels of agricultural production, as my impression is that genetically modified maize has been more readily adopted by the Mestizo population of the Central Depression than by the Maya of the Chiapas highlands (personal observation 2005).

As noted above, irrigation is not heavily employed in the Chiapa de Corzo municipality and maize agriculture is limited to a single wet season harvest. In parts of the study area where maize agriculture is less productive, such as in the iron rich soils around the community of Nueva Palestina, Jocote trees are very productive and heavily cultivated. In parts of the flood plain and on the first terrace, other native and introduced fruit trees are cultivated, and it was likely that arboriculture was an important activity in Prehispanic times. Cotton was introduced into the Chiapas Central Depression briefly in the mid 20th century (Ulloa et al. 2006:662), but was rapidly abandoned. Nonetheless, a variety of the most commonly cultivated cotton in the world, *Gossypium hirsutum L.* , commonly known as Acala cotton, derives its name from a town 40 km to the east of Chiapa de Corzo in the Central Depression (Ulloa et al. 2006:662). However, botanical evidence needed to address the importance of Prehispanic cotton production within the study area is lacking. Evidence for cloth production from cotton (or other fibers) in the form of spindle whorls is very scarce in the study area.

2.2 FIELD METHODOLOGY

The field methodology utilized in this survey builds off of the pioneering work done in the Basin of Mexico (Sanders, Parsons, and Santley 1979), and in the Valley of Oaxaca (Blanton et al. 1982). Among other things, these surveys demonstrated the utility of calculating artifact densities in arriving at population estimates. However, as it has been pointed out (O'Brien and Lewarch 1992), the evaluation of artifact densities and the phasing of occupations based on field observations in the Valley of Oaxaca survey were prone to a number of errors. O'Brien and Lewarch argue that these errors are inherent in methodologies that use subjective estimates of sherd densities and grab samples rather than controlled collections. Drennan et al. (2003) have demonstrated the utility in employing controlled surface collections in estimating changes in relative population densities over time. Furthermore, controlled 100% collections minimize the risk of collection biases towards fancy, decorated, or otherwise more interesting ceramics. While controlled collections can take slightly longer than grab samples, frequently they do not (personal observation, Tepeaca Acatzingo Survey 1995), and the data they provide are more useful than subjective estimates of densities, which can differ between individuals, and are less precise (Blanton et al. 1982:9; Kowalewski et al. 1989:25).

Controlled collections also alleviate the problem of distinguishing "sites" from "background noise" (Gallant 1986), as all areas where artifact densities are high enough are subjected to these collections, whereas lower density areas receive general collections. Contiguous collection units can be viewed as delimiting traditionally defined sites, and collection units that did not meet density thresholds for controlled collections can either be viewed as background noise, or viewed as sites, depending on what threshold the analyst is employing to define these units. As noted below, in this project general collections were not included in the analysis, and as such are treated as background noise.

The strategy of systematic full coverage survey was employed here rather than a probabilistic sampling strategy, as the former is more suited to the collection of information on settlement hierarchies, the spatial relationships of settlements, and the range of variability among settlements (DeMontmollin 1988a:164; Kowalewski et al. 1989). Settlements were identified as relatively dense surface distributions of artifacts surrounded by areas of sparse or no artifact distribution. Settlement outlines were determined by calculating the distribution of phased ceramics within controlled collections utilizing a kernel density analysis provided by Crimestat (Levine 2004). Ideally a full coverage survey should be able to identify all levels of the political hierarchy and the settlement hierarchy, however, as discussed below, it is unlikely that the survey extended over the full territory of the Chiapa de Corzo polity.

The survey was conducted by a single team consisting of four to five people (me and three to four local workers) walking transects generally spaced 50 m. apart, with the interval occasionally decreasing to 20 m. or less as surface conditions and property lines demanded. Controlled surface collections were taken from every hectare in which artifact densities met or exceeded 0.5 sherds per meter. These collections gathered all artifacts within a 3 meter radius circle (area=28.2743 m^2), delimited with a stake, a leash, and outlined and cleared with a machete. Controlled collections were plotted directly using a GPS, or by estimates derived from workers descriptions of their location within a field relative to a point established with the GPS. Data were entered into a GIS database (ESRI ArcMap 9.0) on a daily basis. Where artifact distributions fell below 0.5 sherds per square meter, general collections were made; with each plot collected separately (plots often exceeded single hectares). Supplemental collections were occasionally made where mound cuts were observed, or where interesting ceramics were found in hectares where controlled collections had been made.

Bags were tagged inside and out, with each tag containing UTM coordinates (which served as the unique identifier), property name (or property owners name), and date, which served as further controls on location. Tags also recorded the collector's initials, to control for individual biases; vegetation, to account for visibility; and soil type to provide detailed data on local agricultural conditions.

A total of 622 controlled collections (Figure 2), approximately 1500 general (Figure 2 .1 Distribution of controlled collections) and 425 supplemental collections were made. General collections were collections made in hectares that had ceramics, but in densities too light to merit a controlled collection. These collections are from single or double transects, with a center point located approximately at a midpoint in the collection area. Supplemental collections were additional collections made in hectares which had controlled collections. These supplemental collections frequently included interesting or especially diagnostic sherds.

Due to time constraints in the laboratory, most of the general and supplemental collections have not been analyzed, and consequently there is some bias in this data set toward recognizing more densely occupied sites, and sites that were occupied over multiple phases. The abundance of unanalyzed collections, which likely represent farmsteads with light, or short term occupation, should give us some pause in placing too much weight on the relatively high degree of nucleation in settlement patterns. Future analysis of the general collections in this survey may bolster or undermine some of the conclusions presented in this paper.

The total count of rims and diagnostic sherds from controlled collections was 5219, approximately 29% of which (mostly rims) could not be attributed securely to a specific phase. The sample of diagnostic sherds constitutes approximately 13% of all ceramics collected, most of which were plain or eroded body sherds.

Survey coverage averaged about 0.92 km per day, in 114 days of field work, to a total of approximately 105 km^2. (excluding approximately 3 km^2 of rivers in the survey area). A total of 163 sites (defined by concentrations of all artifacts or architectural features separated by 100 m. or less) were recorded by this project, with occupation from the Early Formative through the Colonial Period. Most of the survey area is readily accessible, although heavy vegetation in some areas slowed progress, and the road access ranged from difficult to impossible in some areas. Permission was readily granted to access the majority of the survey area, but securing permission from absentee landlords, tracking down local landlords, and organizing meetings with the communal landholding groups (*ejidos*) required time. In two (out of seven) cases ejidos denied permission to enter their lands, but these ejidos were on the margins of the survey area and did not substantially affect the continuity of coverage. Several landowners either could not be reached or denied entry, which resulted in a few gaps in the full coverage.

About 49% of the survey area consisted of agricultural lands with medium to high visibility, and about 51% was in medium to low visibility forest cover. In areas where visibility was low we frequently, but not always, conducted 3 m radius machete clearings in each hectare, and took advantage of rodent burrows to detect ceramic concentrations. Consequently occupation in areas with low visibility, including the slopes of Cerro Hueco, the northern part of the ejido Ampliación Zapata, and a forested area of about 46 ha in the ejidos of El Amatal and America Libre, was sampled less intensively than other areas, and as such occupation may be underrepresented in these areas.

Alluvial deposits introduced further impediments to visibility, especially along the margins of the Santo Domingo River, and along some of the margins of the Grijalva River. Modern clay quarries, which are common along the margins of the Santo Domingo provided some remedy to this problem, frequently revealing buried occupations, but also suggesting that a good deal of occupation in the alluvial plain, and on the first terraces around the river, remain undetected, especially for the early Cotorra, Jobo, and Dili phases. On the other hand, artifact distributions around these quarries are often more concentrated than in other surface contexts, because they consist of sherds cast off by workers in the process of making bricks. As such, controlled collections from these areas may reflect artificially high concentrations of ceramics compared to non-quarry contexts. In terms of total population estimates these two factors may come close to balancing each other out, but the extent to which this is the case is uncertain.

To deal with this potential bias imposed by different contexts I multiplied the counts of diagnostic ceramics from controlled collections from excavated contexts by a factor that reduced the highest value to conform to the highest count of diagnostics from collections of ordinary contexts for that phase. The resulting transformation reduces the highest value of Dili phase quarry collection with 24 diagnostic sherds to 9 sherds, and the values of all other Dili phase quarry contexts are adjusted using the same transformation (e.g. multiplied by 0.375). For each phase the transformation is correspondingly distinct.

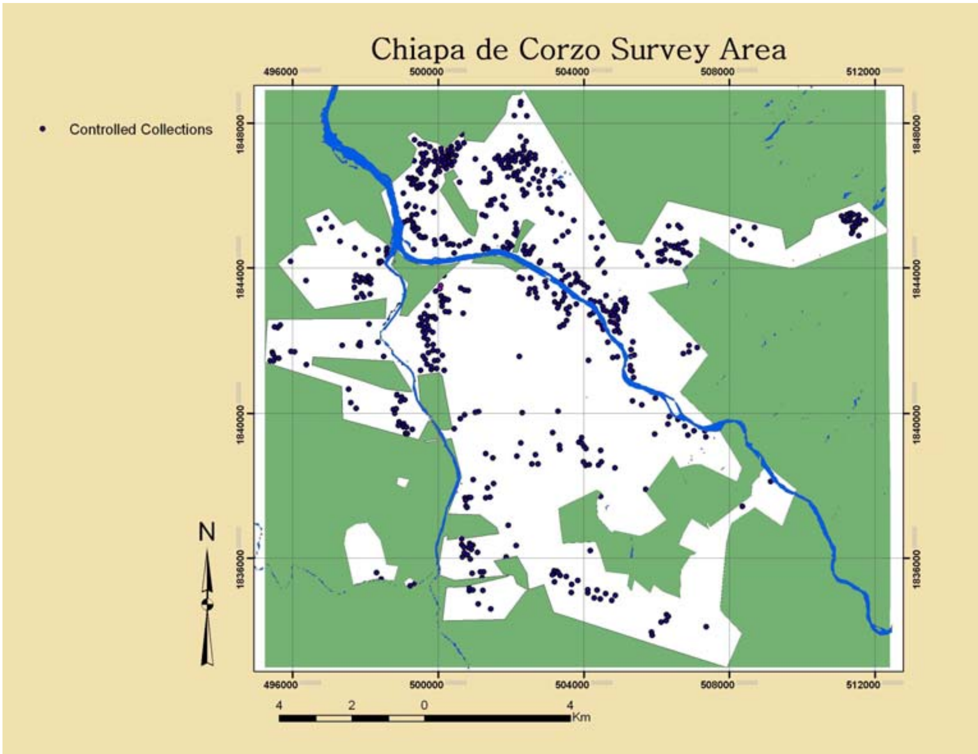


Figure 2 .1 Distribution of controlled collections

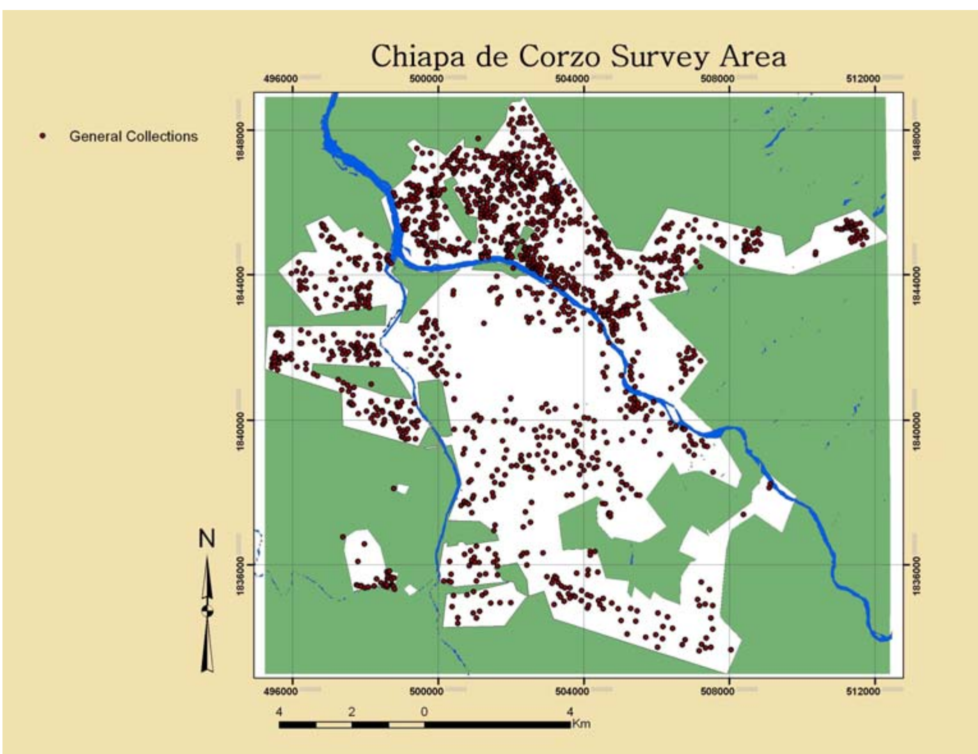


Figure 2. 2 Distribution of general collections

2.3 ANALYTICAL METHODS

Artifact analysis was conducted at the New World Archaeological Foundation (NWAF), in San Cristobal de las Casas, Chiapas, and was greatly assisted by the NWAF's extensive comparative collection from excavated contexts at Chiapa de Corzo, and elsewhere in the Central Depression. As of 2009 the collections from this survey are archived at the NWAF laboratory in San Cristobal. The ceramic sequences for the Early through Late Formative period Central Depression are fairly tight, with phases of 150 to 250 years established through the correlation of changes in ceramic styles to dated excavation contexts (Clark and Cheetham 2005). Ceramics from the Early Formative through Proto-Classic periods were classified primarily following Clark and Cheatham (2005). In the ceramic analysis I recorded information on basic vessel form, sidewall attributes, lip attributes, and other decorative features, wall thickness and estimated vessel diameter (See Appendix A). Due to time constraints detailed coding for these features was done for only about 56% of the sherds from the controlled collections, with collections selected more or less randomly (a higher percentage of collections from Chiapa de Corzo were coded for all features relative to hinterland collections) . The remainder of sherds was coded using a quick analysis, which coded for type and basic vessel form with a brief description for sherds with unusual features.

Before entering into a discussion of how population estimates were extrapolated from sherd densities, I would note that about 87% of the ceramic totals in the collections were non-diagnostic, most of them body sherds. Approximately 20% of the rims were non-diagnostic. The high frequency of non-diagnostic sherds should give us some pause in our confidence in the results. One solution I considered was dividing the sherd totals in each collection by the proportion of diagnostics from each phase present in the collection. Ultimately I rejected this solution, as it has the potential to exaggerate any problems inherent in the analysis. While this problem remains a concern, we currently have no reason to suspect that the number of non-diagnostic sherds is heavily weighted towards any of the phases considered in this study. They are of greater concern in considering the Terminal Formative through Postclassic phases, which have more poorly defined ceramic sequences.

2.3.1 Population Estimates

One of the key advantages of systematic regional surveys is that they provide data amenable to the calculation of long-term regional demographic trajectories. Changes in population size figure prominently in many arguments addressing the emergence and development of socio-political complexity, the degradation of natural environments, and the onset of political collapse. Absolute estimates of population size are key factors in calculating the potential pool of labor that could be mobilized for public works projects, warfare, and the generation of agricultural surpluses.

Many different methods have been used in surface surveys to calculate regional populations such as counts of sites, total area of sites, counts of sherds, counts of collections, or counts of structures (Drennan et al. 2003:154). Utilizing counts of structures in this study area is not practical as the remains of residential structures are scarce in all but the latest phases, and even in these phases they are uncommon. Drennan et al. (2003) provide a clear discussion of the problems with each of these methods, and suggest a solution in the development of an index that combines sherd density and area, in what they term the Density Area Index (DAI). The DAI, as implemented in this study, is calculated by taking sherd per meter values from controlled collections and multiplying these values by the area represented by each collection unit. In contrast to the Drennan et al. study, which utilized the delineation of agricultural plots to outline collection units of approximately one ha each, I employ one ha circular buffers around each collection as a collection unit. Where buffers overlap, the combined area of the merged buffer is used as the collection unit. These buffers were not used to calculate settlement area. As discussed below, settlement area was calculated utilizing a kernel density interpolation (Figure 2.3 a-c).

This method works on the same principles as the methodology of Sanders, Parsons, and Santley (1979) but with the added rigor of controlled collections, instead of the subjective (but faster) visual estimates of densities utilized in their study. The use of the DAI allows for the systematic treatment of differences in artifact density that is ignored by methods that rely exclusively on settlement area. Utilizing the DAI, a settlement of 1 ha with 10 sherds per ha is allocated the same population value as a 10 hectare settlement with 1 sherd per ha. As the phase lengths utilized in this study are variable, I standardize the DAI values by dividing by the number of centuries represented by each phase (DAI/C). This compensates for the fact that a greater amount of garbage should accumulate over the span of longer periods than through shorter periods (Drennan et al. 2003: 159).

A significant assumption accompanying the use of the DAI/C for comparisons of population densities and distributions between phases is that ceramic consumption levels per person remained the same over time (Hassan 1981:78). While this assumption should not be controversial, having been at the core of population estimates in many seminal settlement pattern studies starting with Sanders, Parsons and Santley (1979), a number of economic, social, and environmental factors could influence rates of ceramic production and consumption over time. Drennan et al. point to a solution for controlling for this potential variability, through observations of surface densities from sites with preserved residential architecture from each period under consideration (2003:159). With these data, the DAI/C to absolute population conversion can be adjusted for each phase. Unfortunately, in this study area, the remains of residential structures are all but absent for all phases except those from the Late Classic and Postclassic periods, making this correction untenable for the majority of phases.

Utilizing the DAI/C for comparing patterns of population distribution and density within phases also relies on the assumption that ceramics were consumed at a relatively constant rate across all kinds of settlements, which may also be false for the same reasons (Kowalewski 2003:68). With these caveats in mind, artifact densities and distributions remain the best line of evidence available for both delineating settlement boundaries, and arriving at population estimates in areas where the remains of residential architecture are rarely visible on the surface, such as is the case in this study area.

Four methods of calculating demographic change (all uncorrected for phase length) are outlined in Figure 2.3. Each of these figures charts broadly similar trends, which is encouraging, for as Drennan et al. (2003) point out, this suggests that the trends are real, and not simply the product of the vagaries of sampling. There are, however, some differences in the trends outlined in these charts, which are products of the biases of the different methods. The chart of total diagnostic sherd counts (Fig 2.1 C) is almost identical to the DAI chart (Figure 2.3 A), with the exception of stronger changes between phases. The strongest differences from DAI values are in total settlement area, and total number of settlements (Figure 2.3 B and D), which both show a slight population decrease from the Guanacaste to Horcones phase in contrast to the increase depicted in both the DAI and the ceramic count charts.

The DAI/C creates few significant changes, generally reducing the difference in population change between phases (Figure 2.4). The DAI/C also reduces the severity of the population drop from the Dili to Escalera phase, and converts the change from the Escalera to Francesa phase to a slight population increase rather than the decrease charted for the uncorrected figures.

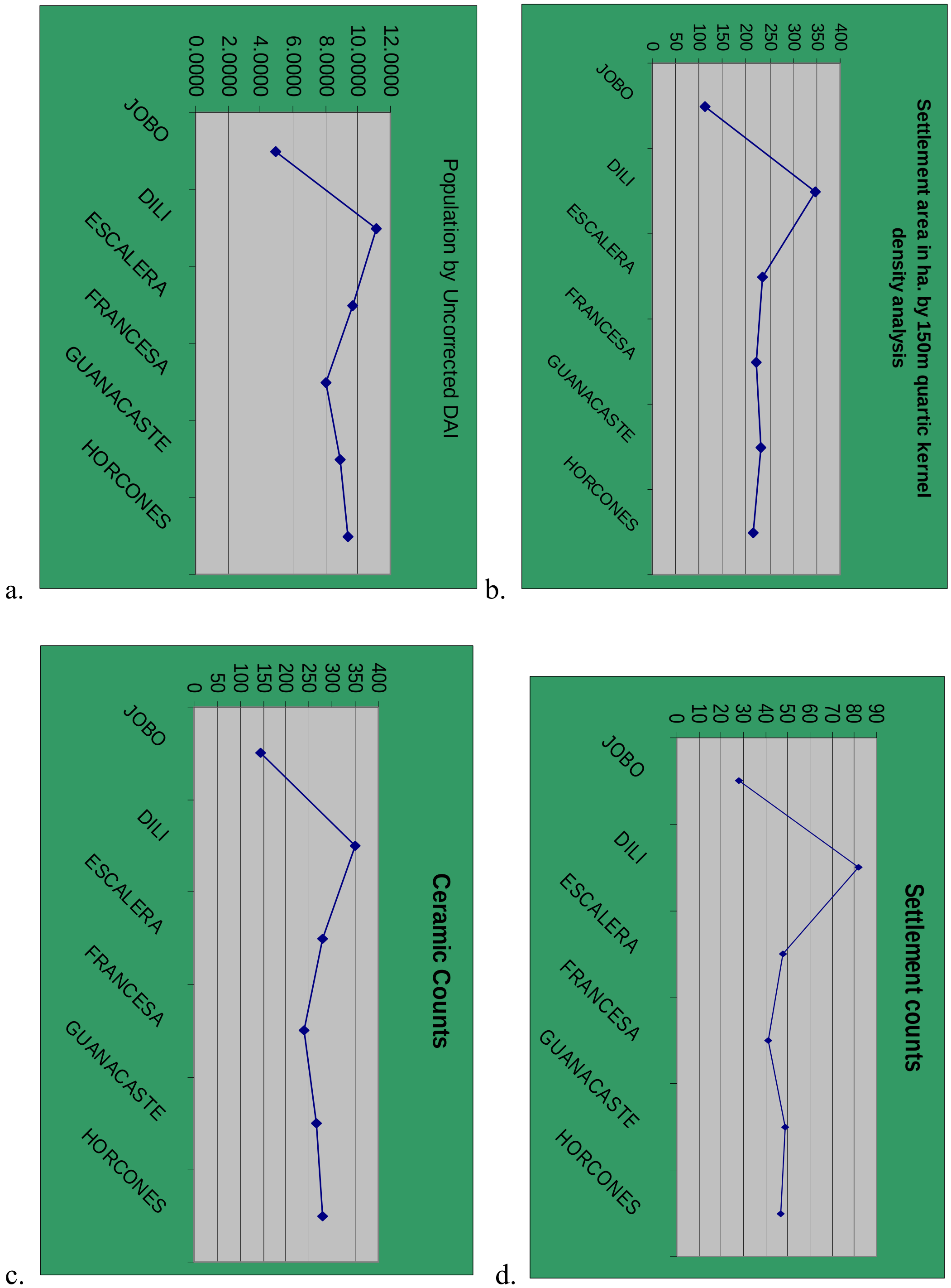


Figure 2. 3 Measures of demographic trends in the study area: a. Population estimates by uncorrected DAI, b. Settlement area by quartic 150m kernel density interpolations in ha, c. Ceramic counts, d. Settlement counts.

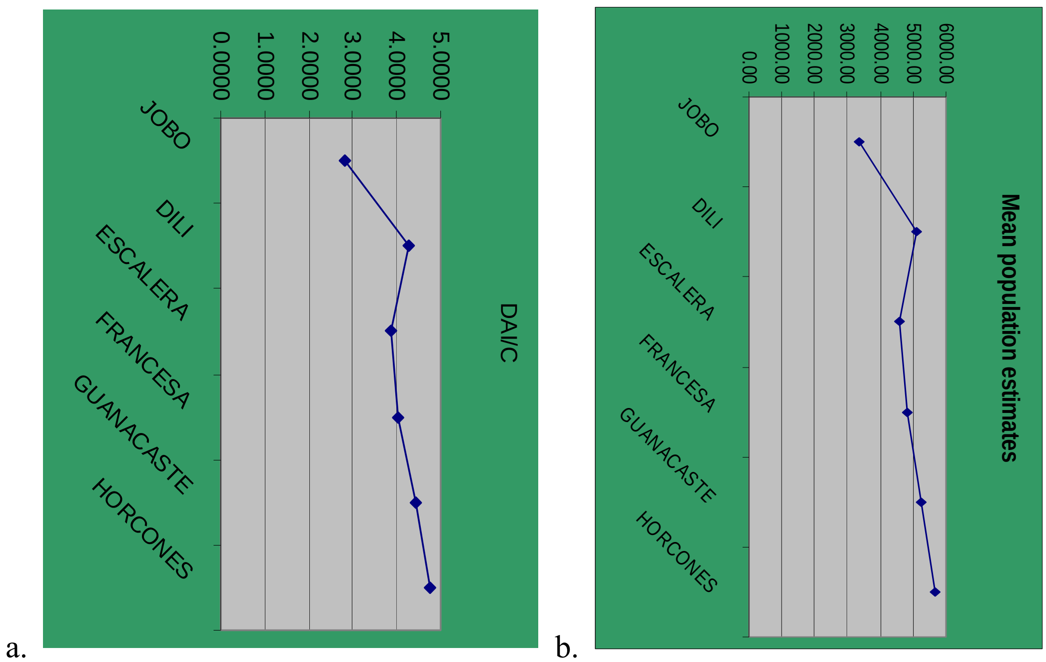


Figure 2. 4 a. Demographic trends in the study area by DAI/C. b. Demographic trends with mean population estimates for study area.

2.3.2 DAI/C to Absolute Population Conversion

Estimates of absolute numbers of people have always been somewhat problematic in archaeology (Blanton et al.1982; Kolb 1985; Sanders, Parsons, and Santley 1979), but these estimates are ultimately valuable as they are central to identifying the scale of polities and societies (Blanton et al. 1993; Feinman 1998). The quantity of people integrated into a system can limit or facilitate the formation and operation of different kinds of political, economic, and social systems (Blanton et al.1982:24; 1993:15-16; Feinman 1998:97-98). Likewise, competition over prime agricultural land and other resources is likely to intensify with larger populations (Carneiro 1970; Keeley 1996:129).

High and low population estimates in this study were calculated by converting the DAI/C values from sites by factors derived from two baselines. The first of these, following the methodology of Drennan et al (2003:162), was established from counts of likely residential structure foundations at the predominantly Postclassic Chiapanec site of Nandalumí (the only site in the survey area with abundant visible house foundations). Residential structures at this site average 56 m^2. The total count of house foundations and platforms (112) was multiplied by 5.5, an estimate of average house occupancy based on mean values observed in ethnoarchaeological studies of household size in a number of different areas in the highlands of southern Mesoamerica (Kolb 1985:586). These calculations provide a population estimate for Nandalumí of 616 (16 people per ha with the site boundaries defined by kernel density analysis) during the Paredon-Ruiz phases.

This method is not without its problems: there are no direct data on household sizes for the Chiapanec, which may or may not have ranged around 5.5 people; some structures at the site may have been entirely ephemeral and invisible on the surface; all structures may not have been occupied contemporaneously; and the settlement may not have been occupied over the entire span of the Ruiz-Tuxtla phases. Because of the possibility of missing structures, all of the residential structures are considered occupied in this analysis. In any case, this method provides an empirically based standardized baseline, however flawed, from which to calculate absolute population values. The DAI/C value for this phase of the settlement was then divided by the population to arrive at a value by which all other DAI/C values would be multiplied (801.92), for their respective absolute population estimates. I employ this conversion factor for the low end population estimates.

The high end population estimate is derived from extrapolations from the center of Chiapa de Corzo during the Postclassic, and also has some problems. First Diaz's population estimate of 4000 “vecinos” for the settlement must be considered carefully. Diaz states that the city of Chiapa:

> “verdadamente se podía llamar ciudad, y bien poblada, y las casas y calles muy en concierto, y de mas de cuatro mill vecinos, sin otros muchos pueblos subjetos a el questaban poblados a su rededor. . .” (2001:521).

In Navarrete (1966:18), Diaz’s “vecinos” are translated as inhabitants, which is likely an artifact of the translator rather than the author’s intent, as this would be an unusual interpretation of the term. In colonial records “vecinos” generally refers to taxable households (Sanders 1976:108) and in modern usage as neighbors. Diaz’s estimate has been used in the conventional manner by subsequent researchers in calculating the population of Chiapa de Corzo at contact (deVos 1994:46; Gerhard 1993: 158).

Given that the term “vecinos” was used to refer to households in Mesoamerica, rather than individuals, if we take Diaz’s figure at face value, and assume an average family size of 5.5, this results in a population of 22,000 for the Chiapanec capital. By my calculations from the colonial maps provided by Navarrete (1966), and of areas with evidence for occupation delineated by Navarrete’s excavations and observations on sewer trench excavations (1966:35-39, Figure 14), the area of Chiapanec settlement at Chiapa de Corzo measured about 98.3 ha. This area is slightly over the median 90 ha area measured by Michael Smith for Mesoamerican urban centers in the Postclassic, and well over the 15 ha. area median measured by Smith for southeastern Mesoamerican urban centers (2005:410). [2] These calculations would provide a population density of just under 225 people per ha, a figure that seems unreasonably high for Postclassic Mesoamerica.

[2] My calculation of the area of Chiapa de Corzo should be taken as tentative, and could certainly be improved upon by future field work, even with most of the Chiapanec occupation overlain by modern settlement (e.g. Smith et al. 1994), but it currently stands as a reasonably informed estimate.

To put this figure in perspective we should consider that the estimated population density at Tenochtitlan, one of the most densely populated Mesoamerican cities, ranges between 125 people per ha. (Sanders 1976:149), to 170 per ha (Sanders and Webster (1988:535).

Colonial records suggest that by 1571 Chiapa de Corzo had over 4000 houses, and there is a historical account by Velasco, who traveled in the region from 1571 to 1574 that this city had over 26,000 inhabitants by this time (Navarrete 1966:100). The figure of 4000 families is repeated by Gage in his description of the city in the second decade of the 17th century (Navarrete 1966: 19). However, by 1571 the Spanish practice of "congregaciónes" or forced resettlement of population into towns and villages was in full effect (Navarrete 1966:19; deVos 1994:57) and consequently it is a reasonable assumption that Chiapa de Corzo would have grown in the 50 years of colonial administration. There are no reliable records of the effects of the Spanish congregaciónes on the population of centers in Chiapas, or elsewhere in Mexico (Sanders 1976:146), nor of the effects of European diseases on the Chiapanec population. As such it is impossible to arrive at a reliable figure at which towns might have grown over this period of social and demographic change.

Perhaps more notable is Diaz's more vague observation that Chiapa "could truly be called a city, [as it was] well populated, with a well organized layout of houses and streets" (Diaz 2001:521, my translation). This is one of the few population centers specified in Diaz's narrative as having the characteristics of a city, and as such it should probably be viewed as exceptional in terms of pre-conquest population. The city would be exceptional in size at 4000 people, but the fact that Diaz uses the term "vecinos" suggests that whatever the size of the population was, it was larger than 4000 people.

Applying the maximum population density estimate for the Basin of Mexico of 130 people per hectare (Sanders et al 1979: 37) to the 98.3 ha area suggested for Chiapa de Corzo by colonial maps and Navarrete's (1966) study of the center, provides a population of 12,778 for Chiapa de Corzo. This figure lies on the upper limit of Prehispanic Mesoamerican urban population densities.

While acknowledging that the foundations for this estimate are not strong, I utilize the figure of 12,778 for the Ruiz-Tuxtla population of Chiapa de Corzo as a baseline for the upper population estimate. In order to turn this figure into a conversion factor for other settlements in the survey area, I take the mean sherd per meter values from 11 collections on the outskirts of the modern (and Postclassic) Chiapa de Corzo and multiplied this value by the area of collection units that would have fit within the estimated area of the Chiapanec settlement. This provides an extrapolated DAI value for areas of the Chiapanec settlement underneath the modern city that were not surveyed. The extrapolated DAI/C value for this phase of the settlement was then divided by the population to arrive at a value by which all other DAI/C values would be multiplied (157.69) for their respective absolute high population estimates.

I utilize the mean of these high and low estimates as the standard reference for population estimates in the following analysis, with a ± factor calculated between the high and low estimates. Because of varying phase lengths and the use of the DAI/C transformation, the minimum population size for settlements varies from phase to phase. This should not be taken to suggest that household size varied significantly over time, as the DAI/C correction merely serves to standardize the overall population size, which allows for more accurate comparisons between phases that have been defined with varying degrees of resolution. Given the longer span of time represented by the Tuxtla-Ruiz (Postclassic period) phases, it would be expected that many of the settlements would have only been occupied for a portion of the time period. Again, these population conversions should be viewed as tentative, but not completely arbitrary, as they have some grounding in empirical evidence from Postclassic house count data and area-population extrapolations for the Chiapanec capital of Chiapa de Corzo.

Throughout this study I utilize tests of significance and strength based on the distribution of estimated numbers of people. A strictly empirical approach might conduct these tests on the number of sherds within controlled collections, which would provide considerably lower levels of confidence. A less empirical method might conduct these tests on extrapolated numbers of sherds within collection units, consistent with the assumptions of the DAI approach (sherd densities in collections are representative of densities in 1 ha collection units), which provide much higher levels of confidence. However, as I am addressing changes in patterns of the distribution of people over the landscape, applying these tests to sherd counts rather than population estimates seems an unnecessary abstraction.

Settlements are classified by mean population estimates, following Sanders et al. (1979). Small hamlets have populations estimated under 50, large hamlets >50 and <100, small villages >99 and <500, and large villages >500. Some of the small hamlets may have been isolated farmsteads but I do not attempt to make this distinction with the available data. A comprehensive list of sites found in the survey can be found in Appendix E.

2.3.3 Settlement Area Estimates

To the end of defining settlement areas that have some correspondence to meaningful social units many “sites,” conventionally defined as concentrations of artifacts separated by less than 100 meters, were lumped together. The area of these settlements was defined by a quartic kernel density interpolation (available in CSTAT III), and correspondingly are larger than the area outlined by the buffers of the individual collection units. This area was not used to calculate the DAI values, as greater sherd counts in a kernel density analysis result in a greater extrapolated area, which would result in a disproportionate weighting of collections with high sherd counts.

The area of settlements defined by the kernel density analysis roughly corresponds to the local-scale communities defined by Peterson and Drennan (2005:8). In this study the boundaries of these community level units were defined through a quartic kernel density interpolation (in CSTAT III) with a 150 m bandwidth, from the diagnostic sherd counts for each phase present in each controlled collection (not collection units). The kernel density interpolation takes into account the density values of individual collections in determining the area surrounding the collection and models a density fall-off corresponding with increasing distance from the collection point. The mathematical formula for the quartic kernel density function works from the following equation:

Outside the specified radius (here 150 m), h:

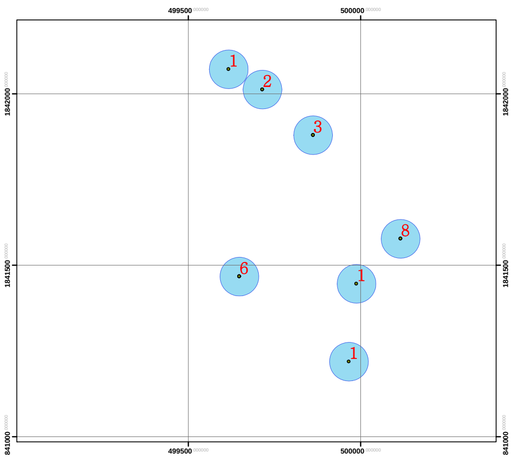
$$g(x_j) = 0$$

Within the specified radius, h:

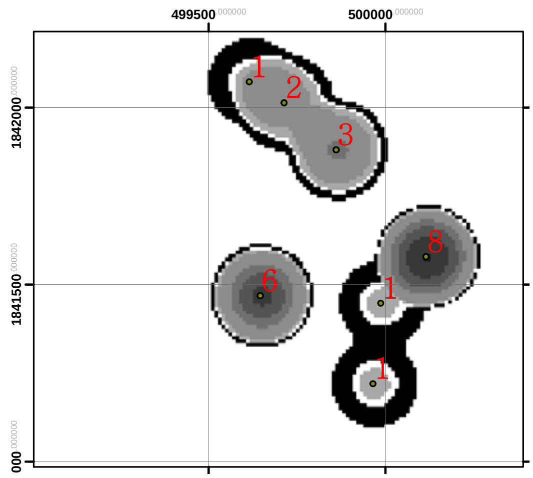
$$g(x_j) = \sum \left\{ [W_i * I_i] * \left[\frac{3}{h^2 * \pi} \right] * \left[1 - \frac{d_{ij}^2}{h^2}\right]^2 \right\}$$

> Where d_{ij} is the distance between an incident location and any reference point in the region, h is the radius of the search area (the bandwidth), W_i is a weight at the point location (all points were weighted evenly in this analysis) and I_i is an intensity (diagnostic sherd count in this analysis) at the point location. (Levine 2004:8.8).

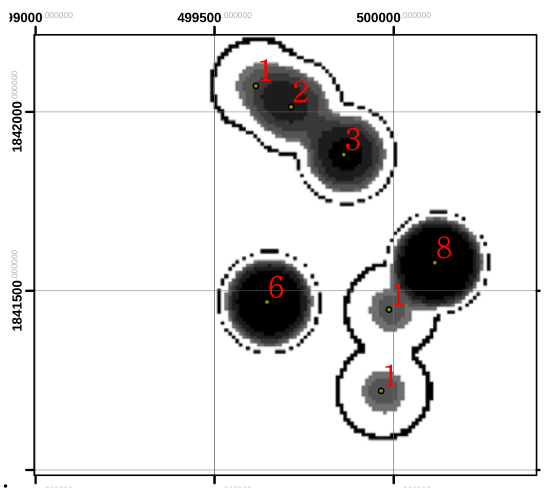
Unlike other interpolation functions such as Kriging, trend surfaces, or inverse distance weighting, the kernel density analysis does not presume that the variable being estimated is a function of location. As such, the kernel density interpolation is more appropriate to plotting non-spatial data such as artifact frequencies (Levine 2004:8.1). A comparative example of plots of the one ha buffers (used for the DAI calculations), triangular, quartic, and normal kernel density functions are included in figure 2.5.



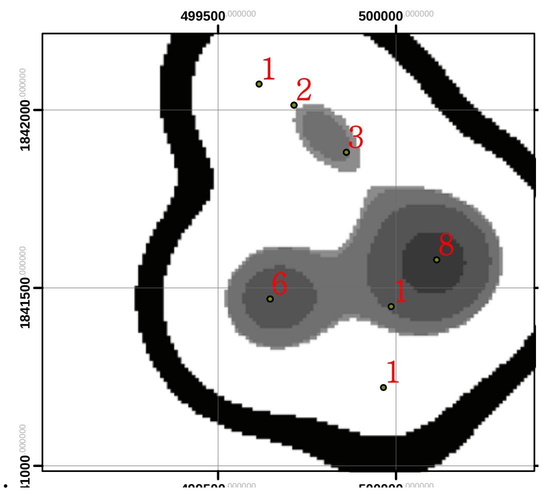
a. 1 ha buffers used to calculate DAI values



b. Triangular kernel interpolation



c. Quartic kernel interpolation



d. Normal kernel interpolation.

Figure 2. 5 buffers of 1 ha and kernel density interpolations with 150 m bandwidth (500 m grid).

In Figure 2.5 Ceramic counts are marked on top of collection points. The descending grayscale in kernel interpolations marks limits of settlement utilized in this study, as defined by a value of 0.003/km². The outer black line marks the limits of the kernel density interpolation. Again, the quartic kernel interpolation (Figure 2.5 c) was employed in this study.

2.3.4 Rank-Size Analysis

In the analysis of settlement hierarchy I utilize rank-size graphs, accompanied by the *A* coefficient and bootstrapped 90% confidence levels (Drennan and Peterson 2004) to compare the distribution of population over the landscape in different phases. Rank-size graphs have long been utilized as a tool to explore the nature of settlement hierarchies in settlement pattern studies (Blanton 1976; Blanton et al. 1982; Johnson 1977; Kowalewski et al. 1989). Log rank-size the adherence of a settlement system to a log-normal slope has often been viewed as a measure of the integration of a settlement system, with specific reference to what kind of integration is represented generally left vague. Even with respect to modern settlement systems, there has been a great deal of speculation, and little agreement about the underlying reasons behind the empirical correspondence to a log-normal slope (the rank-size rule).

As the economists Fujitia et al. (1999:217-220) note, of the many mathematical models developed to account for this correspondence, one of the most successful suggests that the correspondence of the hierarchy of city sizes to the rank-size rule is the product of random population growth and probabilities of people either attaching themselves to existing settlements or founding new settlements (Simon 1955 cited in Fujita et al. 1999:219). If this model is correct, and adherence to the rank-size rule is the product of random population growth, then only deviations from the rank-size rule need to be explained, as they imply the presence of other forces (e.g. political or economic factors) pushing the slope away from log-normality. To this end the *A* coefficient and bootstrapped confidence levels developed for the contrast of rank-size curves by Drennan and Peterson (2005) are useful in avoiding making too much of differences in settlement patterns that may be due to the vagaries of sampling.

2.3.5 Lower Tier Political Centers

Lower tier political centers were defined on the basis of the presence of pyramids and/or platforms. The scale of much of the hinterland architecture is very modest, and in many parts of Mesoamerica would be classified as unexceptional commoner residential platforms. However, architectural remains dating to the Formative period are exceedingly scarce within the study area, likely due to the predominance of wattle and daub architecture without the use of platforms rather than the widespread destruction of early structures.

Some of the settlements classified as second tier political centers in various phases are small hamlets. The small size of some of these settlements combined with the modest scale of their architecture might lead some readers to conclude that attributing lower level political functions to these settlements is presumptuous. I contend that this criticism is only valid if we approach the problem of political organization with preconceived notions of the roles played by lower tier political leaders. By analyzing other lines of evidence I contend that we can arrive at a better idea of what role leaders at these settlements played within the political hierarchy.

At multi component sites with architecture I consider mounds as complete constructions for each phase represented at the site. At Chiapa de Corzo, where excavation data are available for many of the structures within the civic-ceremonial zone I provide volumetric estimates of construction sequences for each phase, with estimates of the labor required for constructions of different phases at Chiapa de Corzo and at second tier centers made following the methodology developed by Abrams (1994, 1998), and others (Webster and Kirker 1995). My estimates of labor costs, derived from calculations presented by Abrams and Webster and Kirker (1995), are presented in Table 2.1:

Table 2.1 Labor costs from Abrams (1994) and Webster and Kirker (1995). m^3/person-day refers to volumetric data. m^2/person day refers to lateral area covered by masonry and plaster

	m^3/person-day	m^2 per person day
Procurement of earth and cobble fill	2.60	
Movement and piling of fill	3.17	
Quarrying limestone for masonry	0.40	1.69
Movement of limestone	0.47	1.99
Manufacture of masonry	0.09	0.37
Construction of masonry 0.25 m thick	0.80	3.38
Plaster manufacture	0.02	0.91
Laying plaster 2.5 cm thick		80.00

It is not currently known where the limestone utilized in cut-stone facing of the Guanacaste and Horcones phases was quarried from, but I utilize a figure of 0.6 km, the same figure employed by Webster and Kirker 1995. As the volume of blocks moved is not known, I base my estimates on the surface area of mounds, with an estimate of 4.22 m^2 covered by each cubic m of block, a figure derived from Webster and Kirker's estimates for Tikal (1995:369). This figure likely over-estimates the area that was covered per cubic meter of block, for as Hansen (1998:97) points out, cut-stone blocks from the Middle and Late Formative tend to be larger and thicker than those from the Classic period, when veneer stones were adopted.

Given that most of the hinterland sites with architecture have multiple phases of occupation, and it is impossible to tell what the construction sequences of mounds were without excavations, the phase-by phase reconstructions of the political hierarchy I provide are hypothetical. Further testing of architecture at hinterland sites may result in a very different picture of changes in the political hierarchy over time.

2.3.6 Nearest Neighbor Calculations

Nearest neighbor statistics have proven useful in measuring changes in the distribution of settlements and in the nature of settlement organization (Adams and Jones 1982; Earle 1979; Hodder and Orton 1977). In this study I utilize nearest neighbor statistics in comparing changes in the distribution of settlements over time. My interpretations of the meaning of changes in the nature of settlement distribution are addressed in each chapter. Nearest neighbor statistics were calculated with Crimstat III, on the centroids of settlements without any correction for boundary effects, due to the irregular nature of the survey area. Boundary corrections reduce the distance between the units of analysis (Levine 2003:5:11), and given that there are several holes and isolated extensions within the survey area, a bias toward clustering should already be present. I decided that a boundary correction would further bias the distribution toward clustering. It should be noted here that the nearest neighbor analysis does not take into account gaps in survey coverage. However, the effects of these gaps are constant through the different phases, so the statistics are useful for comparisons of clustering vs. dispersal within the survey area, but less useful for comparisons to surveys in other areas.

2.3.7 Survey area and polity size

There are inevitable problems in estimating the area and configuration of prehistoric political territories. In the Maya Lowlands where written records document political interaction between leaders and centers, the hieroglyphic texts suggest that territories of states were not entirely contiguous over the landscape, with sections of territory interrupted by the presence of settlements dominated by competing centers, and with control fluctuating over space and time (Demarest 2004; Inomata and Aoyama 1996; Marcus 1998; A. Smith 2003:130). In any society where one center dominates a number of other settlements, territory size will fluctuate and the amount and kind of control exercised by leaders at the center over subordinates will vacillate. In general, the domination of centralized leadership over subject populations decreases with distance from the center. As such the territorial limits of ancient polities should be viewed as frontiers, rather than the boundaries characteristic of modern nation-states (Giddens 1987:49; A. Smith 2003:130). Geographic barriers such as mountains and large bodies of water can provide some natural limits on political territories; however, in many cases, these territories either do not extend to the limits of these geographically bounded areas, or extend beyond them.

Within this part of the Central Depression there are some formidable geographic boundaries, such as the Sierra de Chiapas on the north, the Sierra Madre to the south and the mountainous topography around the mouth of the Angostura Canyon to the east. Approximately 200 km to the west of Chiapa de Corzo the Sierra Madre and the Sierra de Chiapas join, effectively closing the depression. Within this area, two other large centers that held power through the Middle Formative into the Early Classic have been identified at Ocozocoautla and Mirador. Finca Acapulco, to the east of Chiapa de Corzo was a large political center in the early Middle Formative. Each of these centers would have had territories that fluctuated with the ambitions and fortunes of leaders over time and the actions of these leaders likely impacted the size and configuration of each other's territories, as well as that of the Chiapa de Corzo polity.

I advance some estimates of polity size by calculating cost-distance weighted buffers around polity capitals in each phase. Cost distance was calculated in a GIS, utilizing the reciprocal of Waldo Tobler's (1993) hiking function to arrive at a cost for slope values (Bates 2007:58)(See Appendix B). This method of calculation produces rough estimates of territory size based on the bounding presence of neighbors and on the cost of traveling from the capital to the frontiers of the territory. I also offer extrapolated population estimates for the entire polity, based on these boundaries, during each phase, using population estimates weighted by observations on the effect of distance from the capital on population densities within the survey area.

2.3.7.1 *Scale* To put the 105 km^2 scale of this coverage in perspective, the early Valley of Oaxaca surveys covered approximately 2150 km^2 (Kowalewski et al. 1989), over an area that in the Central Depression would encompass the important neighboring Middle Formative political centers of Ocozocuatla and Mirador, approximately 41 and 51 km distant, respectively from Chiapa de Corzo. This 107 km^2 survey area would just about fit into the Etla arm of the Valley of Oaxaca (Figure 2.6). It is important to consider that this survey, in contrast to larger scale regional surveys such as the Valley of Oaxaca, and Valley of Mexico surveys, is sub-regional in scale, and as such is positioned to addresses the evolution of a single polity, primarily from the perspective of the inner hinterland. Regardless, the presence of other polities within the Central Depression cannot be ignored, and it is important to consider the location of the survey area within the likely territorial limits of the polity, in order to identify differences between settlement patterns in the inner hinterland and near likely territorial frontiers.

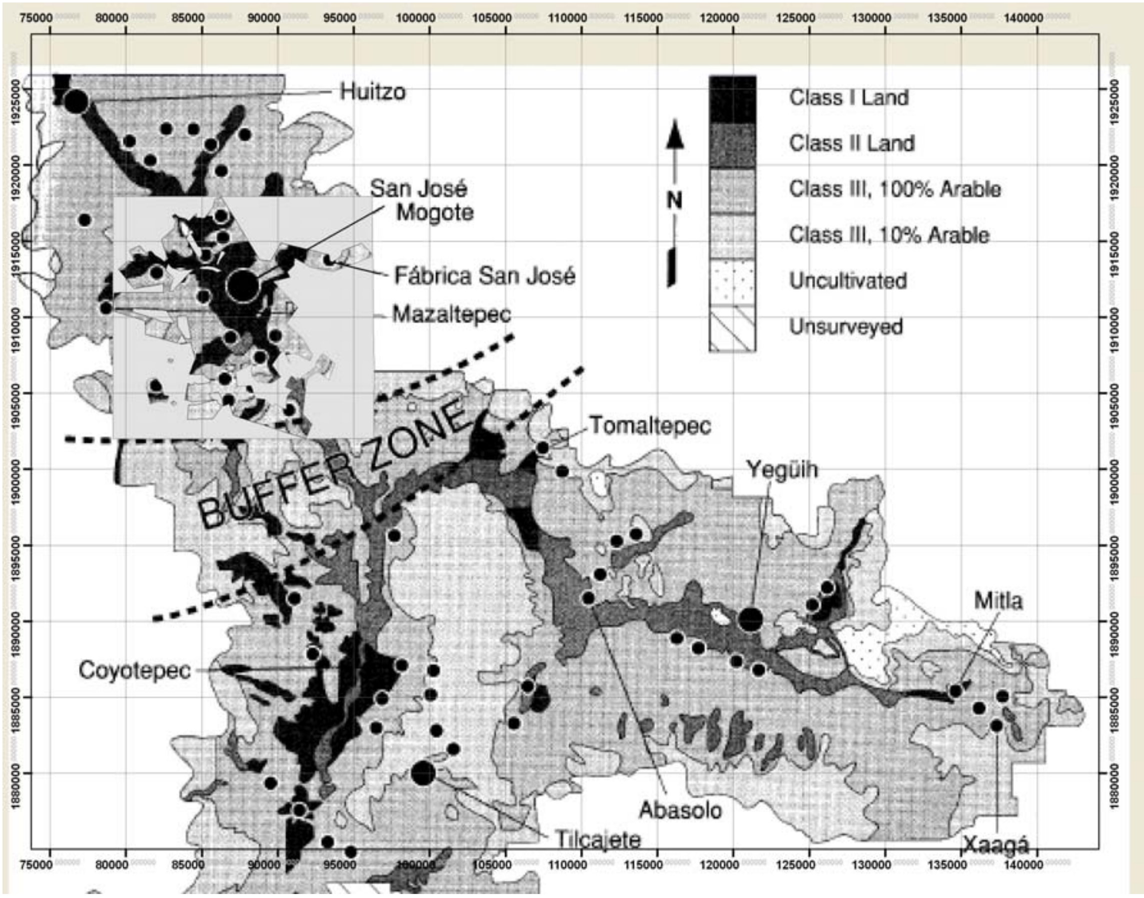


Figure 2.6 Survey area overlaid on Etla arm of Valley of Oaxaca with Rosario phase settlements (VOX map adapted from Flannery and Marcus 1996: fig. 128). (500 m grid, UTM coordinates from Chiapa de Corzo survey area)

2.3.8 Control over Access to Agricultural Land

My assessment of the extent to which access to agricultural land was centrally controlled, rather than controlled by individual households, is based largely on the degree to which the population was concentrated into villages, following the logic of DeMontmollin

(1989b) and Kruger (1996). These researchers posit that all else being equal, nucleated settlement, which is less energetically efficient from the farmers perspective, should reflect more centralized control over access to agricultural land, than where the population is dispersed in hamlets. In these arguments I also consider the degree of population nucleation relative to the productivity of agricultural land. Agricultural land was classified utilizing soil maps from the Instituto Nacional de Estadisticas, Geografia y Informacion (INEGI), and field observations made by myself and the field crew. Soil types were grouped into high, medium and low productivity levels based on their composition, with high productivity land ranked 1, medium 2, medium low 3, low 4-5 (Figure 2.7) (see Appendix C for details on the criteria of classification).

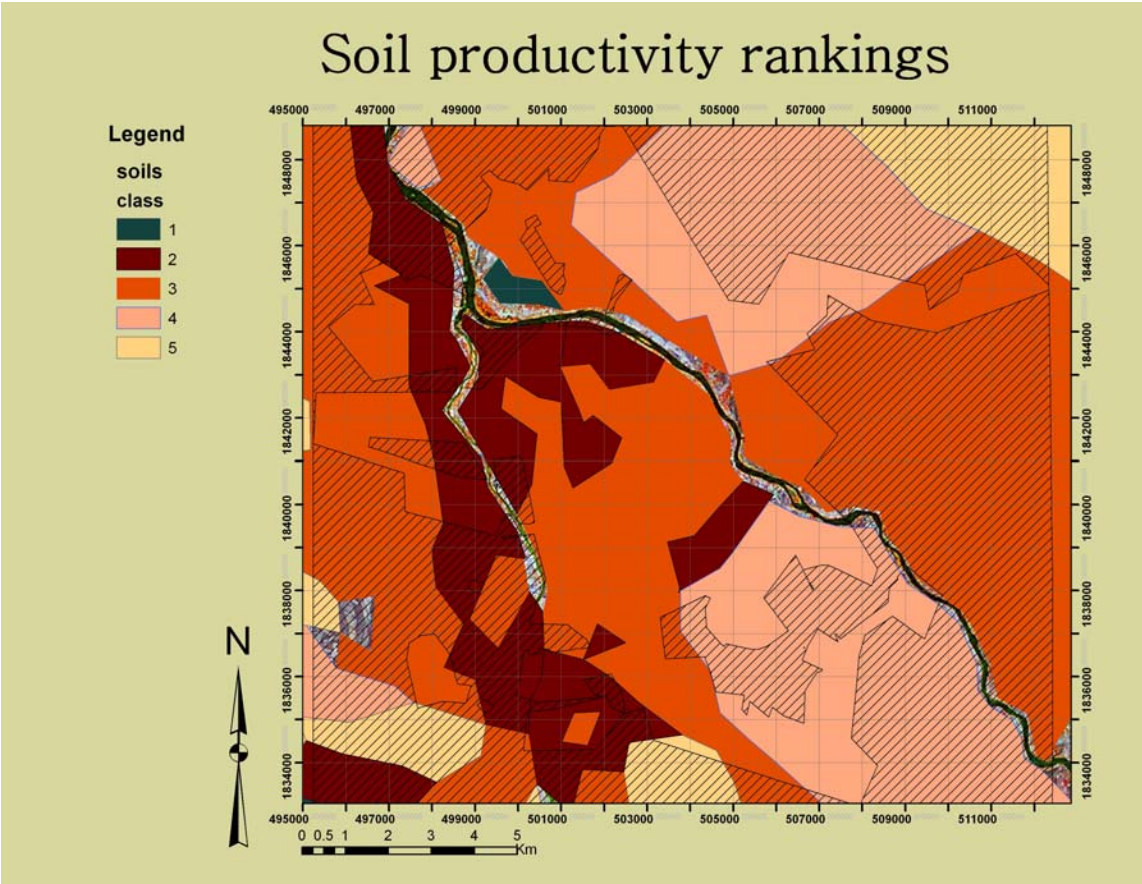


Figure 2.7 Soil Productivity Rankings

2.3.9 Control over Access to Obsidian

The most frequently occurring kinds of obsidian in the study area (San Martin Jilotepeque, El Chayal, Tajamulco, and Pachuca) can be visually sourced with a high degree of accuracy (Braswell et al 2000; Clark 1988). The dating of obsidian from surface contexts is, however, problematic. Obsidian hydration can be used, but it is expensive and can be ineffective with materials from surfaces that have been burned for field clearing, as is the case in many of the fields within the survey area. My attributions of obsidian to settlements in each phase were calculated by multiplying the total counts of obsidian found in each collection by the percentage of ceramic represented from each phase in the collection. This method requires undertaking the questionable premise that rates of obsidian consumption will parallel ceramic consumption. This division of obsidian values can result in the splitting of a single blade between different phases, but is no more flawed than methods that count a single blade for multiple phases (e.g. Santley et al 2001:55). The resulting figure of obsidian attributed to a given phase for a collection can be viewed as a probability that the obsidian was imported this phase.

Pachuca obsidian was excluded from this analysis, as evidence from elsewhere in the Central Depression suggests that this material did not appear until the end of the Early Classic period (Clark and Lee 2007:121). One exceptionally dense collection from Chiapa de Corzo was also excluded from the obsidian analysis. This collection contained 132 blade fragments and production debris of El Chayal obsidian (41% of the total El Chayal collected in the study). Ceramics from this collection were from the Dili through Horcones phases with no Classic or Postclassic ceramics. However all of the blades in this collection with intact platforms, as well as the four core fragments with platforms had abraded surfaces. Abraded platforms were not common until the Middle Classic and gained greater popularity in the Postclassic (Clark and Lee 2007:121; Santley and Pool 1993:197). Given the similarity in the materials from this collection (all El Chayal except for 2 blades of SMJ) it seems likely that this concentration accumulated over a fairly short time, possibly a single blade production episode, which likely took place after the Formative period. As such, this outlier was excluded from the analysis of the Formative period contexts that are the focus of this study. Materials and attributes that were coded for in the lithic analysis are listed in Appendix D.

2.3.10 K-means Cluster Analysis

K-means cluster analysis was utilized to characterize the distribution of obsidian during different phases, as well as to compare the distribution of obsidian from different sources within each phase. The K-means cluster analysis employed in this study is very similar to that introduced into archaeology by Kintigh and Ammerman (1982:39). The Crimestat K-means cluster analysis functions as follows:

> The default K-means clustering routine follows an algorithm for grouping all point locations into one, and only one, of these K groups. There are two general steps: 1) the identification of an initial guess (seed) for the location of the K clusters, and 2) local optimization which assigns each point to the nearest of the K clusters . A grid is over laid on the data set and the number of points falling within each grid cell is counted. The grid cell with the most point s is the initial first cluster . Then, the second initial cluster is the grid cell with the next most points that is separated by at least:
>
> $$\text{Separation} = \quad t * 0.5 * \text{SQRT}\left[\frac{A}{N}\right]$$
>
> where t is the Student ’s t -value for the 0.01 significance level (2.358), A is the area of the region, and N is t he sample size. A third initial cluster is then selected which is the grid cell with the third most points and is separated from the first two grid cells by at least the separation factor defined above. This process is repeated until all K initial seed locations are chosen. The algorithm then conducts *local optimization*. It assigns each point to the nearest of the K seed locations to form an initial cluster . For each of the initial clusters, it calculates the center of minimum distance and then re-assigns all points to the nearest cluster, based on t he distance to the center of minimum distance. It repeats this process until no points change clusters. To increase the flexibility of the routine, the grid that is overlaid on the data point s is re-sized to accommodate different cluster structures, increasing or decreasing in size to try to find the K clusters. After iterating through different grid sizes, the code makes sure that the final seeds are from the "best " grid or the grid that produces the most clusters. Finally, for each cluster, the routine calculates a standard deviational ellipse and optionally can output the results graphically as either standard deviational ellipses or a convex hulls. (Levine 2004: 7.20)

The use of standard deviational ellipses to represent clusters is the most notable departure from the more common practice in archaeology of utilizing circles to represent clusters. The obvious advantage of utilizing ellipses is that they frequently provide a better characterization of clusters than do circles. The ellipses in Crimestat III are calculated using the following formulae:

The (clockwise) rotation of the y axis of the ellipse is calculated as:

$$\theta = \tan^{-1}\left(\frac{\sum(x_i-\bar{x})^2 - \sum(y_i-\bar{y})^2 + \sqrt{C}}{2\sum(x_i-\bar{x})(y_i-\bar{y})}\right)$$

where

$$C = \left(\sum(x_i-\bar{x})^2 - \sum(y_i-\bar{y})^2\right)^2 + 4\sum\left((x_i-\bar{x})(y_i-\bar{y})\right)^2$$

"Using this value the two standard deviations [of x and y] can be computed in much the same way as for conventional standard deviations but with the degrees of freedom in this case being *n*-2, where *n* is the number of points in the sample (for *n* large the divisor will be close to *n*, as per the common formulation of standard distance).The formulas cited are those used within Crimestat, which have been adjusted to ensure the ellipse axes are the correct length and the fourmula is consistent if the standard deviations in *x*- and *y*- are equal":

$$SD_x = \sqrt{\frac{2\sum((x_i-\bar{x})\cos\theta - (y_i-\bar{y})\sin\theta)^2}{n-2}} \qquad SD_y = \sqrt{\frac{2\sum((x_i-\bar{x})\sin\theta - (y_i-\bar{y})\cos\theta)^2}{n-2}}$$

(DeSmith et al. 2007:163)

2.3.11 Least Cost Paths of Transportation and Communication

In this study I employ some reconstructions of likely paths of prehistoric transportation in considering the extent to which rulers were directly controlling the movement of people and goods over the landscape. These reconstructions are based on the locations of modern roads, and on least cost paths plotted between contemporary political centers and Chiapa de Corzo on the same cost surface discussed above for the calculations of polity size (see Appendix B for further discussion of the methods behind calculating cost surfaces).

3. THE FOUNDATION OF CHIAPA DE CORZO: JOBO AND DILI PHASES

The transition from the Jobo to Dili phase marks one of the most important changes in the archaeology of the Chiapa de Corzo study area. During the Dili phase Chiapa de Corzo grew from two small Jobo phase hamlets with a combined estimated population of 55±9 into a large village with a population estimated at 1090±357. As the population of Chiapa de Corzo grew, leaders at that center directed labor into the construction of a large civic-ceremonial space similar in layout to that of the combined Complexes B and C at La Venta, Tabasco and other centers in Chiapas. The growth of Chiapa de Corzo was accompanied or soon followed by the construction of a large civic-ceremonial precinct in a style shared with other Middle Formative centers in Chiapas and Tabasco, the timing of which suggest that a group at Chiapa de Corzo emerged as a ruling elite early during the Dili phase.

In this chapter I begin with an analysis of the organization of society in the study area prior to the emergence of Chiapa de Corzo. By comparing changes in the distribution of artifacts and architecture preceding and accompanying the emergence of Chiapa de Corzo I assess what strategies may have been employed by leaders at this center in establishing and consolidating rulership over the area during the Dili phase. This comparison allows for the evaluation of changes that took place in the social and political organization of the hinterland that accompanied the rise of Chiapa de Corzo, thereby providing insight into what strategies were used in the foundation of the polity.

3.1 AUTONOMOUS VILLAGES: JOBO PHASE (1150-1000 B.C.)

3.1.1 Population Distribution and Nucleation

Changes in the distribution of population are a central feature in the establishment of political authority. Leaders who attract greater numbers of supporters have access to greater labor and military force than those do not. Increases in the size of the local supporting population also augment the potential for expansion of public religious spectacles which may further enhance the prestige of leaders. The distribution of people over the landscape prior to the emergence of a political center provides information on the social and political context within which Chiapa de Corzo developed.

Prior to the emergence of Chiapa de Corzo as a population center the lack of a dominant population center, and the absence of evidence for elite or civic-ceremonial architecture within the study area suggests that society was organized in autonomous villages. No excavations have yet been conducted in Jobo phase villages within the study area, and our understanding of social and political organization within these villages is correspondingly very sparse.

There were 29 Jobo phase settlements in the study area with a total mean estimated population of 3370 (Figure 3.1). The largest settlement had a population with an estimated mean population of 360. Approximately 80% of the population was located in small villages. As we shall see, this is a high degree of nucleation relative to subsequent phases. This nucleation suggests that Jobo phase leaders or the prevailing local social conditions encouraged people to live in relatively large settlements. A nearest neighbor analysis shows an overall random distribution of settlements (NNI= 0.9036 Z= -0.9759 $p \leq 0.5$).

Studies in other areas of the Central Depression (Lowe 1959; Navarrete 1960; Warren 1978) have likewise produced little evidence of large villages (settlements with populations exceeding 500 people) during this phase. Lowe speculates that the site of Finca Acapulco, about 100 km upstream from Chiapa de Corzo, was a regional center for the Chachi sub-region (Figure 1.2) during the latter part of this phase, but this site evidently did not acquire the characteristics of an urban center until the Dili phase (2007:89). Directly outside the Central Depression, in the Middle Grijalva sub-region, the settlement of San Isidro appears to have been a political center in the Early Formative, but underwent a brief late Early Formative hiatus that covered much of the Jobo phase (Lowe 1998b, 2006:9).

A log-rank graph of Jobo phase settlement population within the study area (Figure 3.2) displays a strongly convex curve (n=28 A=0.541), reflecting a top-heavy distribution of 13 small villages, five of which had mean estimated population values greater than 200 people. Convex rank-size distributions have been shown in comparative studies to indicate systems that are poorly integrated or that combine several systems into one (Drennan and Peterson 2005: 11; Johnson 1980; Kowalewski 1989:68). As Johnson notes, these convex patterns may also result from problems of scale; either through the inclusion of multiple independent polities within the analysis, or through the omission of the dominant center in a dendritic system with vertical integration but little horizontal integration (Johnson 1980:241). In this form of organization leaders at the primary center dominates and control interaction (trade, political relations, etc.) between smaller communities. The latter is a possible problem for the scale of this survey, especially given the relatively small size of the largest Jobo phase settlements in the study area. This area may have been within the domain of the early Finca Acapulco polity, but the available evidence does not lend much support to the idea that the Chiapa de Corzo area was integrated in any significant political or ideological way with these neighboring polities. Correspondingly, it seems more likely that this pattern results from the presence of multiple autonomous villages.

3.1.2 Autonomous Villages and the Lack of Political Centralization

If the Chiapa de Corzo sub-region was integrated into a unified polity we should expect to see the presence of dominant political center, marked by relatively large scale architecture and a relatively large population. Only one Jobo phase site has architecture; a low platform and stone house foundations at Saraín Mendoza 1, which is the fourth most populous Jobo phase settlement in the study area. But based on the larger extent of the Dili phase occupation at this site and the absence of later occupation, I attribute these structures entirely to the Dili phase. As noted in Chapter 2, many of the larger settlements from the Jobo phase were revealed by brick quarry excavations and may have buried civic-ceremonial or high-status residential architecture that was not detected by the survey. Nonetheless the currently available evidence suggests a minimal degree of political integration of, or differentiation between settlements within the study area during the Jobo phase.

3.1.3 Agriculture and Access to Prime Lands

While there does not appear to have been a dominant center in, or near to, the Chiapa de Corzo study area during the Jobo phase, there are several ways in which land use rights may have been managed; 1) at the household level, which as discussed in Chapter 1 may be reflected in the high frequency of hamlets in prime agricultural zones; or 2) managed by community level organizations, which should be reflected in the nucleation of people into larger settlements.

I would note here that agriculture may or may not have been an important feature of the subsistence economy by the Jobo phase. While maize appears to have been domesticated as early as 4300 B.C. (cal) (Flannery and Piperno 2001:2102), and relatively productive strains have been found in Early Formative contexts in Oaxaca (1700-1500 B.C) (Marcus and Flannery 1996:71), current data from coastal Chiapas suggests that maize species in this area did not become a significant dietary component in until around 1000B.C. (Clark and Blake 1996:28; Clark, Pye, and Gosser 2007:31). In the Tehuacan area there is evidence for an early reliance on Maize in C13-C14 ratios in bone collagen, but these may also result from the high consumption of CAM pathway plants, such as nopal and other cacti (Smalley and Blake 2003:685). The importance of maize in Early Formative Gulf Coast diets has also been questioned (Arnold 2000:120). Overall, lines of evidence from both botanical remains and stable isotope analysis of skeletal remains suggest that the consumption of maize as a grain was not very important in Mesoamerica until about 1000 B.C. (Smalley and Blake 2003).

However, as Smalley and Blake point out, early variants of maize may have been cultivated for their sugary stalks, rather than for grain (2003). They suggest that the sugar from maize stalks may have been used to brew alcoholic beverages consumed in feasting and ritual activities. Other cultigens such as manioc may also have been part of the subsistence base. Regardless of the importance of agriculture as a subsistence base, maintaining access to prime lands may have been important due to the presence of game, fish (most of these lands are also close to the river), and other wild resources in these areas.

Jobo phase settlements are predominantly located on, or directly adjacent to productive (second class) agricultural lands, suggesting that access to these lands was valued, whether for their agricultural productivity, or for an abundance of wild flora and fauna. The high concentration of people in villages (80% of the study area total, n=2680) and low frequency of hamlets lend support to the idea that rights to land use were managed by community level institutions rather than by individual households.

3.1.4 Long Distance trade, Obsidian Access, Prestige Goods, and Effects on the Jobo Economy

Obsidian appears to have been a very minor import during the Jobo phase, as less obsidian can be attributed to this phase than any other (including the preceding Cotorra phase), with a total of 4.48 pieces (as noted in Ch. 2, obsidian was allocated by phase based on the ratio of ceramic found in each collection). Obsidian constitutes 15% of the total Jobo phase lithic collection. There are no exclusively Jobo phase collections with obsidian and consequently it is speculative that any obsidian was imported during this phase. During the Jobo phase 29% of villages (n=4) had obsidian, and 21% of hamlets (n=3). Obsidian does not occur in any of the five villages with populations estimated at over 200. However, both of the settlements that had fragments of perforated ilmenite cubes, Ribera Amatal S. and Nandambua, had obsidian. Otherwise there is no association between obsidian and other artifacts or settlement qualities that may be linked to trade or participation in a prestige goods network. Despite the very limited access to obsidian evident for the Jobo phase, the evidence for the production of perforated ilmenite cubes (Figure 3.3) suggests that some individuals within the study area were participating in a long distance exchange network with Gulf Coast Olmec centers.

The enigmatic multi-perforate ilmenite cubes, found at a number of Early Formative sites in the Gulf Coast region, appear to have been produced primarily, or exclusively, in the Chiapas Central Depression. While the Valley of Oaxaca has evidence for the production of ilmenite mirrors that were exported to the Gulf Coast, the Chiapas Central Depression is the only region in Mesoamerica with strong evidence for the production of these perforated cubes. Several caches of perforated ilmenite cubes have been found at San Lorenzo, totaling over six metric tons (Cyphers 1996:66). There has been a great deal of speculation about the uses of these cubes, "including net weights, beads, fire starters, tiny hammers, counterweights for spearthrowers, or amulets (Agrinier:1984:80-81; Coe and Diehl 1980a:242; DiCastro 1997:156; Lowe 1989:53)" (Pool 2007:105). Recently, Ann Cyphers and Anna DiCastro (Cyphers and DiCastro 1996; DiCastro 1997) have suggested that ilmenite cubes were imported whole, and perforated in the process of a drilling activity used in the working of basalt or other materials.

However, as Clark (1996:192) and Pool (2007:105) point out the relatively intact and complete state of the perforated cubes in the pits at San Lorenzo, combined with the high frequency of incompletely drilled, fragmentary, and un-perforated cubes at sites in the Central Depression support the notion that these cubes were manufactured and perforated in the Central Depression and exported as finished products to the Gulf Coast. Pierre Agrinier's investigations at the site of Plumajillo in the Jiquipilas sub-region found strong evidence for the production of these cubes (1984:76). Further explorations in this sub-region found evidence of the production of these cubes at three other sites (Agrinier 1984:76).

Within the study area a collection from the site of Ribera Amatal S. produced 80 perforated cube fragments, some of which were incompletely drilled, and two fragments of raw ilmenite were found within an area with about a five meter radius (Figure 3.3 a, b). This collection also had ceramics from the previous Cotorra phase and as such the cubes may date to earlier than the Jobo phase. The presence of perforated ilmenite cubes at Ribera Amatal S. had been noted previously by Agrinier (1984:75-77), who commented on eight ilmenite cube fragments purportedly selected from five gallon bucket of the things, collected by a farmer while constructing a fence. All of the cubes found in this survey from Ribera Amatal S. are fragments, some of which were incompletely drilled (Figure 3.3b), lending further support to the notion that these cubes were produced and exported as finished items from the Central Depression to the Gulf Coast. An isolated drilled ilmenite fragment was found at the Nandambua site, to the east of the Grijalva River and may be a product of local consumption rather than production, as no other evidence for production was found at this site. A number of other collections within the survey area had fragments of un-worked ilmenite (Figure3.4) but none of these fragments were associated with Jobo phase materials. The presence of unworked ilmenite within the survey area, combined with evidence that ilmenite ore occurs in natural outcrops in the Chiapas Central Depression (Agrinier 1984:76-78), and the lack of evidence for natural outcrops with this material in the Gulf Coast region lend further support that these cubes were imported by the Gulf Coast Olmec as exotics.

As such, perforated ilmenite cubes were likely exchanged through a prestige goods network rather than distributed as utilitarian items. If so, this prestige goods network appears to have included non-elite individuals at smaller settlements on the Gulf Coast, as Phillip Arnold has found several of these cubes (some of them broken) at small Early Formative settlements in the Tuxtlas (1995:195). Carl Wendt also found a perforated ilmenite cube in what he interprets as a non-elite context at the site of El Bajio in the San Lorenzo inner hinterland (2003:378, 619).

Gareth Lowe (1997:78) and Pierre Agrinier (1984:91-92) have suggested that the ilmenite industry uncovered at Mirador/Plumajillo, to the west of Chiapa de Corzo, was an indigenous workshop directed by Olmec elites from San Lorenzo. The data from the surface survey are not suited to the evaluation of this hypothesis for the Ribera Amatal S. village, but a San Lorenzo presence in the area remains a possibility. In any case, whether the individuals producing these cubes were Gulf Coast Olmec, local residents directed by leaders from an Olmec center, or local residents provisioning Gulf Coast settlements through their own initiative, this industry does not appear to have had a large, or long term impact on the local economy. Production of these cubes within the survey area appears to be restricted to the settlement of Ribera Amatal S., and whatever economic or social impact this industry had on Jobo phase society appears to have been minimal. The settlement of Ribera Amatal S. is not distinguished by an exceptionally large population, nor settlement area (although both of these factors may be affected by poor visibility, as this settlement was defined from collections at the base of a brick quarry, about 1.5 m below surface), nor by the presence of fancy Jobo phase ceramics (e.g. Siltepec White).

Three pieces of obsidian were found in the collection with ilmenite cubes, all prismatic blades, two of El Chayal and one of SMJ. One of the El Chayal blades had an abraded platform. As noted in Chapter 2, the abrasion of core platforms does not appear to have been an important aspect of prismatic blade technology until the Classic period (Clark and Lee 2007:121), and as such at least some of the obsidian in this collection may date to a phase later than the Jobo phase. Even so, the obsidian values for the Ribera Amatal S. settlement are not exceptionally high, with 0.51 pieces attributed to the Jobo phase of this settlement.

These findings support Drennan's observations on the miniscule contribution of long distance trade to Early and Middle Formative economies (1984a:33, 1984b). But they also suggest that the role of the Chiapa de Corzo sub-region in a prestige goods exchange network during the Jobo phase was primarily that of a supplier, resulting in little to no accumulation of prestige by local participants, and little exchange of ilmenite cubes within the study area. This would be expected if Olmecs from San Lorenzo were sending their own people into the Central Depression to manufacture these cubes. It does not, however, rule out the production of these items by local populations, likely under sponsorship of foreign elites.

While there is evidence that people in the Chiapa de Corzo sub-region were participating in long distance exchange networks during the Jobo phase, this evidence suggests that participation was very limited. The impact of this exchange on the local economy appears to have been negligible. Likewise, despite evidence for participation in what may have been a prestige goods exchange network with Gulf Coast elites, there is nothing to suggest that the individuals participating in this network accumulated higher status than those who did not.

3.1.5 Evidence for Warfare and Raiding

Given the lack of evidence for a dominant political center in the region, to the extent that warfare was a feature of social interaction in Jobo phase, it is likely that it took the form of intercommunity raiding, or possibly raids by warriors from political centers outside of the Chiapa de Corzo sub-region. The predominance of settlement in villages rather than hamlets noted in the Jobo phase supports the idea that raiding and small scale warfare was a problem, as villages are more easily defended than scattered small settlements

(Hassig 1992). There is a relatively high percentage of Jobo phase settlements (21% n=6) and population (22% est. mean=725)) located in relatively defensible positions. The estimated number of people in defensible locations is lower than in the Dili phase discussed below, but about 6 percentage points higher relative to the total population for each phase. Nonetheless, most Jobo phase settlements are located on low-lying agriculturally productive lands. While the evidence is equivocal, the possibility that localized warfare was an important factor influencing choice of settlement location cannot currently be rejected for the Jobo phase.

3.1.6 The Use of Ceremony

As noted in chapter 1, public ceremony and rituals, both public and private, appear to have been important aspects in the foundation of social and political inequality in Mesoamerica. But is there evidence to support the notion that ritual and civic-ceremonial activities played a direct and important role in the development of socio-political inequality in the Chiapa de Corzo sub-region, as it appears to in other areas of Mesoamerica? Civic-ceremonial structures, consisting of platforms supporting elite residences with probable public functions were present during the initial Early Formative at Paso de la Amada (Blake 1991; Lesure 1999; Lesure and Blake 2002). This settlement also had a ballcourt and public plaza spaces (Clark 2004:53; Hill and Clark 2001). Despite this architectural evidence supporting the notion of emergent positions of status differentiation during the early Early Formative, there is little evidence for economic differentiation between individuals or households at Paso de la Amada (Lesure 1999;

Lesure and Blake 2002). If a residence with relatively large structures that were situated on relatively tall platforms at the southern terminus of a plaza area did convey a different level of prestige or status to the occupants of this structure, they do not appear to have engaged in a greater sponsorship of feasts than other households at Paso de la Amada (Lesure and Blake 2002).

At the later Early Formative center of San Lorenzo Tenochtitlan civic-ceremonial complexes appear to have differed from Paso de la Amada and later Mesoamerican civic-ceremonial precincts in the absence of pyramids and platforms supporting elite or civic-ceremonial buildings. Despite this absence, there is evidence for civic/ceremonial-elite residential spaces at San Lorenzo in the "red palace" structure which is qualitatively different from ordinary residences at the site (Cyphers 1999:167). There were associated features with this structure that suggest an attached facility where monuments were modified from thrones to colossal heads, and recycled into utilitarian grinding implements (Cyphers 1996:64). On the basis of the distribution and size of many of the Early Formative monuments at San Lorenzo, Ann Cyphers posits that elites at San Lorenzo, and at secondary centers, may have controlled important ceremonies, defining sacred or ceremonial space through the manipulation of sculptures (Cyphers 1999).

While there is no evidence for sculpture or monumental architecture from the Jobo phase in the Chiapa de Corzo area, it is possible that formal plaza spaces were outlined by trees or perishable buildings rather than pyramids and platforms. Sculptures carved of wood have also been found at the Olmec site of El Manatí, preserved by their deposition in an anaerobic swampy context. It is possible that carved wooden figurines were utilized in rituals and public ceremonies in the small villages of the Jobo phase in the Chiapa de

Corzo sub-region. However even if this was the case, the small scale of Jobo phase villages argues against the idea that leaders in any these villages succeeded in integrating populations beyond neighboring hamlets into ceremonial activities. Given the available data, we can provisionally surmise that the manipulation of ideology and religion through public ceremonies was not an important strategy of leadership during this phase.

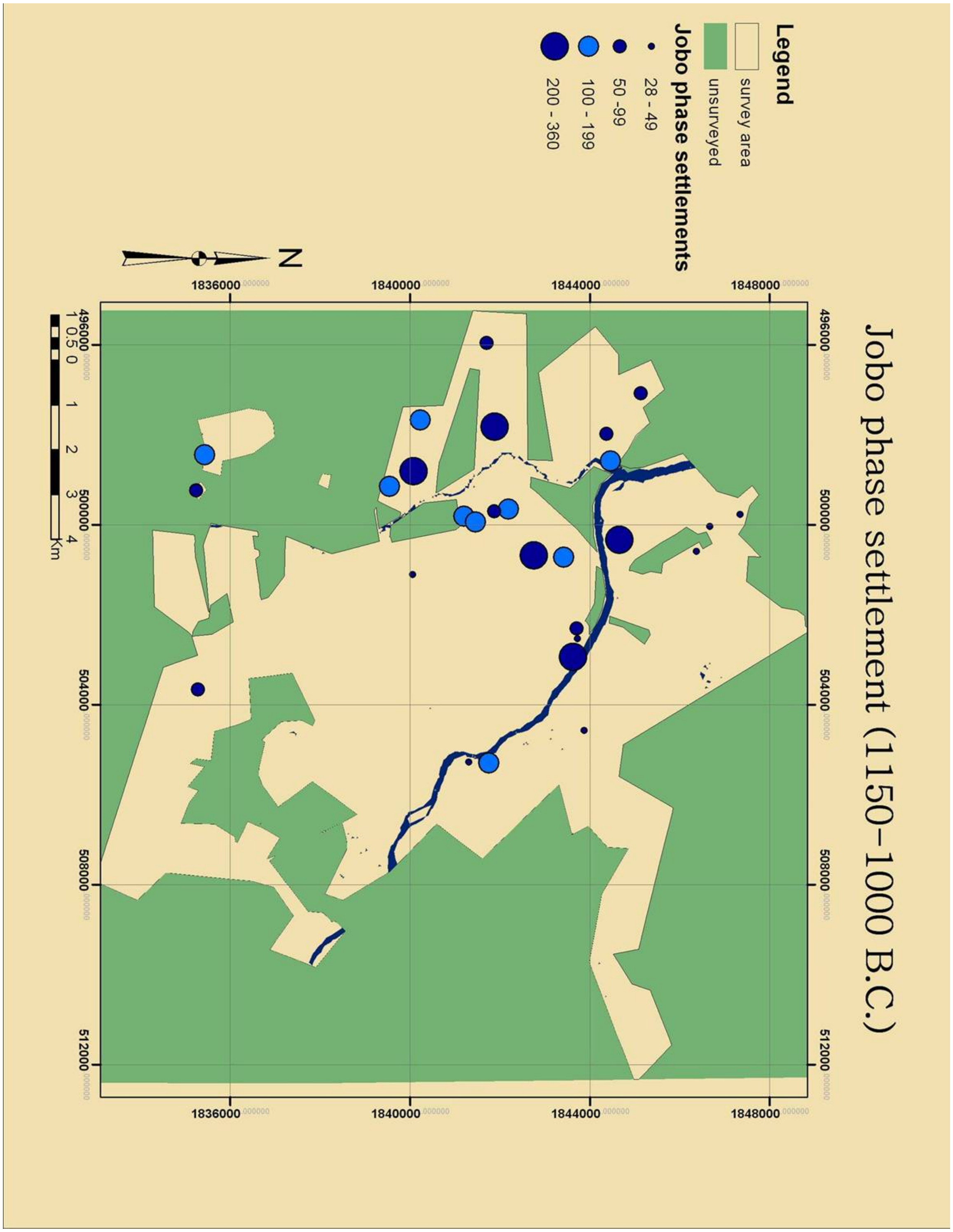
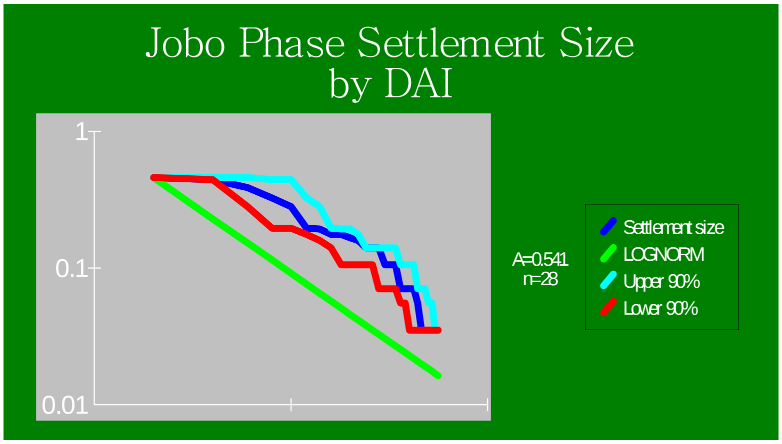


Figure 3. 1 Jobo Phase Settlement

a.



b.

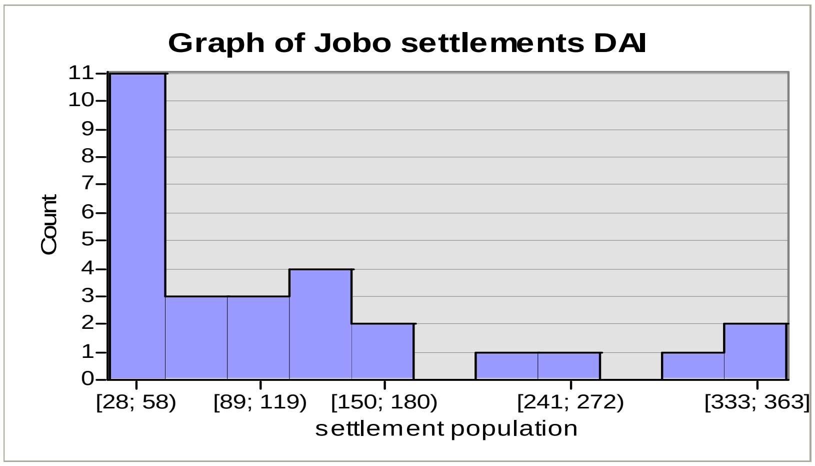


Figure 3. 2 a. Log-Rank Size plot and b. histogram of Jobo phase settlement

a. 

b. 

Figure 3. 3 a. Ilmenite cubes from Ribera Amatal. b. Detail of partially drilled cube from Ribera Amatal

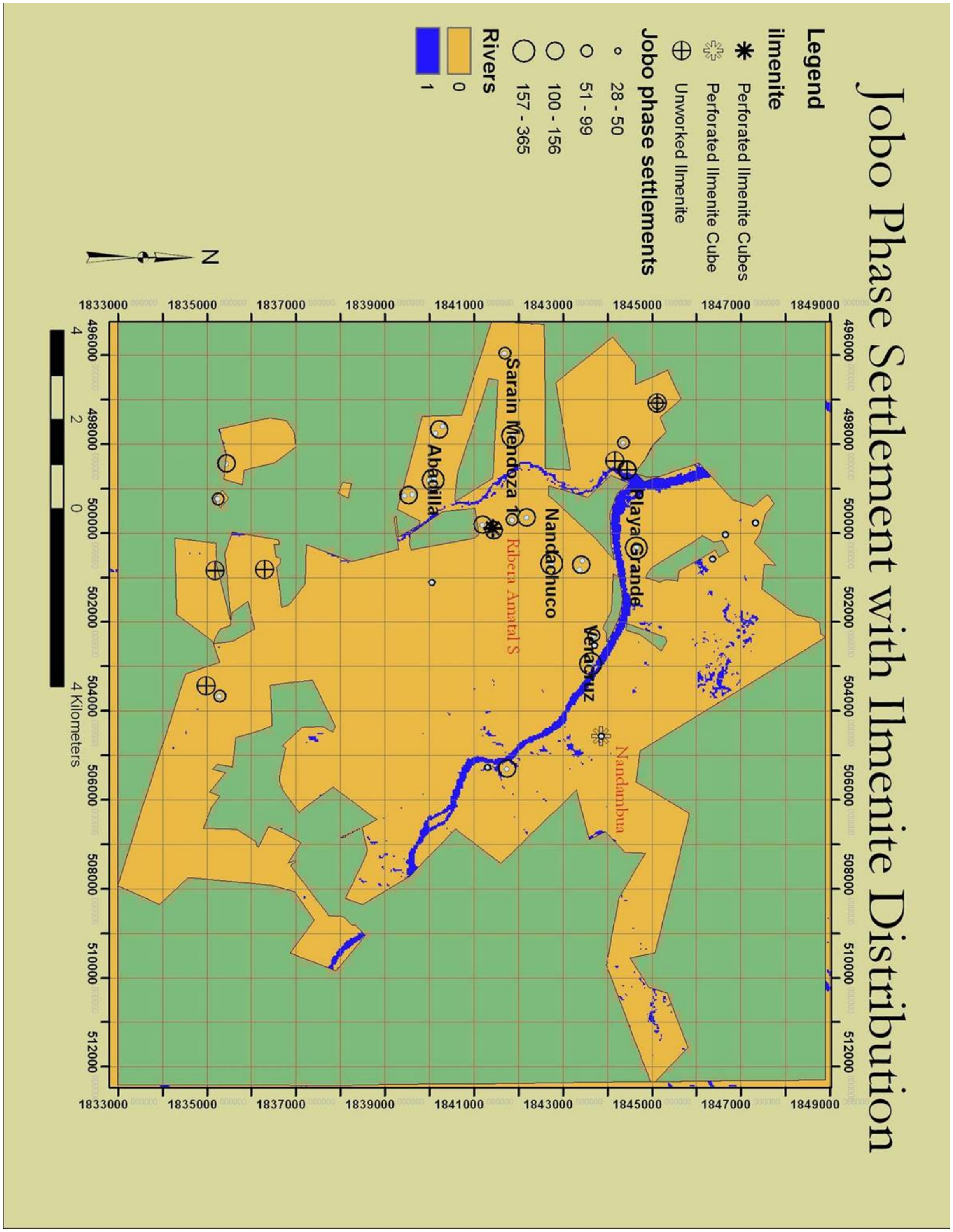


Figure 3. 4 Jobo phase Ilmenite distribution

3.2 THE EMERGENCE OF CENTRALIZED LEADERSHIP: DILI PHASE (1000-750 B.C.)

3.2.1 Population Growth, Resettlement, and Nucleation

The transition to the Dili phase is marked most prominently by the emergence of Chiapa de Corzo and a sharp growth in population within the study area. During the Jobo phase the site of Chiapa de Corzo appears to have been occupied by two small hamlets with a combined area of about 2.4 ha, and an estimated population of about 60 (about 1% of the total Jobo phase population in the study area). Over the course of the Dili phase Chiapa de Corzo grew into a town of approximately 71 ha with 21% of the study area population, estimated at 1090±357. Population growth at Chiapa de Corzo appears to have drawn population from earlier Jobo phase villages in the hinterland, the five largest of which lost 100 or more people from the Jobo phase. Nonetheless, relative to the two subsequent phases a high percentage of the larger Jobo phase settlements remained intact as second tier population centers. Accompanying the reduction in size of Jobo phase villages, there was an increase in the number of small villages and hamlets in the study area (Figure 3.5)

The total population in the survey area increased by about 52% from the Jobo phase to a mean estimate of 5110±1670 people. This estimate indicates an annual growth rate of approximately 0.52%. While much lower than the population growth rates for developing countries in the modern world, which averaged around 2% in the 1950s (U.S. Census Bureau 2008), this growth rate is slightly higher than the average reproductive potential estimated for early agricultural societies (about 0.1-0.4% (Hassan and Sengel 1973:538)).

Several factors likely contributed to this high rate of population increase, as growth rates can be affected by fairly minor changes in the ratio between fertility and mortality rates (Cowgill 1975:514). The Jobo to Dili phase population growth rate is also slightly lower than the Cotorra to Jobo phase growth rate, which is estimated at 0.67%. It is important to reiterate here that increased rates of ceramic consumption during the Jobo and Dili phases might also be a factor in the DAI/C based estimate of these relatively high growth rates. This possibility needs to be tested with further excavations on Jobo phase and Dili phase residential areas.

The high fertility rates of the Dili phase likely resulted from increased labor demands generated by a greater reliance on maize agriculture, and possibly by demands for agricultural surpluses by the Chiapa de Corzo leaders. The development of more productive strains of maize, and a greater reliance on this staple within Mesoamerican subsistence strategies have been documented for the Middle Formative period (Arnold 2000:120; Clark and Blake 1994; Clark, Pye, and Gosser 2007:31; Pool 2007:146). To an extent, the increased capacity of new agricultural strategies to support larger families may have led to higher fertility rates (Hassan 1973), as the labor demands of a subsistence strategy with greater dependence on maize agriculture may have encouraged people to have more children. However, the capacity to produce agricultural surpluses does not by itself provide the motivation to produce surpluses (Chayanov 1991; Cowgill 1975). A transformation of the social structure into one that allowed for agricultural surpluses to be converted into prestige or power (or on the other side of the same coin, where the failure to produce surpluses invoked ridicule or punishment) may have provided motivation for higher rates of reproduction (Blanton 1975; Blanton et al 1993:75). The emergence of a political center and group of ruling elite therefore may have provided greater opportunities and demands for the production and mobilization of agricultural surpluses than existed in the Jobo phase, which in turn may have provided the motivation for families to have greater numbers of children.

Most of the Dili phase population growth took place at Chiapa de Corzo but the hinterland population also increased by 19%, an estimated 750 people. Evidence from the Chiapa de Corzo study area suggests that leaders from one of the larger villages, or from outside of the study area, settled at Chiapa de Corzo and began practices that encouraged the movement of population from Jobo phase villages from within, and possibly from outside the Central Depression into the capital. In the hinterland the decrease in the size of villages suggests that hinterland leaders were less capable of attracting followers than in the Jobo phase. In these respects, the Dili phase formation of Chiapa de Corzo contrasts with the gradual growth of its Valley of Oaxaca contemporary, the political center of San Jose Mogote and more closely resembles the foundation of the later Valley of Oaxaca capital, Monte Alban (Flannery and Marcus 1996:139), which was also established on a previously unoccupied site and drew people from earlier hinterland villages. It bears noting here that there are important differences in scale between Middle Formative foundation of Chiapa de Corzo and the Late Formative foundation of Monte Alban in that the latter had approximately five times the estimated population of Dili phase Chiapa de Corzo.

The rank-size graph of Dili phase settlement size by population is slightly primate, although overall very close to lognormal distribution (A=-.07 n=82) (Figure 3.7), reflecting a fairly developed hierarchy of site sizes, with Chiapa de Corzo dominating the settlement system. This distribution contrasts strongly with that of the Jobo phase (A=0.508 n=29), with over 90% confidence in the difference (Figure 3.7a, b). Primate settlement distributions have been interpreted in a variety of ways (Johnson 1977:497-497), but generally attribute a higher concentration of functions to the primate center and a lower level of integration between lower order settlements (Johnson 1980:245). Following Johnson's interpretations of the rank-size rule, the slightly primate but close to lognormal rank-size distribution suggests a reasonable degree of both horizontal and vertical integration between settlements within the Chiapa de Corzo polity. Alternately, following Simon (1955 cited in Fujita et al. 1999:219) the close adherence of this distribution to a log-normal slope could be attributed to population growth and the forces of chance.

In any case, below the top ranked center of Chiapa de Corzo, the rank size graph of settlement hierarchy looks very similar to that of the Jobo phase with a convex distribution (A=0.542 n=82 vs. the overall Jobo value of A=0.508 n=29), reflecting a lack of change at the bottom of the settlement hierarchy. A comparison of the histograms of settlement populations, however, demonstrates a strong proliferation of hamlets in the Dili phase.

Further changes are also visible in the distribution of Dili phase hinterland settlements. A nearest neighbor analysis reveals a shift from the random distribution of the Jobo phase to a clustered distribution of settlements in the Dili phase (NNI= 0.834;

Z= -2.89; p<.01). Dili villages were dispersed (NNI=1.56 Z=3.71 p<.001), while hamlets were clustered (NNI=.8626 Z= -2.199 p<.05). A number of studies have pointed out that clustered patterns of settlement distribution may result from the budding off of settlements from their parent settlements (Earle 1976:205; Marcus and Flannery 1996:116). As members of junior lineages, individuals in these hamlets were likely subordinate to leaders in parent communities. Both the rank-size distribution and the nearest neighbor analysis (clustered hamlets and dispersed villages) lend some support to the notion that a social, if not a political hierarchy developed in the Chiapa de Corzo hinterland during the Dili phase. Neither of these statistics however, provides information on how second tier settlements were integrated with the center and we must consider other lines of evidence to arrive at a better view of how rulers integrated the hinterland population into the polity.

3.2.1.1 The Size and Population of the Chiapa de Corzo Polity. Before entering into the analysis of how the hinterland population was integrated into the polity, it is worthwhile to consider the scale of the Chiapa de Corzo polity. To this end I offer some preliminary assessments of what the total area and population of the polity may have been during the Dili phase. The population density in the Chiapa de Corzo survey area was approximately 49/ km^2, or 38/km^2 when Chiapa de Corzo is excluded. The territory of the polity is estimated to cover about 1354 km^2, calculated from a cost weighted analysis between neighboring political centers, as discussed above (Chapter 2, Appendix B) (Figure 3.6). If we assume the same population density within the study area, excluding Chiapa de Corzo (because of its unusually high density), and the top of Cerro Hueco, an area of approximately 67 km², which does not appear to have a Dili phase occupation, we arrive at a mean estimate of about 50,000 people within the polity. As population was not distributed evenly over the landscape within the study area (and this would suggest that an unusually small percentage of the population was located at the capital) it is worthwhile to qualify this estimate.

If we take population density to be a function of proximity to the capital (an assumption with some justification in the data), and extrapolate the decrease based on the continuation of the decay rate observed within the survey area, the resulting population estimate is 16,800, in an area of approximately 1290 km² (with the upper slopes and top of Cerro Hueco excluded). This estimate places approximately 7% of the polity's population at the capital of Chiapa de Corzo, and provides a population density figure for the polity of approximately 13 / km².

The estimates of the area and population of the polity are obviously hypothetical, but given the spacing of Dili phase polities, they are feasible, and serve as a basis for comparison with other areas of early political development. The estimated territorial boundaries fall within what Spencer proposes as the spatial limits of chiefdoms (a half-days travel from the seat of power, which he estimates at 2463 km² on an idealized Cartesian plane) (1990:7), and the mean population estimate pushes the limits for many conceptions of organizational capacity in terms of population for chiefly forms of organization (Feinman 1998:97). The extent to which the Chiapa de Corzo polity was chiefdom-like or state-like, of course depends entirely on the ways in which rulers integrated the hinterland population into the polity and these strategies of governance are explored below. Likewise, the extent to which rulers meddled in the day-to-day affairs of commoners in the hypothetical frontiers of the polity has a strong bearing on the extent to which we can consider these areas part of the polity. The Chiapa de Corzo survey area reaches into only limited parts of the outer hinterland, but nonetheless provides some information on how these areas may have been incorporated into the polity.

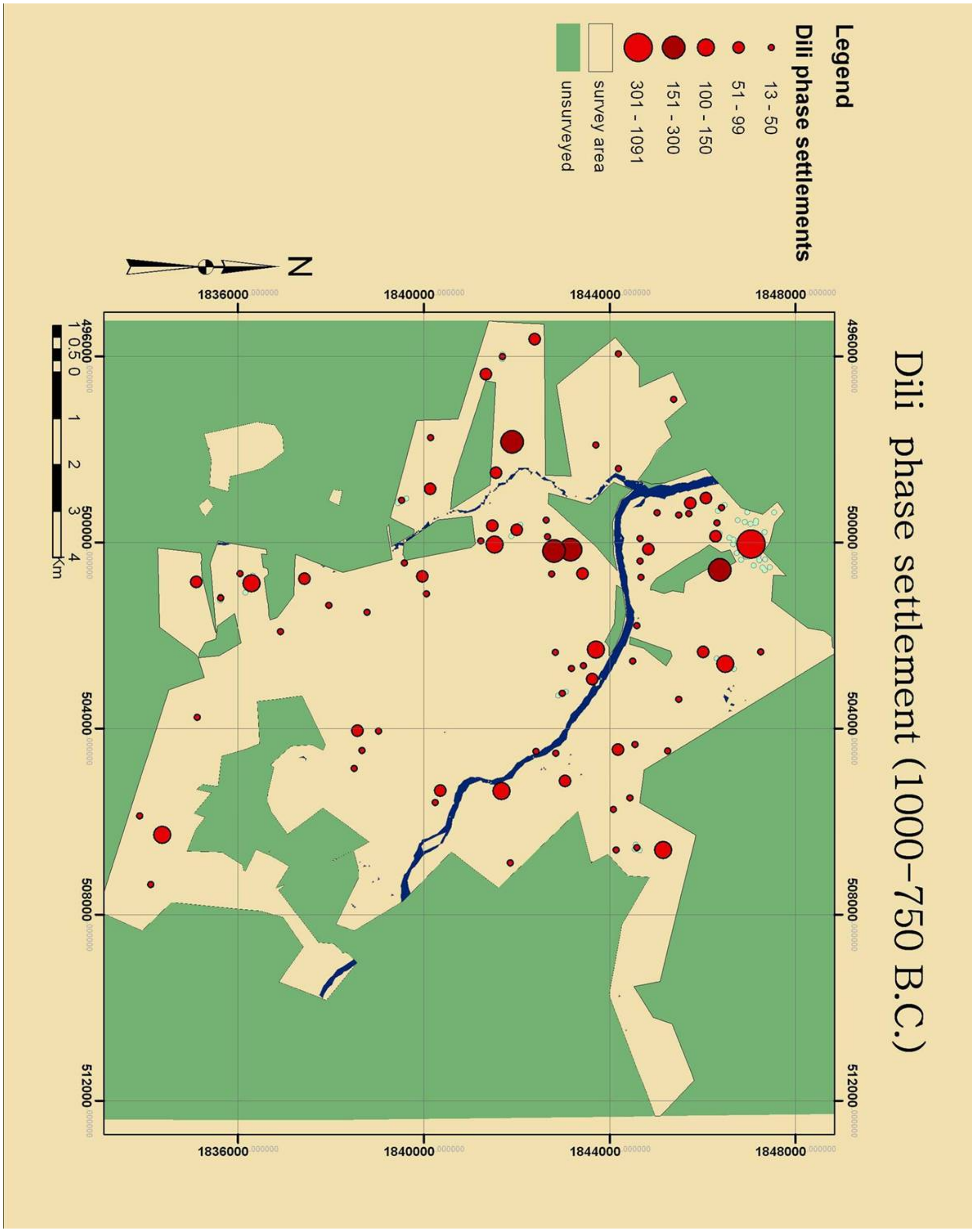


Figure 3.5 Dili phase settlement

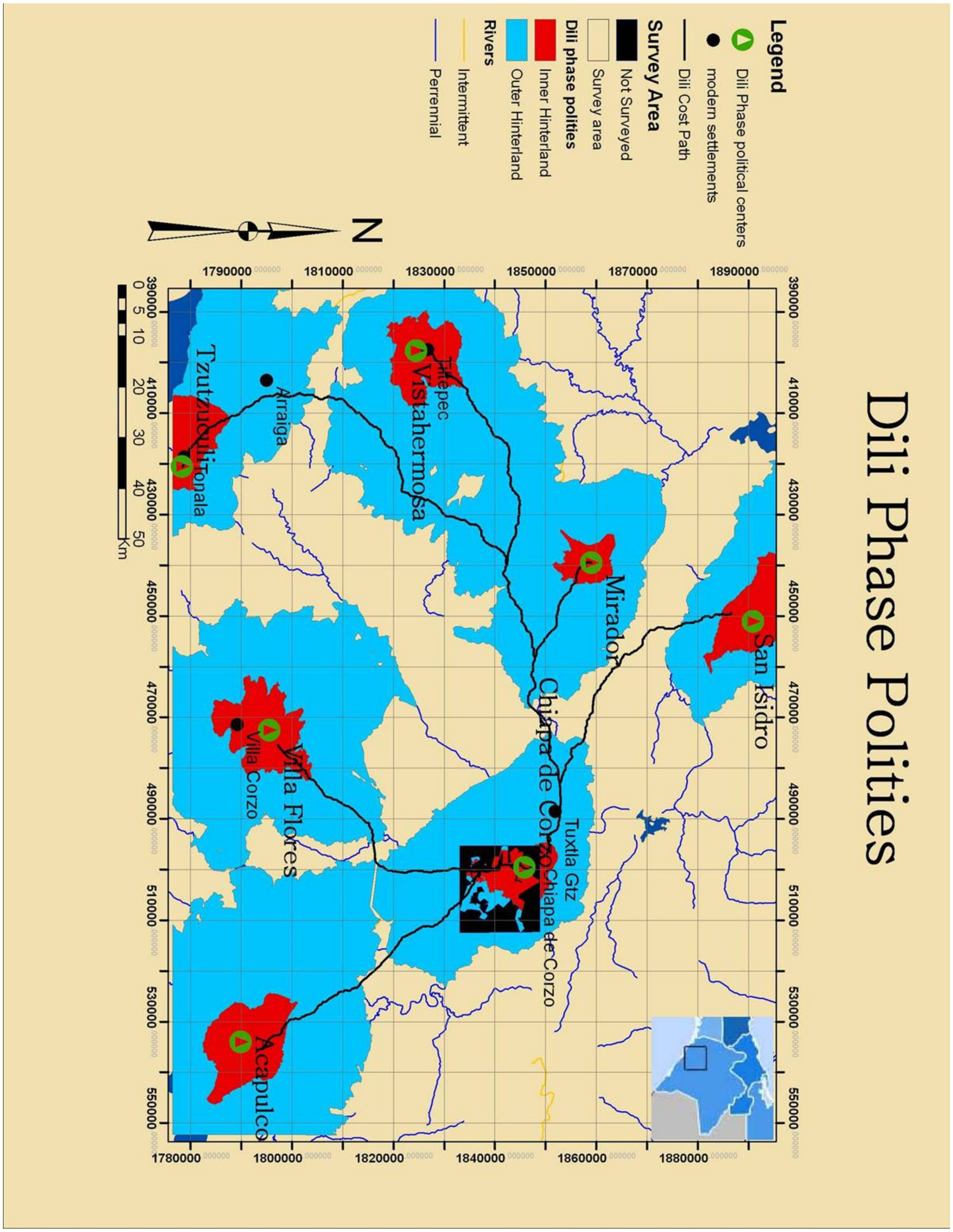
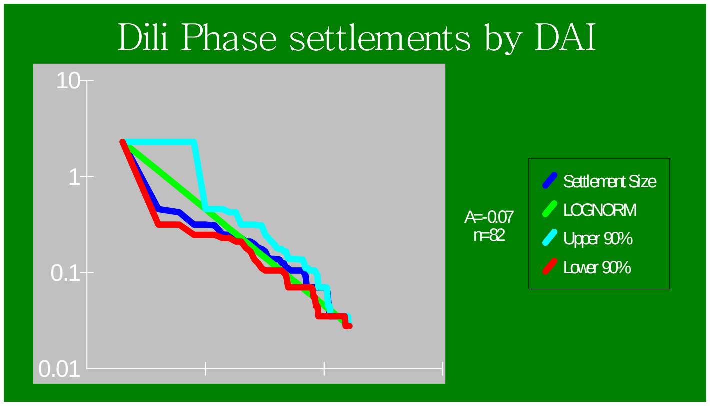
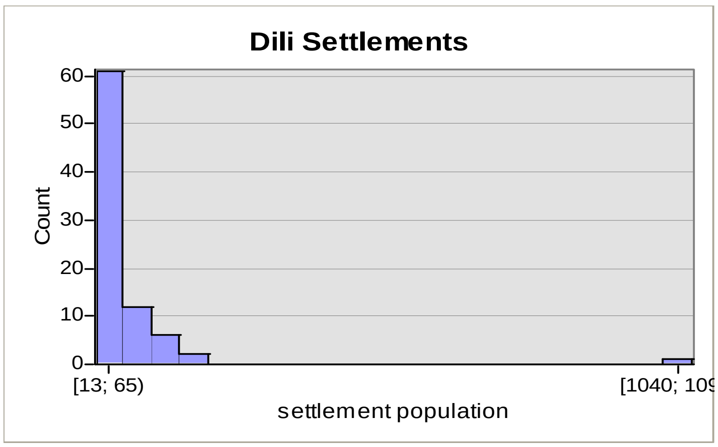


Figure 3.6 Dili phase political boundaries with least cost paths to Chiapa de Corzo.



a.



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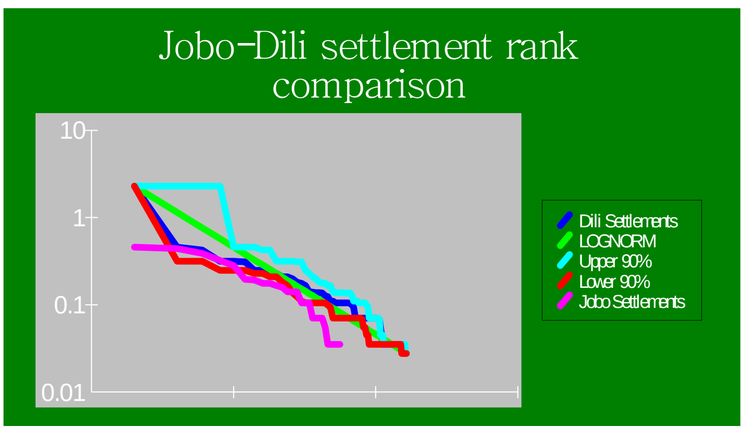


c.

Figure 3.7 a. Log-Rank-Size graph and histogram of Dili phase settlement. b. Histogram of Dili phase settlement, c. Side by Side Comparison of Dili and Jobo phase Rank-Size Graphs.

3.2.2 The Projection of Power into the Hinterland and the Persistence of Village Autonomy

An important facet of how Dili phase rulers at Chiapa de Corzo governed the subject population and how society within the polity was organized lies in the examination of the political hierarchy. Outside of Chiapa de Corzo there are 11 Dili phase settlements with populations estimated at over 100 and two with population estimated at over 200 (Figure 3.5). While only three of the 14 Jobo phase villages maintained populations over 100 into the Dili phase, only one settlement was fully abandoned. This is a relatively high degree of continuity in site location compared to the transition between subsequent phases discussed in the following chapters. The high degree of continuity in village location suggests a relatively low degree of interference by the Chiapa de Corzo rulers in the political organization that had existed in the hinterland prior to its foundation as a political center.

The Dili phase distribution of villages breaks the survey area into nine districts (several of villages are united into single districts because of their close spacing) (Figure 3.8). Four of the nine hinterland districts have second tier centers, and in two of these districts the second tier centers are not the largest settlement in the districts (Figure 3.8). Two of these second tier centers are hamlets, suggesting that the political hierarchy did not correlate tightly with the settlement hierarchy.

Within the Dili phase second tier centers, the orientation of architecture generally does not conform to the Chiapa de Corzo orientation of 28º east of north. One exception is the orientation of the America Libre North settlement, where the platform mound is oriented 26º east of north (Sullivan 2007b:6) (Figure 3.9). No other Dili phase second tier center within the study area, including the neighboring America Libre South settlement, has architecture that corresponds to the Chiapa de Corzo orientation (Sullivan 2007b:6).

The lack of correspondence in the orientation of architecture at three of the four second tier centers to the Chiapa de Corzo orientation suggests that positions of authority in hinterland communities were acquired and held with little interference, sponsorship, or support by the Chiapa de Corzo elite. The America Libre North exception may represent an outpost occupied and maintained by individuals from Chiapa de Corzo, who as discussed below, may have been controlling the movement of goods and people through this transportation corridor. These lines of evidence suggest that whatever authority leaders in rural communities held, with the possible exception of America Libre N., this authority was probably not legitimized by affiliation with the Chiapa de Corzo rulers.

The reduction in size of Dili phase villages from the Jobo phase, and the proliferation of hamlets suggests that Dili phase leaders in hinterland villages had less power to attract or keep followers in their settlements than their predecessors. Correspondingly some of the functions performed by leaders of small villages during the Jobo phase may have relocated to Chiapa de Corzo during the Dili phase. Despite evidence for a two tiered political hierarchy (Table 3.5, Figure 3.10), the architectural and settlement data suggest that leaders at second tier centers were not strongly integrated into the polity. Instead, to the extent that the Chiapa de Corzo rulers were meddling in the affairs of hinterland populations, this control appears to have been exercised directly, not through rural intermediaries.

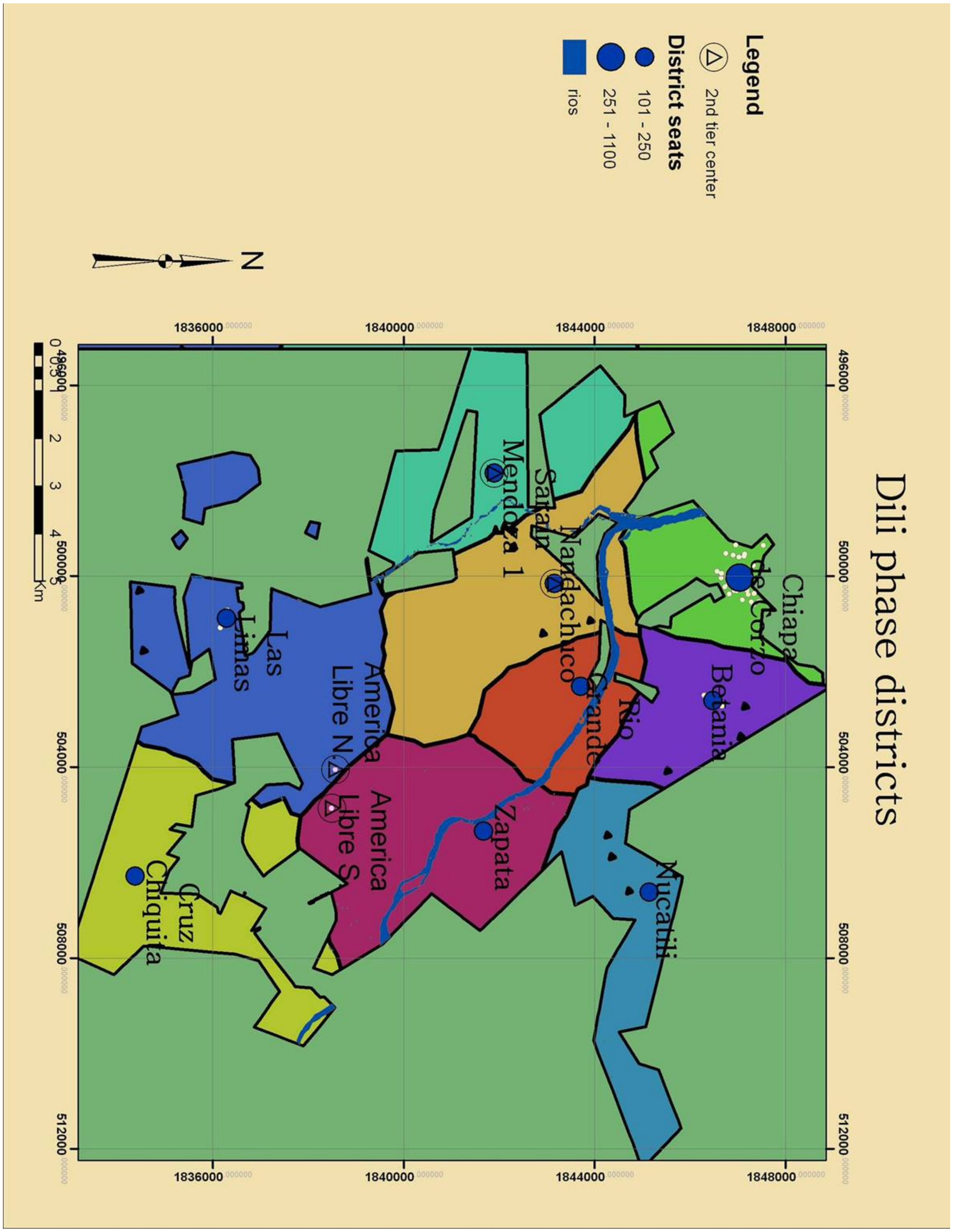


Figure 3.8 Dili Phase Districts Calculated around Village-Sized Settlements (Vournoi Diagram Adjusted by Cost Surface)

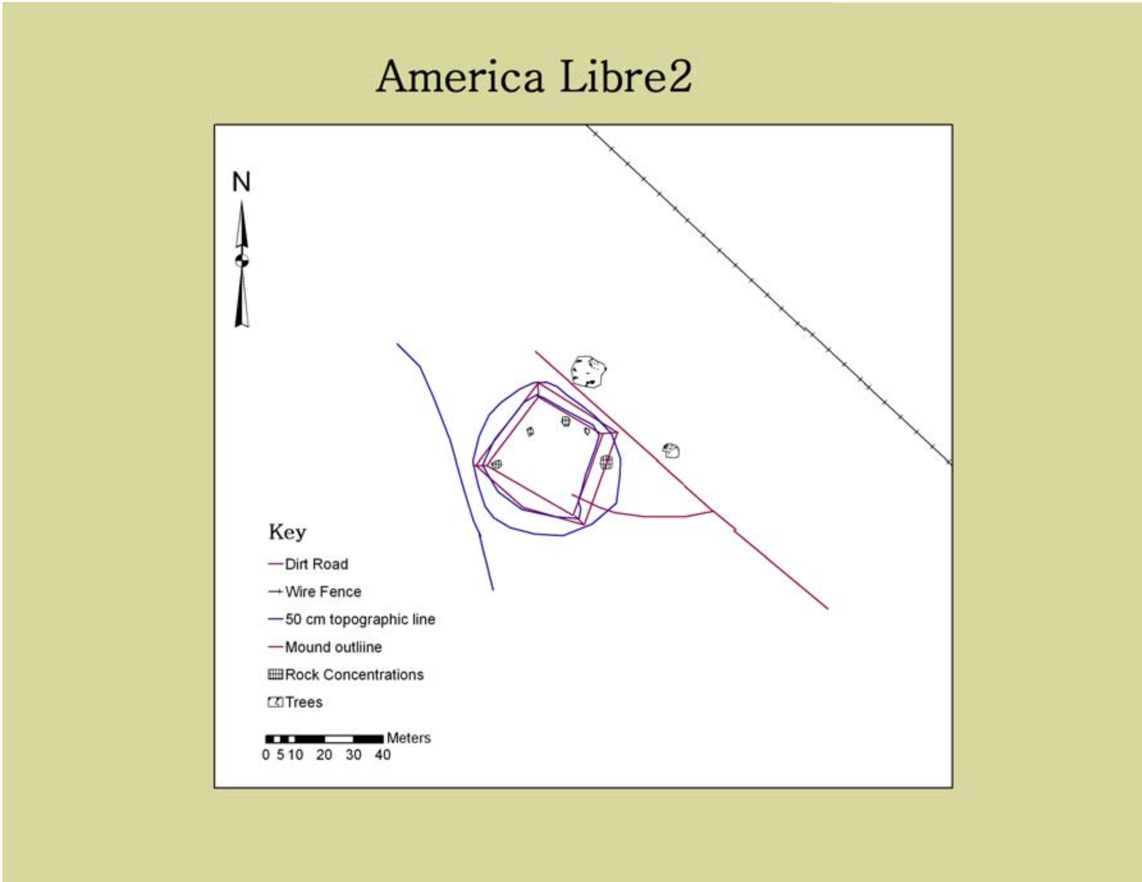


Figure 3.9 Plan of America Libre North

3.2.3 Elite Control over Labor

The ability to mobilize labor into civic-ceremonial or high status residential structures has frequently been used as a measure of authority. The amount of labor mobilized can be measured in terms of volumetrics. Although it is difficult to make precise comparisons from Chiapa de Corzo to hinterland settlements because of our limited knowledge of the dimensions of Dili phase constructions at Chiapa de Corzo, and absence of data from hinterland settlements, data available from excavations provide the basis for some provisional estimates for Chiapa de Corzo, and surface data provide some support for the presence of modest Dili phase constructions in the hinterland. The labor estimates from both Chiapa de Corzo and the hinterland suggest that the labor demands involved in the construction of civic-ceremonial and high status residential were minimal.

Within the civic-ceremonial zone of Chiapa de Corzo there is evidence for Dili phase construction in Mounds 12, 13, and 36[3]. If the subsequent Francesa phase constructions that covered the Mound 36 platform (Lowe 1962:59) did so symmetrically, the Dili phase platform dimensions would be about 50 x 30 m. Excavations indicate that the Dili Mound 36 platform was about 85 cm. tall. Assuming the Mound 36 platform did not support a pyramid, this results in a volume of approximately 1225 m^3, and greater by almost half as much if the platform supported a pyramid, as Clark has speculated (Clark and Hansen 2001:7). Excluding its height of approximately 50 cm (Mason 1960b:3), the dimensions

[3] [3] This assertion is based on my interpretation of the excavation data from Chiapa de Corzo. The original excavator of Mound 12 attributed the initial construction sequence to date to the Escalera phase, despite noting only Cotorra and Dili phase materials in the lower levels (Mason 1960a:3). Mason also noted a only Dili and earlier sherds in the earliest platform in Mound 13 (1960b:1). My interpretation runs contrary to Warren (1977) and Cheetham and Lee(2004), who attribute only the Mound 36 platform and a 20 cm tall platform below Mound 1 as Dili phase constructions.

of the Dili phase Mound 13 platform are unknown, but if we assume it underlies most of the later construction, it would measure approximately 50x50 m, with a volume of 1213 m^3. The Dili phase Mound 12 structure, with a base estimated at 133x19 m and a height of 1.7 m has a corresponding volume of 2225 m^3. Given its spatial relationship to Mound 12 (the western mound of an E-group), it is also likely that Mound 11 had a Dili phase of construction, but as data are lacking from this mound it is excluded from the analysis. If 20% of the total population of each settlement was involved in local construction activities, (218 people at Chiapa de Corzo) at the rate of construction outlined in Chapter 2, the bulk of Dili phase Mound 36 at Chiapa de Corzo could have been built in 4 days, Mound 12 in ten days, and the Mound 13 platform in four days with a minimum combined completion time of 18 days (Table 3.1).

In the hinterland the estimated labor demands from the populations at second tier centers are even more modest. The Saraín Mendoza platform, with a volume of about 70 m^3 and a labor pool of 44 people, could have been built in under 2 days (Table 3.2). The Nandachuco platforms, with a total combined volume of about 166 m^3, and a labor pool of about 41, could have been built in about 4.5 days (Table 3.3). The ratio of construction volume to the estimated local labor force at the two America Libre second tier center hamlets likewise suggests modest demands on the local population. The America Libre North site, with an estimated local work-force of 16 people and a volume of 269 m^3 would have taken about 12 days. The America Libre South site, with an estimated local work force of 7 people and a volume of 90 m^3 would have taken about 9 days (Tables 3.3-3.4).

The scale of constructions at second tier centers suggest they could have been completed in a relatively short time with a labor pool drawn from an extended household or other sub-community level group rather the community at large. These constructions consequently do not support the idea that rural leaders had the authority to mobilize a large proportion of the local population, much less demand labor from neighboring settlements. The larger scale of architecture at Chiapa de Corzo suggests a different kind of labor organization, drawing labor from the community at large rather than the extended family or household of rulers, with more complex means of mobilization and management, likely involving between 100 and 200 laborers, especially if the precinct was constructed in a single season of 20-40 days. Even so, these data suggest that labor demands on the local population of Chiapa de Corzo would not have been heavy during the Dili phase, an observation has also been made for constructions at the Formative through Early Classic period site of Tres Zapotes (Sullivan 2002:130). Even at the later Classic Period Copan, with its much more grandiose architecture, the per-capita labor demands are also calculated to have been very low (Abrams and Bolland 1999; Webster and Kirker 1995).

Beyond the construction of civic-ceremonial structures at Chiapa de Corzo, the maintenance of the structures and the plaza space they outlined would have required annual inputs of labor. The labor demands of maintenance activities would have been lower than those for the construction of civic-ceremonial structures (e.g. Webster and Kirker 1995:371 on rates of plaster application), and could be have been adequately provided by a labor pool drawn from the local population at Chiapa de Corzo. But the maintenance of these large civic-ceremonial spaces would have created an ethos among commoners of providing labor to public, elite sponsored works (McAnany 1989, 1993, 2004a: 157).

McAnany notes that iconographic programs in the Maya area during the Middle Formative thematically focused on deities rather than rulers. This and the lack of palace structures in the Middle Formative leads her to propose that the tradition of royal courts and divine rulers characteristic of the Late Classic had not yet emerged (2004a:151). Correspondingly, these labor demands may have been perceived of as in the interests of commoners, in that the end result bolstered the status of their community and improved relations with the deities (McAnany 2004a:151). The practice of commoners participating in construction and maintenance activities within the civic-ceremonial precinct would have established a precedent of supplying labor to projects directed by elites, with later social transformations allowing elites to direct greater quantities of labor into their own residences (McAnany 1989, 1992, 2004a). .

In sum, there is some support for the idea that a two tiered political hierarchy emerged during the Dili phase. At the top of the hierarchy, the scale of construction at Chiapa de Corzo would have drawn from a labor pool of considerably larger than that of any individual household (probably 50-200 laborers), but would not have necessarily drawn labor from hinterland settlements. The space outlined by these constructions measures approximately 54,400 m^2 (including the plaza space of the E-Group), and could correspondingly have contained a crowd of about 36,000 (allowing each person 1.5 m^2 of personal space, the density of people suggested for the crowd at the Washington Mall during the Obama presidential inauguration (McPhail 2009)).

While it is unlikely that the civic-ceremonial precinct was ever completely filled with people from the E-Group plaza to the base of the Mound 36 platform, these dimensions indicate that this space was amenable to ceremonies involving very large numbers of people, including a substantial portion of the hinterland population. These ceremonies would likely have been attended by most of the people who contributed labor in the construction and maintenance of this space. As such, convincing commoners of their duty to build these structures may not have been difficult (McAnany 2004a:151; Sanders 1974).

Evidence from the hinterland suggests that second tier political leaders, with one possible exception, emerged independently of, or in reaction to the developments at Chiapa de Corzo, not through affiliation with rulers at Chiapa de Corzo. The miniscule demands of labor involved in the construction of platforms in the hinterlands suggest that while these buildings may have demonstrated some status differentiation within and between communities, they were not necessarily manifestations of community leaders' ability to mobilize labor much beyond their own households. Hence the authority of hinterland leaders may have been very limited. These data suggest that positions of leadership in hinterland communities did not change dramatically with the emergence of a ruling elite at Chiapa de Corzo, and in most respects these communities remained largely autonomous, and largely egalitarian in the initial manifestation of the Chiapa de Corzo polity.

Table 3.1 Labor Estimates for Dili phase Chiapa de Corzo constructions.

CdC Dili				
M36	M12	M13	Total	
1500	2527	2500		basal dimensions
1382	1213	2352		top dimensions
0.9	1.7	0.5		Height
1225	3179	1213	5617	Volume
471	1223	467	2160	person/days digging
386	1003	383	1772	person/days hauling soil 50m and piling mound
858	2225	849	3932	total person/days
3.9	10.2	3.9	18.0	days with 20% of mean est. population

Table 3.2 Labor estimates for the Dili phase platform at Saraín Mendoza 1.

Sarain Mendoza1	
Mound 1	
144.0	basal dimensions
136.9	top dimensions
0.5	Height
70.2	Volume
27.0	person/days digging
22.2	person/days hauling soil 50m and piling mound
49.2	total person/days
1.1	days with 20% of mean est. population

Table 3.3 Labor estimates for the Nandachuco platforms

Nandachuco						
m1	m2	m3	m4	M5	m6	
38.9	59.2	31.2	17.4	5.0	29.5	Volume m^3
15.0	22.8	12.0	6.7	1.9	11.3	Person/days digging
12.3	18.7	9.8	5.5	1.6	9.3	Person/days hauling soil 50m and piling mound
27.2	41.4	21.8	12.2	3.5	20.7	Total person/days
0.9	1.3	0.7	0.4	0.1	0.7	Days with 20% of mean est. population

Table 3.4 Labor estimates for the America Libre platforms

America Libre S	America Libre N	
90.39	*268.5*	Volume m³
34.76538	103.3	Person/days digging
28.5142	84.7	Person/days hauling soil 50m and piling mound
63.27958	188.0	Total person/days
8.788831	11.7	Days with 20% of mean est. population

Table 3. 5 Person-day investment in civic-ceremonial/elite architecture

Dili architecture	Person days
Chiapa de Corzo	3932
America Libre N	188
Nandachuco	181
America Libre S	64
Saraín Mendoza 1	49

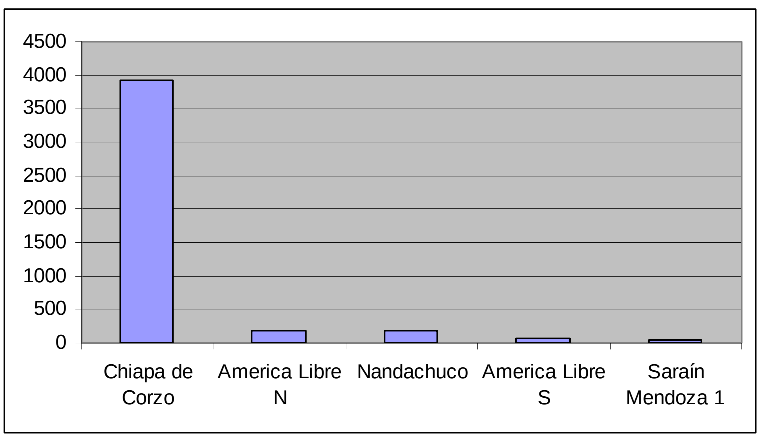


Figure 3. 10 Person-day investment in civic-ceremonial/elite architecture

3.2.4 Control over Access to Agricultural Lands

As noted in Chapter 2, evidence for control over access to prime agricultural lands is indirect; a high frequency of hamlets on prime agricultural lands suggests the lack of centralized control of land tenure, while more nucleated patterns may reflect a variety of centralized landholding forms of organization, including but not limited to the ownership of lands by the political elite (DeMontmollin 1989:296; Kruger 1996:41-42). The Dili phase settlement patterns display a great increase in the absolute number of hamlets from the Jobo phase, as well as a strong increase in the percent of total population residing in hamlets (19% to 48%). This increase in the number of hamlets relative to small villages is significant (X^2=12.29, p<.001) and strong (V=.33).

Within the Chiapa de Corzo district, the population density on prime agricultural lands was higher than in any of the hinterland districts (Figure 3.11, Table 3.6) suggesting that that in the immediate sustaining area of Chiapa de Corzo there was no "agricultural reserve" (DeMontmollin 1989a:309). In the hinterland districts with prime agricultural land there was also a high percentage of population on prime agricultural land, although this percentage was lower than in the Jobo phase.

The proliferation of hamlets in the Dili phase supports the notion that residence directly on prime agricultural lands was a strategy used by families to assert use rights over these areas during the Dili phase. Correspondingly, the notion that land tenure was managed by extra-household groups such as political leaders or community based organizations in the hinterland is not supported. Again, this does not preclude the possibility that rulers and leaders were appropriating agricultural surpluses, as normative, remunerative, or coercive sanctions can be imposed to encourage the provision of agricultural surpluses to elites without interfering with systems of land tenure. The tendency for hamlets to cluster around villages would have facilitated the extraction of agricultural surpluses by rulers at the center from village leaders.

Table 3. 6 District population with population density per ha on prime agricultural land.

Dili districts	district pop	pop per ha	pop on prime	percent prime land in district	pop per ha on prime	percent of pop on prime
CdC	1681	2.19	267	16.43%	2.12	15.88%
Nandachuco	885	0.73	363	42.61%	0.70	41.02%
S. Mendoza	572	1.54	356	84.37%	1.14	62.24%
Zapata	396	0.23	34	9.18%	0.22	8.59%
Las Limas	398	0.21	282	20.80%	0.72	70.85%
mnRio Grande	296	0.37	262	24.72%	1.31	88.51%
Betania	217	0.26	0	0.00%	0.00	0.00%
Nucatilí	382	0.40	0	0.00%	0.00	0.00%
Cruz Chiquita	193	0.16	0	0.00%	0.00	0.00%

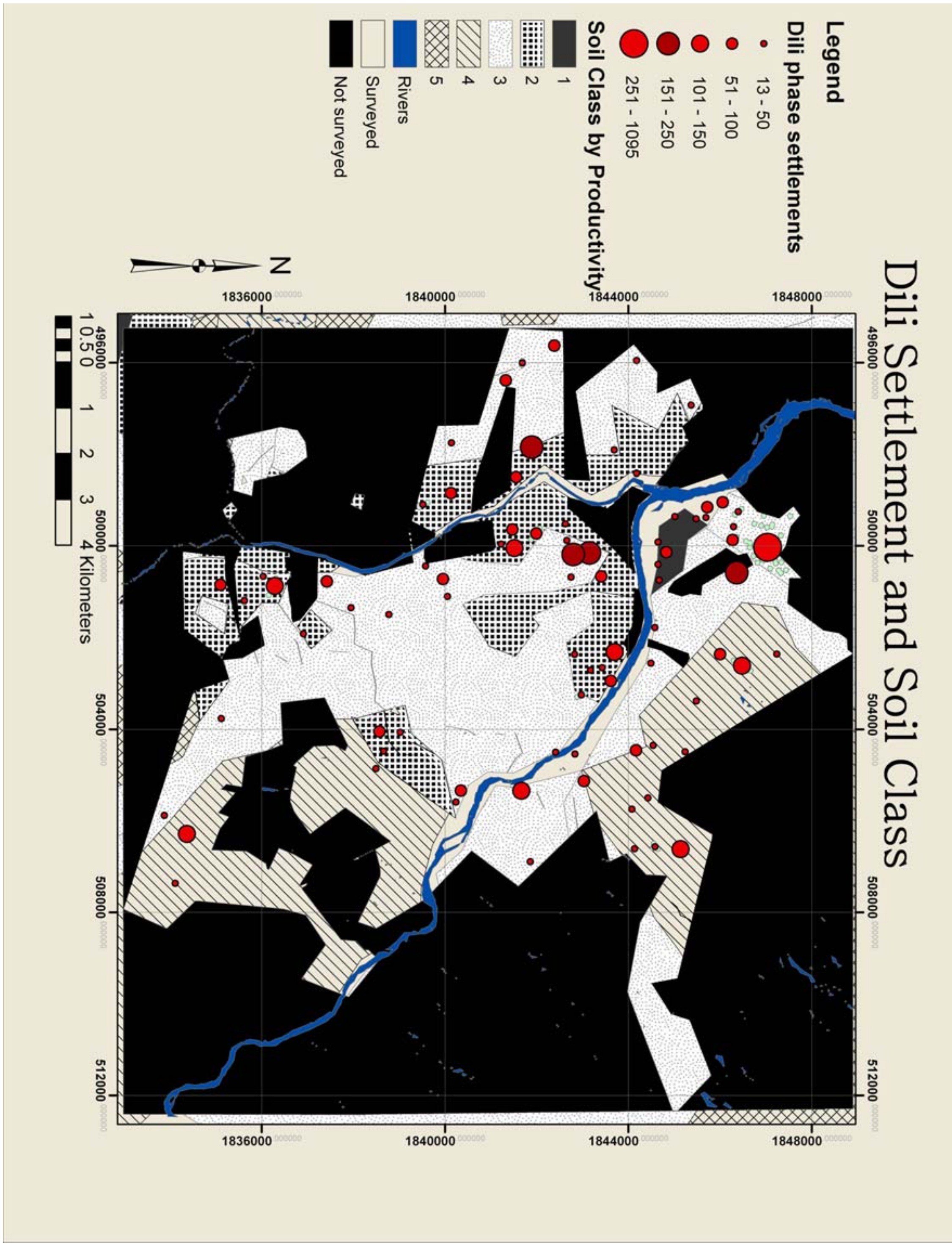


Figure 3.11 Dili phase settlement and soil class.

3.2.5 Control over Prestige Goods and Access to Obsidian

Control over the movement, and consumption of prestige goods, and exotic raw materials was an important strategy in the consolidation and maintenance of power many in early polities (Brumfiel and Earle 1987; D'Altroy and Earle 1985; Earle 1991; 1997; Helms 1979). As noted above, the most frequently occurring prestige good in surface collections was obsidian. Obsidian appears to have been tied into the personal and political relationships that constituted long-distance exchange networks involving the transactions of exotic goods over long distances, such as jade, marine shell, which have been interpreted as prestige items (Clark and Lee 2007:114; Joyce et al. 1995:9). Clark has argued that the manufacture of prismatic blades required a relatively high degree of specialization, and given the correlation of its widespread adoption of blade technology with the emergence of chiefdoms in Mesoamerica during the Middle Formative, he contends that this form of production was initially sponsored by elites, who redistributed blades in order to curry favor from followers (Clark 1997; Clark and Lee 2007:115).

The notion that obsidian was a prestige good finds support in its frequent association with higher status burials at Chiapa de Corzo (frequently occurring in burials with jade and fancy or abundant ceramics) throughout later phases of the Formative (Escalera though Horcones phases). While no high status burials have been identified for the Dili phase, it is likely that as an exotic material obsidian had prestige value at this early date.

Before entering into estimates of obsidian consumption rates and patterns, I would point out that only three of the 38 unmixed Dili phase collections had obsidian. All of these collections are from hamlets and all of this obsidian is from the San Martin

Jilotepeque (SMJ) source: to the west of the Grijalva River obsidian occurred at Culatí, approximately 680 m to the southwest of Chiapa de Corzo, in the form of a secondary reduction flake, at Vergel 2, located at the base of Cerro Hueco, about 5800 m to the southwest of Chiapa de Corzo a single retouched prismatic blade was found with exclusively Dili material; and 4700 m to the southeast of Chiapa de Corzo, Nandambua 1, had a single retouched prismatic blade. From this regrettably small sample that can be confidently attributed to the Dili phase we can conclude that both prismatic blades and non-prismatic flakes of SMJ were utilized during the Dili phase. Neither of these conclusions is particularly groundbreaking but the occurrence of prismatic blade fragments in two Dili phase hamlets, each located over 4 km distant from Chiapa de Corzo indicates that people in hinterland settlements had some access to materials that were likely controlled by elites at the center (Clark and Lee 1984:247; 2007:115).

From the allocated obsidian values, Dili phase obsidian consumption increased 307% from the Jobo phase (37% when adjusted for differences in phase length), from 4.48 pieces to 18.25 pieces, although a comparison of obsidian values between Jobo and Dili collections is not very significant at all ($t=.85$ $p=.46$) ; There was an increase in the relative importance of obsidian in the Dili phase, as it constituted 20% of the lithic assemblage compared to 15% in the Jobo phase but the difference is not very significant at all ($x^2=.603$ $p=.44$); 19% (n=7) of the Jobo collections had obsidian, and 28% (n=33) of the Dili collections had obsidian, but these differences are also not very significant ($x^2=1.27$ $p=.26$ $v=.05$). There is some suggestion in the data that lithic technology changed from the Jobo to the Dili phase, as non-prismatic flakes accounted for 30% of obsidian attributed to the Jobo phase, and only 4% of obsidian attributed to the Dili phase, but again, this difference is not very significant, with a Fishers's exact p=.27.

A total of 52% (n=9.42) of the obsidian attributable to the Dili phase was found within the settlement of Chiapa de Corzo. Considering that 21% of the Dili phase population was located at Chiapa de Corzo, these data indicate that obsidian consumption rates were considerably higher within the center than in most hinterland communities. Nonetheless, obsidian consumption rates at Chiapa de Corzo were not the highest in the study area, and not all of the high per-capita obsidian consumption values come from hamlets (where a single obsidian blade can provide relatively very high consumption rates).

The difference in ratios of obsidian to ceramics at Chiapa de Corzo, and at pooled hinterland sites are significant and moderately strong (X^2=8.993 p=0.002 V= 0.16). Outside of Chiapa de Corzo obsidian is absent at all of the Dili phase second tier political centers and in all but three of the 11 hinterland villages (Figure 3.12). In hinterland settlements there is a weak and not very significant positive correlation between the obsidian counts and population values (r=0.15 p=0.18. Y= 0.55X+.062). Excluding all of the settlements where obsidian was not found, there is a slightly stronger correlation between obsidian counts and population values but it is not very significant at all (r=0.28 p=0.353 Y=1.93X+0.498). Some positive correlation between settlement size and obsidian density should be expected given the method by which obsidian values were allocated to phases.

The relatively high rate of obsidian consumption at Chiapa de Corzo lends support to the hypothesis that the procurement of obsidian was sponsored or controlled by the

Chiapa de Corzo elite. Nonetheless, the high per-capita obsidian values at two of the hinterland villages suggest that the Chiapa de Corzo elite may not have held a monopoly over access to obsidian.

Despite the presence of obsidian at Dili settlements in the hinterland, the absence of obsidian at second tier political centers and general scarcity of the material in hinterland villages suggest that hinterland leaders were not strongly involved in controlling access to obsidian. Insofar as obsidian may have been a component in a prestige goods network, leaders of hinterland communities do not appear to have been included in this network.

As a side note, the obsidian data from the survey suggest that Dili phase Chiapa de Corzo may have participated in a different obsidian procurement network in the Middle Dili phase than contemporary political centers on the Upper Grijalva. In the Upper Grijalva centers obsidian sources changed from an even mix of San Martin Jilotepeque (SMJ), El Chayal, with a minor component of Tajamulco during the Early Formative to an assemblage dominated overwhelmingly by SMJ during the Middle and Late Formative (Clark and Lee 2007:114). In the Chiapa de Corzo region, no such change took place from the Jobo to Dili phase, as a mix of El Chayal and SMJ obsidian continued to be used, with El Chayal dominating (61% n=11.21), although the differences in the counts of El Chayal and SMJ are not statistically significant (T=.459 P>.5). This pattern of obsidian consumption also appears to apply to the Middle Formative Finca Acapulco settlement, where nearly even quantities of SMJ and El Chayal were found, both on the surface and in excavations, however at Finca Acapulco, in contrast to the Dili phase collections, prismatic blades were rare (Clark In press: 34).

In sum, the distribution of obsidian supports the notion that elites at Chiapa de Corzo sponsored its importation, but suggests that they did not have monopoly control over access to this material. To the extent to which obsidian was imported as part of a prestige goods network, rulers at Chiapa de Corzo do not appear to have been enhancing the status of leaders at hinterland settlements by including them in this network. Obsidian at hinterland settlements appears to have been either procured through Chiapa de Corzo elites or directly from traders moving this material to Chiapa de Corzo, rather than through the lower tiers of the political hierarchy.

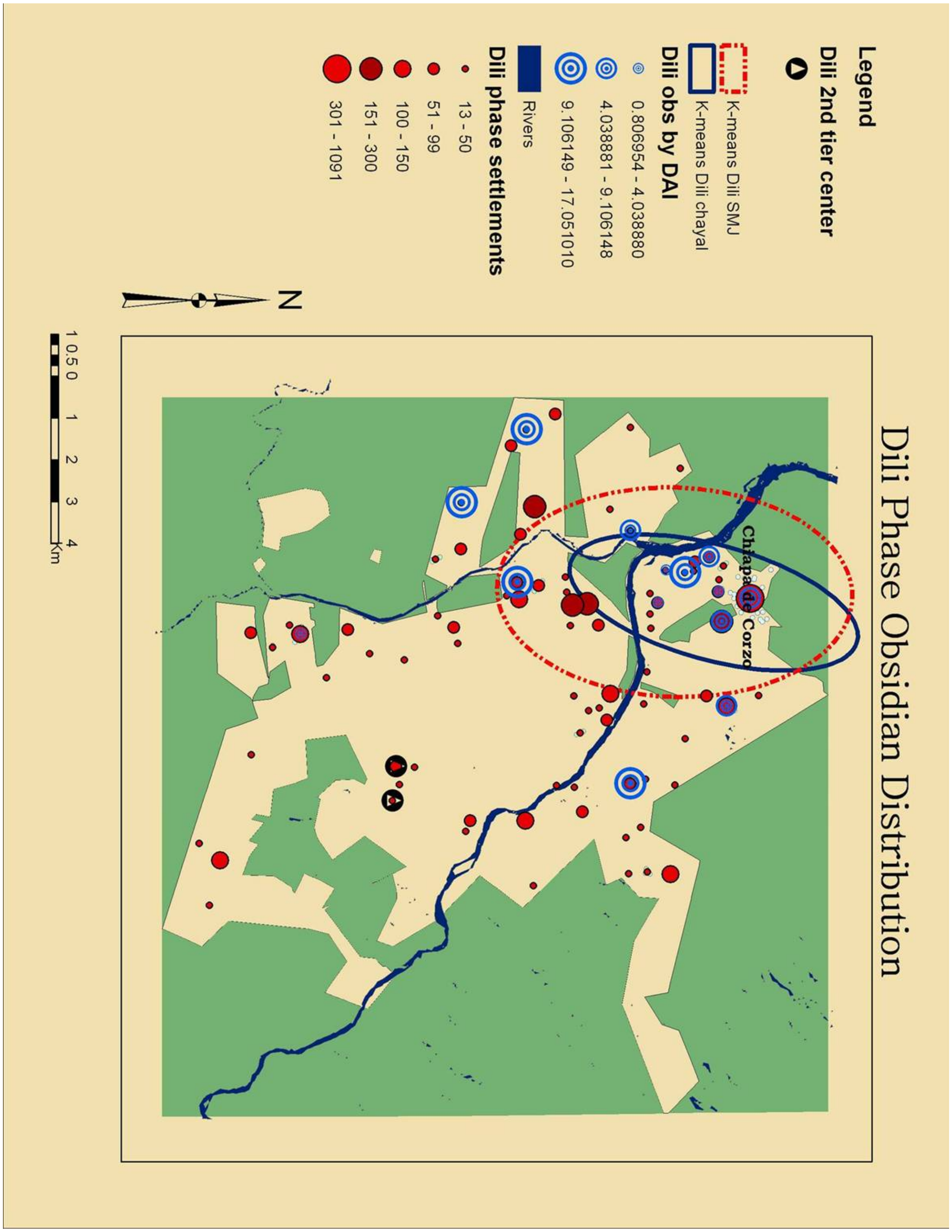


Figure 3.12 Dili phase obsidian distribution with K-means ellipses

3.2.6 Control over Trade and Communication Networks

The control over trade and communication networks through the establishment of outposts on key points of transportation routes has been argued to be a strategy for consolidating and maintaining power by elites during the Mesoamerican Formative period (Symonds, Cyphers, and Lunagómez 2002:93) and in subsequent periods (Carballo and Pluckhahn 2007;). Kenneth Hirth, on the other hand, has argued that there is little evidence for territorial control over trade routes in Mesoamerica until the emergence of expansionist states. Hirth contends that during the Middle and Late Formative elites influenced the flow of goods through control of the production or through alliances with groups that had access to desired resources, rather than through direct control over communication routes (2000:121). The following examines the evidence for territorial control over routes of communication by the Dili phase Chiapa de Corzo elite.

The least cost paths calculated from contemporary centers in the Central Depression and the Northern Pacific Coast sub-region to Chiapa de Corzo in general conform to the paths described by Navarrete (1978:76b). One exception is the least cost path from Tzutzuculi to Chiapa de Corzo, which follows the path of the modern highway, running first to the west through Arraiga before turning east once in the Central Depression and running adjacent to Ocozocoautla, rather than taking the closer, and more direct, northeastward path from above the modern settlement of Tonala to the modern settlement of Villa Corzo. It should be noted, however, that the least cost analysis indicates that the route from Tonala through Villa Corzo is not substantially more costly than the route through Arraiga, and this route, which converges with the Dili phase center of Villa Flores, may have been utilized during times of conflict in the Jiquipilas sub-region. The entrance of these least cost paths into the study area, as well as the location of modern roads is outlined in Figure 3.13.

The evidence for Chiapa de Corzo control over routes of trade and communication in the Dili phase is very limited. The two hamlets classified as second tier political centers, America Libre N and America Libre S are located on the road between Barranca Honda and America Libre, a likely overland route from sites in the Angostura to political centers in the western Central Depression. Given their location, these second tier centers may represent outposts of Chiapa de Corzo on a likely overland route between the Grijalva and the Santo Domingo Rivers leading from the eastern Central Depression to population centers in the Frailesca and western Central Depression. As discussed above, the America Libre N platform conforms fairly closely to the Chiapa de Corzo architectural orientation, while the other does not (Figure 3.9). The fact that one of these platforms conforms to the orientation of Chiapa de Corzo, suggests at least some affiliation of individuals at this site with the Chiapa de Corzo rulership.

The second tier center of Saraín Mendoza lies above the juncture of a modern dirt road to Suchiapa and the modern road to the Frailesca and Angostura areas. However, as noted above, the architecture at this site does not correspond to either the style or orientation of architecture at Chiapa de Corzo. While the development of local leaders at this settlement may have been in part a product of the advantages conferred by the ability to exploit the movement of people and goods over these routes, the available evidence suggests that this development took place without support or interference from the Chiapa de Corzo rulers.

Another potential outpost is the seventh largest Dili phase settlement in the survey area, the small village of Las Limas, located on the southern edge of the town of America Libre, at the juncture of the road to the Angostura and the modern road between Chiapa de Corzo and the Frailesca (Figure 3.6, Figure 3.13). The strategic value of this location is attested to by the presence of a Mexican military inspection outpost here in 2005, and it may have been an equally important in controlling communication and trade routes during Dili phase. Gareth Lowe mentions mounds in the America Libre area (1959:29), but the exact location and date of these mounds is unknown. These mounds may be destroyed, as the survey detected none in this area. Las Limas is one of the few second tier sites to have obsidian, but the Dili phase obsidian values are low here. There is currently little at Las Limas that would suggest an elite presence, and little to support the notion of Chiapa de Corzo rulers meddling in the affairs of this village.

The sparse evidence for elites at the Las Limas site suggests that representatives of the Chiapa de Corzo polity did not reside here, and that whatever control or advantage was taken over trade and communication by individuals at this settlement was exercised without the interference or direction from rulers at the center. The presence of second tier centers along the America Libre-Barranca Honda road may reflect the imposition of Chiapa de Corzo sponsored functionaries in this area. If the residents of these platform mounds were sponsored by, or otherwise affiliated with, the Chiapa de Corzo rulership, then these hamlets may have been established to monitor and control the movement of people and goods through this transportation corridor. As it stands, the evidence suggests that Dili phase Chiapa de Corzo rulers placed minimal emphasis on controlling the movement of people and goods over routes of communication within their territory.

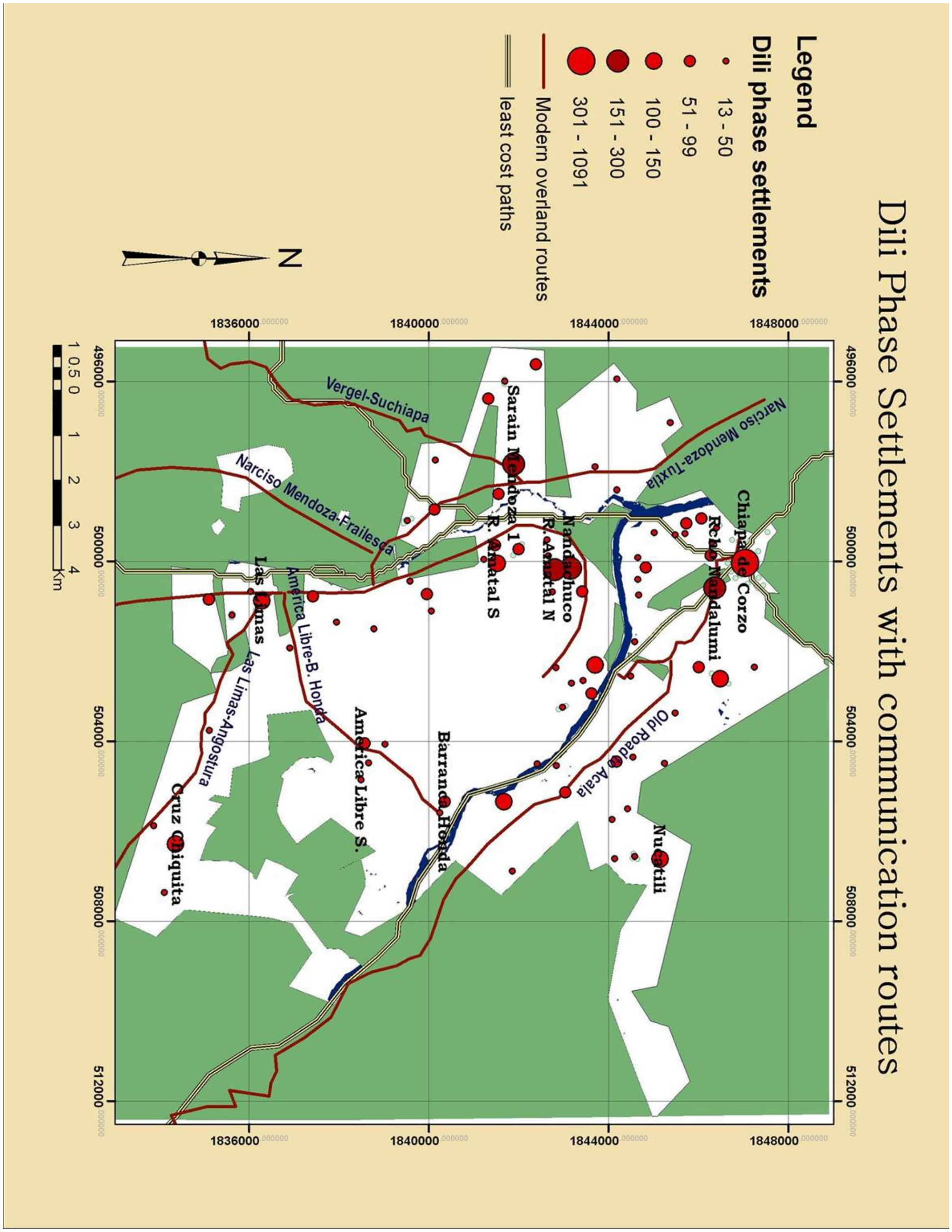


Figure 3.13 Dili settlements with communication routes.

3.2.7 The Use of Warfare and Coercion

Evidence for the presence or use of military force is generally sparse and often indirect for Formative Period Mesoamerica (Hassig 1992:9; Reilly and Garber 2003; Pool 2007:138) and Dili phase Chiapa de Corzo is no exception. That said, during the Dili phase the political landscape of the Central Depression and its neighboring areas changed as competing political centers emerged in other parts of western Chiapas. The emergence of a political landscape characterized by neighboring political centers with relatively large populations, monumental architecture and emergent elites would have changed the nature of conflict and competition in the region. If the emergent rulers of these centers established coercive or military forces, the focus of warfare may have shifted from inter-village raiding towards inter-polity competition focused principally on political centers and their rulers.

Several sites figure prominently as potential rivals to Chiapa de Corzo in the Dili phase. Finca Acapulco was located some 100 km upriver to the east, in the Chachi sub-region (Figure 1.1, Figure 3.6). This center was larger, older, and likely more powerful than Chiapa de Corzo in the Dili phase (Lowe 2007:89; Clark In press). About 36 km upriver from Chiapa de Corzo, in the Acala sub-region, the site of Santa Cruz has a Dili occupation (Sanders 1961) and may or may not have been political center during this phase. In the Jiquipilas sub region, the settlement of Mirador had emerged as a political center (Agrinier 2000:3), about 65 km the west of Chiapa de Corzo. Just outside of the Central Depression, about 75 km to the northwest, in the Middle Grijalva sub-region, the site of San Isidro appears to have reformed into a political center after a hiatus in the late

Early Formative (Lowe 1994; 1998; 2007:98). A small Dili phase political center also appears to have formed at the site of Villa Flores in the Frailesca (Navarrete 1960:9). Any or all of these centers may have been political competitors of Chiapa de Corzo.

There is no evidence of a population buffer on the Grijalva upstream from Chiapa de Corzo, as occupation increased in this area from the Jobo phase. Limited investigations near the boundary of the Chiapa de Corzo and Jiquipilas sub-region, at the site of San Agustin, to the west of Tuxtla Gutierrez, show evidence for Dili phase occupation (Navarrete 1959), and the settlement of Ocozocoautla, although evidently not yet a political center had a Dili phase occupation (McDonald 1999:62). Both of these settlements fall into the area between Chiapa de Corzo and Mirador, suggesting that the frontier between these polities was also populated. The presence of population in these frontier areas suggests that to the extent that inter-polity warfare was a feature of early political interaction, its impact on populations in frontier areas was not strong.

The limited survey data available from around the Suchiapa River in the southwestern portion of the outer hinterland suggests that the Jobo phase settlements were abandoned in this area, which may indicate the development of a settlement buffer in this area. This observation finds further support in the lack of Dili phase occupations noted in the Frailesca between Villa Flores and Chiapa de Corzo (Navarrete1960). If the abandonment of settlements around the Suchiapa does reflect the formation of a settlement buffer, it may reflect conflict with the small political center of Villa Flores (Navarrete 1960: 9). Alternately, the lack of settlement in this part of the outer hinterland may reflect the relatively vulnerable position of this area to raiding from groups without political affiliation.

Given the evidence for military conflict in other areas of Mesoamerica during the Middle Formative (Brown and Garber 2003; Flannery and Marcus 2003:11803; Reilly and Garber 2003), the possibility of military conflict between political capitals in and around the Central Depression during the early Middle Formative cannot be easily dismissed. The increase in the dispersal of population within the study area from the Jobo to the Dili phase may be related to a cessation of raiding between villages. This shift is likely related to the emergence of ruling elite at Chiapa de Corzo, which resulted in the formation of a new setting for the resolution of disputes between hinterland families and groups. This increased population dispersal also suggest that to the extent that warfare was present during the Dili phase, it was directed more at political centers and conducted between rulers, with less effect on hinterland populations than the inter-community raiding postulated for the Jobo phase.

It is possible that an increase of raiding from groups outside the Chiapa de Corzo area contributed to the development of the political center of Chiapa de Corzo, as has been suggested for Monte Alban (Marcus and Flannery 1996:154; Blanton et al 1999:63). However, the lack of a defensive location for Chiapa de Corzo, and the dispersed nature of Dili phase settlement do not support this notion. Either the centralization of military authority at Chiapa de Corzo in the Dili phase was successful enough to neutralize external military threats to hinterland populations, or external threats were not an important factor to begin with. Nor do I suggest that the Chiapa de Corzo was founded by leaders of hinterland villages as a solution to inter-village rivalries, as the evidence we have for the Dili phase layout of the Chiapa de Corzo, in contrast to the evidence from MA I Monte Alban (Blanton 1979; Marcus and Flannery 1996:154), does not support the notion of a confederacy of leaders of equal status. The persistence of villages from the Jobo phase into the Dili phase, which is high relative to the subsequent three phase transitions, suggests that the early rulers at Chiapa de Corzo did not gain control over the hinterland by force. The dispersed settlement pattern and relative continuity of village location from the Jobo phase also suggests that the threat or application of coercive force did not figure prominently as a strategy of the early Chiapa de Corzo rulers.

The establishment of political elite may have formed a new locus for the mitigation of local conflicts, and aggression that previously existed between villages may have been channeled by Chiapa de Corzo elites to conflicts between neighboring centers. The local pacification may have thus emerged as an unintended consequence of the formation of political inequality at Chiapa de Corzo.

3.2.8 The Establishment of Elite Political Identity

The differentiation of elites from commoners has been an important feature of many political systems. This differentiation can allow leaders to break from kin-ordered modes of production, with their accompanying limitations on the accumulation of wealth and power, and to impose a tributary mode of production (Wolf 1984: 398, 1997:98). This process often involves the assertion of a different identity for elites and commoners, with elites asserting a different ancestry than commoners, and promoting that ancestry as privileged, either through asserting ties to the supernatural, to prestigious foreign lineages, or both (Friedman 1979; Marcus and Flannery 1996:95; Wolf 1984:398, 1997:98).

Within Chiapa de Corzo there is little direct evidence for elites from the Dili phase. Only four burials from the Dili phase have been documented, and only one of these had burial furniture (Lowe and Agrinier 1964:9). This burial was accompanied by a single jade bead, which Lowe speculates may have been intrusive (Lowe and Agrinier 1964:67). The small sample size of Dili burials makes this line of evidence insufficient to support the notion that a distinct elite identity had formed by the Dili phase. But the evidence from Dili phase architecture at Chiapa de Corzo provides better evidence for the emergence of a distinct class of elites.

The northernmost structure of the Chiapa de Corzo civic ceremonial zone, the Mound 36 platform, was built with a stone facing that Clark and Hansen describe as duplicating "the middle Olmec style of large stone slabs and alternating stone cobbles (Lowe 1962:57-59, Figure 37, Plate 29h) known for Chalcatzingo and Teopantecuanitlan in highland Mexico (see Martínez Donjuan 1994; Grove 1989)," and similar to the stone facing in platforms of Complex A at La Venta, Tabasco (Clark and Hansen 2001:7). The ad option of a civic-ceremonial architectural style that was shared with major contemporary Mesoamerican centers suggests that some individuals at Chiapa de Corzo were interacting with foreign leaders in a peer-polity interaction network (Renfrew 1996).

The assertion that early leaders at Chiapa de Corzo were participating in a peer-polity interaction network is further supported by the layout of the Dili phase Chiapa de Corzo civic-ceremonial precinct, composed of the early stages of Mounds 36, 13, 12, and probably Mound 11 (Figure 3.14). This layout corresponds closely to what Clark and Hansen have termed the "Middle Formative Chiapas" (MFC) pattern (2001:4), which is shared by La Venta (consisting of complexes B and part of C at La Venta), and many contemporary political centers in Chiapas. A truncated version of this pattern (lacking the northern plaza area delineated by the presence of Mound 36 at Chiapa de Corzo) is present at the two earlier nearest political capitals of San Isidro and Finca Acapulco.

The notion that the early Chiapa de Corzo elite were peers to rather than subjects of neighboring polities is supported by the larger and more complete MFC pattern of its civic-ceremonial precinct compared to its earlier neighbors, Finca Acapulco and San Isidro, which both lack the northern extension of the MFC pattern. This northern extension of the pattern is delineated at Chiapa de Corzo Mound 36, and by Mound C1 at La Venta (Figure 3.15). This northern extension of the MFC pattern adds considerable space to the ceremonial precinct, and correspondingly implies larger scale ceremonies, possibly incorporating different rituals, at Chiapa de Corzo than at the neighboring political centers of Finca Acapulco and San Isidro.

That said, status differentiation between elites and commoners does not appear to have been especially pronounced at Chiapa de Corzo during the Dili phase. The labor demands for the likely elite residential platform of Mound 13 constitute about 849 person-days of labor, or four days with 20% of the Dili phase population of the capital. In relative term the labor investment in the Dili phase Mound 13 platform is also modest, constituting 22% of the estimated Dili total labor estimate for the Chiapa de Corzo civic-ceremonial precinct (less if Mound 36 supported a pyramid and if Mound 11 had a Dili construction phase). Sanders (1974:110), and Flannery (1998:21) in distinguishing between chiefly authority and kingly authority utilize the amount of labor invested in the construction of public civic-ceremonial structures, which have communally beneficial functions, to the quantity of labor invested in the construction of elite residential constructions, which would be less accessible to commoners and correspondingly of less benefit to the community. Following this line of reasoning, the relatively low investment in elite residential architecture within the Chiapa de Corzo civic-ceremonial precinct suggests relatively low levels of status differentiation in the Dili phase polity.

The adoption of architectural styles and patterns of civic-ceremonial space shared with contemporary political centers in and around the Central Depression, suggests that a group of people at Chiapa de Corzo distinguished itself from commoners through participation in a broad network of cultural and ritual interaction. I suggest that the foundation of Chiapa de Corzo adjacent an important node in a prominent communication route was motivated largely by the desire of either individuals from a Jobo phase settlement in the hinterland, or marginalized elites from a neighboring center, to attain prestige vis-à-vis elites from neighboring capitals through the establishment of this new ritual center.

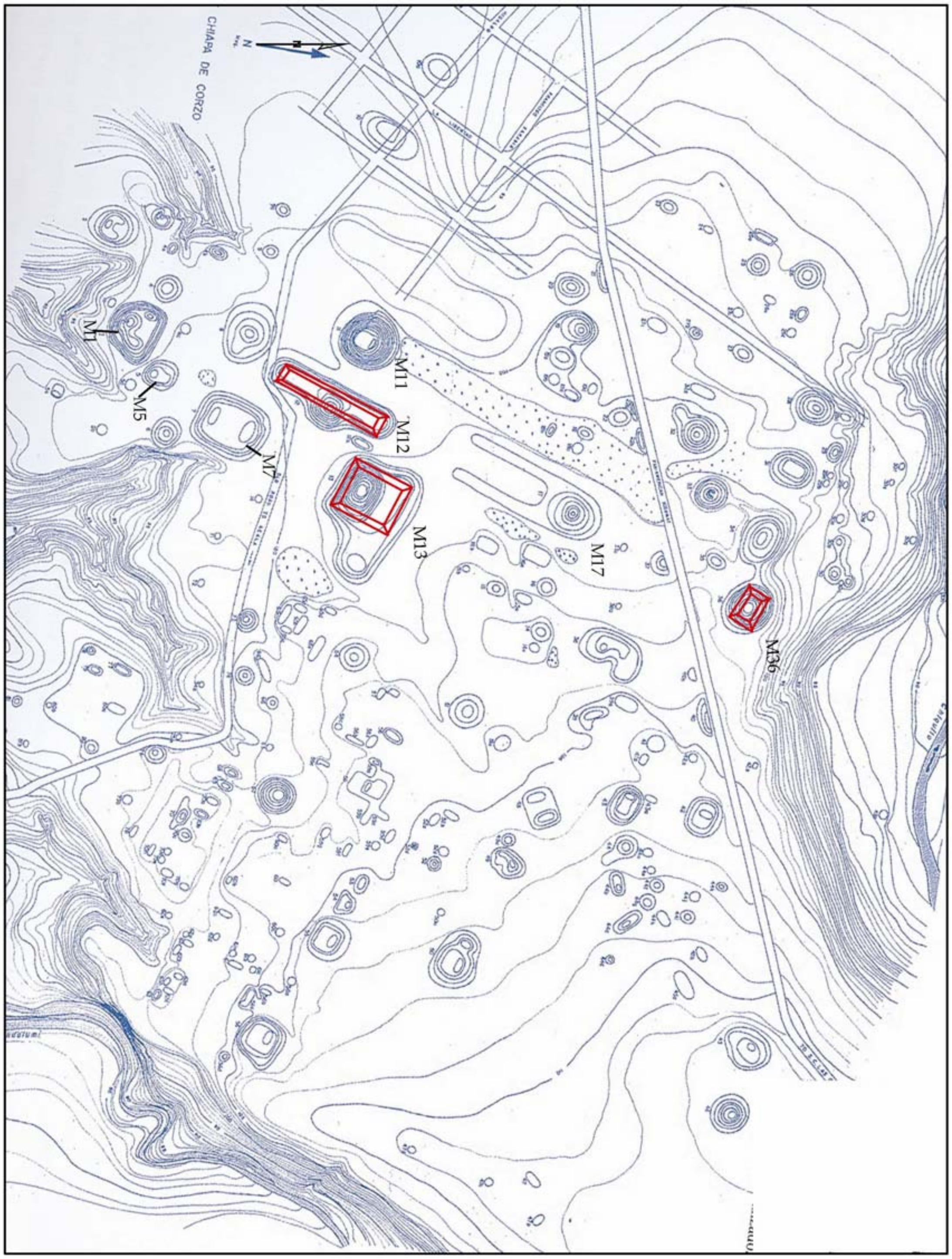


Figure 3.14 Chiapa de Corzo with principal mounds discussed in text numbered and structures with Dili phase components outlined.

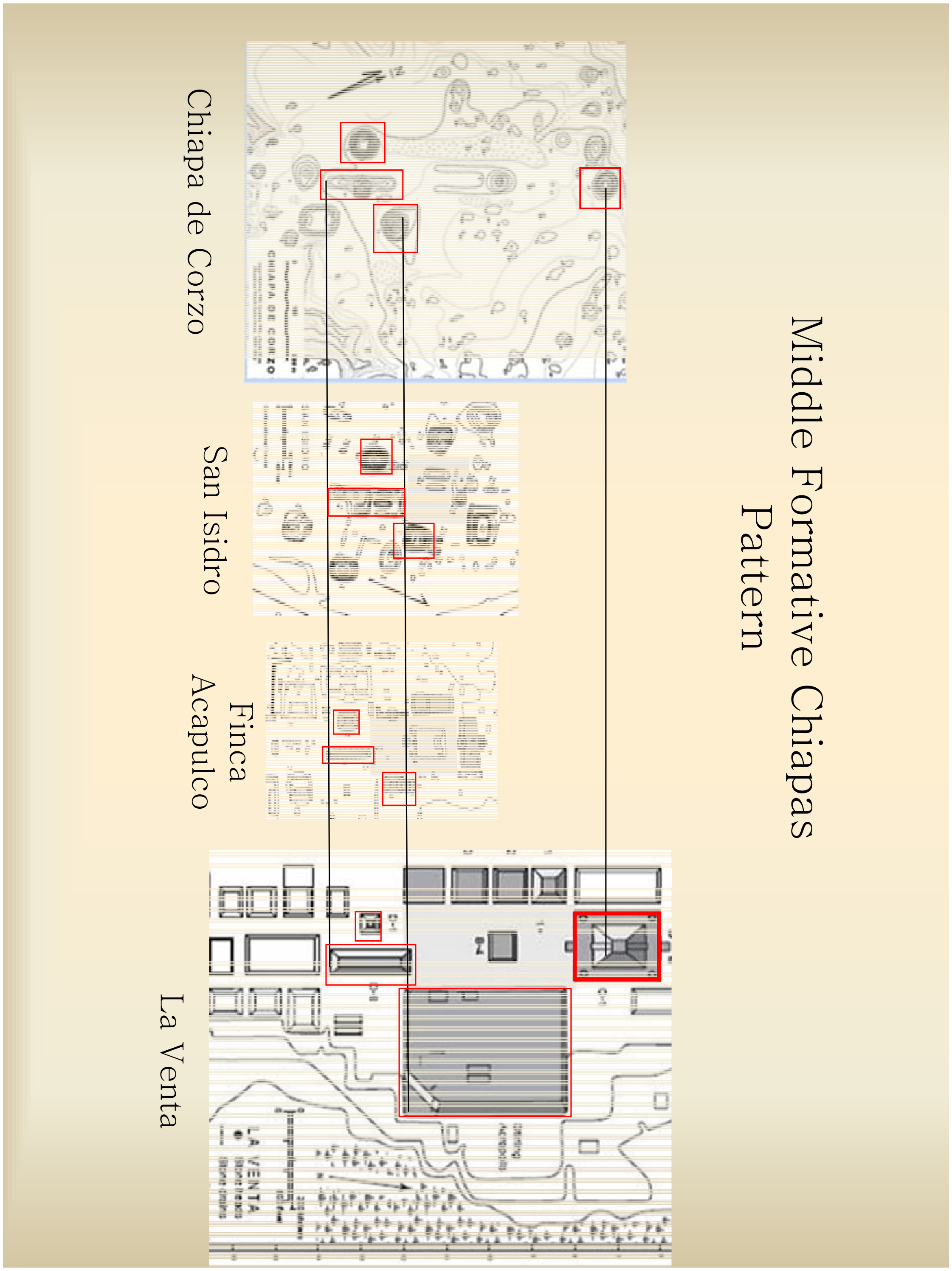


Figure 3.15 Comparison of Chiapa de Corzo Dili phase MFC pattern to the layout of neighboring capitals and La Venta. Maps modified from Clark (In press).

3.2.8.1 Political Identity and Feasting. Feasting was an important component in the establishment and maintenance of social differentiation in many early complex societies (Clark and Blake 1994; Dietler 1996; Dietler and Hayden 2001). This section addresses whether there is evidence for more frequent or larger scale feasting at Chiapa de Corzo than at hinterland sites during the Dili phase, and if feasting practices at Chiapa de Corzo differed from sites in the hinterland.

Feasting should be visible in, among other things, relatively high frequencies of serving vessels relative to cooking and storage vessels (Dietler 1990; Clark and Blake1994; Hayden 2001). This, of course, should be more applicable at elite households, as food preparation in these contexts frequently takes place away from the areas where food is consumed. The data from this survey are poorly suited to address differences between individual households. Nonetheless, at the community level, higher rates of feasting should still result in the consumption of greater quantities of serving vessels relative to cooking and storage vessels as more serving vessels would be needed for larger groups of people. Serving vessels are moved with greater frequency than storage vessels, and therefore experience higher breakage rates (Sinopoli 1991:87). Tecomates, which likely served as both cooking and storage vessels should experience slightly lower breakage rates than serving vessels.

At Chiapa de Corzo 37% (n=25) of the rimsherds were from serving vessels, higher than at hinterland settlements, where serving vessels consist of 29% (n=81) of the assemblage. This difference is fairly significant, but not very strong (x^2=2.40 p=.12 v=.08), suggesting no great difference between the scale and frequency of feasts at Chiapa de Corzo and hinterland settlements. This is somewhat surprising, given the presence of a large civic-ceremonial precinct at Chiapa de Corzo, and the absence of formal ceremonial precincts in the hinterland, which would lead us to expect larger and more frequent feasts associated with ceremonies at the center. These data suggest that feasts associated with ceremonies at Chiapa de Corzo were relatively modest.

There are indicators that feasting practices were different at Chiapa de Corzo than at second tier centers. Second tier centers had a greater of percentage of fancy serving vessels incised with a double line break. As David Grove has pointed out, the double-line break motif was an aspect of Early Formative iconography that carried over into the Middle Formative throughout much of Mesoamerica, and was heavily used by commoners (1993:99). The lack of association of this motif with elites is borne out by both the distribution of this motif within Chiapa de Corzo, and by the relative frequency of the motif at Chiapa de Corzo; first ceramics with this motif were scarce in or around the civic-ceremonial zone at Chiapa de Corzo: in the seven collections in and around the civic-ceremonial zone with Dili phase ceramics only one had sherds from incised serving vessels; second, the percentage of the total incised fancy serving vessel sherds at Chiapa de Corzo relative to ceramic totals is 12% (n=8), almost the same as that of hamlets, and lower than the 19% at second tier centers, with over 80% confidence in this difference (Figure 3.16).

The high percentage of incised fancy serving vessels at second tier centers relative to Chiapa de Corzo, pooled villages, and pooled hamlets, with over 80% confidence in the difference in each case, provides support for the notion that feasts utilizing these vessels were an important component of feasts at second tier political centers. However, comparing the quantities of these ceramics at individual second tier centers reveals a wide range in the frequency of these ceramics at second tier centers. The second tier center of Nandachuco had lower than average quantities of these ceramics, and at America Libre S., a hamlet with a residential mound, these ceramics were absent (Figure 3.18)). The highest percentages of these ceramics come from the second tier centers of Saraín Mendoza with 27% (n=6) and America Libre N 20%(n=1). Only the Saraín Mendoza settlement has a greater than 80% confidence level in the difference between it and Chiapa de Corzo (Figure 3.17). It should also be noted that this motif does not appear to have been associated exclusively with large scale feasting activities, as it occurs in 16% (n=11) of hamlets in the survey area.

From these data it follows that while there was little difference in the frequency of feasts between Chiapa de Corzo and the hinterland, incised serving vessels figured more prominently in the feasts at second tier centers than at Chiapa de Corzo. Feasts utilizing fancy serving vessels incised with the double line motif appear to have been more common, but not universally present at second tier centers.

3.2.8.2 Political Affiliation in the Hinterland Population. There is some evidence in the distribution of the double line break motif that suggests that not all of the hinterland population espoused the ideology that legitimated the privileged position of rulers at Chiapa de Corzo. The double-line break is a simple motif shared with Gulf Coast Olmec styles and with styles from a number other areas in Middle Formative Mesoamerica. David Grove, based on interpretations of the double-line break in Early Formative iconography, interprets this motif as connected with earth symbolism and fertility (1993:99). Grove contends that despite the widespread appropriation of symbolic systems by Middle Formative Mesoamerican elites, the double line break remained one aspect of iconography carried over from the Early Formative that was heavily utilized by commoners (1993:99). This contention is based on the fact that this motif frequently occurs on ceramics, which are a relatively low cost medium, generally available to commoners, and the wide distribution of this ceramic motif in some areas of Mesoamerica. But, as Philip Arnold has pointed out, this motif is absent on ceramics in the Tuxtlas region, and manifested on different parts of vessels (interior vs. exterior) in different parts of Mesoamerica (1995:196). Arnold links the variation in the placement of this motif and its absence on serving vessels in the Tuxtlas to differences in the expression of ethnicity between Gulf Coast groups (1995). Rather than signaling differences in ethnic identity, I suggest that this absence may reflect differences in ideology between groups using the motif, and those who did not.

The use of the double-line break motif was common on ceramics used by non-elites in many areas of Mesoamerica that were under the authority of ruling elites residing at large political centers. In the Tuxtlas this form of authority appears to have been poorly developed or absent during the Middle Formative (Arnold 2000, Santley et al. 1996, 1997). I suggest that the absence of this motif in the Tuxtlas region is related to the motif's connection to religious precepts tied to an ideology that legitimized the differences in social status between elites and commoners, precepts that were rejected or irrelevant in an area that lacked this distinction. Rather than an elite/non-elite religious divide, this motif may have represented an aspect of Middle Formative Mesoamerican religion that gave commoners an important place in a religious and ideological system that afforded elites a more direct communion with deities, or a communion with more powerful deities than was available to commoners. More data on the distribution of this motif in areas which did not have pronounced hierarchical social or political divisions are needed to evaluate this hypothesis. Nonetheless, this hypothesis provides an interesting framework for the interpretation of the distribution of the double-line break motif within the study area.

The broad distribution of fancy ceramics with double line breaks in modest settings around the Santo Domingo River makes their absence more notable in the Nucatilí and Betania districts, along the Grijalva River to the east of Chiapa de Corzo. This observation is supported by the k-means cluster analysis of the distribution of fancy incised serving vessels, which produced a maximum of 2 clusters. These clusters center on Chiapa de Corzo, and around the Santo Domingo River (Figure 3.18). Fancy Dili phase ceramics, such as Vergel White-to-Buff, Vista Gray, and Padre Black do occur in the Nucatilí and Betania districts, but there were no occurrences of incised decorations on any of these types in this area. Given the quantity of Dili phase ceramics found in this district (n=38) and the fact that 10% of the total Dili phase assemblage consists of incised fancy ceramics, we have over 98% confidence that this absence is real, rather than the product of small sample size. If the hypothesis discussed above is correct the absence of the double-line break motif at sites in the Nucatilí and Betania districts may reflect the lack of incorporation of these districts into the Chiapa de Corzo polity, with a corresponding lack of relevance, or rejection of the religious and ideological precepts that accompanied the elite/commoner divide within the polity.

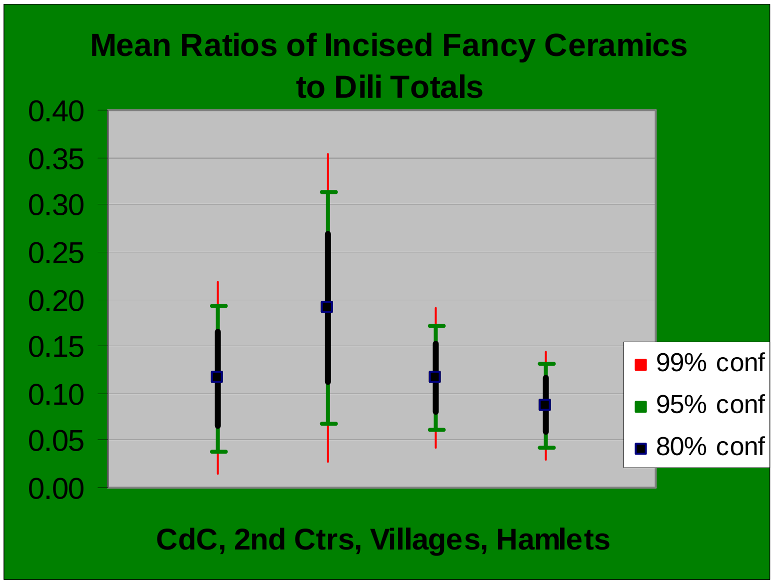


Figure 3.16 Mean Ratios of Fancy Incised Ceramics to Dili Phase Ceramic Totals

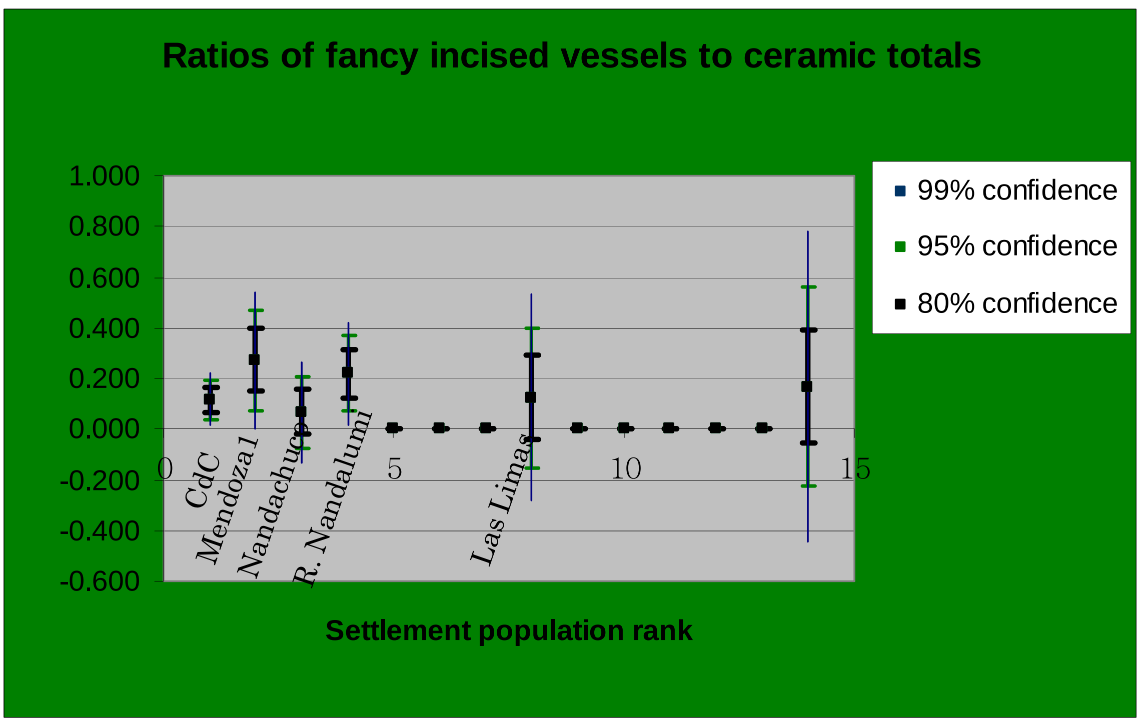


Figure 3.17 Ratio of Fancy Incised Vessels to Dili Phase Ceramic Totals in 14 Largest Settlements

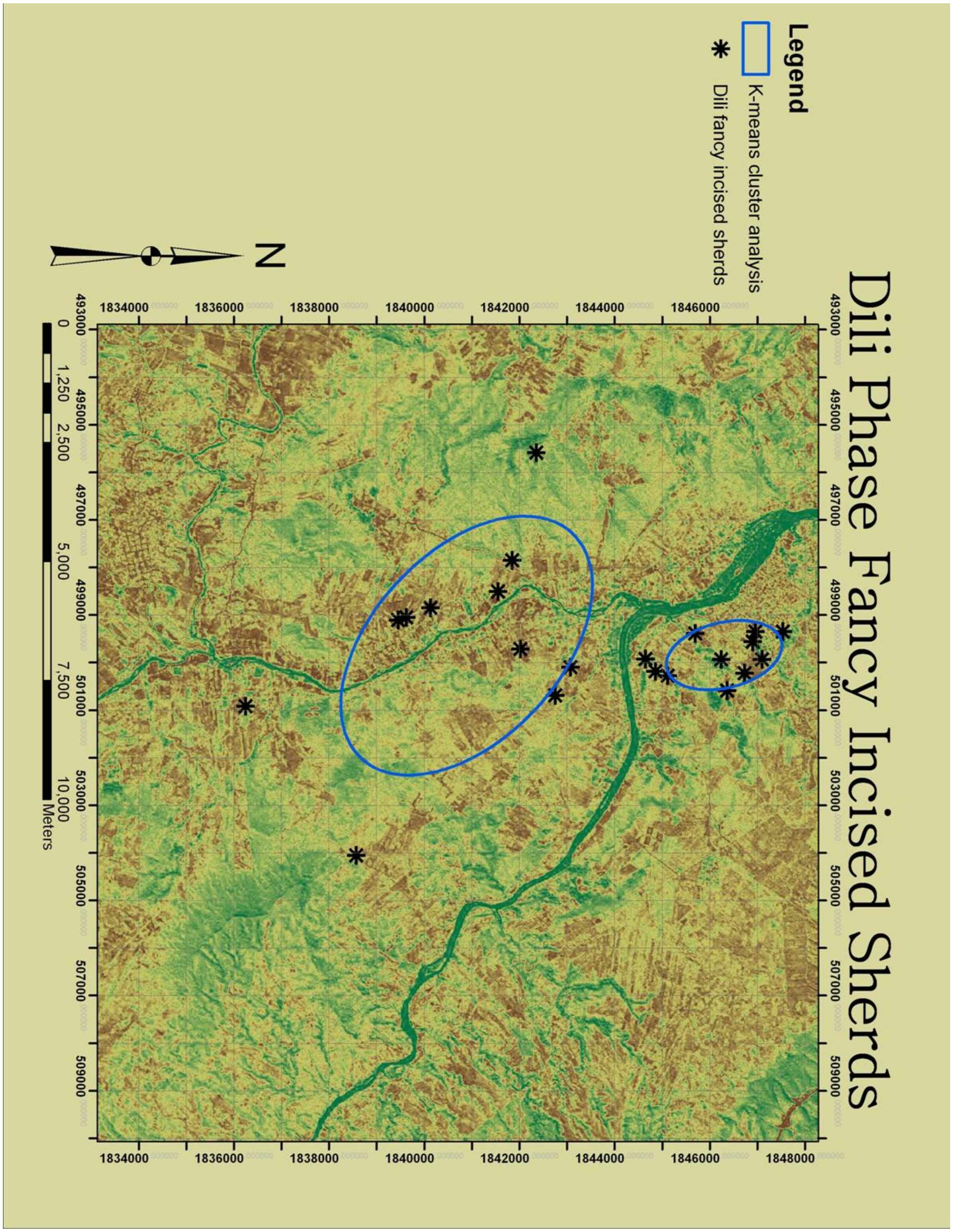


Figure 3.18 Distribution of Dili Phase Fancy Incised Sherds with K-Means Ellipses

3.2.9 Control over Public Ritual, and Religion

The establishment of public ceremonies and ritual which involved the participation of a substantial numbers of people has been argued to have been a development that facilitated the development hereditary inequality (Clark 2003; A. Joyce 2000, 2003; Pauketat 2000). The establishment or adoption of new religious practices may have underwritten an ideology that legitimated or facilitated the emergence of a class of elites at Chiapa de Corzo.

By the Middle Formative the construction of large scale public spaces, consisting of mounds surrounding large plazas was not new in Mesoamerica, with Early Formative precedents at Paso de la Amada on the Pacific Coast of Chiapas (Clark 2005; Clark and Blake 1994; Hill and Clark 2004; Lesure and Blake 2002), at San Isidro and El Maritano, both in the Middle Grijalva Chiapas area (Lowe 1998, 2007:95) (mound groups do not appear to have been constructed at San Lorenzo during the Early Formative, despite the fact that mounds were constructed in its inner hinterland from the pre-Olmec Early Formative onward (Vega 2000)) . As such the Dili phase construction of a large scale civic-ceremonial complex should not be viewed as a local innovation.

As noted above the layout of the Dili phase Chiapa de Corzo civic ceremonial complex, consisting of Mounds 12, 13, 36, and probably 11 (Figure 3.14), is shared with a number of other contemporary Mesoamerican political centers, including the Olmec center of La Venta (Figure 3.15). The shared layout of these precincts suggests the establishment of standardized large scale religious practices throughout much of southeastern Mesoamerica.

The idea that a cosmological template underlay the layout of Dili phase civic-ceremonial centers is supported in the frequent shared orientation of Middle and Late Formative civic-ceremonial spaces in the Chiapas Central Depression. Eight out of the eleven sites with likely Middle or Late Formative civic-ceremonial architecture found in Lowe (1959) and Navarrete's (1960) explorations of the Upper Grijalva and Frailesca regions adhere to within two degrees of the Chiapa de Corzo 28˚ east of north orientation. It is notable that Chiapa de Corzo's nearest large neighbors, the political centers of Mirador and Ocozocoautla in the Jiquipilas sub-region, Finca Acapulco in the Chachi sub-region, and San Isidro in the Middle Grijalva sub-region (outside the Central Depression) do not share this orientation. Some of this divergence may be attributed to the earlier construction of civic-ceremonial architecture in this area (e.g. Finca Acapulco and San Isidro), but the layout of architecture at Mirador appears to have been established contemporaneously with that of Chiapa de Corzo, and that of Ocozocoautla later. Both Mirador and Finca Acapulco align fairly closely with the La Venta orientation (Clark In press), while Ocozocoautla, and San Isidro have alignments that do not seem to correspond to any other sites in the region. Variation in the alignment of the MFC pattern may reflect the adjustment of this template to changes in religion and cosmology over time, adjustments of an imported cosmology to sacred features on the local landscape, or conscious adoption or rejection of the religious and cosmological emphasis of contemporary neighboring polities.

I do not suggest that the initiation or propagation of Early and Middle Formative Mesoamerican civic-ceremonial architecture was the product of cynical manipulation of religious precepts by incipient elites seeking to enhance their status. As Trigger

(2003:411) makes clear, the separation of the supernatural from human affairs may not have been possible in "pre-axial" thought, where there was little distinction between the natural, the supernatural, and the social. However, if Clark and Hansen are correct in their interpretation of the Mound 13 platform and its equivalents in other MFC civic ceremonial layouts, as an elite residential zone, then elite residences were directly integrated with the settings of large scale public rituals (2001:14). This association with religious activities likely contributed to the establishment or enhancement of status differences between elites and commoners. The labor demands and the opportunities for participation in the large scale ceremonies that accompanied the construction of the Chiapa de Corzo civic ceremonial zone would have created and entrenched divides between the families, groups, or individuals that sponsored them and those who merely participated, while at the same time generating a sense of community within the polity.

As noted above, the dimensions of the Chiapa de Corzo civic-ceremonial precinct (about 560m x 100 m), would be capable of accommodating up to about 36,000 people, but probably served as a processional space for lower numbers of participants. Even so, given the open character of the Dili phase civic-ceremonial zone it is likely that the sponsors of ceremonies in this area encouraged the participation of large numbers of people, including individuals from the hinterland.

3.2.10 Summary

In sum, the Dili phase is characterized by the emergence of Chiapa de Corzo as the largest population center in the study area, a process that was achieved at least in part by drawing people out of villages established in the Jobo phase. Population in the study area increased about 37% from the Jobo phase, with most of the villages from the previous phase remaining, but with slightly reduced populations. A number of new settlements, most of them hamlets, appear on the landscape. A three tiered settlement hierarchy emerges, with Chiapa de Corzo almost four times larger than the next largest settlement. Architectural evidence suggests the development of a two tiered political hierarchy which did not closely parallel the settlement hierarchy. Only four of the nine districts defined for the Dili phase had second tier political centers. With the possible exception of the America Libre North site, the style and orientation of this architecture at second tier centers suggest that leaders in hinterland villages remained largely autonomous from the Chiapa de Corzo rulership.

Labor estimates suggest that during the Dili phase leaders at second tier centers did not wield the power to convince many local followers to provide labor for the construction of their residences. The available evidence suggests little status differentiation within or between hinterland communities during the Dili phase. The scale of Dili phase architecture at Chiapa de Corzo suggests that the emergent elite were able to command the labor from a larger number of people than hinterland leaders, certainly from beyond the extended family. However the estimated labor demands at Chiapa de Corzo suggest that they could have been fulfilled easily by the labor force of the local community without drawing labor from the hinterland.

The dispersal of population from the Jobo to Dili phase suggests a shift from centralized control over access to lands to individual or household level control. Neither the Chiapa de Corzo rulers nor hinterland leaders appear to have played a significant role in managing land rights in the Dili phase. The Jobo phase population nucleation may have been linked to the need for territorial defense of agricultural and other resources against raids from neighboring villages phase, rather than specifically the result of the management of land tenure, but the end result was similar in that community members depended on village level institutions for the management and protection of rights to land use. Given that all Jobo phase villages lost population with the emergence of Chiapa de Corzo, it is likely that many families from these communities relocated to the new capital, in a process similar to the political, rather than physical synoecism suggested for Monte Alban (Blanton et al. 1999:63). With this relocation, the principal loci of conflict mitigation and other community level functions may have relocated to Chiapa de Corzo, thereby reducing the power of hinterland decision making organizations.

High obsidian consumption rates at Chiapa de Corzo support the notion that elites at this settlement may have been sponsoring the importation of this material. The distribution of obsidian in the hinterland indicates that access to obsidian was not influenced by the position of individuals within the political hierarchy, suggesting that Chiapa de Corzo rulers did not distribute obsidian as a prestige good to bolster the status of hinterland leaders. There is also minimal evidence for territorial control of routes of communication and exchange by the Chiapa de Corzo leadership. Architectural evidence suggests that the Chiapa de Corzo rulers maintained an outpost on the overland route from the Grijalva River to the Jiquipilas sub-region at the America Libre N site. Apart from this, the evidence suggests that some hinterland communities were taking advantage of the movement of people and goods over communication routes independently of mandates from Chiapa de Corzo rulers.

To the extent that warfare was a feature of interaction between elites in neighboring political centers during the Dili phase, it does not seem to have substantially affected commoners in the hinterland. The dispersed settlement pattern, and lack of evidence for defensive concerns in the choice of settlement location in the hinterland suggests that this population was at less risk of violence than in the Jobo phase. There is also no evidence for the formation of buffer zones between Chiapa de Corzo and neighboring polities. The abandonment of Jobo phase settlements in the southwestern part of the survey area may reflect the formation of a buffer zone with the small political center of Villa Flores. Alternately this area may have been at greater risk to raiding from groups without affiliation to any political center.

The adoption of a civic-ceremonial template shared by many other contemporary political centers in Chiapas and Tabasco suggests that some individuals at Chiapa de Corzo were participating in an elite interaction network by the Dili phase. The participation of a limited number of people from Chiapa de Corzo in this network would have provided some individuals with greater access to esoteric knowledge than the masses, thereby providing the foundation for the development of an elite socio-political identity. The development of this social division does not necessarily imply the development of economic divisions between groups, but did result in the ability of the elite to mobilize modest amounts of labor from the local community.

While the locus of some decision making likely shifted away from Jobo phase villages to Chiapa de Corzo during the Dili phase, elites do not appear to have been interfering strongly with the affairs of the hinterland population. Current evidence suggests that the strongest base of power for the Chiapa de Corzo elite was their role in sponsoring large scale religious ceremonies. While these ceremonies likely served to form a larger scale community identity than existed in the Jobo phase, it seems likely that the target audience for the sponsors was elites in neighboring centers, rather than establishing control over the hinterland population. Nonetheless, the construction of a civic-ceremonial precinct, and the establishment of large scale ceremonies associated with it, may have been one of the most important factors drawing population from hinterland villages into Chiapa de Corzo.

I suggest that the establishment of Chiapa de Corzo as a large population center is tightly related to the emergence of a peer polity network that extended from earlier political centers to the north of the Central Depression such as San Isidro and Gulf Coast Olmec centers to the political center of Finca Acapulco. The establishment of such a network would have brought elite traffic through the communication node of Chiapa de Corzo. The construction of a large civic-ceremonial precinct early in the development of Chiapa de Corzo as a large population center suggests that the site was founded by individuals endeavoring to increase their status vis-à-vis supernatural forces, and on a more mundane level in the eyes of neighboring elites. The notion that Chiapa de Corzo elites operated independently of neighboring centers is supported by strong differences in the scale, organization, and orientation of civic-ceremonial space at Chiapa de Corzo.

In sum, the emergence of Chiapa de Corzo as a large population center appears to have been closely followed by the construction of a large civic-ceremonial precinct, accompanied by the emergence of an elite group, charged with the direction of rituals within the civic-ceremonial zone. The extent to which the power of these elites extended beyond privileged relations with the supernatural is still uncertain, but their powers of governance do not appear to have been extensive.

Given what we know about the behavior of elites in modern “traditional” societies (e.g. Hayden 1995, 2007), it is unlikely that Chiapa de Corzo was founded by individuals seeking to resolve problems inherent in the social organization of the Jobo phase. It is more that Chiapa de Corzo was founded by individuals striving to increase their status within the emerging peer polity network through the construction of a large scale civic-ceremonial center on an important node in the transportation route that underlie this network. These individuals may have come from within the hinterland, but it seems more likely that they were disaffected elites from one of the earlier neighboring centers who were already familiar with large-scale religious practices.

4. THE CONSOLIDATION OF POWER: THE ESCALERA PHASE (750-500 B.C)

Rulers at Chiapa de Corzo during the Escalera phase augmented the civic-ceremonial precinct with new constructions and the expansion of earlier constructions. Burial data provide some support for the notion that hereditary social inequality had emerged by this phase, and that the Chiapa de Corzo royal lineage was established or strengthened through a hypogamous marriage into the Gulf Coast La Venta royal lineage. Over the course of the Escalera phase the Chiapa de Corzo rulers consolidated their power over the hinterland population and there is evidence for a greater degree of political and economic integration of hinterland settlements. Increasing labor investments in elite residential architecture and marked disparities in burial wealth support the idea that during the Escalera phase a ruling lineage consolidated power at Chiapa de Corzo. These trends are not restricted to Chiapa de Corzo, as the political landscape of western Chiapas became more complex with the growth of previously existing political centers and the emergence of new ones. In this chapter I investigate changes in the strategies exercised by rulers at Chiapa de Corzo and the responses to these changes by groups and individuals in hinterland communities.

4.1 SETTLEMENT HIERARCHY AND POPULATION DISTRIBUTION

The Escalera phase rulers continued to attract followers into the capital, with the population of Chiapa de Corzo increasing by 33% to a mean estimate of 1450 people, comprising 32% of the regional population. At the same time, the occupied area of Chiapa de Corzo decreased in area from 71 ha to approximately 68 ha, suggesting higher population density within the capital. Despite the growth of Chiapa de Corzo, people do not appear to have been drawn into the hinterland, as the total study area population declined 10% from the Dili phase to a mean estimate of 4590. Total occupied area decreased by 32% to 236 ha, and the total number of settlements decreased from 83 to 48. Leaders at hinterland villages appear to have been more successful than those of the Dili phase in attracting followers, as the hinterland population was more nucleated, with 40% of the Escalera phase population located in villages vs. 30% in the Dili phase, a change that is both significant and strong (X^2=621 $p<.001$ V=.25). The Ribera Amatal north site grew into a large village, with a mean estimated population of 640, approximately 14% of the study area population.

Many settlements in the outer hinterland were abandoned in the Escalera phase; the population within a 5 km radius of Chiapa de Corzo remained essentially unchanged, but compromised 73% of the population in the Escalera phase compared to 64% in the Dili phase. This population shift is highly significant and fairly strong (X^2=84.7 $p<.001$ v=.09). Settlement in the three southernmost Dili phase districts, America Libre, Cruz Chiquita, and Las Limas was greatly reduced, with villages in these areas abandoned or reduced to small hamlets (Figure 4.1).

The log-rank-size plot of Escalera phase settlement size displays a log-normal slope at the top end, reflecting the emergence of Ribera Amatal as a population center approximately half the size of Chiapa de Corzo (Figure 4.4a). Overall the rank-size curve is slightly more concave (A=-0.249 n=49) than in the Dili phase, but the differences are not significant at the 90% confidence level (Figure 4.4c). These data indicate that the changes in the settlement size hierarchy were not dramatic; however the emergence of a second tier village with approximately half the population of Chiapa de Corzo creates a three tiered settlement hierarchy(Figure 4.4b), which contrasts with what are essentially two tiers in the Dili phase (Figure 3.7b). The emergence of a population center the size of Ribera Amatal, approximately 4.5 km to the south of Chiapa de Corzo suggest the presence of a potentially powerful, but as discussed below, a likely subordinate population center in the inner hinterland during the Escalera phase.

A nearest neighbor analysis displays slightly higher degree of clustering than in the Dili phase (NNI=.7196 Z=-3.677 $p<.001$) vs (NNI=0.834; Z= -2.89; $p<.01$). As with the Dili phase, Escalera phase villages are dispersed (NNI=1.35142 Z=2.2297 $p<.05$) and hamlets are clustered (NNI=.7176 Z=-3.34 $p<.001$) suggesting a continuation of the Dili phase pattern of daughter communities budding off from parent communities. However, there is an important difference between the phases in that there is less continuity in village location from the Dili to Escalera transition than from the Jobo to Dili transition. Outside of Chiapa de Corzo none of the Escalera phase villages were carryovers from the Dili phase, suggesting a high degree of social and political reorganization in the hinterland between these phases.

4.1.1 The Size and Population of the Escalera Phase Chiapa de Corzo Polity

The emergence of Ocozocoautla midway between Chiapa de Corzo and Mirador reduced the estimated size of the Chiapa de Corzo polity by about 3% to 1317 km², 1250 km² when the unoccupied Cerro Hueco is excluded (Figure 4.3). Taking population density to be a function of proximity to the capital (as was done above in sec. 3.2.1.1), and extrapolate the decrease based on a decay rate calculated from data observed within the survey area, the resulting population estimate is 12,000, a 29% decrease from the Dili phase, with an overall population density of 9.6/ km². This estimate places approximately 12% of the polity's population at the capital of Chiapa de Corzo.

Within the study area the population declined about 10% in the Escalera phase. This change is not very strong and may be attributed to random variation in an otherwise demographically stable population. Regardless of how much faith we place in the extrapolated population values, these data suggest that the increasing prestige and power of rulers at Chiapa de Corzo evidenced in architecture and burials of the Escalera phase did not result in an increase in the number of followers within the polity. If the population decline for the polity as a whole is correct, then the leaders at the emergent Ocozocoautla polity may have drawn followers out of the Chiapa de Corzo polity.

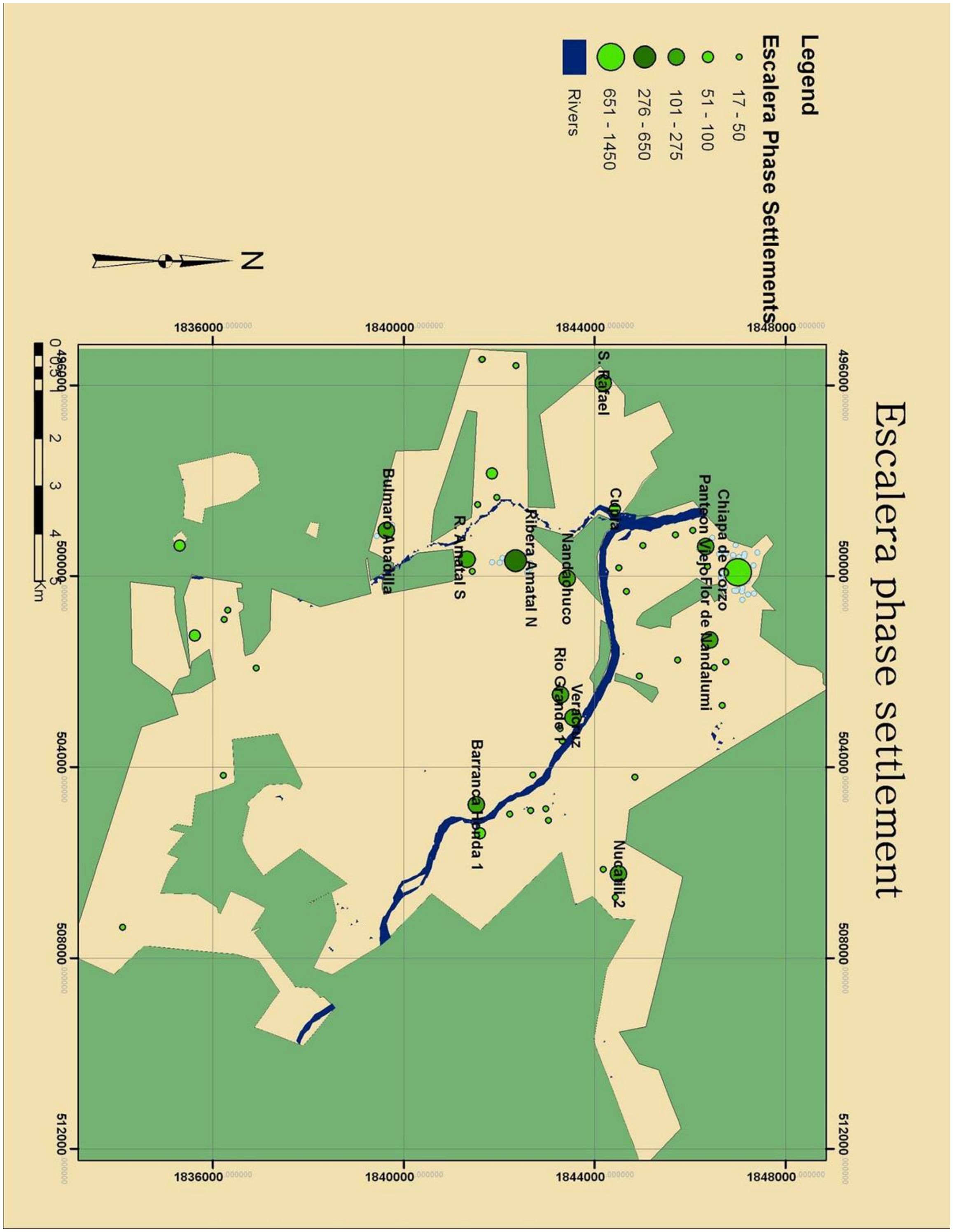


Figure 4.1 Escalera phase settlement

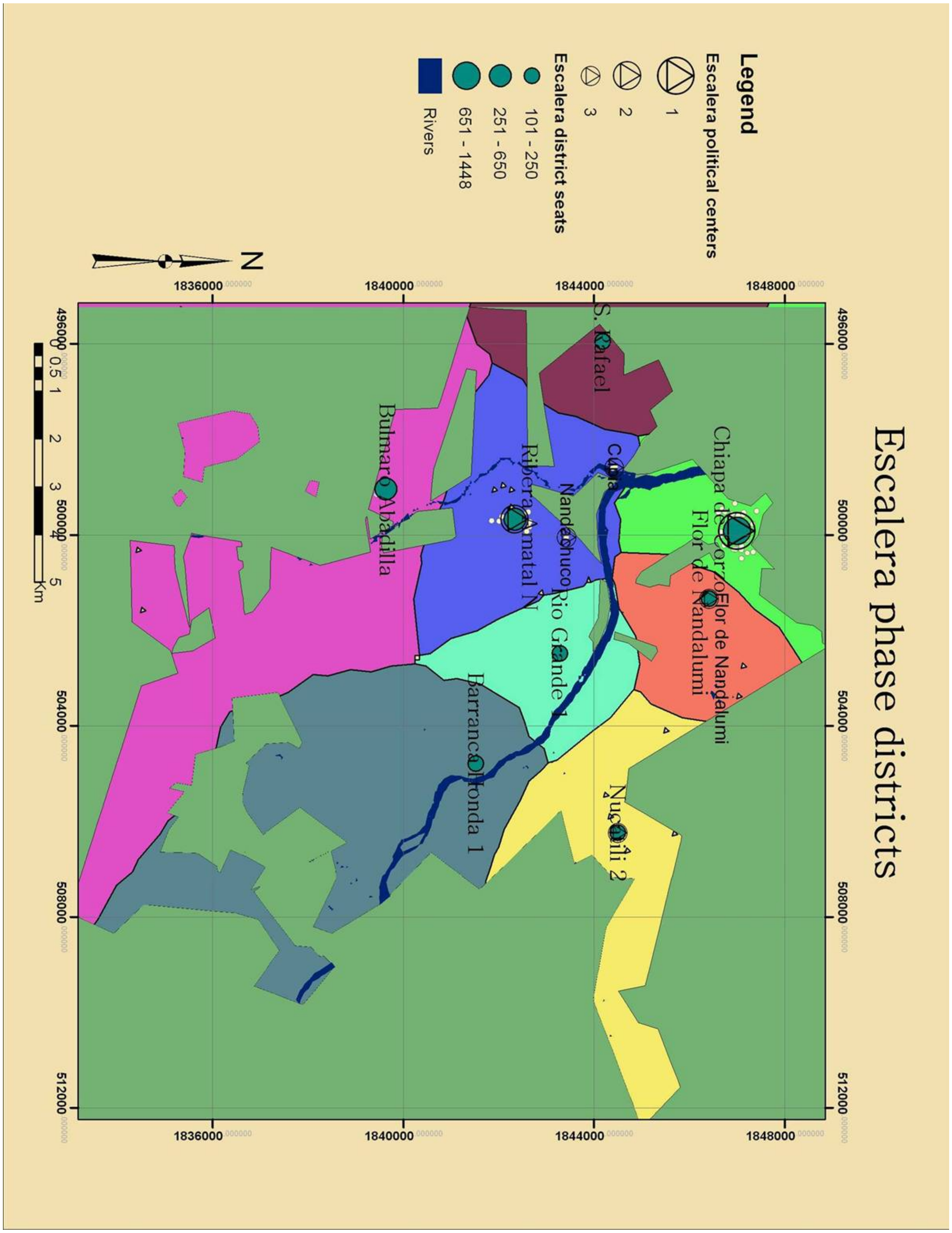


Figure4.2 Escalera phase districts

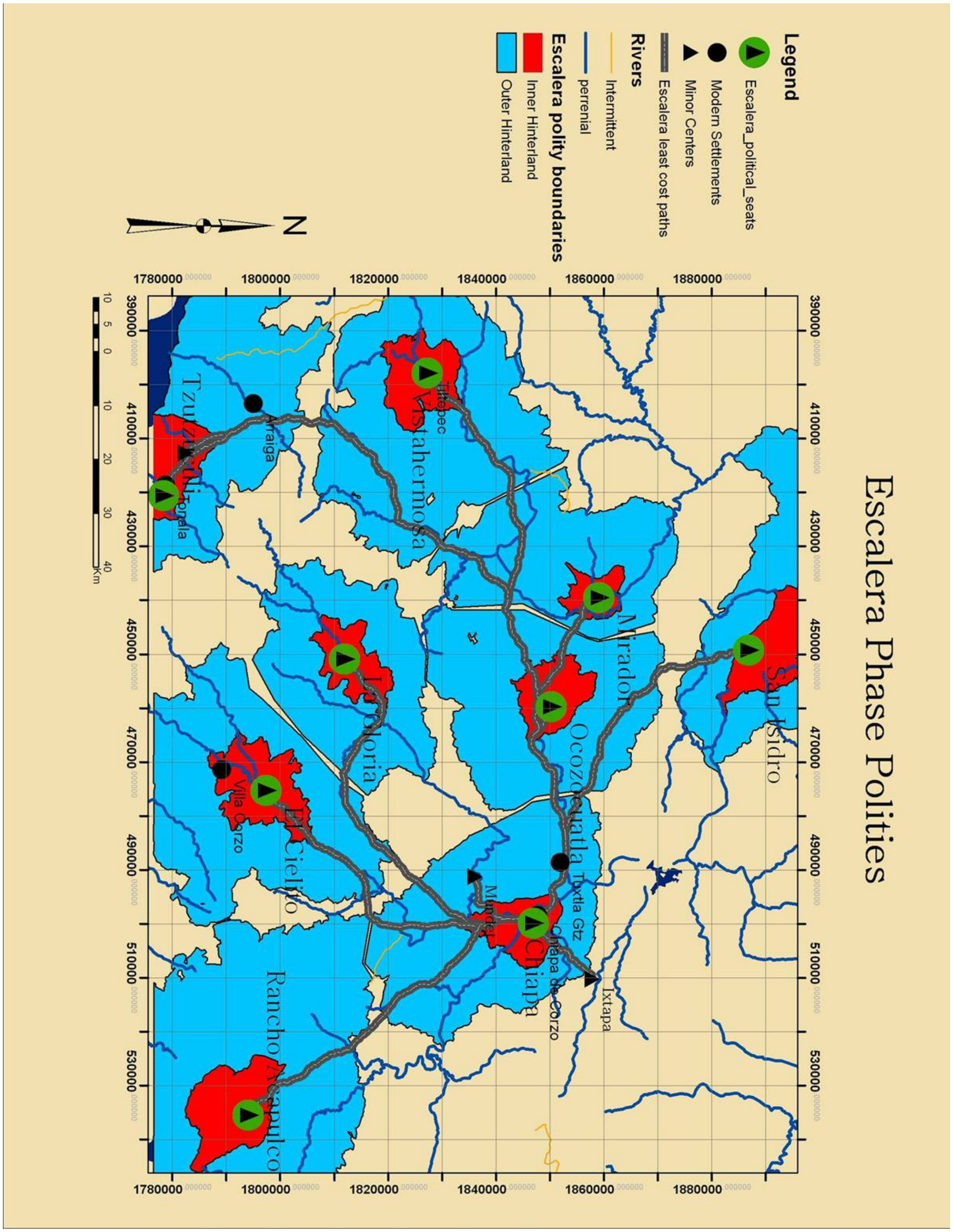
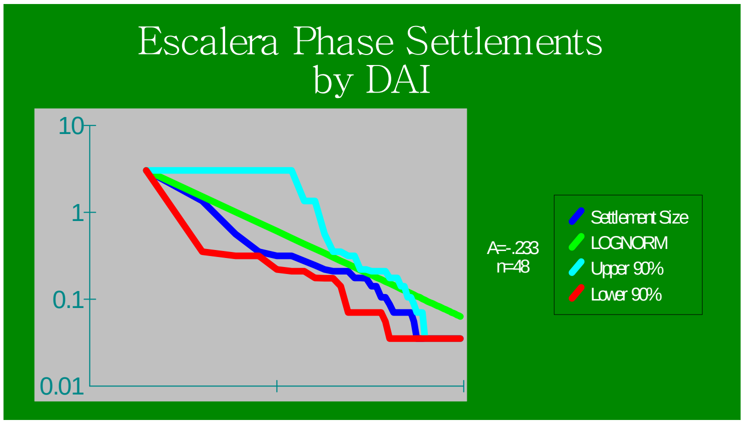
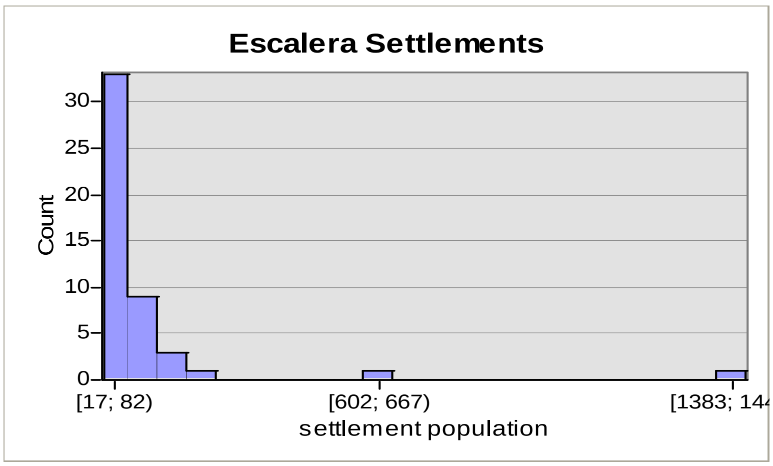


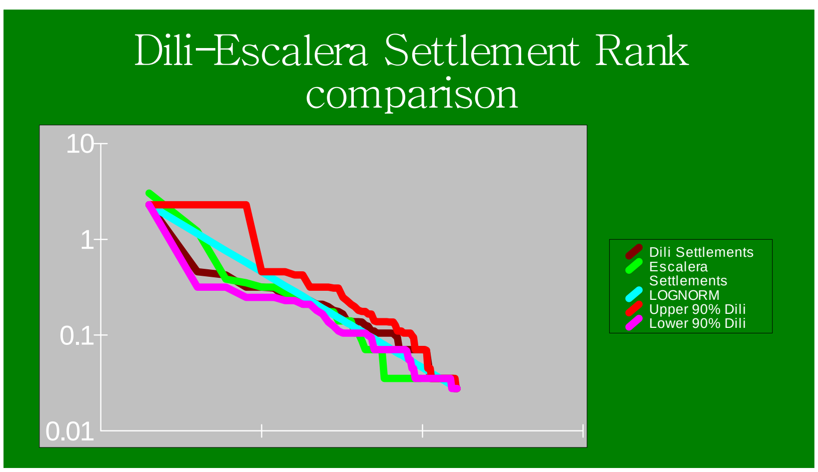
Figure 4.3 Escalera phase polity boundaries



a.



b.



c.

Figure 4.4 a. Log rank size graph of Escalera phase settlements; b. Histogram of Escalera phase settlement sizes; c. Comparison of Dili and Escalera rank-size graphs

4.2 THE PROJECTION OF POWER INTO THE HINTERLAND AND THE REDUCTION OF VILLAGE AUTONOMY

A restructuring of political organization in the Chiapa de Corzo hinterland is suggested by pronounced changes in the distribution of villages and second tier centers from the Dili to the Escalera phase, a change which contrasts with the relative stability of the Jobo to Dili transition. None of the hinterland villages from the Dili phase survived as villages through the Escalera phase, with all of them ether abandoned or reduced to hamlets. None of the Escalera phase second tier centers were occupied in the Dili phase. Architectural similarities at two of the four Escalera phase second tier centers with the layout of architecture at Chiapa de Corzo suggests that leaders at these centers may have been affiliated with the Chiapa de Corzo rulership.

Changes in the distribution of villages reduce the number of districts from nine to eight, and strongly alter the shape of districts in the southern margins and western margins of the study area (Figure4.2 vs. Figure 3.8), which may be related to the formation of an unoccupied buffer zone, discussed below, in the southern margin of the polity. The southern Dili phase Las Limas and Cruz Chiquita villages were abandoned or reduced to hamlets, with their districts consequently subsumed in the districts of El Vergel and Barranca Honda. In the western margins of the study area, the Mendoza site was reduced to a hamlet and the new village of San Rafael, located at the base of Cerro Hueco was founded, splitting the Dili phase Mendoza district in half. Three of these eight districts had second tier centers, one, the Ribera Amatal district, had two.

The largest Escalera phase hinterland settlement, both in terms of area and population is Ribera Amatal. Three mounds were identified at this site, two of which are about 2 meters in height, with a third low (40 cm) housemound (Figure 4.5). The construction requirements for the mounds at this site are three times greater than those of any other contemporary second tier center in the study area. The alignment of Mounds 1 and 2, and the small housemound at Ribera Amatal (Figure 4.5), conform to the Chiapa de Corzo alignment of 28˚ east of north. However, the second largest mound at the site, Mound 3, is aligned on an east-west axis with Mound 1, very different from that of the dominant Chiapa de Corzo orientation. Nonetheless, the organization and alignment of the Ribera Amatal complex corresponds fairly closely with that of a minor residential mound group at Chiapa de Corzo consisting of Mounds 73, 74 and 66 (Figure 4.19). Excavation records from Chiapa de Corzo are currently unavailable for Mound 73, and Mounds 74 and 66 have not been excavated, consequently the construction sequences of these mounds are not known. Depending on when these mounds were constructed (both at Ribera Amatal and Chiapa de Corzo) it is possible that this shared template reflect the affiliation of leaders at this site with a group of individuals, possibly minor elites, at Chiapa de Corzo.

The second largest Escalera phase second tier center in terms of population is Nucatilí 2, with an estimated population of 150, and an area of 5.2 ha. Nucatilí 2 has least three small platform mounds (part of this area was covered in tall grass and some mounds may have been missed). Two of these platforms are just over a meter tall, with a third very disturbed mound under 50 cm tall. These three mounds form a line approximately 70˚ east of north, approximately 170 m long (Figure 4.8). The orientation of the structures themselves, however, as indicated by the alignments of stone visible on their surfaces, are oriented approximately 27˚ east of north, an orientation almost identical to that of Chiapa de Corzo. I have identified no similar organization of mounds at Chiapa de Corzo, but this part of the Nucatilí ejido had generally poor surface visibility, and it is possible that other low mounds exist in the area that would compose a group similar to one of the many groups at Chiapa de Corzo. There are also later occupations in and around this mound grouping, but the Escalera phase is the most strongly represented in close association with these architectural features. Furthermore, the construction materials of these mounds (clay and river cobbles) are consistent with Escalera phase constructions.

The third most populous Escalera phase second tier center is the site of Flor de Nandalumí. Located about 1.5 km to the east of Chiapa de Corzo, this settlement had a mean estimated population of 130, and an estimated area of 8.2 ha. It is the seventh most populous Escalera phase settlement in the study area. The orientation of mounds at this site is constrained by the local topography, with two of the three mounds consisting of platforms built on the hill slope, and is approximately 57˚ east of north (Figure 4.7). No similar organization of mounds has been noted at Chiapa de Corzo.

The fourth largest second tier center in the study area is San Isidro/Cupía (Figure 4.6), with an estimated population of 83 and an area of 5 ha. The orientation of architecture at this site is about 55˚ west of north, very different from that of Chiapa de Corzo, and consists of a linear arrangement of three mounds extending over a 117 m long area. The principle mound, Mound 1, is a 3.5 m tall pyramid mound with a larger volume than any other possible Escalera phase structures in the hinterland. Mound 2 is a 50 cm tall platform, heavily disturbed by recent and old excavations. Mound 3 now consists of a 20 cm rise and a 10 m diameter, roughly circular, concentration of cobbles under a large tree. A fourth possible mound, mostly destroyed by heavy machinery is located to the south of Mound 1.

In sum, the conformity of architecture at the two most populous Escalera phase second tier centers to the Chiapa de Corzo alignment supports the notion that there was a higher degree of political integration within the polity than during the Dili phase. The lack of conformity of architecture at Flor de Nandalumí and at San Isidro/Cupía does not necessarily reflect the presence of centers that functioned independently or in opposition to Chiapa de Corzo rulers, but nonetheless suggest that some hinterland leaders were less strongly affiliated with these rulers than others. The greater degree of affiliation suggested for leaders at the two most populated second tier centers in the study area supports idea that the Chiapa de Corzo rulers were governing some hinterland populations through affiliated rural leaders, suggesting a greater degree of political integration of the hinterland than in the Dili phase.

4.3 ELITE CONTROL OVER LABOR

The scale of architecture at Chiapa de Corzo during the Escalera phase suggests that rulers had greater power to mobilize labor into both elite residential and civic-ceremonial architecture than in the Dili phase. Architecture at three of the four Escalera phase second tier centers is also of a larger scale than any of the Dili phase architecture suggesting that hinterland leaders had the ability to draw labor from a larger part of the community than in the Dili phase.

Investment in civic-ceremonial construction at Chiapa de Corzo appears to have expanded greatly in the Escalera phase, with the augmentation of all the Dili phase civic-ceremonial constructions and the initiation of new structures within the civic-ceremonial zone. More excavation data are available for the Escalera phase construction sequences in of many of the Chiapa de Corzo mounds than for the Dili phase. But nonetheless, no excavations have been conducted in Mound 11, and only limited excavations have been conducted on other mounds at the site. As such the Escalera phase mound dimensions presented below are based on estimates informed by excavation data with the exception of Mound 11. The Mound 11 estimates are based on the assumption of an equivalent ratio of Escalera phase constructions to those documented for Mound 17 (Lee n.d.). As discussed in the previous chapter, Mound 11 may have a Dili phase construction sequence, which would reduce the Escalera phase volume.

Constructions dating to the Escalera phase include the greater part of Mound 17 and its “wings,” much or all of the Mound 36 pyramid, the construction of a pyramid on the earlier Mound 13 platform, and the expansion of this platform, the first stage of the Mound 7 platform, an expansion of Mound 12, and presumably much of Mound 11. The estimated labor demands of these constructions are considerably larger than those of the Dili phase (3823 vs. 21,175 person days). Even so, the labor demands of this construction sequence appear to have been well within the capacity of the local population of Chiapa de Corzo without imposing a great burden, or requiring the recruitment of labor from hinterland communities. As outlined below (Table 4.1), I calculate that these constructions would have required a total of about 73 days with 20% of the Escalera phase Chiapa de Corzo population. None of the individual structures would have necessitated more than 20 days for completion with this number of laborers, suggesting that each of the structures could have been completed over the span of a dry season without imposing great inconvenience on the local population. Considering the 250 year span of the Escalera phase, the burden these labor costs placed on commoners would have been minimal.

Construction demands at hinterland settlements also could have been met with the local labor force of each of the hinterland communities with architecture, even taking on the dubious assumption that all of the construction in these settlements dates to the Escalera phase. Working the assumption of a single phase construction event for hinterland structures, the per capita labor demands for all of the second tier centers were greater than those of the Dili phase, and large enough to suggest that labor was drawn from a larger portion of local communities than in the Dili phase. Nonetheless, the per-capita labor demands at all of the second tier centers are still lower than those of Chiapa de Corzo, suggesting that hinterland leaders had greater power to mobilize labor into what were likely residential as well as public structures than those of the Dili phase, but this power was relatively limited.

Ranking second tier centers by labor investment produces a more pronounced hierarchy in the Escalera than in the Dili phase, with the total architectural investment at Ribera Amatal a little over three times that of Cupía, about five times that of Flor de Nandalumí, and about 12 times that of Nucatilí (Table 4.6, Figure 4.9). In this respect, the argument can be made that a three tiered political hierarchy had emerged by the Escalera phase, with Ribera Amatal as the single second tier center and Cupía, Flor de Nandalumí, and Nucatilí 2 as third tier centers.

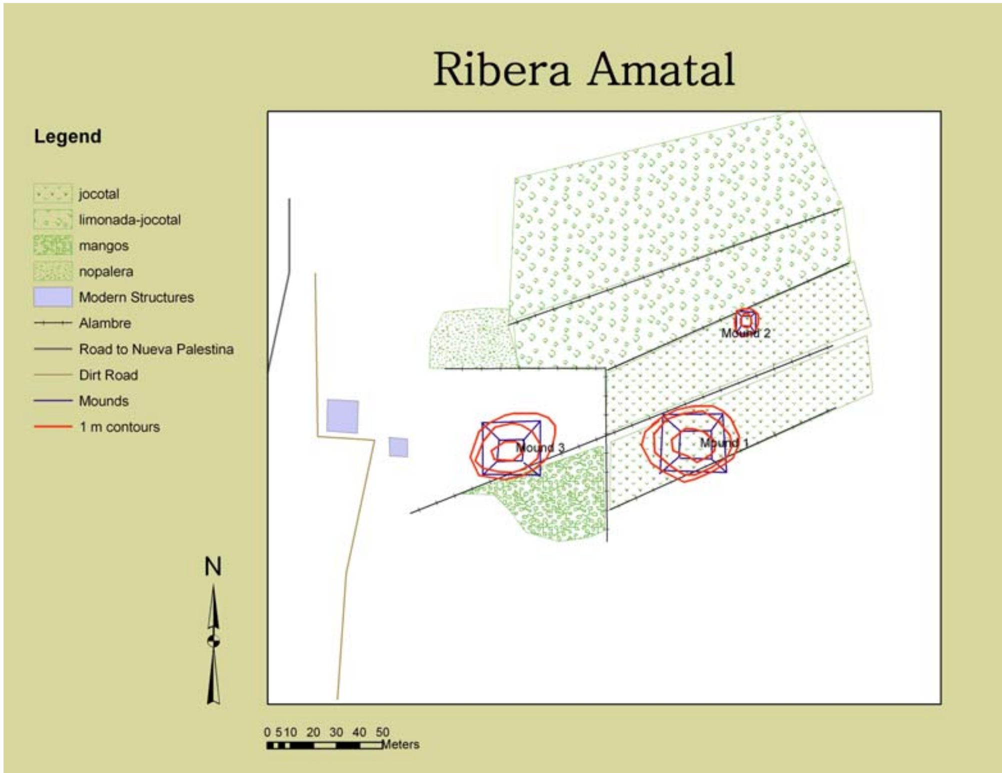


Figure 4.5 Ribera Amatal

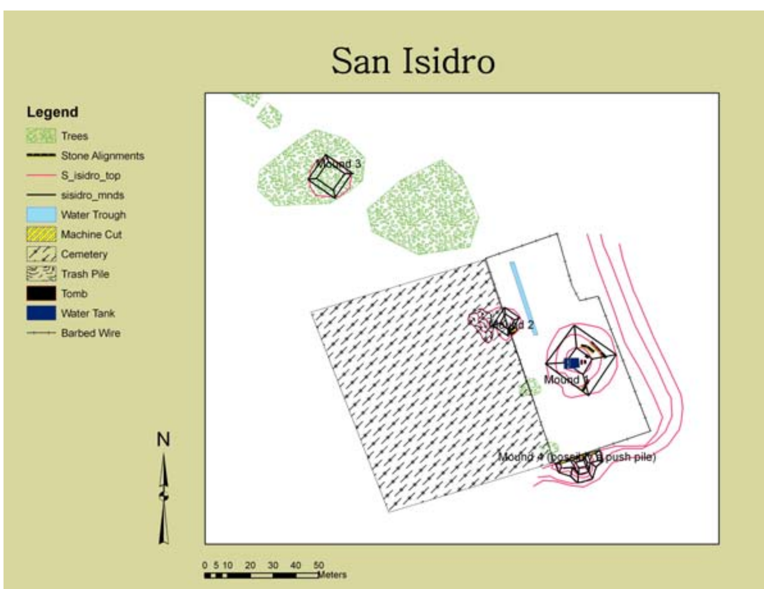


Figure 4.6 a. San Isidro/Cupía

Figure 4.6b. Mound 1 San Isidro facing southeast.

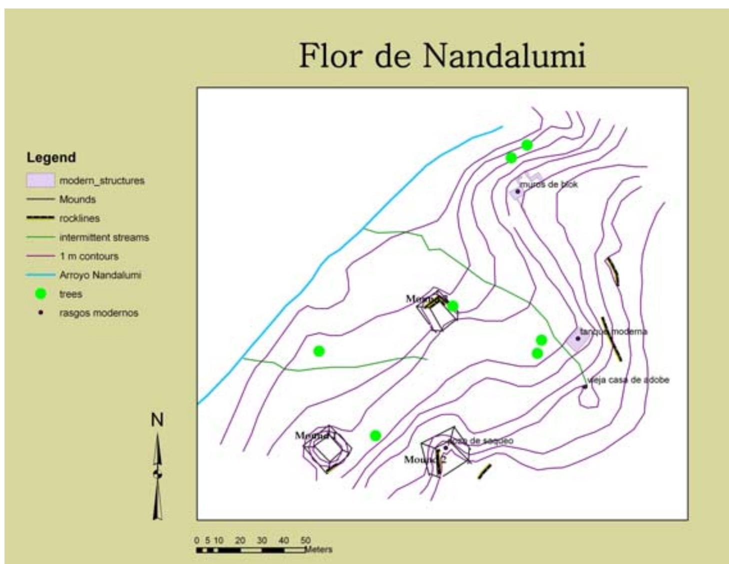


Figure 4.7 Flor de Nandalumí

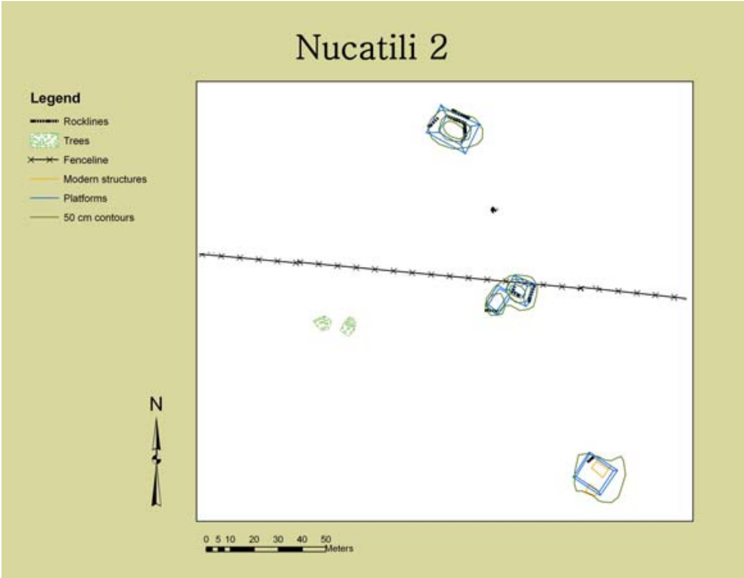


Figure 4.8 Nucatilí 2

Table 4.1 Chiapa de Corzo construction volume and labor cost estimates

CdC Escalera								
m11	m12	m13 plat	M13 anc. plat	m7	m17	m36	Totals	
2172	2970	4087	1236	225	2623	1600		Base
950	1146	3078	633	100	648	930		Top
5.00	4.99	1.50	2.40	1.30	3.50	5.60		Height
5215	7929	5374	2233	211	5724	8223	34910	Volume
0	2225	1213	0	0	0	1225	4663	Dili Volume
5215	5704	4161	2233	211	5724	6998	30246	Escalera Volume
2006	2194	1600	859	81	2202	2692	11633	person/days digging
1645	1799	1312	704	67	1806	2208	9541	person/days hauling soil 50m and piling mound
3651	3993	2913	1563	148	4007	4899	21175	total person/days
12.6	13.8	10.0	5.4	0.5	13.8	16.9	73.0	days with 20% of mean est. population

Table 4.2 Ribera Amatal construction volume and labor cost estimates

Ribera Amatal				
m1	M2	M3	Total	
1005	103	810		Base
174	21	74		Top
2	0.7	2		Height
2067	79.45	1507		Volume
795.00	30.56	579.62	1405.17	Person/days digging
652.05	25.06	475.39	1152.51	Person/days hauling soil 50m and piling mound
1447.05	55.62	1055.01	2557.68	Total person/days
12.47	0.48	9.09	22.05	Minimum days with 20% of mean est. population

Table 4.3 Cupía/San Isidro construction volume and labor cost estimates

Cupía/SanIsidro					
m1	m2	m3	m4	total	
701	135	256	131		Base
103	23	25	16		Top
3	0.75	0.5	3		Height
889.5	59.25	70.25	186	1205	Volume
342.1	22.8	27.0	71.5	463.5	Person/days digging
280.6	18.7	22.2	58.7	380.1	Person/days hauling soil 50m and piling mound
622.7	41.5	49.2	130.2	843.6	Total person/days
37.5	2.5	3.0	7.8	50.8	Minimum days with 20% of mean est. population

Table 4.4 Flor de Nandalumí construction volume and labor cost estimates

Flor de Nandalumí				
m1	m2	M3	Total	
316	215	134		Base
90	96	79		Top
3	3	0.45		Height
548	359.5	47.925	955.43	Volume
210.77	138.27	18.433	367.47	Person/days digging
172.87	113.41	15.118	301.4	Person/days hauling soil 50m and piling mound
383.64	251.68	33.551	668.87	Total person/days
23.111	15.161	2.0211	40.293	Minimum days with 20% of mean est. population

Table 4.5 Nucatilí 2 construction volume and labor cost estimates

Escalera Nucatilí 2					
M1	M2	M2a	M3 (40 cm tall)	Total	
281	170	76	298		Base
98	74	33	4		50 cm
45	26				100 cm
130.5	86	27.25	60.4		Vol.
50.2	33.1	10.5	23.2		Person-days digging
41.2	27.1	8.6	19.1		Person-days transport
91.4	60.2	19.1	42.3	212.9	Total person-days
3.05	2.01	0.64	1.41	7.10	Minimum days to completion with 20% of population

Table 4.6 Labor investment in hinterland architecture

Escalera hinterland architecture-	Person days
Ribera Amatal	2558
Cupía	844
Flor de Nandalumí	506
Nucatilí 2	213

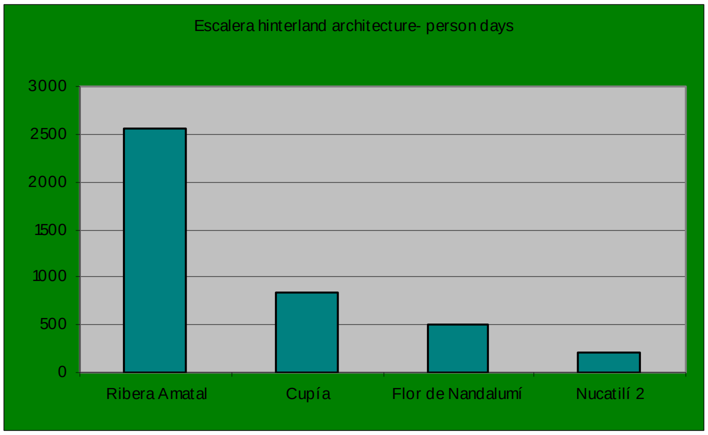


Figure 4.9 Labor investment in hinterland architecture.

4.4 CONTROL OVER ACCESS TO AGRICULTURAL LANDS

One important strategy for establishing control over people and over agricultural surpluses is the establishment of centralized control over access to agricultural lands. As outlined in Chapter 1, a dispersed population can result from household level management of land access, while a nucleated population may result from a variety of systems regulating access to agricultural lands.

The Escalera phase population was more nucleated than the Dili phase population, with 72% of the Escalera phase population located in villages, compared to 51% in the Dili phase. The differences in the distribution of population in villages vs. hamlets from the Dili to Escalera phase are significant and strong (X^2=444.9 $p<.0001$ V=.26). These data provide preliminary support for notion that access to agricultural lands was more centrally regulated during the Escalera phase than in the Dili phase. This regulation may have been directed by rulers at the Chiapa de Corzo, rural leaders, or local community based organizations operating independently of the center.

The Chiapa de Corzo district has a population density of 0.58 people per ha on its prime agricultural land, which is low compared to population densities on prime agricultural lands in the hinterland (Table 4.7), or to the Dili phase, where population density in prime lands of the Chiapa de Corzo district had a population density of 2.1 per ha (Table 3.2). This suggests an increase in control by rulers over land tenure in the immediate sustaining area of Chiapa de Corzo through the creation of an agricultural reserve (DeMontmollin 1989b:299). The establishment of this control may have been a response to greater difficulties in feeding a Chiapa de Corzo population that was 33% larger than in the Dili phase. In the hinterland districts there is no evidence for the presence of agricultural reserves. Settlement in the hinterland heavily favored prime (1st and 2nd class) agricultural lands in every district where there were substantial quantities of these lands (Figure 4.10, Table 4.7).

The distribution of second tier centers over the survey area does not support the idea that control over prime agricultural lands was universally a source of power for hinterland leaders. While the centers of Ribera Amatal and San Isidro/Cupía, both within the Ribera Amatal district, were located on prime agricultural lands, the centers of Flor de Nandalumí and Nucatilí 2 were not. Nonetheless, the greater nucleation of population suggests that access to agricultural lands was controlled through institutions or individuals in villages rather than by individual households.

In sum, the evidence for an agricultural reserve adjacent to Chiapa de Corzo provide better evidence for centralized regulation of land tenure by the Chiapa de Corzo rulers within their own district than in the Dili phase. The greater degree of nucleated population in the hinterland also suggests more centralized control over access to agricultural land than in the Dili phase, but the evidence does not necessarily support the notion that this control was exercised on behalf of the Chiapa de Corzo rulers.

Table 4.7 Escalera phase district populations and prime agricultural land

	district pop	pop on prime	People per ha	percent prime in district	ha prime per person	pop per ha on prime	percent of pop on prime
CdC	1716	67	2.94	20%	0.07	0.58	4%
Ribera Amatal	1075	1075	0.69	44%	0.64	1.56	100%
Flor de Nandalumí	232	0	0.28	3%	0.10	0.00	0%
Nucatilí	268	0	0.21	0%	0.00	0.00	0%
Rio Grande	318	268	0.34	23%	0.68	1.25	84%
Barranca Honda	335	0	0.13	9%	0.70	0.00	0%
El Vergel	486	486	0.18	19%	1.06	0.78	83%
San Rafael	159	0	0.36	23%	0.65	0.00	0%
Total	4589	1811	0.42	17%	0.41	0.96	39%

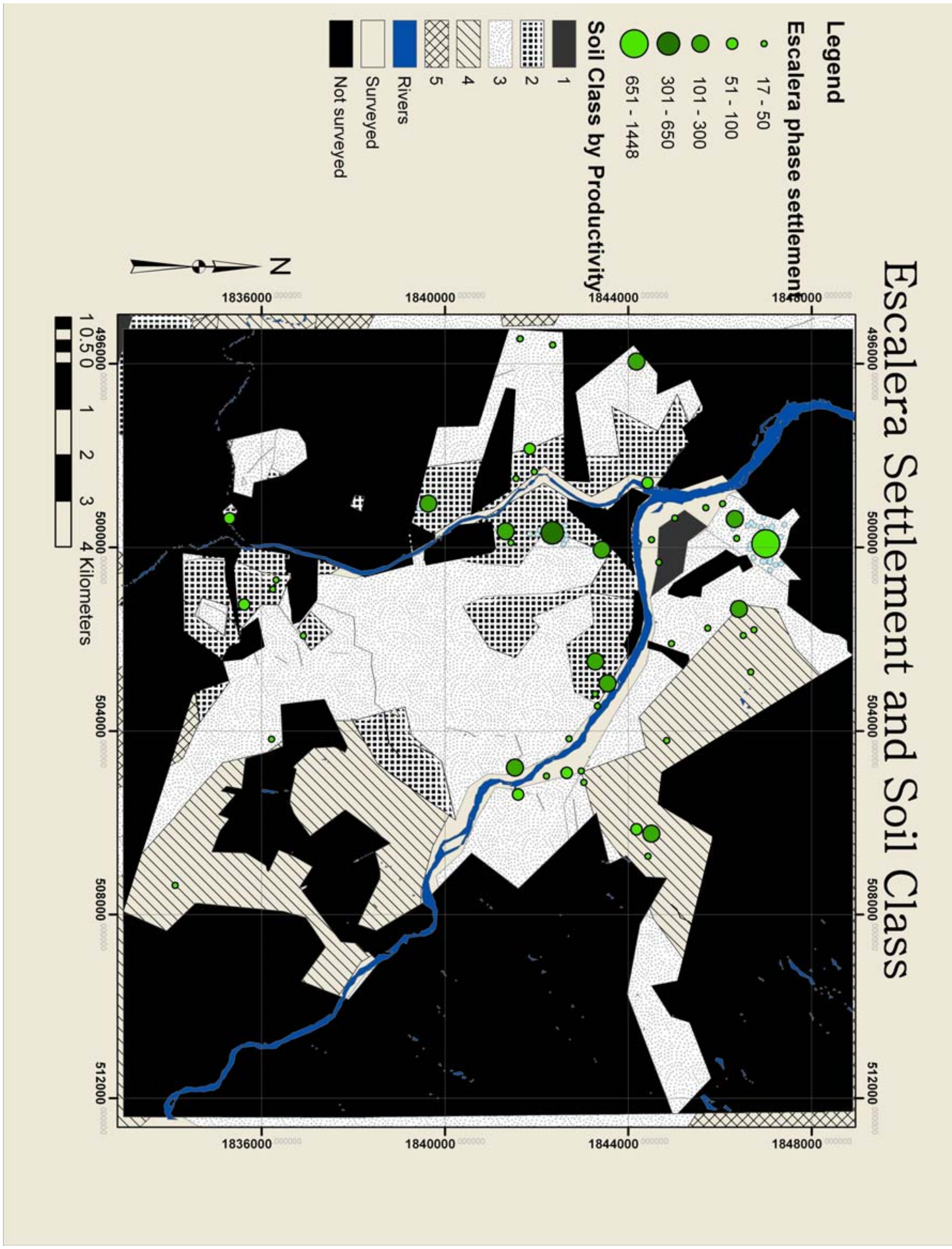


Figure 4.10 Escalera phase settlement and soil productivity ranking

4.5 CONTROL OVER OBSIDIAN ACCESS

In the Escalera phase the quantity of obsidian imported into the area increased by 21% from the Dili phase, with an allocated count of 23.05 pieces, compared to 18.25 in the Dili phase. Obsidian constituted 40% of the lithic assemblage compared to 20% of the Dili assemblage, a change that is both significant and strong (x^2=2.79 p<.10 V=.26). Accompanying the increase in the importation of obsidian, there is evidence that access to obsidian was controlled both by Chiapa de Corzo elites and by leaders at second tier political centers. To a greater extent than the Dili phase, obsidian procurement appears to have been controlled by individuals at Chiapa de Corzo, as this center had much higher obsidian consumption rates than hinterland settlements. In the Escalera phase, Chiapa de Corzo had 32% of the study area population but 77% of the total obsidian (n=17.6), compared to the Dili phase, where Chiapa de Corzo had 21% of the population and 52% (n=9.42) of the obsidian. The estimated per-capita rate of consumption at Chiapa de Corzo was approximately 30% higher during the Escalera phase than in the Dili phase.

In contrast to the Dili phase, where no second tier political centers had obsidian, all but one of the four Escalera phase second tier centers had obsidian. The mean count of obsidian for these three sites is 0.7, which is higher than the mean values of 0.32 for other hinterland sites with obsidian. This difference is fairly significant (t=-2.05, p=.065). It is probable that some of this obsidian was imported during later occupations of these sites, but these data offer preliminary support for the idea that obsidian may have been distributed by Chiapa de Corzo elites into the hinterland through leaders at second tier centers.

Per-capita rates of obsidian consumption at second tier political centers are not uniformly higher than ordinary settlements. The largest second tier center, both in terms of architecture and population, Ribera Amatal, ranked the lowest in per-capita obsidian consumption of all settlements with obsidian, and Flor de Nandalumí ranked third from last in obsidian consumption rates (Figure 4.11). Only 36% of hinterland villages (n=4) had obsidian, two of them second tier centers. The percentage of hamlets with obsidian is slightly lower than that of villages, at 22% (n=8), but the two highest per-capita rates of consumption come from hamlets.

The lack of correspondence between high per-capita obsidian consumption values at individual lower tier political centers casts some doubt on the idea that leaders at these settlements were more intensively involved in the obsidian exchange network than individuals at other settlements in the study area. However, given the scarcity of Escalera villages with obsidian (5 out of 12), its presence within these centers supports the idea that access to obsidian for many members of hinterland settlements was controlled by leaders at second tier political centers. The notion that Escalera phase obsidian access was ultimately controlled by elites at Chiapa de Corzo is also supported by the lack of obsidian at settlements further than six km from the center, a pattern reflected in the k-means ellipses of obsidian distribution (Figure 4.11).

There is also evidence that access to SMJ and El Chayal obsidian was controlled differently, with Chiapa de Corzo rulers exercising tighter control over the former[4]. El

[4] None of the exclusively Escalera phase collections had obsidian, so all attributions of obsidian to this phase are speculative. Clark has suggested that El Chayal was not imported into the Chiapa de Corzo sub-region until the Late Formative, and has suggested that the strong prevalence of El Chayal in the survey collections is a product of incorrect attribution (Personal Communication 2008). However, recent excavations at Chiapa de Corzo found 71% of the Escalera phase obsidian assemblage to be El Chayal and 20% SMJ (Bachand et al. 2008:157). Of the total obsidian attributed to the Escalera phase from the surface

Chayal was present in all five of the districts that had obsidian, while SMJ is restricted to the Chiapa de Corzo and Ribera Amatal districts. This stands in contrast to the Dili phase, where SMJ occurred in four of the nine districts. Escalera phase SMJ is very scarce outside Chiapa de Corzo: none of the six hinterland collections with this material had a value of over 0.29 (mean= 0.23). The low SMJ values of the hinterland collections suggest a high probability that the SMJ at these sites was imported in later phases and that this material was largely restricted to Chiapa de Corzo during this phase. Four of the 15 hinterland collections with El Chayal obsidian had values of 0.5 or greater (mean= 0.29), a finding which further supports the hypothesis that El Chayal was more widely accessible in the Escalera phase than SMJ.

A k-means analysis of collections with SMJ and El Chayal displays the contrast between the distributions of these materials (Figure 4.11). The distribution of SMJ produces a single ellipse oriented between Chiapa de Corzo and the Santo Domingo River. The distribution of El Chayal produces three ellipses, with the broadest of these centered on Ribera Amatal. This contrast supports the idea that access to El Chayal may have been controlled by leaders at Ribera Amatal as well as by rulers at Chiapa de Corzo, while access to SMJ was controlled exclusively by rulers at Chiapa de Corzo.

About 4% of the Escalera phase obsidian was non-prismatic, which is the same as the percentage of the Dili phase assemblage, but non-prismatic obsidian occurs only at Chiapa de Corzo, Ribera Amatal, and Cupía/San Isidro, all political centers. This distribution is more restricted than in the Dili phase, where non-prismatic obsidian was only found in third tier settlements. As non-prismatic obsidian is more likely to be

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collections, 68% is El Chayal. This correspondence suggests that incorrect attribution of El Chayal to the Escalera phase may not be a significant problem.

exchanged without elite sponsorship (Clark and Lee 2007:114), these data suggest that rulers may have increased their control over access to both prismatic and non-prismatic obsidian in the Escalera phase.

The more limited distribution of SMJ obsidian suggests that Chiapa de Corzo rulers may have restricted the access of the hinterland population to this resource to a greater degree than in the Dili phase. The hinterland population may have accessed El Chayal through hinterland leaders as well as through the Chiapa de Corzo elite. The data suggest greater overall control by the Chiapa de Corzo elites over obsidian access, and possibly the development of a hierarchical system of redistribution through second tier centers. If the latter is true, then the Chiapa de Corzo rulership may have been enhancing the status and authority of leaders at second tier centers through including them in a prestige goods network.

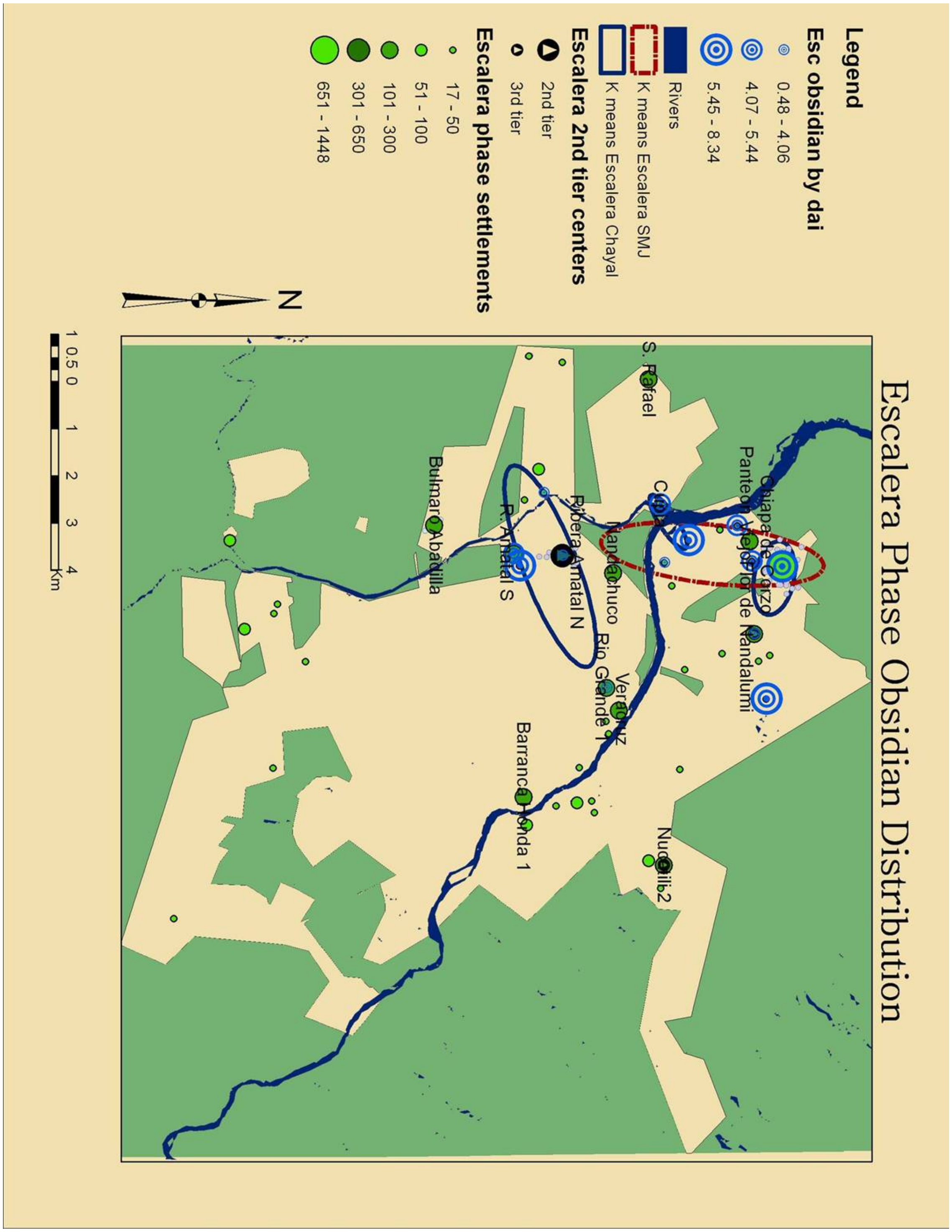


Figure 4.11 Escalera phase obsidian distribution.

4.6 CONTROL OVER ROUTES OF TRADE AND COMMUNICATION

As noted above, control the movement of people and goods through routes of trade and communication has been proposed as a source of elite power in Formative Mesoamerica. The movement of people and goods between polities may have increased during the Escalera phase due to the increase in the number of neighboring primary and secondary centers in western Chiapas. In the Jiquipilas sub-region, the primary center of Ocozocoautla emerged (McDonald 1999), as did the secondary centers of Mundet, El Cielito and La Gloria (Navarrete 1960) (Figure 4.3). These developments could have increased the opportunity for trade between members of different polities, but also may have inhibited contact between members of different polities if conflicts arose between them.

The least cost paths calculated from the Escalera phase capitals to Chiapa de Corzo in general conform to the paths described by Navarrete (1978:76b). One exception is the least cost path from Tzutzuculi to Chiapa de Corzo, which follows the path of the modern highway, running first to the west through Arraiga before turning east once in the Central Depression and running adjacent to Ocozocoautla, rather than taking the closer, and more direct, northeastward path from above the modern settlement of Tonala to the modern settlement of Villa Corzo (Figure 4.3). It should be noted, however, that the least cost analysis indicates that the route from Tiltepec through Villa Corzo is not substantially more costly than the route through Arraiga, and this route, which converges with the center of El Cielito (Figure 4.3), may have been utilized during times of conflict in the Jiquipilas sub-region.

Evidence for Escalera phase rulers exercising control over routes of communication and trade in the hinterland through rural intermediaries is even more limited than in the Dili phase. The single possible Escalera phase Chiapa de Corzo outpost on the convergence of communication routes is the hamlet of San Isidro/Cupía (Figure 4-12 Escalera phase settlements and communication routes.). This site was located about 1200 m to the southwest of Chiapa de Corzo, directly above the confluence of the Grijalva and Santo Domingo Rivers. Individuals at this settlement may have been charged with surveillance and control of traffic moving through this confluence by Chiapa de Corzo rulers. San Isidro/Cupía is situated on top of a steep bluff about 15 meters above the river, and directly to the north of a broad beach. This site is visible from Chiapa de Corzo and has a direct view of traffic moving through the confluence and below Chiapa de Corzo. Its location would have enabled the communication of information about traffic through this area to rulers at the center, and potentially facilitated physical interference with canoe traffic moving through the confluence and into Chiapa de Corzo[5].

In the rest of the hinterland, however, the evidence suggests that there was very little interference by rulers at the center in the movement of people through the polity. The contraction of settlement toward Chiapa de Corzo noted above was accompanied by the abandonment or decrease in the population of settlements along nodes of communication networks in the southern part of the survey area. The Dili phase village of Las Limas, located at the juncture of the least cost path from Finca Acapulco, sites in the Frailesca, such as El Cielito and La Gloria, and Chiapa de Corzo, was reduced to a pair of hamlets.

[5] The idea that naval combat involving canoes was a feature of control over communication networks is supported by observations made by T. Gauge in 1694 on the dexterity of the Chiapanec in the mock naval battles conducted as part of the January festivals (cited in Navarrete 1966:21). Navarrete agrees with Gauge in attributing this practice to contact with the Spanish, but an emphasis on riverine combat may well have roots that date to the Formative.

Both of the Dili phase America Libre second tier centers on the portage route from the Grijalva River to the Santo Domingo River, and on the least cost route from Finca Acapulco to settlements in the Jiquipilas sub-region, were abandoned, as was the settlement at the portage point of Barranca Honda. This Barranca Honda settlement was re-established (or a new settlement founded) on the bluffs overlooking the river above the earlier settlement.

To the west of the Santo Domingo River, the Saraín Mendoza settlement on the El Vergel-Suchiapa communication route was reduced to a small hamlet, suggesting that this route had declined in importance. On the other hand the Bulmaro Abadilla site grew from a pair of small Dili phase hamlets into a small village during the Escalera phase. This site is located 600 m to the west and above the least-cost routes between El Cielito/ Finca Acapulco and Chiapa de Corzo, and about 300 m to the southeast of the least cost route from the Mundet site (Figure 4.3, Figure 4.12). No mounds were visible at this site, but two of the three collections defining the site come from quarry contexts, and it is possible that buried mounds exist, or existed at the site. Nonetheless the available data do not support the notion that this site was an outpost of the Chiapa de Corzo polity.

Aside from the possible exception of San Isidro/ Cupía, civic-ceremonial or high status residential architecture was absent from settlements located on or directly adjacent to principal routes of communication. This absence suggests that whatever control Escalera phase rulers of Chiapa de Corzo were exercising over the movement of people and goods through their territory, this control was not principally implemented through leaders or functionaries at second tier centers.

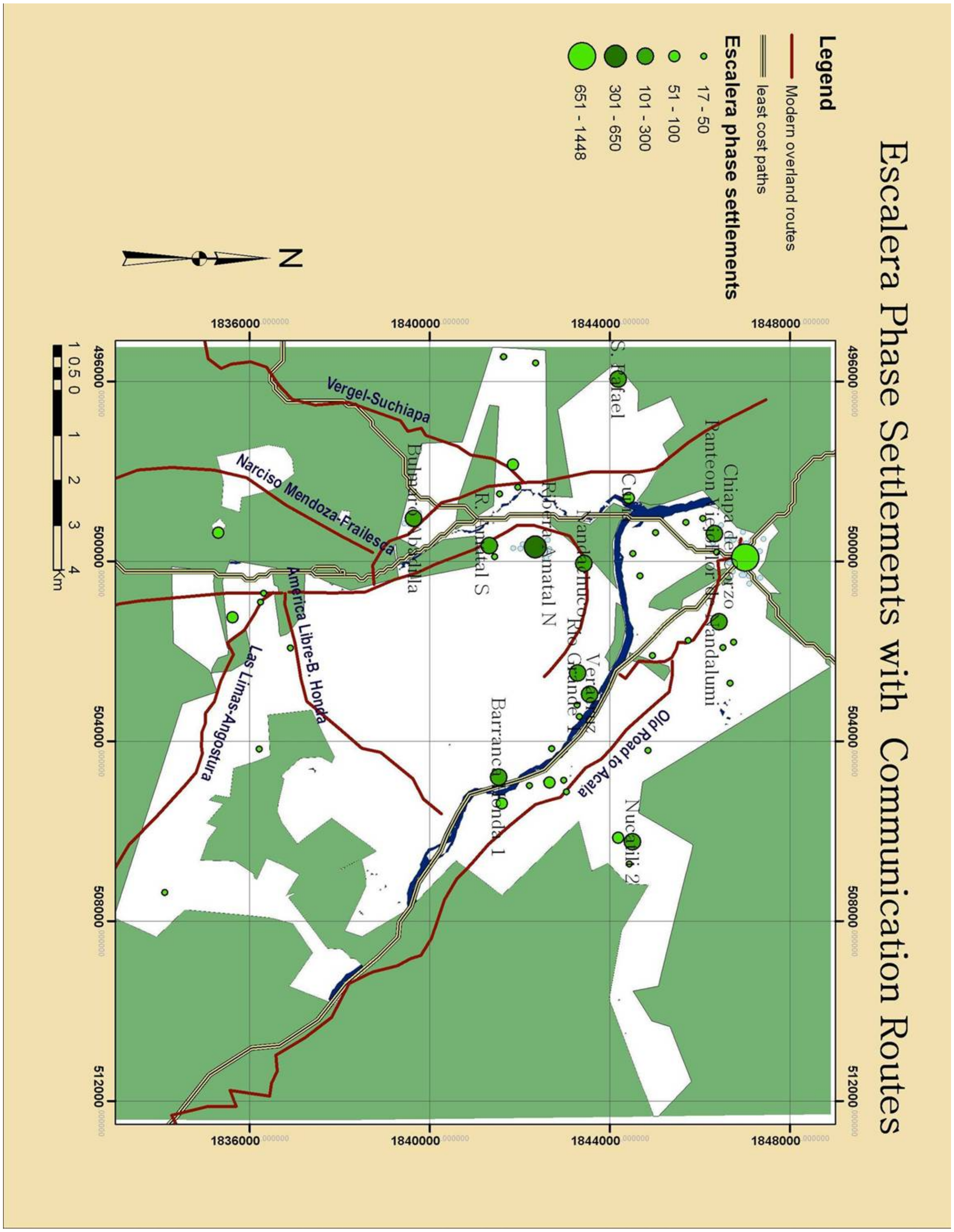


Figure 4-12 Escalera phase settlements and communication routes.

4.7 THE USE OF WARFARE AND COERCION

As with the Dili phase, there is scant direct evidence of warfare during the Escalera phase. There is little in the iconography of the Escalera phase, either at Chiapa de Corzo or at neighboring centers that indicates warfare as a prevalent theme. A single Escalera phase burial of a young male from below Mound 1a had a 1 cm cicatrized hole in the sternum, which may be the result of a spear or arrow injury (Agrinier 1975:34). This was a simple interment unaccompanied by any grave goods. Otherwise there is nothing emphasizing warfare in the burial population at Chiapa de Corzo or in neighboring political centers. We must then turn to other lines of evidence to evaluate what kinds of warfare may have been waged by the Chiapa de Corzo rulers and others.

The following explores evidence for three different kinds of violence and warfare that may have been undertaken by rulers and others within the Chiapa de Corzo polity. Inter-polity warfare may have increased during the Escalera phase, as neighboring centers, as well as Chiapa de Corzo became more powerful (at least in the sense of being able to mobilize labor into the construction of monumental civic ceremonial centers), and more numerous. Chiapa de Corzo rulers may have applied military force to subjugate the hinterland population. Inter-village conflict and raiding within the Chiapa de Corzo polity may have reemerged, as hinterland leaders sought to gain advantages over their neighbors.

Changes in the regional political landscape of the Escalera phase included the construction of much of the civic ceremonial precinct of Mirador, to the west of Chiapa de Corzo in the Jiquipilas sub-region. There is evidence that superstructures on Mounds

20 and 27 at Mirador were burned during the Escalera phase, with the Mound 27 superstructures burned several times (Agrinier 1970:14, 2000:7), these events may represent attacks on this center, termination rituals, or both (Pagliaro et al. 2003; Webster 2000:75).

In between Chiapa de Corzo and Mirador, civic-ceremonial construction at Ocozocoautla was initiated and it appears to have emerged as a political center (Clark In press). In between Ocozocoautla and Chiapa de Corzo Escalera phase materials appear to be scarce or absent at the small center of San Agustin (Navarrete 1961). To the east, the center of Finca Acapulco reached its apex and was eventually abandoned during this phase. In between Finca Acapulco and Chiapa de Corzo, excavations at Sta. Cruz suggest abandonment or a much reduced population at this secondary center during the Escalera phase (Sanders 1961:50).

Escalera phase settlement location in the hinterland is not oriented toward defensive locales, with most settlements located near the river and prime agricultural lands. However, the trend towards abandonment and reduction in size of settlements in the outer hinterland, a trend echoed in the abandonment of San Agustin to the west of Chiapa de Corzo and Sta. Cruz to its east, may have resulted at least in part from intensified inter-polity conflict. The retreat of settlement from the outer hinterland suggests that the population may have moved out of areas that were not directly accessible from the center and consequently vulnerable to attack, forming an empty buffer zone around parts of the polity (Figure 4.1). The evidence for this vacant buffer zone supports the notion of an increase in the frequency of violent inter-polity conflict, or a change in the nature of this conflict to include hinterland populations as valid targets. This stands in contrast to the

Dili phase, where the data indicate no significant fall-off in population at increasing distances from the center.

The Escalera phase movement of population out of hamlets and into villages also supports the notion that hinterland populations were more at risk from violence. Within the study area 72% of the Escalera phase population was located in villages compared to 51% in the Dili phase, a change that is both significant and strong (x^2=621 p<.001 V=.26). While a variety of factors may account for increased nucleation of population, defensive concerns figure prominently among them. These defensive concerns may relate to greater inclusion of commoners as targets of interpolity warfare, forced resettlement of hinterland populations by Chiapa de Corzo rulers (e.g. the use of coercive force), or to a return to the inter village conflict attributed to the Jobo phase.

The reduction in size and frequency of settlements on important routes of communication and transportation discussed in the previous section lends support to the first of these possibilities, as groups moving to attack the center would likely follow paths of least resistance. Combined with the appearance of vacant buffer zones, this change supports the notion that inter-polity warfare did affect hinterland populations in the Escalera phase.

There is evidence supporting the notion that some of the Escalera phase change in settlement may have been in part a result of the exercise of forced resettlement of the hinterland communities by Chiapa de Corzo rulers. None of the eleven of the Dili phase hinterland villages persisted into the Escalera phase. Four of these villages were abandoned, four reduced to small hamlets, and three reduced to large hamlets. Most of the new villages were established within less than a km of many of the old ones. The decrease in the number of people living in hamlets, and the relatively high instability in village location may have been the product of a restructuring of the political network in the hinterland by Chiapa de Corzo rulers. The notion that this restructuring was sponsored by the Chiapa de Corzo rulers rather than the result of small scale raiding between leaders of hinterland communities acting independently of Chiapa de Corzo is largely circumstantial. Top-down political restructuring is supported by architectural evidence of political integration from two of the Escalera phase second tier centers discussed above, and by the development of a three tiered political hierarchy. Furthermore if inter-polity warfare was more prevalent than in the Dili phase, Escalera phase rulers would have had a more powerful military force at their disposal than hinterland leaders, thereby enhancing the ability of rulers to threaten hinterland communities with coercive force.

4.8 ELITE POLITICAL IDENTITY

In the Escalera phase there is stronger evidence for a distinct class of elites than in the Dili phase. As noted above, one prominent burial from Mound 17 at Chiapa de Corzo suggests that the ruling lineage enhanced its status through a hypogamous marriage into the La Venta dynasty during the Escalera phase (Clark 2000:48; Clark and Pérez 1994:271; Clark and Pye 2000:243-45). This burial, an adult female, is the only tomb burial known for the Escalera phase. The individual was accompanied by 106 jade beads, two alabaster tecomates, a fancy incised vase, ten ceramic vessels, all of which were very similar to La Venta vessels, and seven of which were likely La Venta imports (Cheetham and Lee 2004:291; Lee n.d.).

Pronounced differences in social status are suggested by differences in the allotment of mortuary goods within the Chiapa de Corzo burial population. Jade occurred in only three of the 15 known Escalera phase burials at Chiapa de Corzo; the 106 beads from the Mound 17 female noted above, 13 jade beads in a richly furnished adult male burial, also in Mound 17 (Lee n.d.), two jade beads in a child burial to the north of the later Mound 1 (Agrinier 1964:10).). The remaining 12 Escalera phase burials were all simple interments, accompanied by one to seven vessels (mean of three) and no other preserved burial goods save for the occasional mammal bone (Lowe 1964:65-68). These data provide some support for the notion that there was pronounced social differentiation at Chiapa de Corzo in the Escalera phase and weaker support that this inequality was hereditary.

Beyond burials, an analysis of labor investment in elite residential vs. public architecture from the Escalera phase also suggests an increase in social differentiation from the Dili phase. In the Dili phase the Mound 13 platform (likely an elite residential structure), constituted an estimated 22% of the total construction cost of the civic-ceremonial precinct (Table 3.1). The estimated labor costs of Escalera phase construction on the Mound 13 residential platform constitute 21% of the civic-ceremonial zone totals, suggesting relatively little change in the ability of elites to mobilize labor into residential constructions. However, this interpretation must be modified if Cheetham and Lee are correct in their interpretation of the Escalera phase Mound 17 platform as an elite residential structure, an argument supported by a relatively high quantity of Escalera phase domestic debris in the fill of this mound (2004:291). The Escalera phase Mound 17 platform constitutes 19% of the estimated total labor investment at Chiapa de Corzo, and the combination of this and the Mound 13 construction constitutes 40% of the total labor costs (Table 4.1). If both of these platforms were residential, then this represents a marked change in the direction of the investment of public labor at Chiapa de Corzo from the Dili phase, with a strong increase in the investment in elite residential buildings suggesting the presence of more powerful elites, and an increase in the status differentiation between elites and commoners.

4.8.1 Political Identity and Feasting.

Feasting continued to be an important component of political behavior in the Chiapa de Corzo polity, both among rulers and hinterland leaders. With the development of more pronounced status differences between elites and commoners feasts hosted by rulers may have included larger numbers of the population, or become restricted to other elites. Feasts in the hinterland may also have changed, as the power of leaders became more linked to affiliation with the ruling elite rather than through the generation of community support. To the end of examining changes in the nature of feasts at the center, and differences in feasting between the center and hinterland communities we turn to a consideration of feasting vessels.

Within the Central Depression, the data suggest that Nicapa Resist ceramics (Figure 4.13) may have been utilized as a serving vessel in the provisioning of feasts related to participation in the Chiapa de Corzo political sphere. Nicapa ceramics occur predominantly in bowl and dish forms, and have a larger mean diameter (30 cm) than any other Escalera types of fancy serving vessels. We have slightly more than 80% confidence in the difference in diameters between Nicapa Resist and White and Gray types, and over 99% confidence in the difference between Nicapa Resist and Llomo Variegated Brown (Figure 4.14). Ethnographic studies have demonstrated that larger serving vessels are often associated with feasting activities involving large groups of people (Adams 2004: 70-71; Clarke 2001; DeBoer 2003, cited in Rosenswig 2007). While the validity of these cases as analogies depends on how serving vessels are used (e.g. as vessels in which individual portions were served, or as vessels containing shared food) the relatively large diameter of Nicapa Resist serving vessels would have made them well suited as containers of shared food in feasts (LeCount 2001:945).

Nicapa resist serving vessels are more common at Chiapa de Corzo and lower tier political centers than at either villages or hamlets, supporting the notion that feasts provisioned with these vessels were more common in the upper levels of the political hierarchy. At Chiapa de Corzo Nicapa Resist constitutes 25% of the ceramic totals; at pooled lower tier political centers Nicapa constitutes 22% of the total. We have over 95% confidence that the percent of Nicapa ceramics at Chiapa de Corzo is higher than either the pooled hinterland villages (12%) or hamlets (14%), and around 80% confidence that the percent of Nicapa serving vessels at lower tier political centers is higher than villages or hamlets (Figure 4.17).

It should be noted that the higher Nicapa frequencies at second tier centers are strongly driven by the high frequency of Nicapa at San Isidro/Cupía, with less than 80% confidence in the difference between the higher Ribera Amatal frequencies and those of villages and hamlets, and lower frequencies present at the second tier center of Flor de Nandalumí. Comparisons between individual sites show Chiapa de Corzo with higher ratios of Nicapa resist to total ceramics than the ratios of most individual villages. A notable exception is the large hamlet and secondary center of San Isidro/Cupía, where approximately 70% of the Escalera ceramics were Nicapa Resist (Figure 4.18).

Differences in the sizes of serving vessels may also reflect differences in feasting practices, especially where serving vessels are used communally rather than individually. Sizes of Nicapa Resist serving vessels were not highly standardized within the study area, ranging from 14 to 54 cm, displaying a slightly bimodal distribution with peaks between 20-25 cm and 35-40 cm (Figure 4.15 Histogram of Nicapa Resist Diameters). The mean diameter of Nicapa serving vessels is larger at Chiapa de Corzo than at hinterland settlements (31.7 cm vs. 26.5 cm at second tier centers, and about 28 cm at both villages and hamlets), with just over 80% confidence in the difference between Chiapa de Corzo and second tier centers, but slightly less than 80% confidence in the difference Chiapa de Corzo and villages and hamlets (Figure 4.17).

The larger diameter of Nicapa serving vessels at Chiapa de Corzo compared to second tier centers supports the idea that feasts at the center involved the presentation of greater quantities of food than those at second tier centers, suggesting that Escalera phase rulers hosted feasts for larger groups of people than those hosted by hinterland leaders. It is possible that feasts at second tier centers may have been more exclusive than those at Chiapa de Corzo, with less of an emphasis on gaining support from the local population and more of an emphasis on strengthening ties with the Chiapa de Corzo elite. If feasts at second tier political centers were more exclusive than those at Chiapa de Corzo , these feasts may have been intended to accentuate differences in status between hinterland leaders and followers.

Figure 4.13 Chiapa de Corzo Nicapa Resist sherds (from Clark and Cheetham 2007)

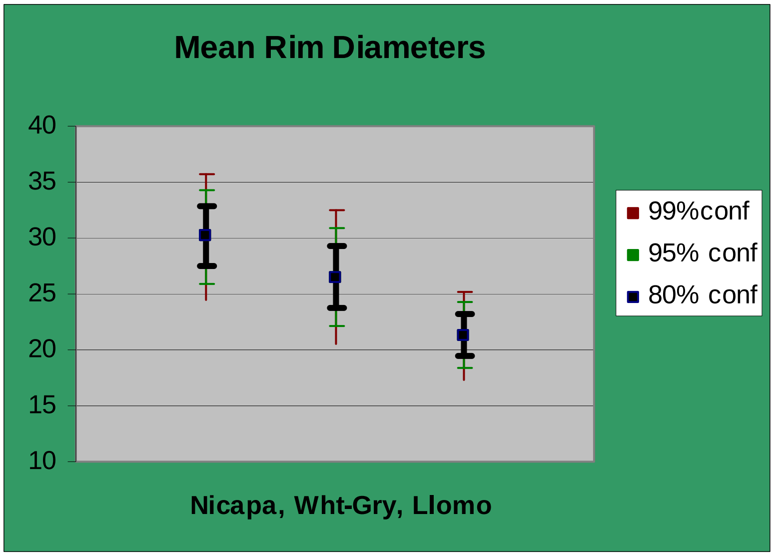


Figure 4.14 Mean Rim Diameters for Serving Vessels with confidence levels : Nicapa Resist 29.9 cm, Escalera White and White-and-Gray 26.5 cm, Llomo Variegated Brown 21.3 cm.

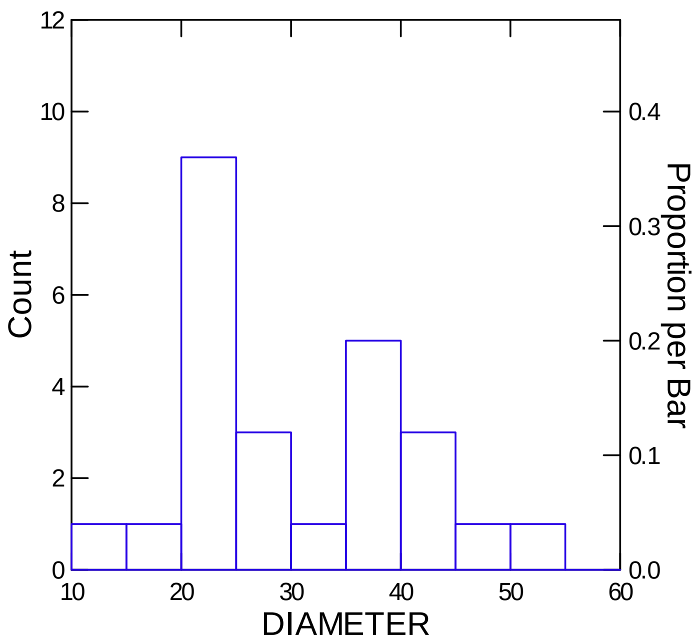


Figure 4.15 Histogram of Nicapa Resist Diameters

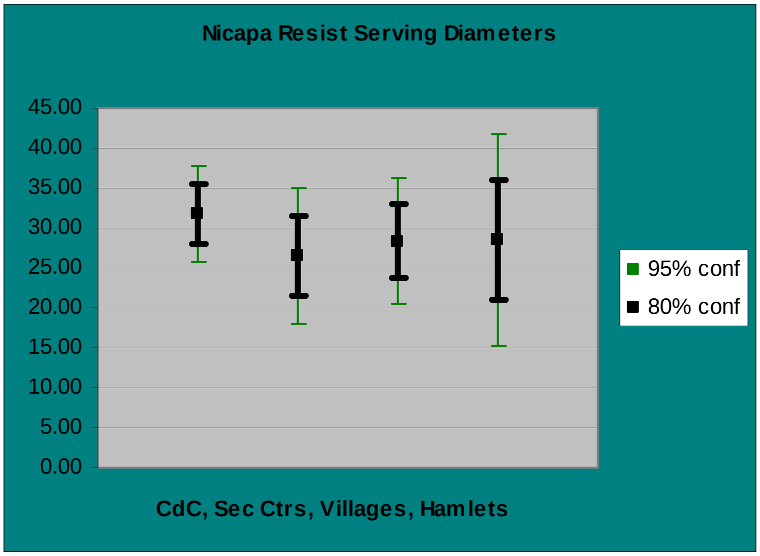


Figure 4.16 Nicapa Serving Vessel Diameters at Chiapa de Corzo and Hinterland settlements.

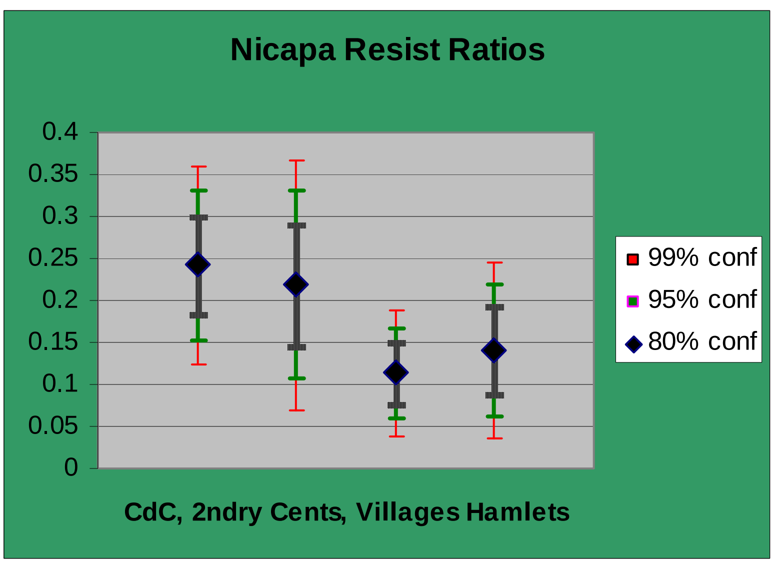


Figure 4.17 Nicapa Resist ratios to ceramic totals by settlement class

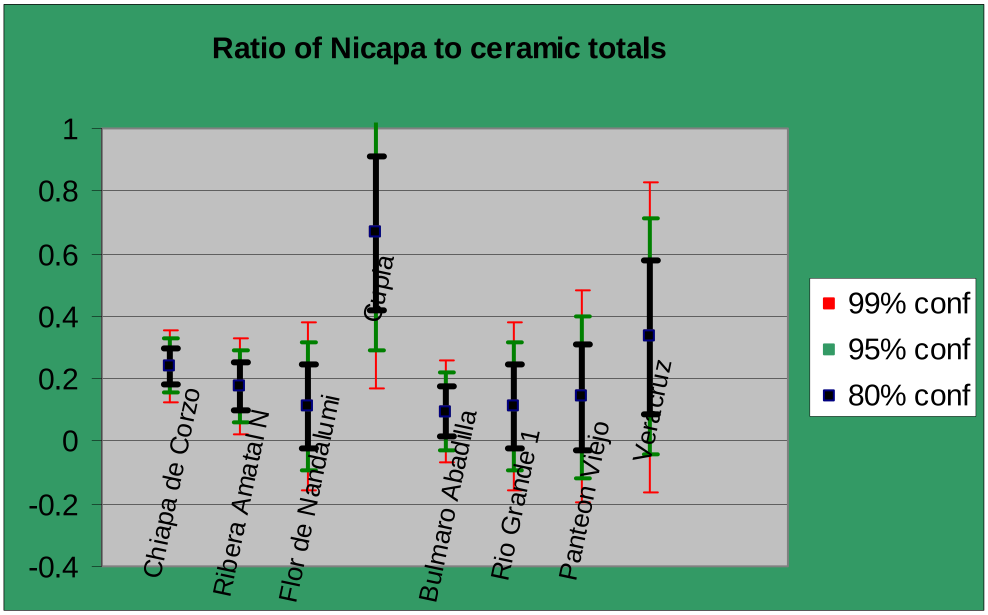


Figure 4.18 Nicapa Resist ratios to ceramic totals by largest settlements

4.9 CONTROL OVER PUBLIC CEREMONY AND IDEOLOGY

The construction of new structures and the enlargement of Dili phase structures in and around the civic-ceremonial precinct suggest an elaboration of the ceremonial practices established during the Dili phase. The plaza area was not expanded, but rather interrupted with the construction of the 3.7 m tall initial stage of the Mound 17 platform in its center (Figure 4.17). The placement of Mound 17, about half-way between the earlier northern and southern boundaries of the Chiapa de Corzo civic-ceremonial plaza, the E-group formed by Mounds 11 and 12, and Mound 36, altered the structure of ritual space.

If Cheetham and Lee (2005:291) are correct in their interpretation of the Escalera phase Mound 17 platform as an elite residential structure, then elites may have moved from the sidelines of ritual activity to the center, a change that suggests the role of elites as occasional intermediaries with the supernatural, evolved into a more direct association with the supernatural. The central position of this structure within the civic-ceremonial zone suggests the association of its residents with the axis mundi, a position that in shamanic cosmology served as a link between the celestial, terrestrial, and underworld realms (Reilly 1995:30)[6]. In Middle Formative Olmec iconography rulers are frequently depicted as manifestations of the axis mundi, a position interpreted as a link between different levels of the cosmos (Reilly 1990, 1994:7, 1995:37; Taube 1998: 454). The placement of a royal residence and eventually a royal tomb in the central location of Mound 17 likely privileged the position of rulers as intermediaries with the otherworld, thereby elevating their importance relative to non-elite shamans who likely continued to practice in the hinterland.

The twin 100 meter long platforms that extend to the south of Mound 17 may have enclosed a ballcourt or an open ended courtyard (Clark and Hansen 2001:7). In either case, the construction of these platforms created a more enclosed space than the earlier civic-ceremonial precinct. This space measures approximately 3200 m^2 and could have contained over 2100 people (allotting 1.5 m^2 per person), more than the entire Escalera phase population of Chiapa de Corzo. As with the larger civic-ceremonial space, it is unlikely that this area was ever entirely filled with people, but the size of this plaza and its open southern end suggest that it was relatively accessible. The flanking platforms appear to have been less than a meter tall above the surrounding plaza area, suggesting

[6] The idealized quincunx pattern of a bar surrounded by four dots common to Middle Formative celt iconography is not readily apparent in the layout of Chiapa de Corzo, but nonetheless, the central position of this structure within the plaza suggests it may have been imbued with this significance.

that whatever performances took place within this space were open to view by non-participants.

In the hinterland, the plaza delimited by Mounds 1 and 3 at Cupía/San Isidro measures approximately 116 m long. The length of this plaza is roughly equivalent to the space enclosed by the “wings” of Mound 17 at Chiapa de Corzo, a fact that allows for the possibility that aspects of ceremonies performed at Chiapa de Corzo were replicated at this settlement. The alignment and organization of architecture at this site do not, however, correspond to anything at Chiapa de Corzo, nor do they resemble anything from neighboring centers in the Central Depression, suggesting a departure from local ceremonial conventions (or a later construction date). Whatever ceremonies were conducted at this center differed from anything at Chiapa de Corzo.

In the hinterland the only replication of architectural arrangements found at Chiapa de Corzo come from Ribera Amatal. At this site there are about 38 meters between the two large mounds (Mounds 1 and 3), and about 33 m between Mounds 1 and 2. As noted above, this arrangement is very similar to that of Mounds 73, 74, and 66 at Chiapa de Corzo. This would suggest that ceremonies performed at this site were similar in scale and orientation to that of minor house or corporate groups at Chiapa de Corzo. Ceremonies at this settlement consequently may have served to emphasize ties of the leaders at this settlement with a group of lower tier nobles residing at Chiapa de Corzo.

Given our lack of information on the construction sequences of hinterland settlements any conclusions about the nature of ceremonial activities in the hinterland during the Escalera phase are speculative. If the Cupía/San Isidro complex does date to the Escalera phase then relatively large scale ceremonial activities, possibly directed at fostering a sense of community identity were present in the hinterland. The architectural organization of this settlement suggests that whatever ceremonies took place at this site did not mimic those of Chiapa de Corzo, and consequently did not serve the same political functions of ceremonies at the center. Smaller scale ceremonies may have taken place at Ribera Amatal, which were likely more directed at expressing status differences between local leaders and commoners than at integrating the local population into the polity or community.

Regardless of whether or not the architecture at these hinterland sites dates to the Escalera phase, the elaboration of the civic-ceremonial precinct at Chiapa de Corzo suggests that the differences in religious functions between the center and hinterland communities established in the Dili phase were exaggerated in the Escalera phase. The construction of Mound 17 as an elite residential platform in the center of the main civic-ceremonial plaza at Chiapa de Corzo suggests that rulers established themselves as manifestations of the axis mundi, thereby gaining the status of privileged intermediaries with the supernatural in the Escalera phase. The scale of the space enclosed by the twin platforms extending to the south of Mound 17, and the low height of these platforms suggest that ritual and religious at Chiapa de Corzo remained predominantly inclusive and open to the public.

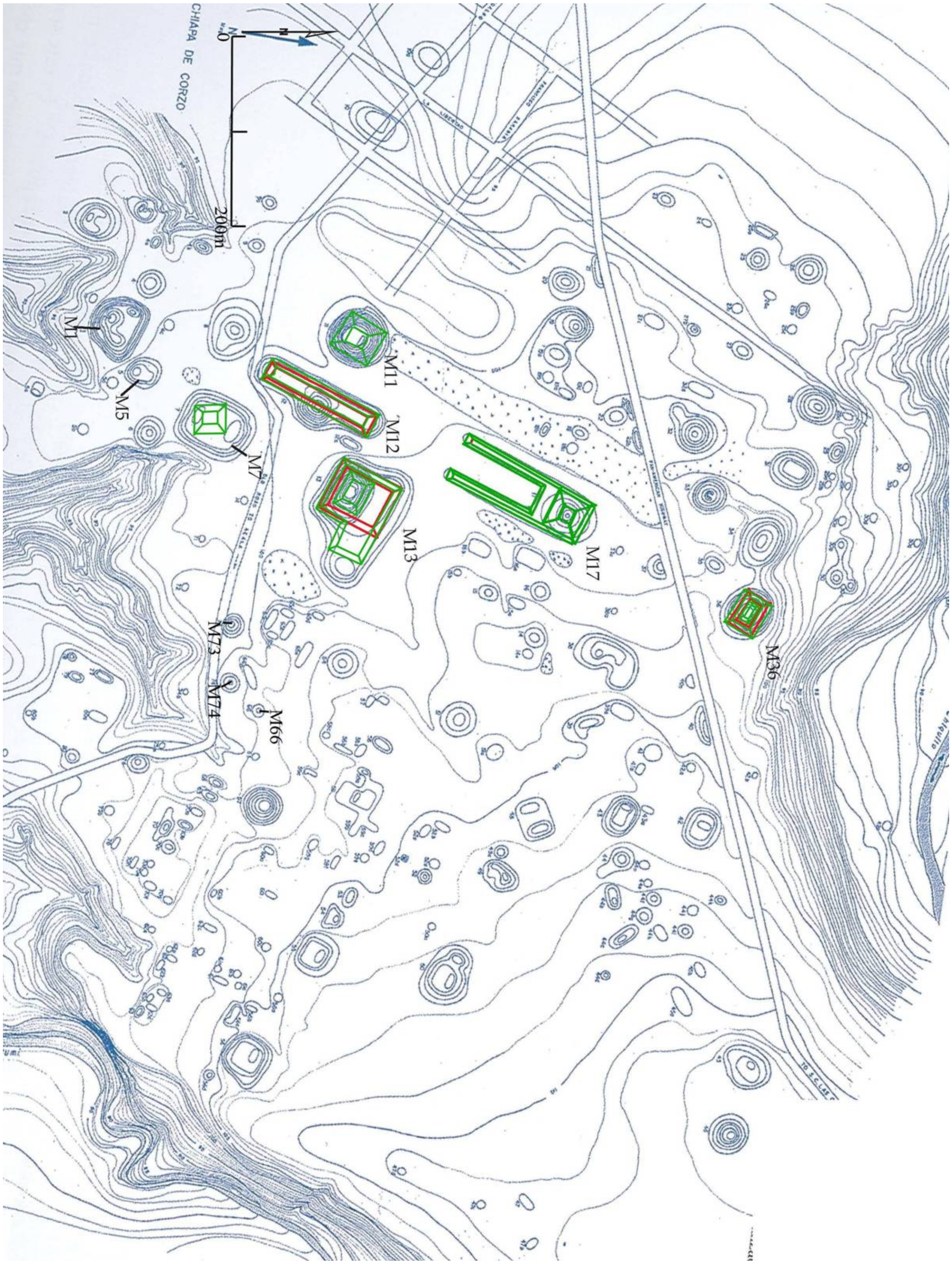


Figure 4.19 Chiapa de Corzo with Escalera phase constructions outlined in green (Mounds 7, 11,12,13, 17, and 36)

4.10 SUMMARY

During the Escalera phase social differentiation appears to have become more pronounced than in the Dili phase, as reflected in increasingly elaborate burials and the expansion of the Mound 13 residential compound. Burial evidence from Mound 17 suggests that rulers at Chiapa de Corzo consolidated their legitimacy through marriage into an elite royal lineage from La Venta. This evidence for increased differentiation between rulers and commoners was accompanied by evidence for several changes in strategies of governance.

There is better, but still limited, evidence supporting the notion of closer affiliation hinterland leaders to Chiapa de Corzo rulers than in the Dili phase. The largest two of the four lower tier political centers attributed to the Escalera phase have architecture that conforms to the dominant orientation of architecture at Chiapa de Corzo, a trait which may have signaled adherence to cosmological precepts propagated by Chiapa de Corzo rulers. Ribera Amatal has the strongest architectural indicators of affiliation with the center, as the layout of mounds at this site has a close parallel in a minor mound group at Chiapa de Corzo. This parallel may reflect the presence of leaders with family ties to Chiapa de Corzo, or the establishment of an enclave of the dominant Ribera Amatal lineage at Chiapa de Corzo.

Rulers at Chiapa de Corzo and leaders in hinterland communities were able to mobilize greater quantities of labor than those of the Dili phase into the construction of ceremonial and elite residential architecture. Nonetheless the labor demands of these construction projects do not appear to have been heavy. Both at Chiapa de Corzo and in hinterland communities these demands could have been easily met by the local population without interfering with the fulfillment of household needs of commoners.

The management of land access appears to have changed in the Escalera phase. The increased nucleation of population on prime agricultural lands supports the notion that land rights were managed at the community level. At Chiapa de Corzo evidence for an unoccupied agricultural reserve on the most productive lands adjacent to the settlement suggest that rulers were exercising stronger control over the management of land rights within their district than in the Dili phase.

There is limited evidence that the access of hinterland populations to obsidian was controlled by the Chiapa de Corzo elite, but also by leaders at second tier centers, as three of the four second tier centers had obsidian. The absence of obsidian at seven of the ten hinterland villages argues against the notion that obsidian was a freely traded commodity. Higher frequencies of Nicapa Resist serving vessels lower tier political centers also supports the notion that hinterland leaders hosted more prestige oriented feasts than their neighbors.

Despite evidence for an increase in the importation of obsidian, the reduction of settlement on nodes of trade and communication routes in the Escalera phase from the Dili phase suggest that the overall importance of trade to hinterland populations declined in the Escalera phase. The lack of second tier centers around these nodes suggests that Chiapa de Corzo rulers invested little effort in controlling the movement of people and goods through the polity.

The reduction in trade may have resulted from an escalation in the frequency or intensity of interpolity violence. The evidence for an increase in the intensity or frequency of warfare is largely indirect. The settlement data indicate no trend towards the relocation of settlements to defensive locales, but the increase in nucleation of population would have provided defensive advantages. Further evidence for an increase in the intensity or frequency of warfare is present in the abandonment and reduction in size of many settlements in the outer hinterland, which suggests the formation of an empty buffer zone around some frontiers of the polity. The restructuring of hinterland political organization reflected in the abandonment or reduction in size of all Dili phase villages, and their replacement by new villages suggests that Chiapa de Corzo rulers may have utilized force in establishing control over the hinterland.

At least part of the power of Rulers at Chiapa de Corzo continued to be based on their sponsorship of large scale ceremonies and association with the expansion and maintenance of the civic-ceremonial zone. As with the Dili phase, the ceremonies that took place within this zone, and the expansion and maintenance of its structures and plaza areas were likely perceived by commoners to be in their own interest. Despite evidence suggesting that all of the architecture at Chiapa de Corzo could have been completed by the labor force of the center itself without any great inconvenience to commoners, it is likely that some labor was provided by people from the hinterland.

The modifications of civic-ceremonial space that took place during the Escalera phase suggest that while rulers may have played a more central role in religious functions, these functions continued to be open to most of the polity's population. Given the evidence for qualitative differences in the kinds of ceremonies performed at the center from those of the hinterland, it is likely that Chiapa de Corzo drew in people from around the polity for these ceremonies. While the mound group of the Ribera Amatal site has a possible analog at Chiapa de Corzo, this is a minor group, and whatever ceremonies were performed at this hinterland site likely related to lineage oriented ceremonies, rather than the larger scale integrative ceremonies of the principal Chiapa de Corzo ceremonial zone. There is nothing in the Escalera phase architecture in any of the second tier centers to suggest that aspects of the main ceremonial precinct were reproduced at a smaller scale in the hinterland.

5. SHIFTING ALLEGIANCES AND CHANGING MODES OF GOVERNANCE: GUANACASTE (300-100 B.C) AND HORCONES (100 B.C-A.D.100) PHASES.

This chapter outlines the changes in political and ceremonial organization, as well as in political affiliation evident for the Guanacaste and Horcones phases at Chiapa de Corzo. Through an examination of the survey data I evaluate the effect these changes had on the strategies employed by rulers at Chiapa de Corzo in their rule over the hinterland, and the responses of the hinterland population to these changes. Before entering into this discussion we first need to briefly address the intervening period between the Escalera and Guanacaste phases.

The Francesa phase, while important, represents on the whole a continuation of strategies and traditions of the Escalera phase. Around the beginning of the Francesa phase, the Olmec capital of La Venta to which Chiapa de Corzo rulers appear to have been affiliated with in the Escalera phase, was abandoned. This decline does not appear to have affected Chiapa de Corzo substantially, as the Francesa phase demonstrates a continuation of building activities in the civic-ceremonial zone, an acceleration of building activity outside the civic-ceremonial zone (Lowe 1962), and a population increase at Chiapa de Corzo of 20% from the Escalera phase and an 8% increase in population in the study area. Ceramics from the Francesa phase are predominantly elaborations of Escalera phase styles and forms (Clark and Cheetham 2005), suggesting general cultural continuity.

The Guanacaste and Horcones phases represent what is possibly the most important political and cultural transformation in the Chiapa de Corzo trajectory since its establishment as a civic-ceremonial center. The Guanacaste and Horcones phases mark a sharp change from the Escalera and Francesa phases in architectural traditions. Prominent among these changes were the Guanacaste phase construction of two-room temples (early stages of Mound 1 (Lowe and Agrinier 1960; Agrinier 1975), and possibly in the early stages of Mounds 3 (Tucker 1970)) and the Horcones phase construction of the Mound 5 palace (Lowe 1962). Both of these classes of structures were built with cut-stone and plaster facades, in a style similar to contemporary architecture from the Maya lowlands. These developments suggest an increase in the expression of status differentiation between elites and commoners, and an increase in the degree of religious and political specialization within Chiapa de Corzo. Maya styles of ceramics also became popular during the Guanacaste and Horcones phases. Changes in architectural and ceramic styles suggest a shift in allegiances from Gulf Coast polities to Maya Lowland polities.

5.1 POPULATION DISTRIBUTION AND NUCLEATION

In order to provide an overview of the political landscape necessary for framing of evidence on the use of different political strategies, I first provide an outline of changes in the settlement patterns from the Escalera phase through the Guanacaste phase, including some comparisons to the intervening Francesa phase. I then compare the Guanacaste phase patterns (Figure 5.1) to those of the Horcones phase (Figure 5.2), which as noted above may mark a change in political organization, as a palace was constructed during this phase.

The Guanacaste phase saw a 10% increase in the study area population from the Francesa phase (which itself marked an increase of 5% from the Escalera phase) to a mean estimated population 5265±1499. Total occupied area remained essentially the same, increasing by 4% from the Francesa phase, to 230 ha, six ha less than in the Escalera phase. The total number of Guanacaste phase settlements is also very similar to both the Escalera and Francesa phases (49 vs. 48 and 41, respectively). During the Francesa phase the occupied area of Chiapa de Corzo remained unchanged from the Escalera phase, but in the Guanacaste phase it decreased by 10% to 61 ha. The population of Chiapa de Corzo, which had risen by 20% in the Francesa phase, declined during the Guanacaste phase by 6% to an estimated 1640 people. Correspondingly the percentage of the total study area population located at Chiapa de Corzo declined from the Francesa high of 36% to 31% during the Guanacaste phase, a change which is significant but not at all strong (x^2=19.01 p<.001 v=.04).

There was a slight decrease in the nucleation of hinterland population in the Guanacaste phase (Figure 5.1), which had remained essentially stable from the Escalera to the Francesa phase. In the hinterland, approximately 57% of the Guanacaste phase population was located in villages, compared to 65% in the Escalera, and 74% in the Francesa phase. The contrast between Escalera and Guanacaste population nucleation in the hinterland is significant but not very strong ($X^2 = 45.7$ $p<.001$ $v=.08$). The second largest settlement in the study area continued to be Ribera Amatal, as it had been since the Escalera phase. This settlement, which had decreased 17% in population during the Francesa phase, grew by 33% in the Guanacaste phase to a mean estimated population of 717. Changes in the log-rank size plot of Guanacaste phase settlement population (Figure 5.6) are not dramatic, with less than 90% confidence in the differences between the Escalera, Francesa, and Guanacaste phases. Nonetheless, the Guanacaste phase pattern displays a longer log-normal slope for the largest settlements than that of the Escalera phase (Figure 4.4), and notably less primate curve on the upper tail than in the Francesa phase (Figure 5.5). Overall the rank size curve is slightly less convex for the Guanacaste phase than either the Escalera or Francesa phases ($A= -.222$ $n=49$ vs $A= -.249$ $n=48$ and $A= -.297$ $n=42$, respectively).

Again, these changes are not dramatic, but suggest a trend towards greater dominance of the hinterland during the Francesa phase by Chiapa de Corzo. The return to log-normality in the Guanacaste phase suggests, following the logic of Johnson (1980), the development of greater horizontal as well as vertical integration of the political and/or economic system, or following the logic of Simon (1955 cited in Fujita et al. 1999:219), a return to normal population growth patterns caused by the removal of whatever forces were causing the deviation from Zipf's Law during the Escalera and Francesa phases. Evidence for what aspects of society were or were not integrated are explored below. The distribution of settlements was slightly more dispersed in the Guanacaste than in the preceding two phases (NNR=.817 Z= -2.5110 p=.05 vs. Escalera: NNR=.7647 Z=-3.0497 p=.01 and Francesa: NNR=.7792 Z= -2.7049 p=.01).

Outside of Chiapa de Corzo only two of the 11 Escalera phase hinterland villages maintained populations over 100 through the Francesa phase. Of the nine Francesa phase villages only these two settlements maintained a population of over 100 through the Guanacaste phase; the settlements of Ribera Amatal and Bulmaro Abadilla (Figure 5.1). The Rio Grande village was abandoned in the Francesa phase and reoccupied as a village in the Guanacaste phase. The change in the location of villages over time indicates that the political instability suggested for the Dili to Escalera transition continued into the Guanacaste phase. On the other hand, the persistence of Ribera Amatal, a second tier political center throughout these phases, suggests that certain aspects of political organization remained steady over time.

Stronger changes are visible in many aspects of the Horcones phase settlement system (Figure 5.2). The overall population of the study area increased from the Guanacaste phase by about 10% to a mean estimate of 5780±1845. Despite this overall increase, people continued to move out of Chiapa de Corzo resulting in a 12% decline to an estimated 1450±475 people, now representing 25% of the study area total, a change which is significant but again, not very strong (X^2=40.5 p<.001 v=.06). Total occupied area decreased by 7% to 214 ha and the area of Chiapa de Corzo decreased by approximately 8% to about 56 ha. This produces an estimated decrease of one person per ha at Chiapa de Corzo, but an 18% increase, estimated at 7 people per ha for settlements in the total study area. Horcones phase settlements were markedly more clustered than in the Guanacaste phase (NNR=.62 Z= -4.890 p=.0001). The distribution of villages during the Horcones phase is random (NNR=.8652 Z= -.9652 p>.1), which contrasts with the dispersed patterns of the earlier phases. Despite the increased concentration of villages on the landscape, there was a good deal of continuity with the Guanacaste phase, with seven of the eight Guanacaste hinterland villages surviving into the Horcones phase.

The rank size plot of Horcones phase settlement is closer to log-normal than the preceding phases (A= -.102 n=47). However, the plot of Horcones phase settlement population produces a line that rises above log-normal before turning into a convex curve, reflecting the prevalence of small villages in the sample visible in the histogram (Figure 5.7). The confidence in the differences between the Horcones phase and the Guanacaste phase is less than 90%. On the other hand, confidence in the difference between the Horcones slope and the more primate slopes of the Francesa and Escalera phases hovers around 90%. The combination of changes in the shape of the rank-size plots and in the nearest-neighbor analysis suggest that the relationship between Chiapa de Corzo rulers and the hinterland population changed substantially from the Escalera phase to the Horcones phase, although as discussed below, these changes do not appear to have proceeded uniformly towards greater integration of the hinterland population into the political system.

5.1.1 The Size and Population of the Guanacaste and Horcones Phase Polities

While the political center of Finca Acapulco appears to have been abandoned before the start of the Francesa phase, the small center of Santa Cruz, located in between Chiapa de Corzo and Finca Amatal appears to have been occupied during both the Guanacaste and Horcones phases (Sanders 1961). Santa Cruz is treated here as a neighboring polity rather than a subordinate center, a status that likely changed over time. In any case, the presence of a Santa Cruz polity reduces the estimated area of the Chiapa de Corzo polity by approximately 245 km^2, to a total of 1005 km^2 (Figure 5.8).

Utilizing the same methodology applied in the previous chapters, this results in an estimated increase of about 11% of the polity population from the Escalera to the Guanacaste phase, to a mean total of about 13,300 people. During the Horcones phase the extrapolated population in the polity grew by about 25% to a mean total of 16,600. Given the uncertainties about the political role played by the center of Santa Cruz, and the evidence for the persistence of an unoccupied buffer zone in the outer hinterland during the Guanacaste and to a lesser extent the Horcones phases, this estimate of polity size should be viewed as tentative. Nonetheless, these calculations suggest that the Guanacaste phase rulers did not place a high emphasis, or were not very successful in attracting new followers into the polity. The population growth during the Horcones phase within this reduced territory may reflect the movement of people into the Chiapa de Corzo polity, but as I discuss below, this may not have been the direct result of a strategy implemented by the Chiapa de Corzo rulers.

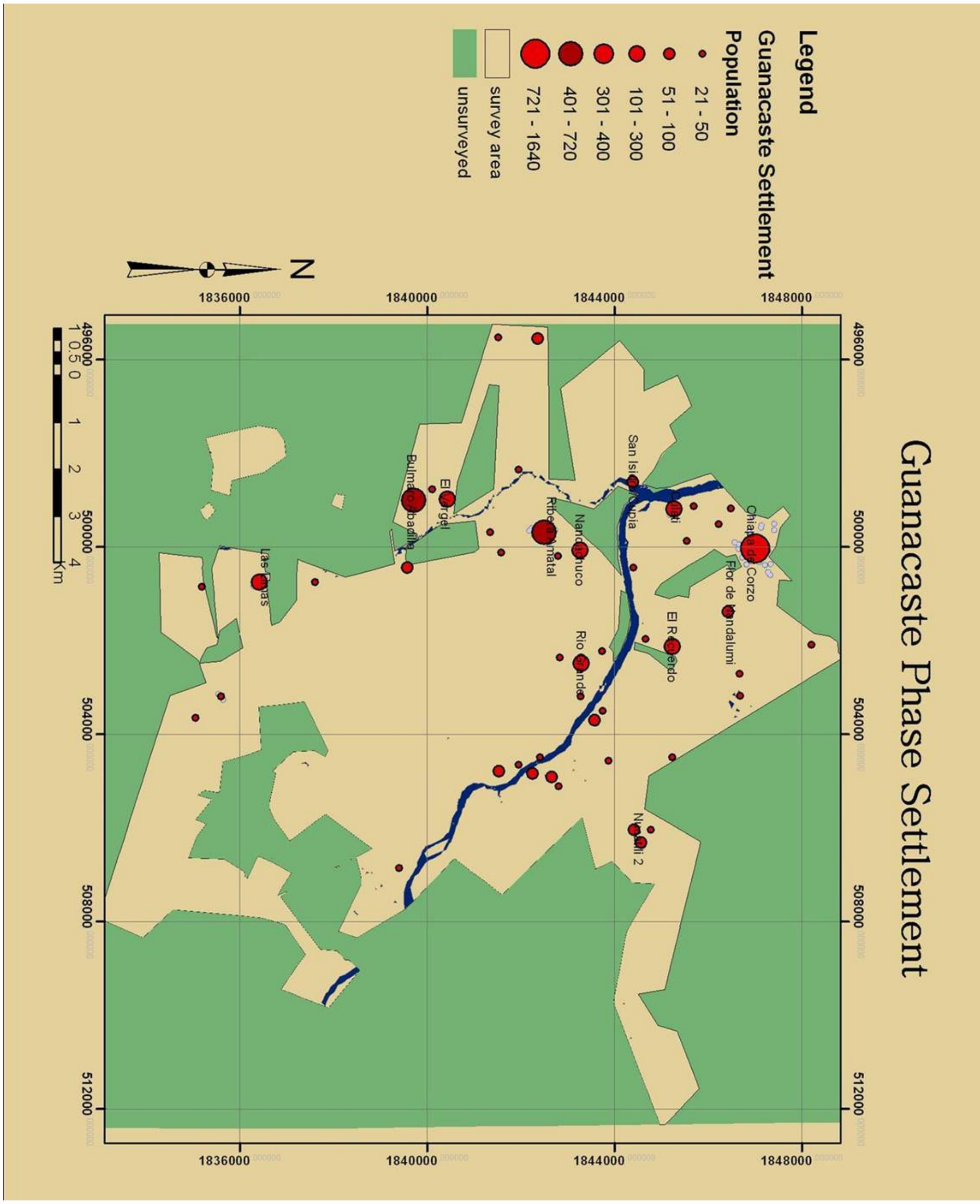


Figure 5.1 Guanacaste phase settlement map

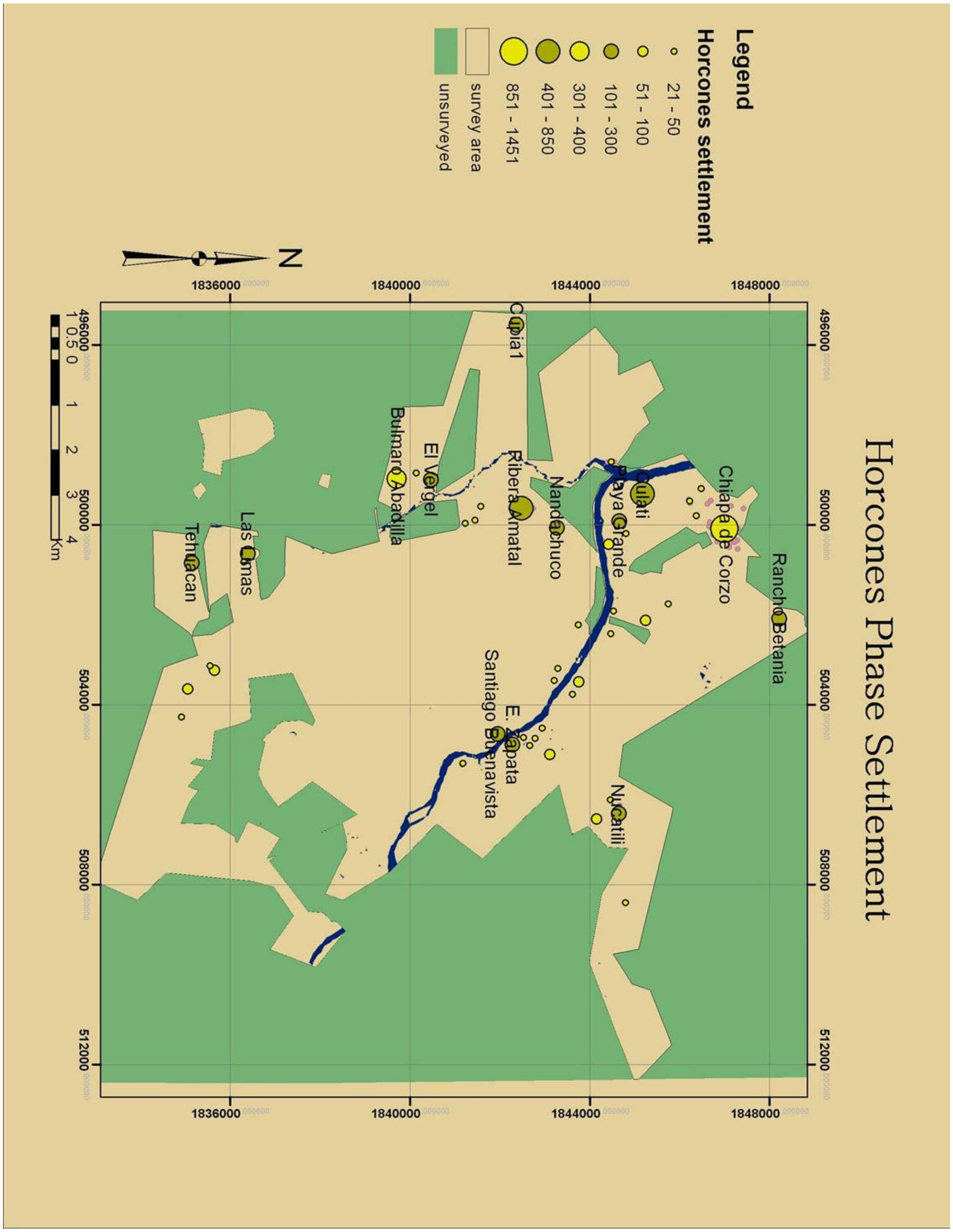


Figure 5.2 Horcones phase settlement map

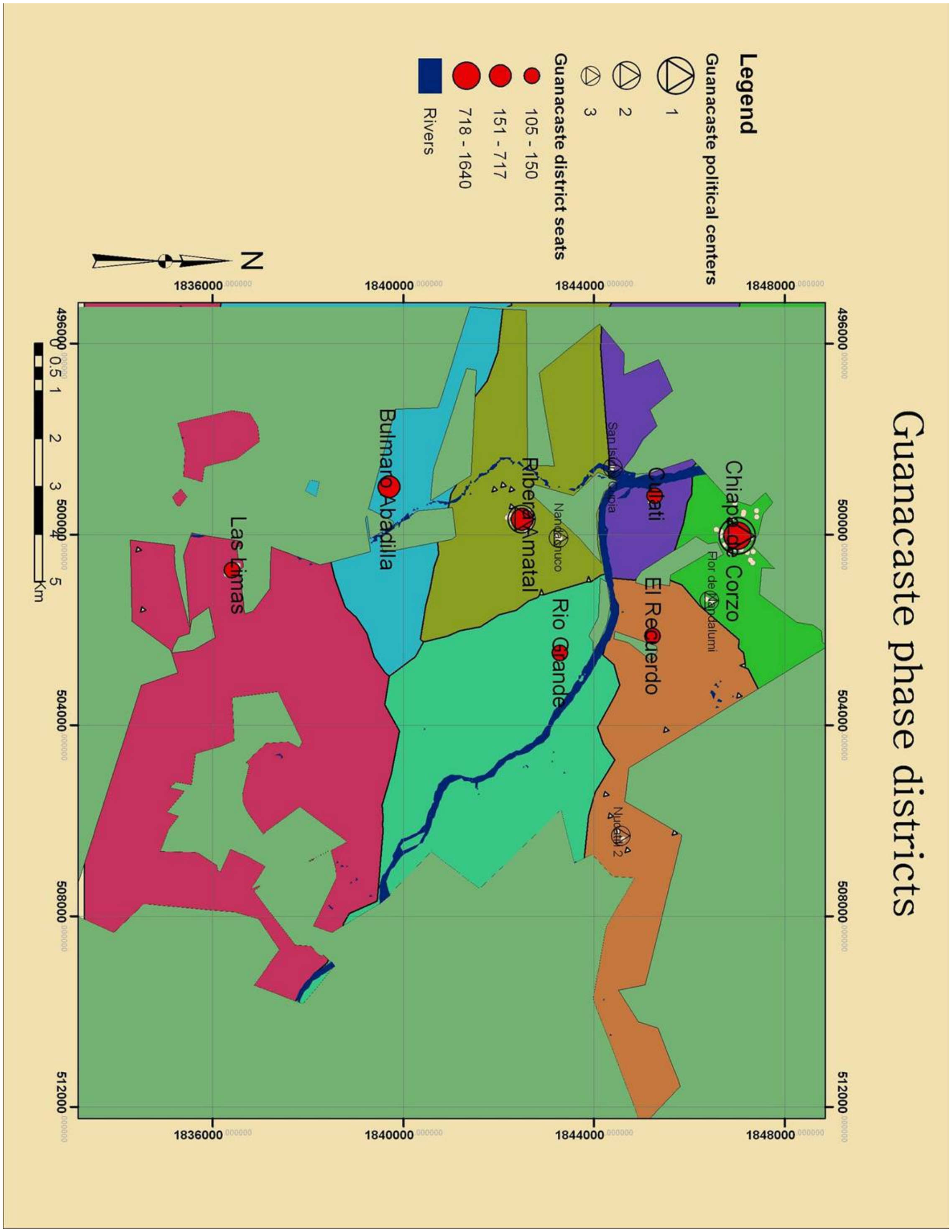


Figure 5.3 Guanacaste phase districts

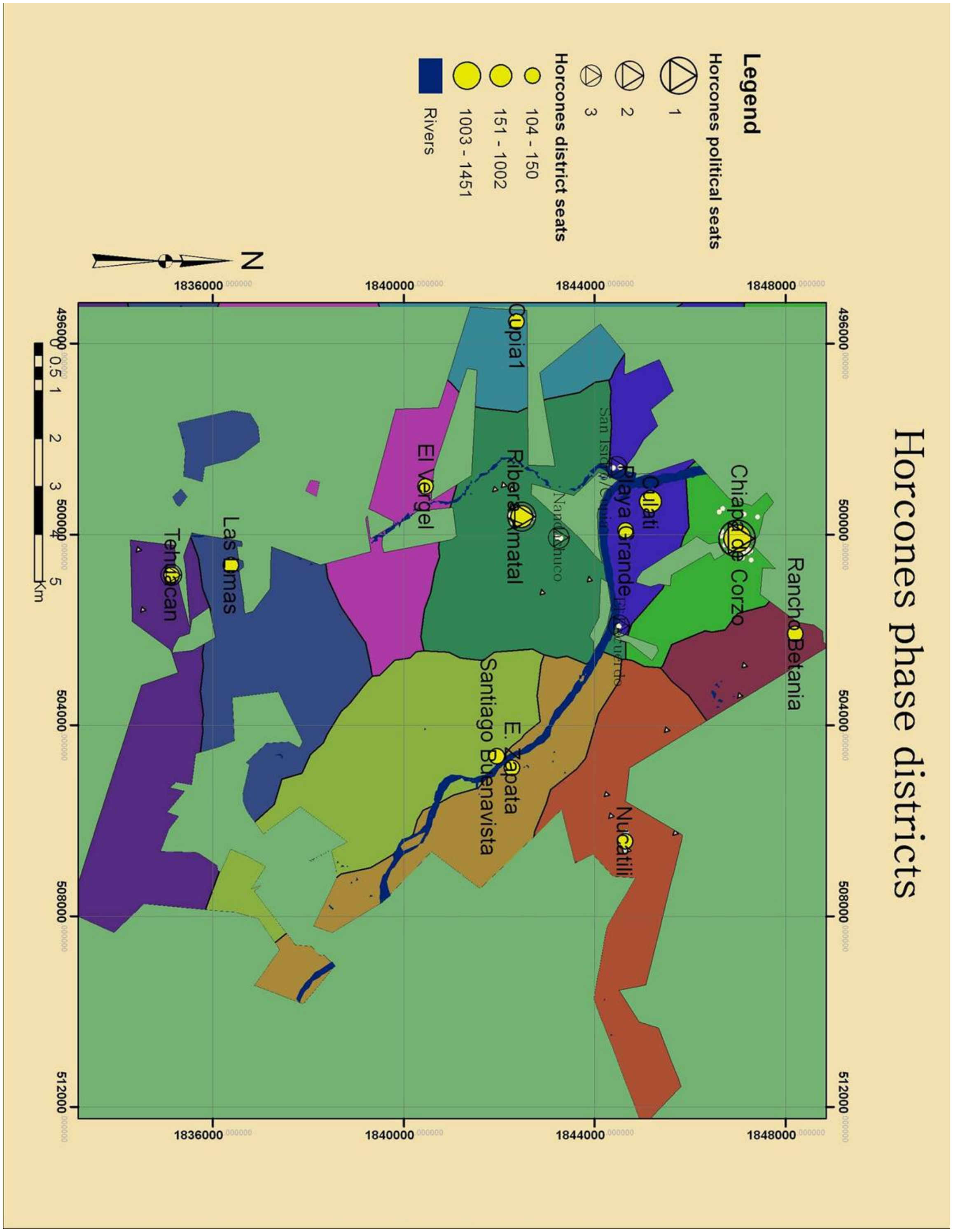
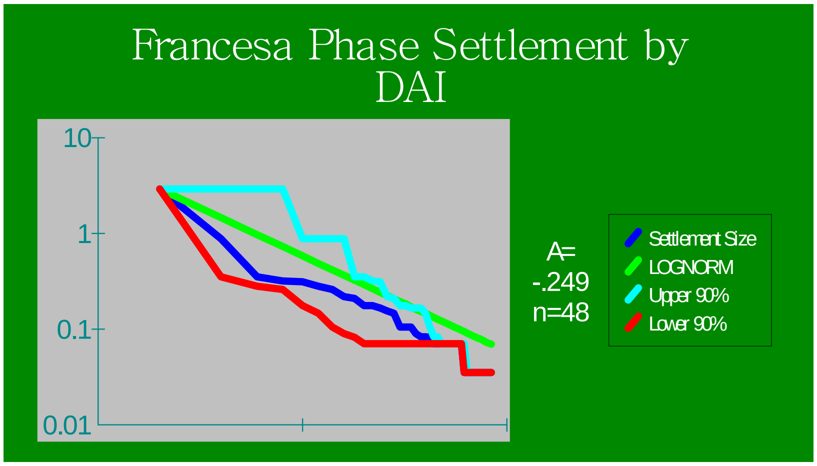


Figure 5.4 Horcones phase districts.



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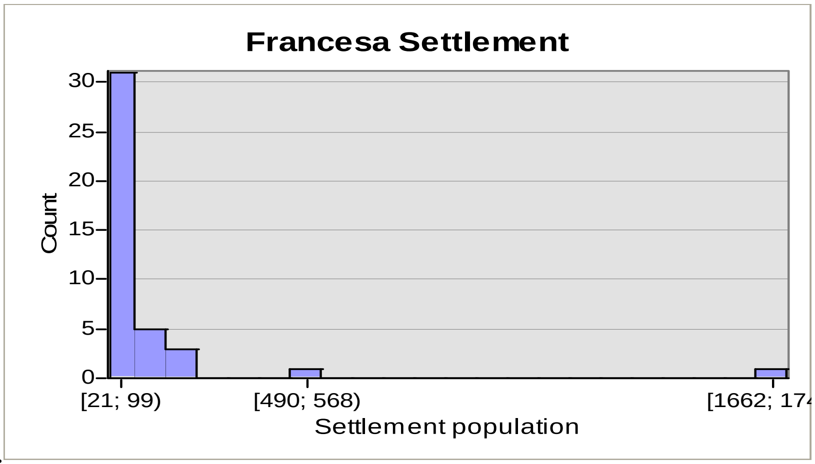
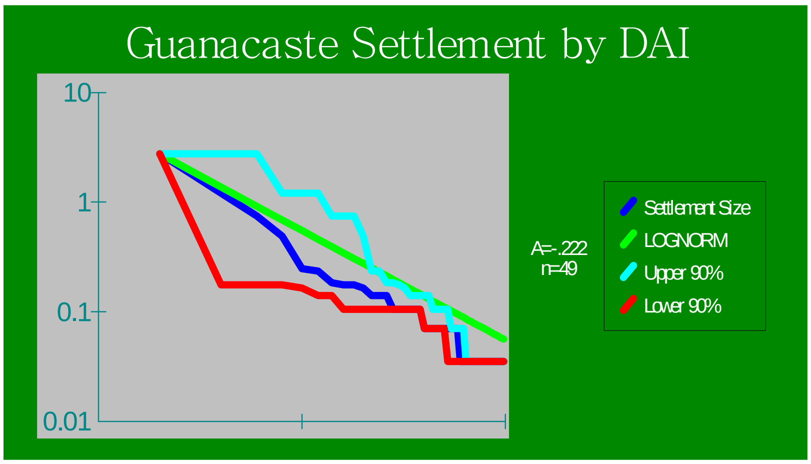
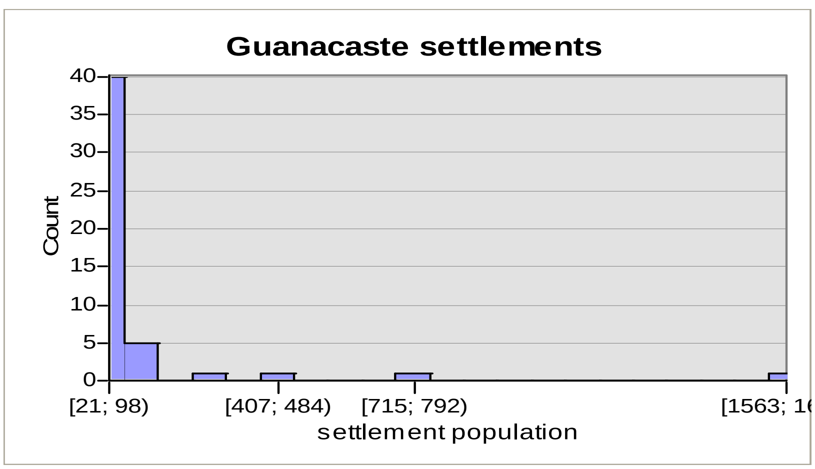


B.

Figure 5.5 Francesa phase settlement sizes. A. Rank-Size plot. B. Histogram



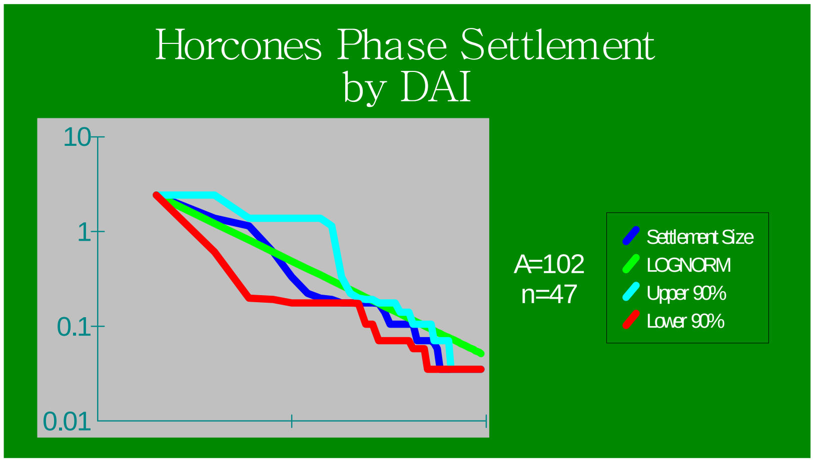
A.



B.

Figure 5.6 Guanacaste phase settlement size. A. Rank-size plot. B. Histogram.

A.



B.

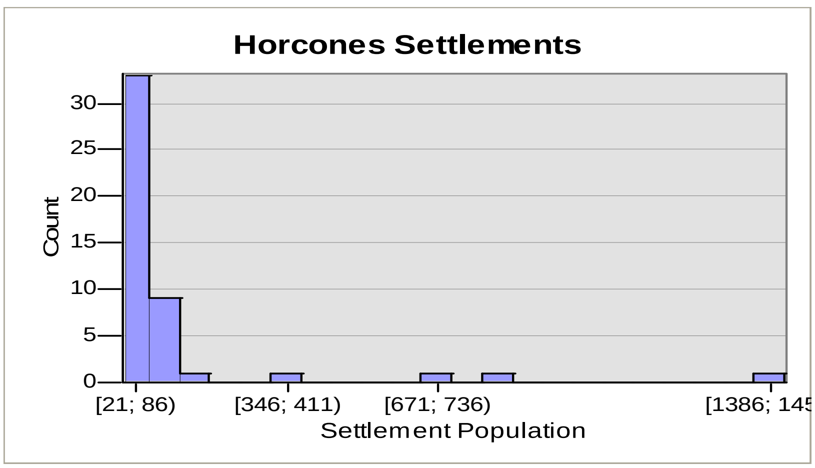


Figure 5.7 Horcones phase settlement size. A. Rank-size plot. B. Histogram.

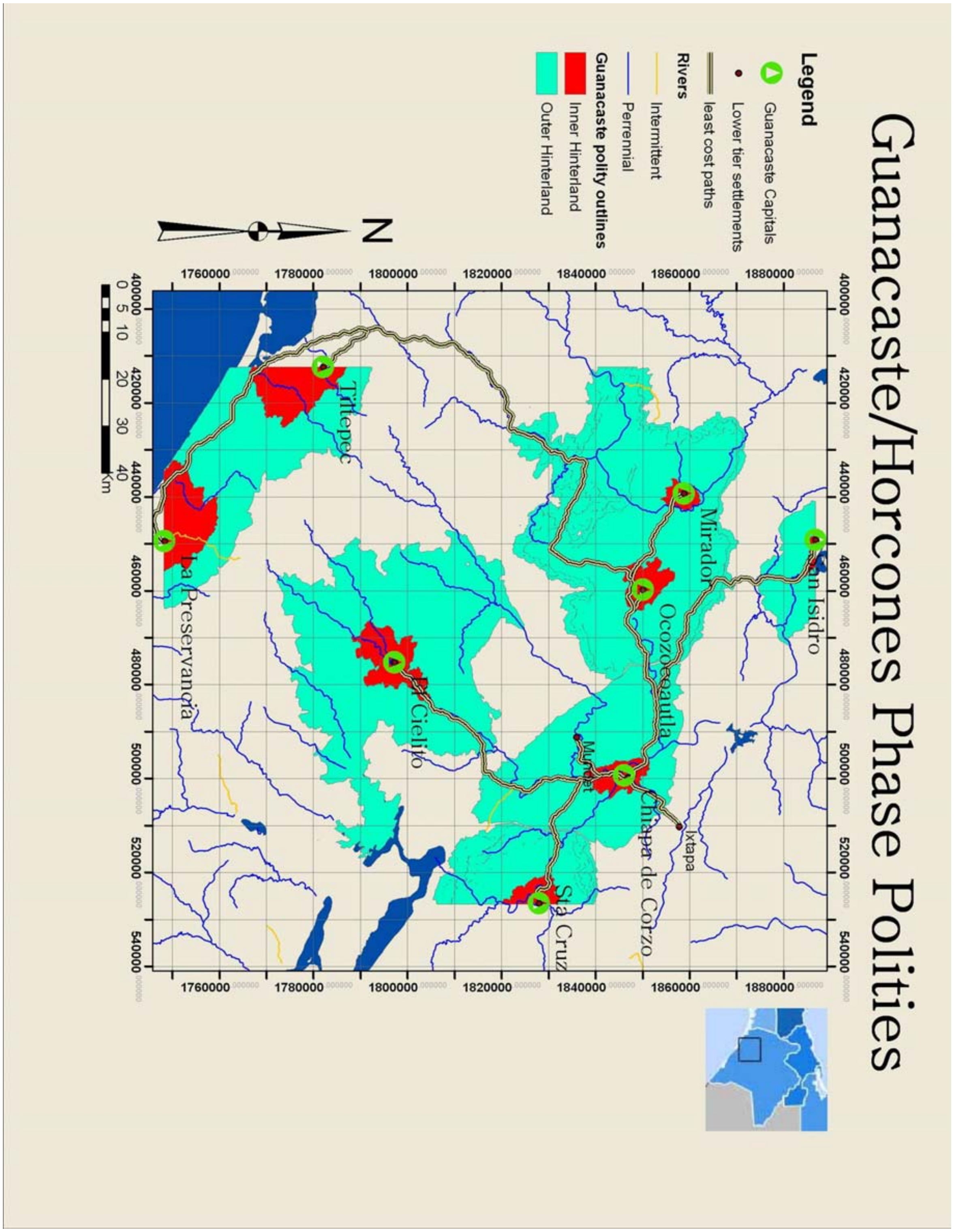


Figure 5.8 Guanacaste/Horcones phase polity boundaries with least cost paths of transportation to Chiapa de Corzo.

5.2 POLITICAL CONTROL OF HINTERLAND POPULATION AND THE LOSS OF VILLAGE AUTONOMY

The stability in the location of Ribera Amatal and the abandonment or reduction in size of Escalera and Francesa phase villages in the Guanacaste phase suggests a continuation of meddling in the hinterland by Chiapa de Corzo rulers and possibly by leaders at Ribera Amatal in the political structure of the hinterland. Three of the ten Francesa hinterland villages persisted with populations over 100 into the Guanacaste phase, and two of these were villages in the Escalera phase. These changes are relatively modest compared to the Dili to Escalera phase transition, in which no villages in the hinterland maintained large populations through the Escalera phase. Changes in the location of villages suggest some political restructuring from the Francesa to the Guanacaste phase, but less extreme restructuring than that suggested for the Dili to Escalera transition. Given the relatively dispersed settlement pattern of the Guanacaste phase, it would appear that the ability of hinterland leaders to attract followers into their settlements was lower than in the Escalera or Francesa phases.

During the Guanacaste phase, there is no evidence for the development of new second tier centers, and greater disparity between the political hierarchy and the settlement hierarchy is evident than in the Escalera phase. Three of the four Escalera second tier centers were occupied during the Guanacaste phase. Ribera Amatal continued to be the second largest population center in the study area. San Isidro/Cupía, which grew into a village during the Francesa phase, was reduced to a large hamlet. Flor de Nandalumí, a village in both the Escalera and Francesa phases was reduced to a large hamlet, but may have persisted as a second tier political center. The platform mounds at Nucatilí 2 appear to have been abandoned, and the site fragmented into three hamlets. The site of The area of the Nandachuco site with architecture which was abandoned in the Escalera phase, was reoccupied as a small village in the Francesa phase and despite a population reductionin the Guanacaste phase, may have persisted as a minor political center. These changes left only one second tier center with architecture sharing the orientation of Chiapa de Corzo, the site of Ribera Amatal, which suggests a reduction in number of hinterland leaders who were affiliated with the Chiapa de Corzo rulers during the Guanacaste phase.

There are seven districts in the Guanacaste phase (Figure 5.3), one less than in the Escalera phase, and the configuration of districts changes substantially between these phases. With the reduction in size of the Escalera phase San Rafael site at the base of Cerro Hueco, this district is subsumed into the Ribera Amatal district. The fragmentation of the Nucatilí 2 village into three hamlets allows this district to be subsumed into the El Recuerdo and Rio Grande districts. The village of El Recuerdo 2, replaces the center of Flor de Nandalumí in that district. The Barranca Honda district is subsumed by the Rio Grande district. Three of the seven Guanacaste districts have second tier political centers, and at only one of these, Ribera Amatal, is the political center the largest settlement in the district.

During the Horcones phase the political landscape within the study area appears more complex as the number of villages of villages increased from 10 to 14 (Figure 5.2). Eleven districts were identified for this phase (figure 5.4). There also appears to have been a relatively high degree of stability in the political structure of the hinterland, with none of the eight Guanacaste phase villages abandoned, and only three reduced to hamlets.

There is evidence for changes in the organization of leadership in the hinterland during the Horcones phase. The number of districts increased to eleven, three of which had second tier centers. The Guanacaste second tier center of Flor de Nandalumí appears to have been abandoned. Ribera Amatal, San Isidro/Cupía, and Nandachuco continued to be occupied. Ribera Amatal grew in population by about 15%. San Isidro/Cupía decreased in population to a small hamlet, and the population of Nandachuco grew by approximately 80%. Two new second tier centers were founded during the Horcones phase, the settlements of El Recuerdo (Figure 5.9) and Tehuacan (Figure 5.10).

The second tier center of El Recuerdo was a small hamlet with an estimated population of about 20, and an area of about one ha. The site has two mounds with surface ceramics suggesting a possible Horcones phase construction date (Figure 5.9). Late Classic period ceramics were also ubiquitous at this site and these constructions may date to this later period. The stone alignments on the two mounds at the El Recuerdo site do not appear to align with one another, and as such the mounds may not have formed a formal plaza group. The stone alignments on the larger el Recuerdo Mound 1 are about 30˚ east of north, within 2˚ of the Chiapa de Corzo alignment. There are also similarities between the larger Mound 1 at El Recuerdo and Mound 45 at Chiapa de Corzo, in that both appear to be modifications of natural rock outcrops. Lowe speculates that Mound 45 at Chiapa de Corzo dates to the Horcones or Istmo phases based on the presence of finished cut stone blocks on its surface (1962:61). While no evidence of cut stone architecture was noted at the El Recuerdo Mound 1, the similarities in its modification of a natural landform, and the conformity of its stone alignments to the Chiapa de Corzo orientation suggests that leaders at this site may have been affiliated with a group at Chiapa de Corzo.

The other new Horcones phase second tier center, Rancho Tehuacan, overlooked the confluence of the Santo Domingo and Suchiapa Rivers. This site has an estimated population of about 130 and an area of about 5 ha. The largest standing mound at Tehuacan, Mound 1, is currently about 1.8 m tall and about 17 x 17 meters at the base (Figure 5.10). The land owner reports that his father had removed about a meter off the top Mound 1 for the construction of a house (now in ruins). A machine cut on the southern end of this mound revealed finished cut stone facades over an earth and cobble fill. All of the sherds from this fill in this profile appear to be from the Horcones phase, providing the most secure evidence we have for a Horcones phase structure in the hinterland. The area to the south of Mound 1 has been leveled by a bulldozer. There are three modest housemounds to the southwest of Mound 1, the largest of which, Mound 2, measures approximately 15x8 m at its base and just over 50 cm in height. The landowner reported that these small mounds also previously had finished cut stone facings. A wide but low rise (about 30 cm tall and about 25 m in diameter) is visible to the northwest of Mound 1, which may be the vestiges of a low residential platform.

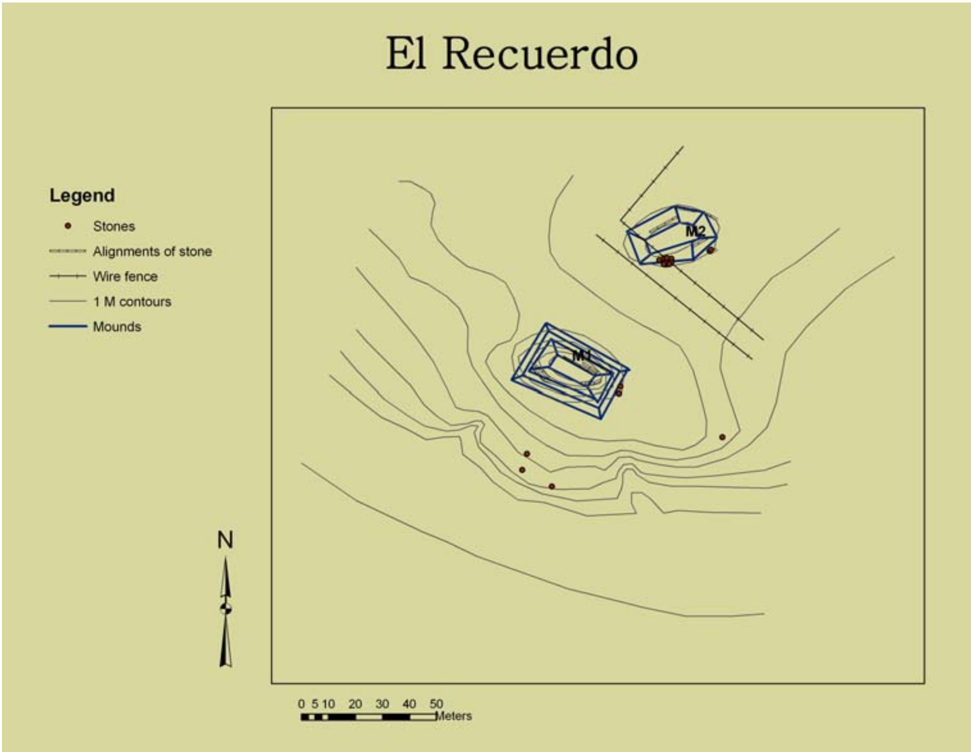
The overall alignment of mounds at Tehuacan appears to be about 20˚ east of north, which is not very close to the 28˚ Chiapa de Corzo orientation. While there is a possibility that modern or historic activity removed architectural features in the modern patio to the south of Mound 1, currently there are no mound complexes at Chiapa de

Corzo that closely resemble this architectural arrangement, but nor is this arrangement strongly different from many of the Chiapa de Corzo arrangements.

Nonetheless, the cut-stone construction at Tehuacan suggests that people familiar with masonry construction, which is rare in the study area, may have been loaned to leaders at this center by the Chiapa de Corzo elite. While no preserved plaster was visible on the exposed walls of this structure, most of the cut-stone structures at Chiapa de Corzo appear to have been finished with lime plaster. It is consequently possible that the labor of specialists in lime plaster production may have been provided to leaders at this hinterland center by the Chiapa de Corzo elite. This finding lends support to the idea that at least some hinterland leaders may have had direct support from the Chiapa de Corzo elite in the Horcones phase.

In sum the political power of hinterland leaders appears to have decreased in the Guanacaste phase, as people moved out of villages and into hamlets. One new second tier center with very modest architecture may have emerged at Nandachuco, while most Escalera phase second tier centers lost population or were abandoned. The Chiapa de Corzo rulers may have been suppressing emergent leaders in the hinterland as reflected in the high degree of village relocation, but this interference appears less dramatic than that suggested for the Dili to Escalera phase transition.

The Horcones phase data suggest an increase in the power of hinterland leaders and an increase in the extent to which hinterland leaders were affiliated with the Chiapa de Corzo rulership. Two new second tier centers emerged, at least one of which, Tehuacan, had elite residential architecture and a possible temple. In neither of these phases is there evidence within the study area for the elaboration of the political hierarchy beyond the three tiers suggested for the Escalera phase. This brings us to a consideration of absolute labor costs, and a comparison of the labor mobilized into the construction of elite residential and civic-ceremonial architecture at Chiapa de Corzo and at second tier centers.

a.


b.


Figure 5.9 a. El Recuerdo, b. El Recuerdo Mound 1 viewed from river plain

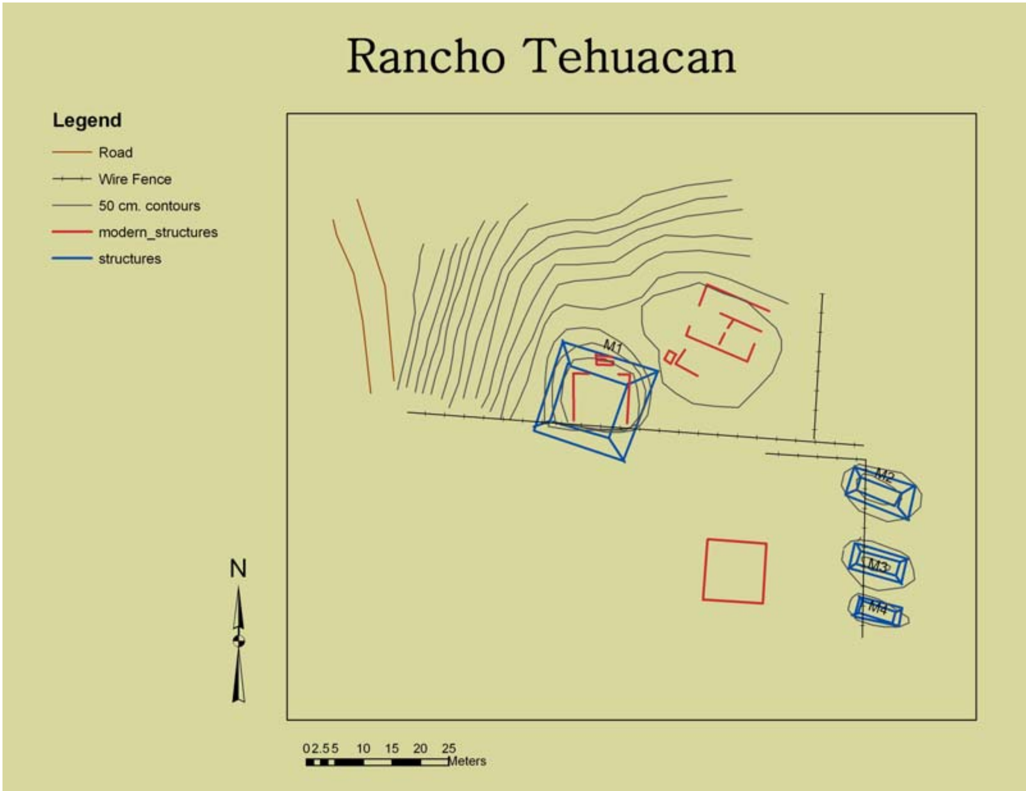


Figure 5.10 Plan of Tehuacan.

5.3 ELITE CONTROL OVER LABOR

During the Guanacaste and Horcones phases the estimated amount of earth and rubble moved into mounds within the Chiapa de Corzo civic-ceremonial zone was somewhat smaller than that of the Escalera phase (Table 5.1)[7]. The introduction of finished cut-stone and lime-plastered facades as an architectural element, however, would have substantially increased the labor demands of many of the constructions at Chiapa de Corzo[8]. The extent to which buildings within the civic-ceremonial zone were constructed or covered with cut and finished stone facades is not well understood, and complicated by the borrowing of finished stones in later phases (Lowe 1962:19), but excavations into the major structures associated with the civic-ceremonial precinct suggest that most of the structures in this area constructed or modified during the Horcones phase, and many of the Guanacaste phase, were faced with cut-stone blocks (Hicks and Rozaire 1960; Lee n.d.; Lowe 1962; Mason 1969a;, 1969b:2; Tucker 1970). Furthermore, by the Horcones phase, most of these structures appear to have been faced with a true fired lime plaster, the manufacture of which is one of the most labor-intensive processes of early Mesoamerican architecture (Abrams 1994, 1998), much more intensive than the tamped caliche and/or clay plaster used in earlier phases (Lowe 1962:46).

In Abrams and Bollard's study of the labor involved in the construction of several Maya platforms faced with cut stone blocks at Copan (1998) they found that the labor costs of moving and piling earth and cobble fill were relatively minor, constituting

[7] Francesa phase volumetric estimates were calculated for all structures and excluded from the Guanacaste/Horcones calculations.
[8] Hicks and Rozaire (1960:5) suggest that cut-stone and lime plaster may have been adopted at Chiapa de Corzo as early as the Francesa phase, but do not cite any specific structures where it was found. It is present at San Agustin during the Francesa phase (Navarrete 1959).

between 7.4 and 2.5% of the total. The highest cost was incurred through the manufacture and transport of cut stone and plaster, which in Abrams calculations added up to 89% of total construction costs. Webster and Kirker's (1995) calculations allocate a much higher cost for the movement of cobbles into pyramids Tikal and Copan, (36% and 46% of total costs, respectively). The logistics at Copan, where cobbles were procured from the river bed, contrast rather strongly with that of Chiapa de Corzo, where cobbles are relatively common on the surface of the site, and on slopes around the site (especially in areas of the site without mounded architecture). This difference suggests that the costs of procuring fill would have been closer to those proposed by Abrams. These data suggest that the introduction of cut-stone and lime plaster into the architecture of Chiapa de Corzo would have generated much larger labor demands than simple measures of mound volume would indicate.

The distance estimates for earth and cobble fill transport remained the same as in the previous phases. It is not currently known where the limestone utilized in cut-stone facing was quarried from, but I utilize a figure of 0.6 km, the same figure employed by Webster and Kirker 1995. As the volume of blocks moved is not known, I base my estimates on the surface area of mounds, with an estimate of 4.2 m^2 covered by each m^3 of block, a figure derived from Webster and Kirker's estimates for Tikal (1995:369). This figure likely over-estimates the area that was covered per cubic meter of block, for as Hansen (1998:97) points out; cut-stone blocks from the Middle and Late Formative tend to be larger and thicker than those from the Classic period, when veneer stones were adopted.

Comparing the volumetric data to that of the Escalera phase, we see 82% less labor involved in procuring and dumping fill in the Guanacaste phase and 51% less in the

Horcones phase than in the Escalera phase. However, including the added labor costs involved in the procurement, transport, and manufacture of cut stone and plaster, labor demands appear to have increased by about 68% from the Escalera phase to the Guanacaste phase. Total labor demands increased again, by about 58%, from the Guanacaste to Horcones phases, despite a decline in the Chiapa de Corzo population between these phases.

With 20% of the Chiapa de Corzo population the estimated minimum number of days to complete the Guanacaste phase constructions is slightly higher than that of the Escalera phase (108 vs. 73). In the Horcones phase, the per-capita costs of these constructions would have been substantially higher, requiring an estimates 193 days with 20% of the local population. Nonetheless, the estimate of days needed to complete the Horcones phase constructions with 20% of the Chiapa de Corzo population, suggests that even if these constructions were completed without drawing labor from hinterland communities, the demands on the local population would not have been particularly heavy. Even with smaller percentages of the population working on these structures, if we consider the 200 year length of both the Guanacaste and Horcones phases, these constructions do not look overly ambitious.

Even so, the introduction of cut-stone and the use of lime plaster during the Guanacaste phase mark the appearance of a new scale of conspicuous consumption among elites at Chiapa de Corzo. The labor intensive architectural innovations would have provided marked visual distinctions between elite residences and civic-ceremonial structures, and the residences of commoners. The Horcones phase direction of public labor into the construction of a multi-room palace, much more elaborate than any other structures at the site, also built with cut-stone and plaster, suggests a new degree of social differentiation between rulers and other elites as well as commoners at Chiapa de Corzo.

Labor investment in the construction of the palace constituted approximately 5% of the Horcones total. The estimated Horcones phase labor investment in the northern civic ceremonial zone constituted approximately 88% of the total. The implications of the direction of labor investment by Chiapa de Corzo rulers are further considered below in a discussion of elite identity.

Again, with respect to the hinterland architecture we are somewhat limited by the lack of excavation data from mounds in the hinterland. With the exception of the Tehuacan mound discussed below, we have no information on the construction sequences of mounds in the hinterland, or on the construction techniques that may have been employed during the Guanacaste and Horcones phases. With the quality of available data it makes little sense to offer highly speculative contrasts with the Escalera phase. However, as with the Escalera phase, the total volume of construction at Ribera Amatal would have been well within the capacity of the local labor force within much less time than the 200 year spans of each of these phases.

The settlement of Tehuacan provides a notable exception, as the machine cut into Mound 1 at this site indicates that the bulk of this mound was constructed in the Horcones phase. This mound had cut-stone and plaster faced architecture, and according to the landowner, the smaller residential Mounds 2, 3, and 4 also had cut-stone facings. These data indicate that elites with the power to mobilize labor into the construction of civic-ceremonial and relatively modest elite-residential structures (defined as such by the novel and unusual use of cut-stone) were present in the hinterland. The estimated per capita labor required for these structures (assuming 20% of the local population as available labor) is considerably smaller than that of Chiapa de Corzo, with a minimum of 46 days needed to complete all of the surviving structures. These estimates also suggest that the labor requirements for these structures could have been met relatively easily by the population within the Tehuacan settlement.

I do not offer labor estimates for the El Recuerdo center, as the largest mound at this site is a modified natural landform making volumetric assessments very speculative. However, the Horcones phase population at this second tier center is estimated at 20 people, and as such it seems likely that whatever part of the construction that took place at this site during the Horcones phase drew labor from neighboring settlements.

In brief, the Tehuacan data support the notion that that in some parts of the hinterland social differentiation of leaders was more pronounced during Horcones phase than in previous phases, with leaders having access to part-time specialized labor (stone masons and plaster manufacturers). At Chiapa de Corzo itself, the adoption of cut-stone and plaster construction techniques increased labor investments in public and elite residential architecture, suggesting that rulers were able, or motivated to increase their labor demands on commoners. Nonetheless the scale of construction at Chiapa de Corzo suggests that labor demands on commoners were not too demanding.

Ranking Guanacaste phase hinterland political centers by labor investment into architecture produces a hierarchy that is very similar to that of the Escalera phase. This similarity is hardly surprising as three of the four Guanacaste phase second tier centers were the same as in the Escalera phase and I employ the same estimates for labor investment in each phase. The fourth lower tier center was the site of Nandachuco, which is comparable in its scale of labor investment to the smallest Escalera phase political center, Nucatilí 2 (Table 5.4). As with the Escalera phase, this can be interpreted as reflecting the persistence of a three tiered political hierarchy into the Guanacaste phase.

The Horcones phase architectural labor estimates (Table 5.4, Figure 5.12b) suggest greater change in the political hierarchy of the hinterland, as the new hinterland center of Tehuacan has approximately half of the labor investment of the largest hinterland center, Ribera Amatal. While I offer no estimates for the labor involved in the construction of the El Recuerdo mounds, the size of the large mound/modified landform at this site suggests to me an investment of labor roughly equivalent to, or larger than, that of Tehuacan. At the low end of the spectrum Nandachuco persists as a center with relatively modest architecture. These changes suggest the persistence of a three tiered hierarchy, but with more powerful leaders at some third tier centers, at least in the ability of these leaders to mobilize labor into civic-ceremonial or elite residential constructions during the Horcones phase.

Table 5.1a. Guanacaste phase labor estimates for fill of mounds in Chiapa de Corzo civic-ceremonial zone.

Guanacaste cdc	M1	M1a	M2	M3	M11	M13	Total
height	1.46	2.6		1.7	6	5.9	
base area	143	163	1222	259	430	1600	
top area	143	120	357	76	2058	400	
Total fill vol	209	368	1535	284	2007	5741	
person/days digging	80.4	141.5	590.4	109.2	771.9	2208.1	3901.5
person/days hauling soil 50m and piling mound	65.9	116.1	484.2	89.6	633.1	1811.0	3200.0
total person/days fill movement and piling	146.3	257.6	1074.6	198.8	1405.0	4019.1	7101.5

Table 5.1b Guanacaste phase Chiapa de Corzo labor estimates for mounds in civic-ceremonial zone including masonry and plaster.

Guanacaste	M1	M1a	M2	M3	M11	M13	total
lateral surface area	72.61	127.84	212.62	47.28	1628.00	519.94	
Person days masonry procurement	42.96	75.65	125.81	27.97	963.31	307.66	1543.36
Person days masonry movement	36.49	64.24	106.84	23.76	818.09	261.28	1310.69
Person days masonry manufacture	196.24	345.52	574.64	127.78	4400.00	1405.24	7049.41
Person days for masonry construction	21.48	37.82	62.90	13.99	481.66	153.83	771.68
Sum person days masonry	297.18	523.23	870.19	193.49	6663.06	2128.00	10675.15
Person days plaster manufacture	79.79	140.49	233.64	51.95	1789.01	571.36	2866.24
Person days laying plaster	0.91	1.60	2.66	0.60	20.35	6.50	32.60
Sum person days Guanacaste fill	146	258	1075	199	6205	14040	21922
Total Guanacaste person days	524.19	922.94	2181.10	445.04	14677.61	16745.50	35496.38
Minimum person days to completion with 20% of Guan. pop.	1.60	2.81	6.65	1.36	44.75	51.05	108.22

Table 5.2a Horcones phase labor investment in the mound fill for southern Chiapa de Corzo civic-ceremonial complex.

Horc	M1	M1a	M2	M3	M5	M6	total
height	6	4.3	2	2	2.2	3	
base area	1148.0	196.5	1952.0	685.0	700.7	844.0	
top area	200	128.2	764.0	124.0	705.5	39.0	
tot vol	4044.0	698.1	2564.0	695.5	1444.0	1126.0	
Horc vol	3835.2	329.7	1029.0	411.5	1444.0	1126.0	4340.2
person/days digging	1475	127	396	158	555	433	3144
person/days hauling soil 50m and piling mound	1210	104	325	130	456	355	2579
total person/days for fill	2685	231	720	288	1011	788	5723
days w/ 20% of pop	9.26	0.80	2.48	0.99	3.49	2.72	20

Table 5.2b Horcones phase labor investment in mound construction in southern Chiapa de Corzo civic-ceremonial complex including plaster and masonry.

Horcones phase	M1	M1a	M2	M3	M5	M6	Totals
Lateral surface	594	216	243	115	245	127	
Person days masonry procurement and prep	351.48	127.68	143.79	68.05	145.20	74.85	911.04
Person days masonry movement	298.49	108.43	122.11	57.79	123.31	63.57	773.70
Person days masonry manufacture	1605.41	583.17	656.76	310.81	663.21	341.89	4161.25
Person days for masonry construction	175.74	63.84	71.89	34.02	72.60	37.43	455.52
Sum person days masonry	2431.12	883.12	994.55	470.67	1004.32	517.74	6301.51
Person days plaster manufacture	652.75	237.11	267.03	126.37	269.66	139.01	1691.94
Person days laying plaster	7.425	2.697175	3.0375	1.4375	3.06735	1.58125	19.25
Sum person days in fill	2685	231	720	288	1011	788	5723
Total Horcones person days	5776.22	1353.74	1984.99	886.56	2287.95	1446.61	13736.08
Minimum person days to completion with 20% of Horc. pop.	19.92	4.67	6.84	3.06	7.89	4.99	47.37

Table 5.2c Horcones phase labor investment in mound fill in the Chiapa de Corzo northern civic-ceremonial complex.

Horc	M17	M11	M12	M13	M32	M33	total
height	7	7	3	6.81	3	3	
base area	10	530	1146	1024	390	451	
top area	3037	2539	3500	1681	231	100	
tot vol	5157	3039	8875	7649	931	827	
Horc vol	146	1032	946	1907	415.35	415	4862
person/days digging	56	397	364	733	159.7	160	1870
person/days hauling soil 50m and piling mound	46	326	298	602	131.0	131	1534
total person/days for fill	102	722	662	1335	290.8	291	3404
days w/ 20% of pop	0.35	2.49	2.28	4.60	1.00	1.00	11.74

Table 5.2d Horcones phase labor investment in Chiapa de Corzo northern civic-ceremonial complex including masonry and plaster, plus overall Horcones labor total.

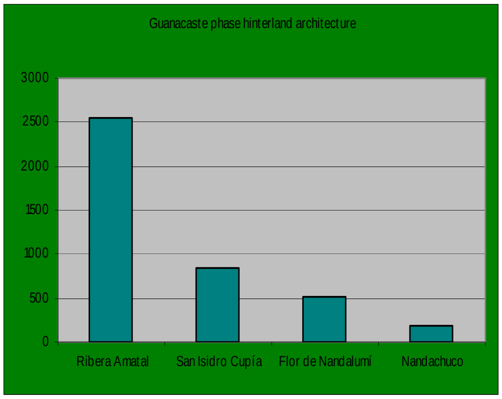
Horcones north	M11	M12	M13	M17	M32	M33	
Lateral surface	2009	884	910	3027	327	328	
Person days masonry procurement and prep	1188.76	523.16	538.35	1791.12	193.49	194.08	4429
Person days masonry movement	1009.55	444.29	457.19	1521.11	164.32	164.82	3761
Person days masonry manufacture	5429.73	2389.57	2458.96	8181.08	883.78	886.49	20230
Person days for masonry construction	594.38	261.58	269.18	895.56	96.75	97.04	2214
Sum person days masonry	8222.41	3618.60	3723.69	12388.87	1338.34	1342.43	30634
Person days plaster manufacture	2207.69	971.58	999.80	3326.37	359.34	360.44	8225
Person days laying plaster	25.11	11.05	11.37	37.84	4.09	4.1	94
Sum Horcones person days in fill	102	722	662	1335	291	291	3404
Total Horcones person days	10557.43	5323.71	5397.12	17088.12	1992.54	1997.75	42357
Minimum person days to completion with 20% of Horc. pop.	36.40	18.36	18.61	58.92	6.87	6.89	146
Total Horcones person days for combined north and south complexes							56093
Minimum total person days to completion for N and S groups							193

Table 5.3 Horcones phase Tehuacan labor investment.

Horc Tehuacan	m1	m2	m3	m4	Total
Vol	300.3	101.8	32.3	20.8	
Person days excavating fill	115.5	39.1	12.4	8.0	175.0
Person days moving fill 50 m	94.7	32.1	10.2	6.5	143.5
Total person days fill	210.2	71.2	22.6	14.5	318.5
Lateral surface area	18.8	7.5	6.2	3.1	
Person days masonry procurement	11.09	4.44	3.69	1.85	21.07
Person days masonry movement	9.42	3.77	3.13	1.57	17.90
Person days masonry manufacture	50.68	20.27	16.86	8.45	96.25
Person days for masonry construction	5.55	2.22	1.85	0.92	10.54
Sum person days masonry	76.74	30.70	25.53	12.79	145.75
person days manufacturing plaster	230.99	78.28	24.81	15.96	350.04
Person days laying plaster	0.23	0.09	0.08	0.04	0.45
Total Horcones person days	517.9	180.2	26.4	16.8	741.3
Minimum person days to completion with 20% of Horc. pop.	19.6	6.8	1.0	0.6	28.1

Table 5.4 Guancaste and Horcones labor investment in hinterland architecture.

Guanacaste phase hinterland architecture	person days	Horcones hinterland architecture	person days
Ribera Amatal	2557	Ribera Amatal	2557
San Isidro Cupía	843	Tehuacan	741
Flor de Nandalumí	506	El Recuerdo	?
Nandachuco	181	San Isidro Cupía	843
		Nandachuco	181



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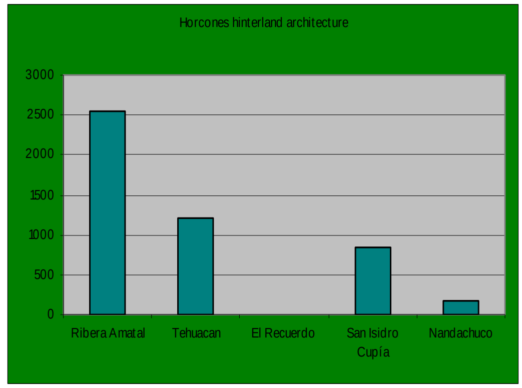

b.

Figure 5.11 a. Guanacaste and; b. Horcones labor investment in hinterland architecture

5.4 CONTROL OVER AGRICULTURAL RESOURCES

Control by Chiapa de Corzo rulers over the agricultural reserve adjacent to the settlement described for the Escalera phase, appears to have persisted into the Guanacaste phase, as the Chiapa de Corzo district retained a low population on prime agricultural lands. Within the prime agricultural land Chiapa de Corzo's immediate hinterland the population density was 0.18/ ha, lower than the Escalera phase density of 0.58/ha (Figure 5.. One important difference between the Escalera phase and the Guanacaste phase is the appearance of the small village of Culatí. Because of its status as a village and its location about 2 km distant from Chiapa de Corzo, Culatí is allocated its own district in the map of Guanacaste phase districts (Figure 5.3). However, given its location adjacent to the prime agricultural lands farmed by modern residents of Chiapa de Corzo it is unlikely that leaders at this settlement controlled access to land independently of Chiapa de Corzo. The access of Culatí residents to the prime agricultural lands may have been granted by Chiapa de Corzo leaders in return for the provision of food surpluses to elites at Chiapa de Corzo.

The greater part of the Horcones phase settlement of Culatí is located on the edge, but extending into prime agricultural land, resulting in a population density of about 6.37/ha. The Horcones population of Culatí grew by an estimated 540 people, and it is likely that some of the people in this settlement were part of the population that moved out of Chiapa de Corzo during this phase. If this is the case, then agricultural producers supporting residents of Chiapa de Corzo may have increasingly been residing outside of this center.

In the Guanacaste phase hinterland, access to prime agricultural land appears to have continued to be controlled at the community level. The Guanacaste phase saw the greatest percentage of the population located in hamlets since the Dili phase; 43% of the Guanacaste phase hinterland population was located in hamlets, compared to 35% in the Escalera phase. The increase in the number of people in the hinterland located in hamlets vs. villages from the Escalera to the Guanacaste phase is highly significant, but not very strong (X^2=44.7 p<.001 V=.08). These data could be interpreted as evidence for a slight decrease in community level control over land access from previous phases, but a closer examination of the data suggests that this was not the case.

The percentage of the Guanacaste phase population located on first class agricultural lands was greater than earlier phases with 43% of the total Guanacaste phase population located on these lands compared to 27% of the total Escalera population. Despite the overall population dispersal, a greater percentage of the Guanacaste population in prime agricultural lands were located in villages (88% Guanacaste vs. 74% for the Escalera phase), a change which is significant and strong (X^2=957 p<.001 V=.47). These changes suggest an increase in the importance of prime agricultural lands, and an increase in the importance of village level organizations in controlling access to these lands.

The Horcones phase saw a slight increase in population nucleation, with approximately 60% of the Horcones phase hinterland population located in villages compared to 57% of the Guanacaste population. This difference is significant but not very strong (X^2=10.09 p<.002 V=.04). Within prime agricultural lands, 99% of the Horcones phase population was located in villages, compared to 88% in the Guanacaste phase. This change is both significant and strong (X^2=219 p<.001 V=.23), suggesting that access to prime agricultural lands was more tightly controlled by village level organizations in the Horcones phase.

When we consider the ½ hour buffer around prime agricultural lands, differences between the Guanacaste and Escalera phase village vs. hamlet populations largely disappear. Between 88% and 89% of the population was located within this buffer in these phases and including Chiapa de Corzo in these phases. Within the buffer 76% of Guanacaste phase population was located in villages compared to 81% of the Escalera phase population, a change that is significant but not strong (X^2=45 p<.001 V=.07) suggesting little overall change in strategies of agricultural production or control over land access. The hypothesis that access to prime agricultural land was more centrally controlled during the Guanacaste and Horcones phases than in the Escalera phase are thus only supported if we assume that this control was exercised from settlements directly on or proximate to prime agricultural land.

While these data suggest more centralized control over access to agricultural lands in the hinterland, they do not distinguish between the management of land rights by village level organizations acting autonomously from the Chiapa de Corzo rulers, or management controlled by rulers at the capital. Nonetheless, the appropriation of agricultural surpluses could have been achieved without direct control over access to agricultural lands. The concentration of people in villages within prime agricultural lands conforms to the expectations of a governmental system relying on staple finance (D'Altroy and Earle 1987; Spencer and Redmond 2001:214). The establishment of nucleated communities on prime agricultural lands would facilitate the bundling and collection of agricultural surpluses, as well as the imposition of sanctions targeted at encouraging the production of surpluses. If these changes in settlement do reflect increases in demands of agricultural tribute by the center, these demands do not appear to have been generated by, or resulted in the growth of population at the center.

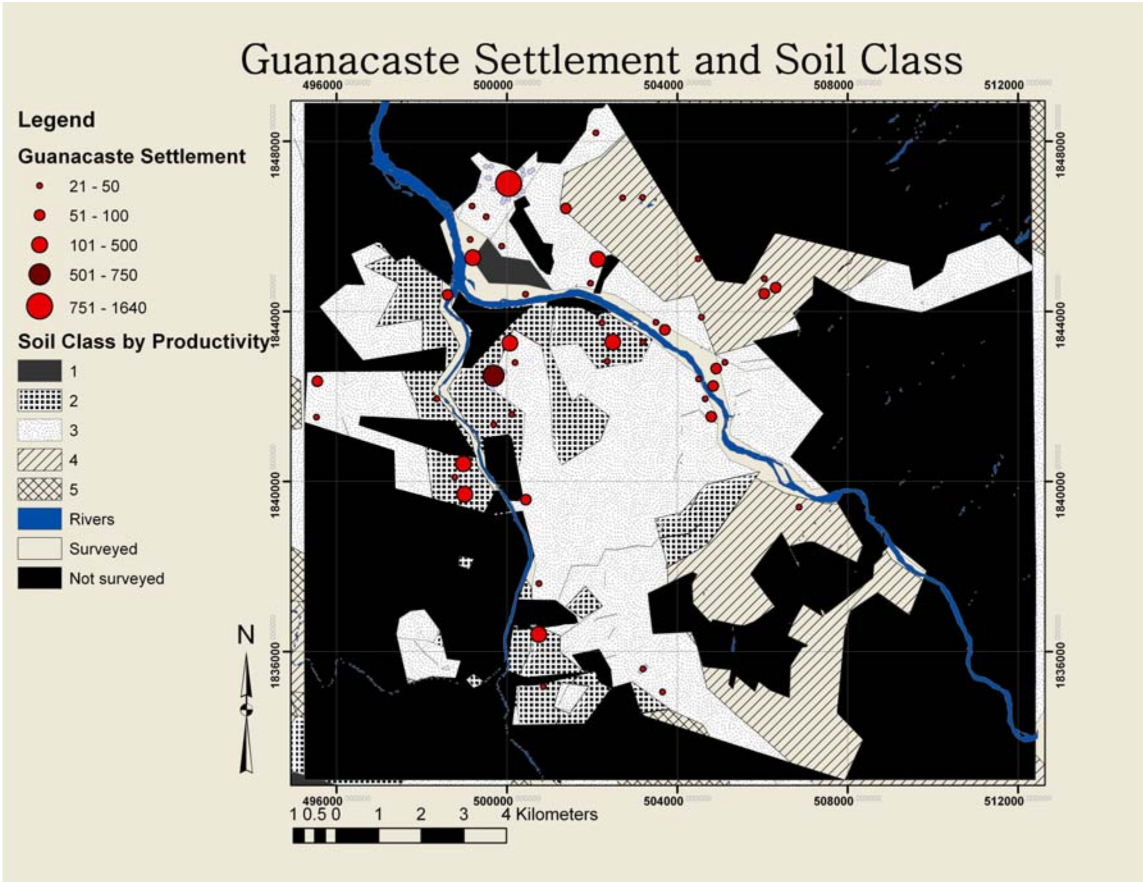

Figure 5.12 Guanacaste Phase settlement and soil class

5.5 CONTROL OVER ACCESS TO OBSIDIAN

Control over access to obsidian by the Chiapa de Corzo rulers and by hinterland leaders appears to have changed from the Escalera to the Guanacaste phase and again in the Horcones phase. The total count of obsidian attributed to the Guanacaste phase increased by 17% from the Escalera phase (from 23.1 to 27.8), and approximately 3% from the Francesa phase, suggesting a slow increase in the rate of obsidian importation over these two phases. During the Horcones phase obsidian values increased by about 5% (n=29.27).

The per-capita Guanacaste phase rates of obsidian consumption at Chiapa de Corzo, when adjusted for differences in phase length increased by 28% from the Escalera phase. During the Horcones phase per capita consumption at Chiapa de Corzo remained stable from the Guanacaste phase. The quantity of obsidian at Chiapa de Corzo relative to the hinterland during the Guanacaste phase is lower than in the Escalera phase (70% vs. 76%) but the differences are not significant (X^2=.09 p=.75). During the Horcones phase the relative quantity of obsidian at the center was higher than in the Guanacaste phase, with 80% of the total (n=21.7), but again, the difference is not significant (X^2=.22 p=.63). The Horcones phase increase in obsidian counts at Chiapa de Corzo is, however, more remarkable when the 12% decrease in the population of Chiapa de Corzo is taken into account. By themselves, these statistics suggest little change in control over obsidian access by Chiapa de Corzo elites from the Escalera through Horcones phases. However, contrasts in the distribution of collections with obsidian in the hinterland between the Guanacaste and Escalera phases, and between the Horcones and Guanacaste phases suggest that there were important changes in control over the hinterland population's access to obsidian over these periods.

5.5.1 Guanacaste phase control over obsidian access

The notion that access to obsidian from the SMJ and El Chayal sources was controlled differently in the Guanacaste phase than in the Escalera phase is supported by changes in the quantity of SMJ relative to El Chayal imported during to the Guanacaste phase, and in changes in the distribution of SMJ. The amount of El Chayal imported into the study area increased 12% from the Escalera phase, compared to an increase of 34% in the amount of SMJ. SMJ values had remained essentially static from the Dili through Francesa phases.

Differences in distribution of obsidian from these two sources suggest that Guanacaste phase access to El Chayal continued to be controlled primarily by the Chiapa de Corzo elite, and by leaders at second tier political centers. SMJ, on the other hand may have been accessed by hinterland populations independently of either the Chiapa de Corzo elite or second tier centers, possibly through the village of El Vergel, a settlement on the bottom of the political hierarchy located to the west of the Santo Domingo River. The change in the distribution of obsidian is visible in a K-means cluster analysis of collections with SMJ, which produced two k-means ellipses, the first centered on Chiapa de Corzo, and the second centered roughly on the site of El Vergel, on the Santo Domingo River (Figure 5.13). The location and orientation of these ellipses contrast strongly with the single k-means ellipse produced for the Escalera phase SMJ distribution (Figure 4.11). The distribution of El Chayal in both of these phases, in contrast, produces ellipses that are broadly similar in orientation and location to those of the Escalera phase, despite the production of three ellipses for the Escalera phase vs. two for the Guanacaste phase.

At the center of the southern SMJ ellipse is the village of El Vergel. El Vergel has the highest SMJ values outside of Chiapa de Corzo, and a higher overall per-capita obsidian consumption rate than Chiapa de Corzo. This small village was located on the least cost path between at least three political centers to the south west of the survey area and Chiapa de Corzo (Figure 5.9). The high obsidian value and the central location of El Vergel with respect to the k-means ellipse of SMJ lend support to the hypothesis that this village was an important node of distribution for SMJ. El Vergel is on the bottom tier of the political hierarchy, which suggests that access to SMJ obsidian was not exclusively controlled by the Chiapa de Corzo elite and leaders at second tier political centers.

The two Guanacaste phase second tier centers that had obsidian had both El Chayal and SMJ, an equal split at San Isidro/Cupía, and El Chayal predominating at Ribera Amatal. Obsidian values at San Isidro/Cupía were low, but those at Ribera Amatal were relatively high for both SMJ and Chayal. Ribera Amatal has the highest value of El Chayal outside of Chiapa de Corzo. The relatively high value of El Chayal obsidian at Ribera Amatal and its location in the center of the k-means ellipse of the Guanacaste phase El Chayal distribution both support the notion that leaders at this center were controlling access to El Chayal. On the other hand, both San Isidro/Cupía and Ribera Amatal had the lowest per-capita obsidian consumption of any settlements with obsidian, which would argue against leaders at these centers exercising substantial control over access to obsidian. The data are thus somewhat equivocal on the extent to which hinterland leaders were controlling access to El Chayal, but nonetheless, suggest that access to El Chayal was controlled differently than SMJ, a pattern that contrasts with the Escalera phase.

5.5.2 Horcones phase control over obsidian access

The Horcones phase distribution of obsidian suggests that the Chiapa de Corzo rulers exercised stronger control over access to obsidian than in the Guanacaste phase. The village of El Vergel no longer appears to have been an important point for obsidian access, and in general access to obsidian among the hinterland population appears to have been much more limited than in the Guanacaste phase (Figure 5.14).

Obsidian was more concentrated at Chiapa de Corzo than in the Guanacaste phase, with 84% (n=15.2) of El Chayal and 74% (n=5.66) of SMJ, but the differences between the Horcones and Guanacaste phase quantity of obsidian at Chiapa de Corzo relative to the hinterland are not significant (X^2=.612 p=.43). Nonetheless, the Horcones phase distribution of obsidian is very different in the hinterland than during the Guanacaste phase, a difference concisely captured by the differences in K-means ellipses (Figures 5.12 and 5.13).

The quantity of Horcones phase SMJ in the study area decreased by 19%, to levels slightly higher than in the Escalera and Francesa phases. In contrast to the Guanacaste phase, there was no Horcones distribution of SMJ along the western margins of the Santo Domingo River and the two ellipses produced by the k-means cluster analysis of SMJ distribution differ strongly from those of the Guanacaste phase. The southern ellipse poorly characterizes the clustering of SMJ, with a centroid between the two positive Ribera Amatal collections, and two collections from hamlets in the Zapata district. The northern ellipse is centered on Chiapa de Corzo and oriented northeast to southwest. The distribution of El Chayal produced two clusters, both very similar in location and orientation to the El Chayal ellipses of the Guanacaste phase, suggesting little change in control over access to obsidian from this source.

The hypothesis that Horcones phase obsidian access was controlled by rulers at Chiapa de Corzo through the hierarchy of political centers is supported by the high obsidian values at the second tier center of Ribera Amatal, and Cupía/San Isidro. But not all leaders at second tier centers appear to have been controlling access to obsidian, as it is absent at the settlements of El Recuerdo and Tehuacan. The estimated per-capita obsidian consumption rates at second tier centers are relatively low; Ribera Amatal has the lowest per-capita consumption rates of all settlements. But as in the Escalera phase, and in contrast to the Guanacaste phase, obsidian is rare in Horcones phase villages, occurring in three out of the 12 villages, a finding that makes its presence at these centers more notable.

The only core fragment associated with Horcones phase materials, found at the Nucatilí 2 hamlet is interesting in several respects. First, this fragment could be interpreted as reflecting an episode of blade production in a hinterland community, which would suggest that Chiapa de Corzo did not have a monopoly on the production of El Chayal blades. But no other evidence for blade manufacture was found in this collection. The absence of any other evidence for blade production suggests that this core fragment may have been imported as-is, and was not a by product but a finished tool or object. If the Chiapa de Corzo elite were exercising greater control over obsidian exchange, then the prestige value of the obsidian itself may have increased, not merely in the activities associated with obsidian blades (e.g. bloodletting, warfare). This core fragment was found in a collection with exclusively Horcones materials may also indicate a contrast to sites in the Upper Grijalva sub-region, where Clark and Lee found that during the Terminal Formative, obsidian was imported as finished blades, not macrocores (Clark and Lee 2007:117). This contrast is also supported by recent excavation data from Chiapa de Corzo, which found 20 prismatic cores of El Chayal in Horcones contexts (1.7% of the Horcones El Chayal assemblage) (Bachand personal communication 2008).

In sum the control exercised over access to SMJ obsidian by Chiapa de Corzo elites and by hinterland leaders appears to have decreased during the Guanacaste phase. Hinterland populations may have accessed SMJ obsidian through traders acting independently of the Chiapa de Corzo elite, possibly at the village of El Vergel, while elites continued to control access to El Chayal. During the Horcones phase Chiapa de Corzo elite appear to have reasserted control over access to SMJ, and continued to control access to El Chayal.

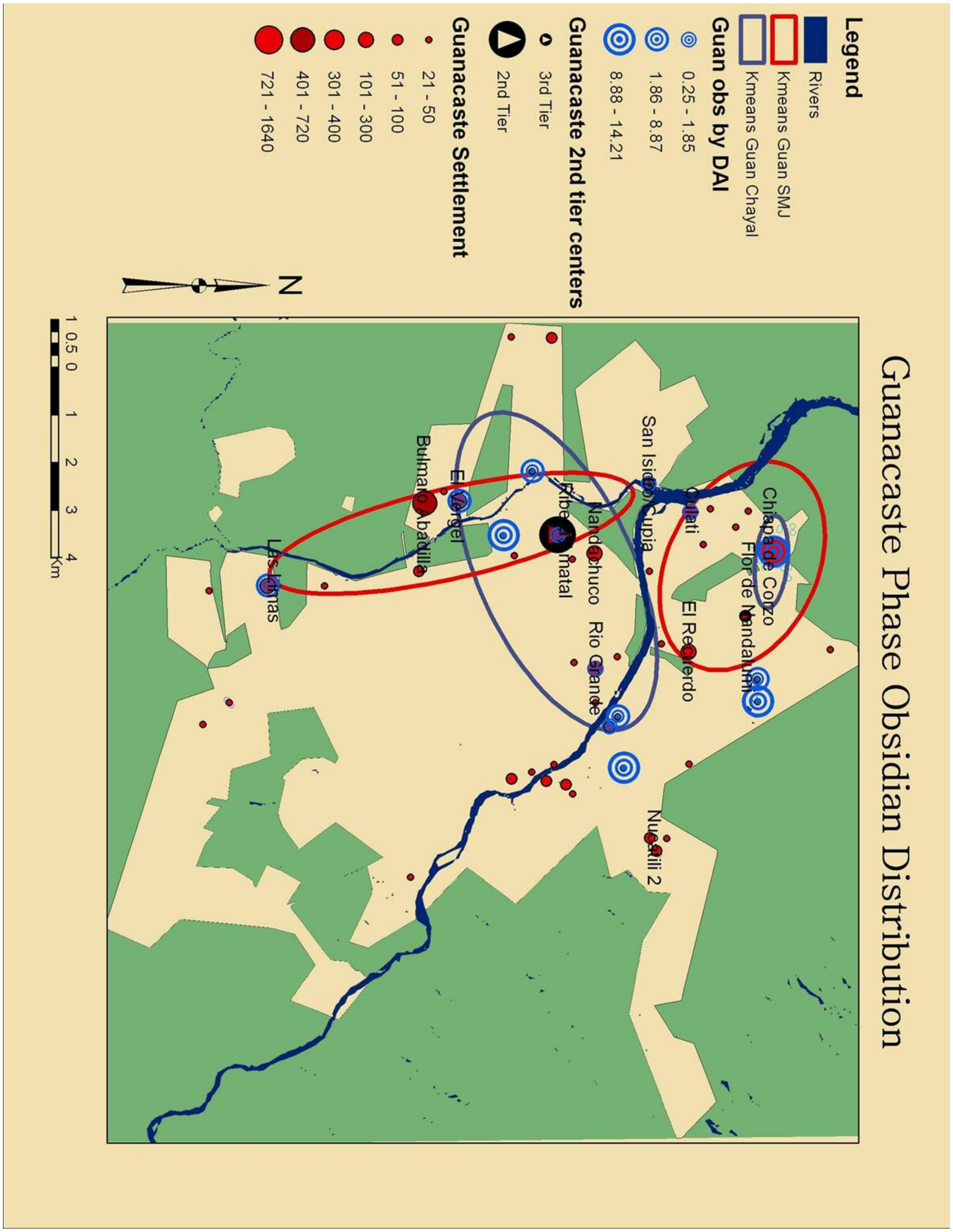

Figure 5.13 Guanacaste phase obsidian distribution.

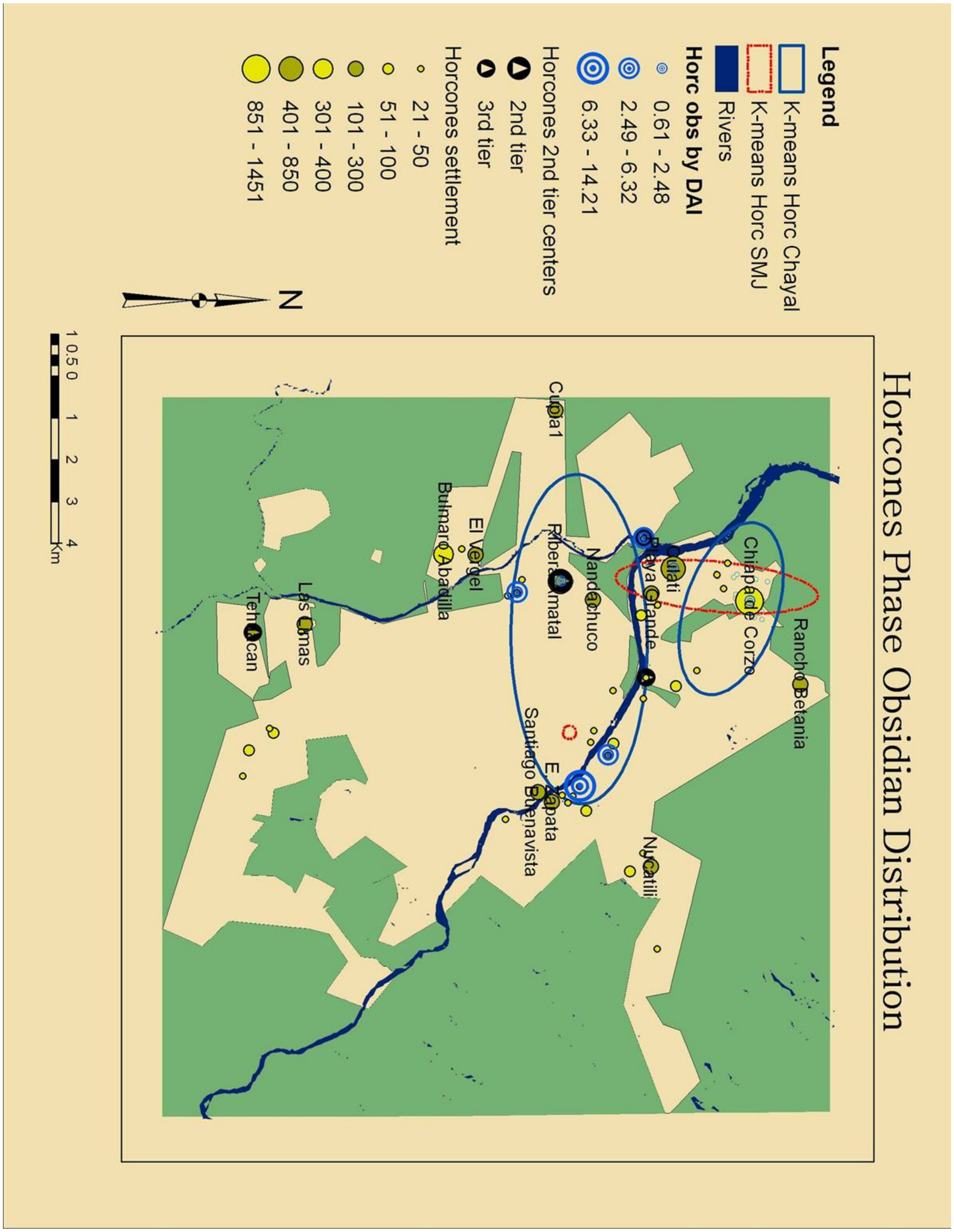

Figure 5.14 Horcones phase obsidian distribution.

5.6 CONTROL OVER TRADE AND COMMUNICATION NETWORKS

Despite evidence that long distance communication and exchange was important to the Guanacaste Chiapa de Corzo elite, the evidence suggests minimal interference by Chiapa de Corzo rulers or hinterland leaders in the movement of people and goods through prominent intersections of trade and communication routes. On the other hand, hinterland populations appear to have favored intersections of communication networks, suggesting that participation in regional trade networks may have been important to hinterland populations.

The Guanacaste phase Tomb 7 at Chiapa de Corzo provides us with strong evidence that rulers during the Guanacaste phase were engaged in long distance relations with other regions of Mesoamerica. This tomb had 35 ceramic vessels, all of which were imported from other regions of Mesoamerica, including an Usulutan Resist vessel from El Salvador, polished gray bridge-spout face-neck jars from Oaxaca, partially smudged bowls from Veracruz, and 12 Sierra Red vessels from the Guatemala lowlands (Lowe and Agrinier 1960:49). This finding suggests a potential increase in the length and number of trade networks in which the Chiapa de Corzo polity was involved. In order to evaluate the extent to which Chiapa de Corzo rulers controlled routes of trade and communication during the Guanacaste phase, we again turn to data from the hinterland.

During the Guanacaste phase there was an increased frequency of villages located on the intersection of transportation routes from the Escalera phase. El Vergel, discussed above as a locus of high obsidian consumption and a possible locus of hinterland obsidian access, was located about 500 m south of the intersection of the least cost paths from the minor center of Mundet, political capitals in the Pacific Coast sub-region and the Frailesca, to Chiapa de Corzo. Five hundred meters to the south of El Vergel, the Abadilla site maintained its status as a village from the Escalera phase through the Guanacaste phase. Residents at both of these sites may have played some part as intermediaries in the trade of goods moving from the Sierra Madre site of El Cielito, and the coastal site of La Preserverancia into the Central Depression. Neither El Vergel nor the Abadilla site has any evidence of second tier political status or of direct ties between leaders at these settlements and the Chiapa de Corzo elite.

The site of Las Limas, located on the least-cost path from Chiapa de Corzo to the Chapatenango-Chejel sub-region, returned to its Dili phase village size during the Guanacaste phase after a population drop in the Escalera phase. Whether or not this growth had anything to do with a reopening of this route to sites on the Grijalva is not clear, as most of the centers in the Chachi sub-region appear to have been abandoned during the Guanacaste phase (Lowe 1959; Warren 1978: Fig. 7) and the least cost path to Santa Cruz follows the Grijalva River. However, the return trip from Chiapa de Corzo to Santa Cruz may have been more expedient via a route paralleling the Santo Domingo than navigating upstream through the often swift currents of the Grijalva, or over the broken hilly terrain that flanks the Grijalva upstream from the Barranca Honda and Zapata sites. Nonetheless, as in the Dili phase, the lack of architecture at Las Limas suggests that whatever roles individuals at this settlement played in facilitating or exploiting the movement of people and goods along this route, they were not representatives of, or sponsored by the Chiapa de Corzo rulership.

Directly above the confluence of the Grijalva and Santo Domingo Rivers population at the settlement of San Isidro/Cupía remained largely unchanged during the Guanacaste phase, persisting as a large hamlet. As noted above this site has several mounds with construction sequences that may date in part to the Guanacaste phase. As in the Escalera phase, individuals at this hamlet may have monitored or interfered with the movement of canoe traffic through this confluence on behalf of the Chiapa de Corzo rulership.

In short, as with the Escalera phase, there is little to suggest that the Chiapa de Corzo rulership was exercising much control over the movement of people and goods through the hinterland during the Guanacaste phase. While there was a slight increase in the number of settlements located at the intersections of likely trade routes during the Guanacaste phase, there is no support for the notion that the Chiapa de Corzo rulers played a role in establishing these settlements or in administering the activities in that took place in them. On the contrary, the distribution of SMJ obsidian during the Guanacaste phase discussed above suggests that intercommunity trade increased independently of any meddling by Chiapa de Corzo rulers.

As noted in the previous section, there is some evidence that the Chiapa de Corzo elite reasserted control over obsidian exchange during the Horcones phase. The hypothesis that Chiapa de Corzo rulers were exercising control over trade routes on the whole finds better support than in either the Escalera or Guanacaste phases.

The settlement of San Isidro/Cupía was further reduced in size during the Horcones phase to a small hamlet, and may have lost whatever political functions it had during the Guanacaste phase. A possible replacement for this settlement emerged in the second largest Horcones phase village in the hinterland, the site of Culatí. Culatí is located directly on the least cost communication route that runs along the Santo Domingo River into Chiapa de Corzo. This settlement is located approximately 2 km SSE of Chiapa de Corzo on the same side of the river. Culatí has no visible architecture, but as noted above, its proximity to Chiapa de Corzo and its prime agricultural lands suggest that Culati residents may have been strongly tied to the Chiapa de Corzo elite. This site also had obsidian in two of its collections, both El Chayal and SMJ. It is likely that individuals at this settlement were taking advantage of the movement of traders through this area during the Horcones phase, which may account for the presence of obsidian at this settlement.

Better evidence for control by Chiapa de Corzo rulers over important nodes of transportation is found in location of the Horcones phase second tier political centers of Tehuacan and El Recuerdo. Tehuacan was located directly above and overlooking the floodplain of the confluence of the Suchiapa and Santo Domingo Rivers, which may have been an important transportation juncture for people and goods moving between Chiapa de Corzo and the Mundet area, and the least-cost path between Chiapa de Corzo and the southern centers of El Cielito and La Preserverancia. The use of cut stone in principal mound at this settlement suggests the presence of elites, possibly sponsored or otherwise affiliated with the rulers of Chiapa de Corzo at this site. This combination of factors lends support to the idea that a group at this site was exercising some control over the movement of people and goods through this transportation node on behalf of the Chiapa de Corzo elite.

The second tier center of El Recuerdo appears to have been a small hamlet during the Horcones phase. Its location on the point of disembarkment for least cost path from Santa Cruz to Chiapa de Corzo would have facilitated the control over traffic moving along this route by individuals at this site. Again, the conformity of stone alignments on this mound suggests that it may have been occupied by representatives of the Chiapa de Corzo elite.

In sum, there is better evidence for hinterland leaders meddling in the movement of people and goods on communication routes to Chiapa de Corzo during the Horcones phase than in either the Guanacaste or Escalera phases. The evidence also provides better support for the hypothesis that this control was exercised on behalf of the Chiapa de Corzo elite.

5.7 THE USE OF WARFARE AND COERCION

In both the Guanacaste and Horcones phases we have the first examples of elite burials from Chiapa de Corzo accompanied by weapons, suggesting a greater emphasis on military aspects of leadership. The individual in Tomb 7 from the Guanacaste phase was accompanied by two large Chalcedony spear points (Lowe and Agrinier 1960: 48). In the Horcones phase Tomb 1 contained a spear with a hafted obsidian point and shark teeth inlays (Lowe and Agrinier 1960: 40). Evidence for weaponry is absent from all other Guanacaste and Horcones phase burials, elite or commoner, suggesting that the use of tools of war as burial goods was restricted to a very limited group of elites. Weapons and direct references to warfare in Mesoamerican burials are rare in general, even in periods and areas where a warrior culture seems to have been prevalent (Hassig 1992; Hirth 1989; McAnany and Plank 2000). While the occurrence of weaponry in elite burials suggests a change in the symbolism associated with authority, at least in death, it does not necessarily reflect change in the frequency or intensity of warfare in inter-polity relations.

Within Chiapa de Corzo there are signs of periodic episodes of violence during the Guanacaste and Horcones phases. Tim Tucker describes an accumulation of burned objects and evidence for an uncontrolled fire underlying the first Guanacaste phase elite residential or civic-ceremonial platform of Mound 3 at the southern end of the civic-ceremonial precinct (1970:12), which may indicate either a termination ritual, the destruction of this building in an attack, or both (Pagliaro et al. 2003; Webster 2000:75). It is not clear if the Francesa phase Mound 3 structure was a temple, an elite residence, or a commoner residence. The Francesa phase platform appears to have been relatively modest (under 50 cm tall), and dwarfed by the contemporary 3.4 m tall residential (?) platform of Mound 7. The area to the south of the E-Group and Mound 7 was utilized as a cemetery during the Francesa phase, and it is possible that the Francesa Mound 3 platform structure was a temple associated with this space.

About 400 years later, at the end of the Horcones phase, the Mound 5 palace, and the Mound 3 elite residential structure at Chiapa de Corzo were destroyed by fire (Lowe 1962:17; Tucker 1977:170), with both subsequently rebuilt and utilized by people who used very different (and non-Maya style) ceramics than the Horcones occupants (Lowe 1962:7-18). The destruction of the Mound 5 palace has been interpreted as the product of an overthrow of a Maya affiliated ruling lineage and its replacement by local rulers (Clark 2000a). These lines of evidence suggest that during these phases there was at least sporadic violent conflict. These data from Chiapa de Corzo provide us with a limited amount of information on the impact of warfare on elites. For a different evaluation of the forms of warfare and violence employed by the Chiapa de Corzo rulers and hinterland leaders we turn to a consideration of settlement data from the hinterland.

As with the Escalera phase, there is little to suggest that defensive concerns were an important factor in the choice of settlement locations during the Guanacaste and Horcones phases. Defensible locations such as hilltops and areas surrounded by steep slopes were not favored settlement locations. The Guanacaste abandonment of the Escalera phase San Rafael Buenavista settlement, located at the base of Cerro Hueco may reflect some decrease in defensive concerns during the Guanacaste phase, but this is an isolated incidence. Another small village at the base of Cerro Hueco, Cupía 2 emerged during the Horcones phase but overall there was no real trend towards relocating settlements in defensive locales[9].

On the other hand, a larger percentage of hinterland population was located hamlets during the Guanacaste phase than the Escalera phase (43% vs 35%), a change that is highly significant but not very strong (X^2=12.8 p<.001 V=.04). This slight decrease in nucleation may have resulted from the reduction in a number of different defensive concerns, including the threat from inter-polity violence, the threat of coercive force from the Chiapa de Corzo rulers, or the threat of raids organized by hinterland leaders (although see Webster 2002:74 for a well informed dissent).

The notion that this Guanacaste phase dispersal resulted from a reduction in the frequency of inter-polity warfare is undermined by the persistence of very light occupation in the outer hinterland. Population in the outer hinterland decreased from

[9] This pattern appears to contrast with the Upper Grijalva sub-region, where after a period of widespread abandonment of settlements in the Guanacaste phase, during the Horcones phase the area was reoccupied with settlement heavily favoring highly defensible hilltop positions (Bryant et al. 2005, Bryant and Clark 1983).

12% in the Escalera phase to 9% during the Guanacaste phase. These changes are significant but not strong (X^2=20.04 p<.001 V=.05). The persistence of sparse occupation in the outer hinterland into the Guanacaste phase suggests that the vacant buffer zones around parts of the polity persisted from the Escalera phase. There is further evidence for the reemergence of a vacant buffer zone between Chiapa de Corzo and the center of Ocozocoautla in the Guanacaste phase abandonment of the Francesa phase second tier center of San Agustin, located midway between the two centers (Navarrete 1959; Warren 1978:55).

There continued to be a high incidence of village relocation from the Francesa to the Guanacaste phase, with three of the ten Francesa hinterland villages persisting into the Guanacaste phase, two of which were villages in the Escalera phase. These changes are relatively modest compared to the Dili to Escalera phase transition, in which no villages maintained large populations through the Escalera phase. The changes in the location of villages suggests some political restructuring from the Francesa to the Guanacaste phase, but to a lesser extent than in the Dili to Escalera transition. Given the relatively dispersed settlement pattern of the Guanacaste phase, it is less likely that either Chiapa de Corzo rulers or hinterland leaders were using coercive force to maintain the loyalty of subjects or gain followers in the Francesa to Guanacaste phase transition than in the Dili to Escalera transition. The higher frequency of Guanacaste phase villages adjacent to intersections of transportation routes suggests that some of this village relocation may have been the product of hinterland populations taking advantage of trade routes, rather than forced resettlement.

During the Horcones phase a greater percentage of the hinterland population than any phase since the establishment of Chiapa de Corzo was located in villages (73%). The Horcones change in the hinterland village vs. hamlet population from the Guanacaste phase is significant and fairly strong (X^2=219 p<.001 V=.17). As with the previous phases, highly defendable locales were not favored locations for settlement in the Horcones phase. Nonetheless, this nucleation suggests a response to higher risk of violence as, depending on the nature of warfare, larger settlements are generally more defendable than smaller settlements.

There was a much greater degree of stability in the location of villages from the Guanacaste to Horcones phases, with none of the eight Guanacaste villages abandoned, and only two reduced to hamlets. The combination of greater settlement nucleation and greater stability in the location of villages suggests that hinterland leaders consolidated control over their subject populations through forced resettlement. The population decline at Chiapa de Corzo may also be related to a different kind of forced resettlement, with elites forcing part of the commoner population out of the capital. The extent to which these changes in settlement were coerced cannot be confidently addressed with these data, but nonetheless, the evidence discussed above for greater political integration of the hinterland provides support for the notion that the Horcones resettlement was directed by the Chiapa de Corzo elite.

The threat to populations in the outer hinterland from inter-polity conflict or raiding by unaffiliated groups suggested for the Escalera and Guanacaste phases may have abated in some parts of the polity during the Horcones phase. Population continued to grow in the outer hinterland during the Horcones phase, with 16% of the population in this area compared to 11% of the Guanacaste phase population. This change is due primarily to the growth of the Tehuacan site from a Guanacaste phase hamlet into a Horcones phase small village. The increase of population in the outer hinterland, which as noted above is a significant but not very strong trend, provides weak support for a decrease in the importance of the unoccupied buffer zone in the southern margins of the polity. It is worth noting here that the small political center of Santa Cruz, located about 35 km upstream from Chiapa de Corzo on the Grijalva River may have been abandoned in the Horcones phase (Sanders 1961:50). The disappearance of this potential competitor may have reduced the risk of violence in this part of the hinterland. To the west of Chiapa de Corzo, the threat of conflict with the neighboring Ocozocoautla polity may have persisted, as the limited evidence we have from the San Agustin site suggests that this area continued to be an unoccupied buffer zone between Chiapa de Corzo and Ocozocoautla from the end of the Francesa phase to the Late Classic period (Navarrete 1959).

In sum several changes in the use coercion and warfare are supported from the Escalera to Guanacaste and Guanacaste to Horcones phases. First, the notion that inter-polity warfare continued to be a threat to populations in the outer hinterland during the Guanacaste phase is supported by the persistence of a lightly occupied buffer zone in the southern margin of the study area. The outer hinterland was more heavily occupied during the Horcones phase, suggesting that, at least in this part of the polity, risk from inter-polity warfare decreased during the Horcones phase.

The greater dispersal of the population during the Guanacaste phase suggests that the implementation of forced resettlement by the Chiapa de Corzo elite or by rural leaders was less prevalent than in the Escalera phase. The abandonment of Escalera and Francesa phase villages and the formation of new villages in the Guanacaste phase suggest that political restructuring may have taken place during the Guanacaste phase. The abandonment and reduction in size of two of the four Escalera phase second tier centers, combined with the overall dispersal of population, suggest that this Guanacaste phase restructuring may have taken place relatively independently of Chiapa de Corzo rulers.

Horcones phase settlement was heavier in the outer hinterland, suggesting that the threat from inter-polity conflict diminished, at least in the southern parts of the polity. The higher continuity in the location of villages from the Guanacaste to the Horcones phase transition suggests a greater degree of stability in the hinterland political structure. Nonetheless, the higher nucleation of population suggests that strategies of forced resettlement were more prevalent than in the Guanacaste phase, possibly directed, or assisted by the threat of coercive force from the Chiapa de Corzo rulers.

A nucleated population would have been desirable to rulers for a number of reasons, as tax collection, the imposition of labor demands, and the training and mobilization of militias would have all been facilitated by nucleated populations. As noted previously, there are other reasons why population nucleation may take place, not the least of, for the concerns of this study, are changes in the regulation of access to agricultural lands. But even if the greater prevalence of villages in the Horcones phase reflects more centralized control over access to agricultural lands, this development may have been a secondary effect of top-down forced resettlement of hinterland populations executed by rulers for reasons other than consolidating control over agricultural lands.

5.8 ELITE POLITICAL IDENTITY

An increase from the Escalera phase in status differentiation between commoners and elites and between rulers and elites is supported by burial and architectural data from the Guanacaste and Horcones phases. The richest burials from both the Guanacaste and Horcones phases were more modest than the richest burials of the either the Escalera or Francesa phases in terms of quantities of shell and jade.

However these materials are not the only measures of burial wealth, and there were marked differences between both the quantity and quality of burial goods within the sample of Guanacaste phase burials. A greater amount of labor was invested in elite burials during the Guanacaste and Horcones phases, as tombs appear to have become more popular than in either the Escalera or Francesa phases. The most richly furnished Guanacaste burials come from Mound 17 (a child burial), Mound 32 at the north end of the civic ceremonial precinct, and the Mound 1 Tomb 7 burial.

The late Guanacaste phase Tomb 7 from Mound 1 contained a male, approximately 25 years old, accompanied by 35 ceramic vessels, all of which were imported. Most of these vessels were imported from the Gulf Coast and the Maya Lowlands, but the assemblage also included three bridge-spout grayware jars from the Valley of Oaxaca and five stucco-painted Usulutan jars, probably imported from El Salvador (Agrinier and Lowe 1960:49). The presence of these vessels suggests that the Guanacaste phase Chiapa de Corzo rulers were participating in an interaction sphere that extended throughout much of Mesoamerica.

Mound 32, probably a temple platform (Martinez and Lowe n.d.:31), contained a tomb, a cist burial, and a simple burial. The burial furnishings in these burials were predominantly local, but among them there was a modified spondylus shell, jade ornaments and an Usulutan vessel. Martinez and Lowe emphasize the contrast between the preponderance of local vessels in the Mound 32 burials and the absence of local vessels in Tomb 7, suggesting that the scarcity of foreign vessels in these burials reflects a rejection of foreign styles in non-royal tombs (n.d.:33) during the Guanacaste phase. The differences in predominance of foreign ceramics in elite burial assemblages may reflect temporal differences in elite interaction spheres through the span of the Guanacaste phase, or a difference in the interaction spheres of rulers and lower tier elites. The continuation of the custom of including almost entirely imported objects in the Horcones phase Tomb 1, also from Mound 1 (Martinez and Lowe n.d.:35), suggests that a single group or lineage at Chiapa de Corzo was participating in a broader exchange network than other groups at the site. The association of Mound 1 with the Horcones Mound 5 palace suggests that this group constituted the royal lineage at Chiapa de Corzo, an association that likely extends back to the Guanacaste phase.

The Guanacaste burials found in Mound 3 were all accompanied by relatively modest quantities of exotic goods and no jade artifacts. Mound 3 during the Guanacaste phase appears to have consisted of several platforms with finished cut-stone and lime plaster, one of which appears to have supported a stone walled superstructure (Tucker 1970:12). These qualities of architecture suggest that the Guanacaste Mound 3 structures were elite sponsored constructions, supporting either temples or elite residences or both. On the other hand, the relatively modest burial furnishings of the Mound 3 interments relative to contemporary burials in Mound 1 suggest it have been occupied or utilized by elites of lower status than those interred in Mound 1 during the Guanacaste phase.

Evidence for the participation of rulers in broad networks of interaction continues to appear in royal burials from the Horcones phase. The burial sample for the Horcones phase is currently limited to nine burials, all of which were found in what were likely structures associated with the elite, Mounds 1 and 3. The mound 1 temple platform contained four tombs, three of which were looted in antiquity (possibly as part of a practice of ancestor veneration (Clark In press:28)). The Mound 1 Horcones tombs also contained materials from a wide array of Mesoamerican regions, including Usulutan ceramics from El Salvador, jade from the Guatemalan highlands and other artifacts and ornaments from the Pacific and Gulf Coasts. All of these Mound 1 tombs had jade ornaments, in contrast to the four Horcones phase burials from Mound 3 which lacked Jade. The wider array of sources of grave goods, and the overall higher quantities of exotic goods in the Mound 1 burials compared to the Mound 3 burials suggest the expansion of status distinctions between rulers and ordinary elites in the Guanacaste and Horcones phases.

There is some evidence that during the Francesa phase distinctions between lower ranked elites and commoners were not emphasized in burial location. Burial in mounds and platforms appears to have been relatively rare during the Francesa phase. It is possible that mound burials were reserved for the ruling elite. The cemetery to the north of the later Mound 1 contained what appears to be a cross-section of society including elites and commoners totaling 78% of the Francesa phase burial population. The richest burial of the Francesa phase was located in Mound 17 and had more than double the amount of shell and jade found in any other burial from the phase. However, 32% (n=20) of Francesa burials from relatively undistinguished contexts in the cemetery to the north of Mound 1 had either jade or marine shell ornaments, some with large quantities (>100) of these artifacts.

The Guanacaste phase cessation of the use of the plaza to the north of Mound 1 as a cemetery skews the sample of burials towards what were presumably higher status contexts (burials within platforms with cut-stone and plastered facades constitute 74% of the Guanacaste burial population). But by itself the redefinition of the Mound 1 plaza as a civic-ceremonial space rather than a cemetery marked a change in the relationship of commoners to the main civic-ceremonial precinct. The disappearance of a burial ground associated with the principal civic-ceremonial zone at Chiapa de Corzo, and shared by people from a variety of social strata, suggests that the status of commoners within the religious system declined in the Guanacaste phase.

A new locus of civic-ceremonial construction emerged during the Guanacaste phase on the southern end of the civic-ceremonial precinct, which in the Francesa phase had been used as a cemetery (Lowe 1964:68). The first stages of the Mound 1 and 1a platforms were constructed with cut-stone and plastered finish. These structures supported one room temples in the early Guanacaste phase and two room temples in the late Guanacaste phase (Agrinier 1975:5-23). To the southwest of the Mound 1 structures, a small complex of temples and/ or elite residential structures were built over the burned remains of what may have been a Francesa phase residence on Mound 3 (Tucker 1970: 13). It is not clear if the Francesa phase structure was a temple, an elite residence, or a commoner residence. As noted above, the Francesa Mound 3 platform may have supported a temple associated with the cemetery to the north of Mound 1. It also seems likely the first stages of the associated Mound 2 were constructed during the Guanacaste phase (Figure 5.16).

In the Horcones phase the Mound 5 palace was constructed, and the Mound 1 and 1a temple platforms were expanded. Nonetheless, in both the Guanacaste and Horcones phases construction in the older northern, and by this time non-residential, portion of the civic-ceremonial zone continued to surpass that of the southern zone, with 79% of the Guanacaste phase and 78% of the Horcones phase labor invested in the older northern part of the civic-ceremonial complex. These figures suggest that the labor demands for constructions continued to be invested primarily in structures to which commoners would have relatively open access. The Guanacaste and Horcones phase investment in elite residential architecture within the civic-ceremonial zone relative to public structures was less than in the Escalera phase, where elite residential constructions may have constituted up to 40% of the total labor cost. An estimated 2288 person-days were invested in the construction of the Horcones phase Mound 5 palace, compared to an estimated 4007 days in the Escalera phase Mound 17 platform. This suggests that leaders in these later phases were no more powerful than those of the Escalera phase in terms of convincing commoners to provide labor for structures to which they would have little access.

On the other hand, the introduction of cut-stone and lime plaster architecture introduced a new degree of specialization and expense into high status architecture. This development would have created a stronger distinction in the appearance of elite houses vs. commoner houses, and require perpetually higher labor costs for the upkeep of the plaster finish on these structures. The Horcones phase construction of a complex palace with about 11 rooms would have created further distinctions between rulers and lower tier elites. The Mound 3 superstructure suggests that at least some lower tier elites at Chiapa de Corzo were living in structures that were simplified versions of the Mound 5 palace. The Horcones phase Mound 3 superstructure had four rooms, laid out in the same plan as the central four rooms of the Mound 5 palace (Tucker 1970:17).

Clark has interpreted the presence of imported Sierra Red at Chiapa de Corzo and the introduction of cut-stone and plaster finished architecture at the southern end of the civic-ceremonial zone to indicate that a group of Maya, likely from El Mirador in the Peten, took control of the Chiapa de Corzo polity (2000a:56). The proposition that the Chiapa de Corzo ruling lineage was replaced by a prestigious Maya lineage is subject to further investigation, as local elites may have emulated the architecture and ceramics of increasingly powerful Lowland Maya El Mirador polity in order to enhance their status. Without getting into the messy question of the criteria for defining a change in the ethnicity of rulers, I would note that the discovery of a Guanacaste phase sherd incised with Epi-Olmec text in Mound 5a (Mélutzin 1995:2) supports the idea that, at least through the Guanacaste phase, there was continuity in the Zoque ethnic identity of rulers at the site.

The carved panel with the earliest known Mesoamerican Long-Count date, December 7, 36 B.C., Stela 2 from Chiapa de Corzo (Coe 2005:64; Lee 1969:105) has been widely interpreted as an example of Epi-Olmec text (Kaufman and Justeson 2001:2.2; Justeson and Perez de Lara 2006:8), but as it bears no inscriptions other than a date, and a fragment of a day-name glyph shared by Zoque and Maya writing systems (Kaufman and Justeson 2001:2.30), it is equally possible that this inscription was carved by participants in a Maya tradition (Clark In press: 32). Regardless of whether individuals from an El Mirador Maya lineage replaced the local ruling Zoque lineage or if local rulers adopted the trappings of prestigious foreign rulers, changes in elite architectural styles and in ceramic styles suggest a shift in the affiliation of elites. I would also emphasize that the Stela 2 monument appears to have been a wall panel (Perez de Lara and Justeson 2006:8). If Stela 2 was part of an interior panel, whatever affiliation or esoteric knowledge the use of this calendar implied, was targeted to a relatively restricted audience rather than the public at large.

While elite funerary rituals may have been large scale ceremonies, the context of elite interments from the Guanacaste and Horcones phases, all within cut-stone and plaster faced temples and residential platforms, suggests that the viewing of actual interments was not open to the general public. Thus the presence of imported and locally made fancy Maya style ceramics in elite burials from these phases, may have been an inter-elite expression of identity with little concern over whether commoners received the message or not. The restricted context of richly provisioned burials of the Guanacaste and Horcones phases appears to contrast with patterns of the Francesa phase, where several simple (i.e. not tomb or cist) burials in the Mound 1 plaza cemetery were richly furnished (Agrinier 1964). The more restricted access to elite burial ceremonies implied by the location of these burials within temples and residential platforms suggests the development of stronger distinctions between elite and commoner identities in the Guanacaste and Horcones phases than in earlier phases.

Further evidence for a widening of the divide between elites and commoners is found in the reduction in the size and population of Chiapa de Corzo during the Guanacaste and

Horcones phases, both of which saw population growth in the study area. During the Guanacaste phase the Chiapa de Corzo population declined by 6% and in the Horcones by 12%[10]. This population decrease at Chiapa de Corzo may have been caused by the imposition of sanctions that discouraged commoners from residing at the center, either through an increase in tax burdens, through the imposition of sumptuary laws, or the imposition of brute force. Whether a reduction of population at the center was an intended or unintended consequence of strategies employed by the Chiapa de Corzo elite is not clear, but the reduction in the number of commoners living at the capital may have had the effect of changing the status of the Chiapa de Corzo capital to a more exclusive elite residential and civic-ceremonial settlement than it had been in earlier phases.

5.8.1 Political Identity and Feasting

The evidence for continued use and elaboration of the civic-ceremonial precinct at Chiapa de Corzo supports the notion that large scale ceremonies, likely including public feasts continued into the Guanacaste and Horcones phases. The way that food was served in feasts, as well as in the home, appears to have changed during the Guanacaste phase, with the adoption of Maya food serving traditions at Chiapa de Corzo. This change is manifested in a reduction of the mean diameter of fancy serving vessels from those of Escalera and Francesa phase serving vessels. New contrasts also developed between

[10] A similar population decrease is noted in the roughly contemporary context of MA II at Monte Alban but , in contrast to the Chiapa de Corzo area, the MA II population decrease was part of a valley wide population decline. Marcus and Flannery suggest that the MA II population decline was the result of people from the Valley of Oaxaca moving out and colonizing other areas. The data from the Chiapa de Corzo study area and the available regional data make this an unlikely explanation for the Guanacaste and Horcones phase population decline at Chiapa de Corzo.

feasting (and general food serving practices) at Chiapa de Corzo and second tier political centers during the Guanacaste and Horcones phases.

Locally made Sierra Red, a type copied from Lowland Maya Sierra Red , were the most common diagnostic ceramic type during the Guanacaste and Horcones phases (Clark and Cheetham 2005: 405) . Despite the foreign origin of Sierra Red style ceramics, the ubiquity of these ceramics in the study area suggests that they were not intrinsically prestigious. There is, however, a wide degree of variation in the elaboration of vessels form, with more elaborate forms more costly in terms of labor required for their production (Feinman et al. 1981).

In both the Guanacaste and Horcones phases more elaborate forms, such as vessels with of labial, sidewall, and basal flanges and rim tabs constituted a greater percentage of the Chiapa de Corzo Sierra Red assemblages than in assemblages of Sierra Red in second tier centers or villages in the hinterland. During the Guanacaste phase 13% (n=7) of the Sierra serving vessels at Chiapa de Corzo were flanged compared to 2% (n=1) at both second tier centers and villages, with just under 95% confidence in this difference (Figure. 5.15a). During the Horcones phase the pattern is very similar, with the ratio of flanged serving vessels increasing to 20% of the Chiapa de Corzo assemblage (n=4) , and (10% n=3) of second tier center assemblages, and 7% (n=6) of village assemblages, with just under 80% confidence in the difference between Chiapa de Corzo and second tier centers (Figure 5.15b). In both phases the percentage of flanged ceramics is relatively high at hamlets, constituting 6% of Sierra vessels during the Guanacaste phase and 22% of the Sierra Red totals (n=6) in the Horcones phase. During both phases, the percentage of flanged Sierra Red was higher in hamlets than at either villages or second tier centers.

The higher percentage of flanged Sierra Red ceramics at Chiapa de Corzo in both phases are broadly what would be expected if the elaboration of vessel form was an expression of status, as residents at the main political center could reasonably be expected to participate more intensively in prestige enhancing activities than individuals in smaller hinterland communities. The relatively low percentages of flanged Sierra Red serving vessels at second tier centers and villages compared to hamlets in both of these phases is unexpected. This finding suggests that leaders at second tier political centers had less access fancy ceramics than in the Escalera phase. The disparity between Chiapa de Corzo and second tier centers is lower in the Horcones phase, where there is less than 80% confidence in the difference between the two. These patterns may reflect the participation in different ceramic procurement networks between leaders at second tier political centers and individuals at Chiapa de Corzo during the Guanacaste phase, and a either convergence of Chiapa de Corzo and hinterland procurement networks or the production of fancier vessels by people supplying ceramics to second tier centers in the Horcones phase. These data suggest a lower intensity of interaction between leaders at second tier centers and Chiapa de Corzo rulers in the Guanacaste phase, and a greater degree of interaction between the two in the Horcones phase.

An alternative hypothesis is that Sierra Red manufactured and/or consumed in Guanacaste phase villages and second tier political centers departed less strongly from older Zoque serving forms (although the large everted rims of the Francesa phase are absent) because individuals in these communities rejected some of the Maya innovations in vessel form. The greater frequency of flanged vessels at hamlets noted for the Horcones phase may be the product of small groups of ethnically Maya individuals who had the same preferences in ceramic styles as Maya individuals who were living at Chiapa de Corzo. As noted above there is some support in architecture and burial data for the notion that people with a Maya identity were residing at Chiapa de Corzo.

The presence of a cut-stone and plaster faced platform at the site of Tehuacan and relatively high frequencies of flanged Sierra Red serving vessels (25% of Sierra from surface collections, and one of two Sierra sherds from mound cut collection) may reflect the presence of a group with a similar identity to Chiapa de Corzo elite at this second tier center. Further household level investigations at Chiapa de Corzo and at hinterland settlements from the Horcones and Guanacaste phases may help resolve the question of whether ethnically distinct groups were present in the Chiapa de Corzo sub-region during the Late and Terminal Formative periods.

Modes of food presentation and consumption appear to have changed more dramatically at Chiapa de Corzo than at second tier centers during the Guanacaste phase, shifting away from the large serving vessels of the Escalera and Francesa phases towards smaller Sierra Red serving vessels. The larger serving vessels of the Escalera and Francesa phases would have been well suited to serving food to groups of people, while smaller serving vessels would have been better suited to serving individual portions of food (LeCount 2001:945). The Sierra Red serving vessels of the Guanacaste phase, with a mean diameter of 25.6, are about the same size as the most common fancy serving vessels of the Francesa phase, Mundet Red, which had a mean diameter of 25.89 cm. But they are smaller than Belgica and Vincente Brown serving vessels of the Francesa phase, which had a mean diameter of 30.8, and the Nicapa resist serving vessels of the Escalera phase, which had a mean diameter of 32.6. These differences are fairly significant for the Nicapa to Guanacaste Sierra comparison(t=1.86 p=.07), and for the Belgica/Vincente Brown to Sierra comparison (t=2.195 p=.03). The Horcones Sierra Red mean serving vessel diameter is 25.9, essentially identical to those of the Guanacaste phase, suggesting little overall change in food serving practices between these phases.

The notion that food was presented differently at Chiapa de Corzo than at second tier centers during the Guanacaste phase is supported by the smaller diameters of serving vessels at Chiapa de Corzo. The mean diameter of Sierra Red vessels at Chiapa de Corzo during the Guanacaste phase is 24.8 cm, close to those of serving vessels (predominantly Sierra Red) from roughly contemporary contexts at the Late Preclassic Lowland Maya site of Lamnai (Powis 2005:60). At all hinterland settlements mean diameter of Sierra Red vessels were larger than those of Chiapa de Corzo. At second tier centers the mean diameter was 29.5, while at both villages and hamlets the mean diameter was approximately 27 cm. There is about 95% confidence in the smaller size of Sierra Red vessels from Chiapa de Corzo and those from second tier political centers in the Guanacaste phase, but less than 80% confidence in the difference between Chiapa de Corzo and villages and hamlets (Figure 5.16a).

These data support the notion that food at second tier centers was served on Sierra Red vessels similar in size to the larger serving vessels of the Escalera and Francesa phase. This in turn suggests that food serving practices in feasts and domestic contexts at second tier centers did not change as much as those at Chiapa de Corzo during the Guanacaste phase.

The trend of smaller serving vessels at Chiapa de Corzo and larger vessels at second tier centers did not last into the Horcones phase. The average diameter of Horcones phase Sierra Red serving vessel is substantially larger at Chiapa de Corzo than in the hinterland, with a mean diameter of 31.3 cm compared to about 24 cm for second tier centers and villages, and 26.3 cm for hamlets. The strength of this disparity is due partly to an outlier in the Chiapa de Corzo assemblage of Sierra Red serving vessels (a vessel with an 80 cm diameter), and as such I present the comparisons with a 13% trimmed mean for each class of sites (Figure 5.16b). The 13% trimmed mean diameter of Chiapa de Corzo vessels is 27.54 cm. With this trimmed mean there is about 95% confidence in the difference between Chiapa de Corzo and second tier centers, and just over 80% confidence in the difference between villages. The difference in Sierra Red serving vessel diameters between Chiapa de Corzo and second tier centers and villages in the hinterland during the Horcones phase may mark the return to more communally oriented feasts, or the provision of larger individual portions of food within feasting contexts at Chiapa de Corzo.

The Guanacaste phase transition to smaller fancy serving vessels at Chiapa de Corzo accompanies the appearance of increasingly enclosed, elaborate and labor intensive elite residential and ceremonial architecture at Chiapa de Corzo. The Guanacaste transition may consequently be related to a shift to more exclusive feasting practices than those of the Escalera and Francesa phases. The return to larger serving vessels sizes at Chiapa de Corzo in the Horcones phase is accompanied by the construction of a palace, which formed a more enclosed civic-ceremonial precinct at the southern end of the civic-ceremonial zone. As noted above, the reduction of the Chiapa de Corzo population during the Horcones phases may have resulted from the movement of commoners out of the settlement, which by itself would have created a more limited audience for many of the ceremonies that took place at Chiapa de Corzo. These lines of evidence suggest that during the Guanacaste and Horcones phases more exclusionary feasting practices took place at Chiapa de Corzo than in the Escalera or Francesa phases. However, continued expansion of structures in the older part of the civic-ceremonial zone suggests that at least some ceremonies of the Guanacaste and Horcones phases at Chiapa de Corzo continued to involve substantial numbers of commoners.

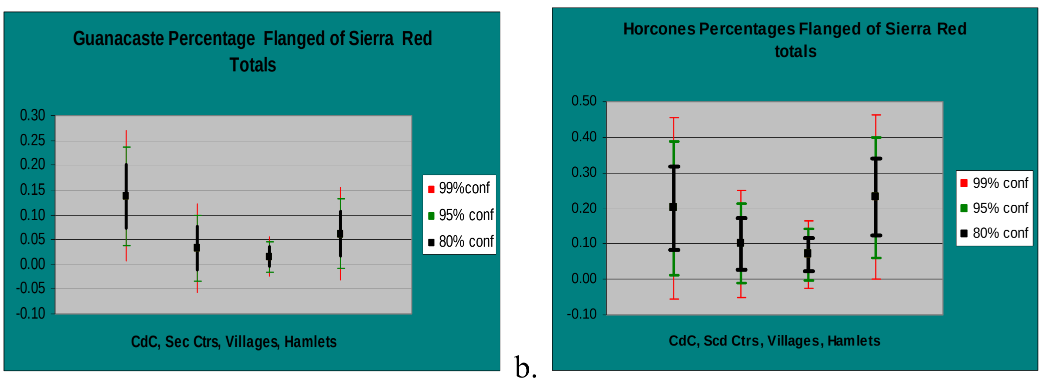

Figure 5.15 Bullet Graphs for Confidence in differences of Flanged Sierra Red flanged frequencies.: a. Guanacaste phase; b. Horcones phase.

a.

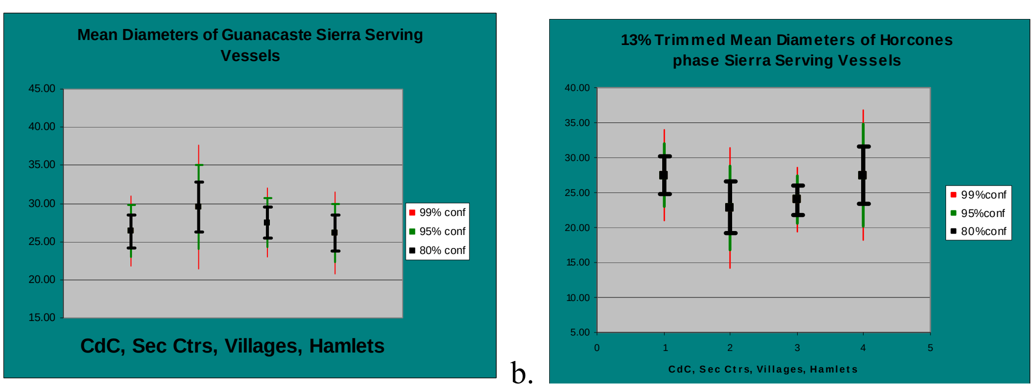

Figure 5.16 Bullet Graphs for confidence in differences in Sierra Red serving vessel diameters: a. Guanacaste phase; b. Horcones phase.

5.9 CONTROL OVER PUBLIC CEREMONY AND RELIGION: CHANGES AT CHIAPA DE CORZO

The construction of new temple and elite residential platforms at the southern end of the civic-ceremonial zone marks a change in the organization of civic-ceremonial activities during the Guanacaste phase (Figure 5.17) and especially in the Horcones phase (Figure 5.18). In contrast to the overall MFC pattern of the northern civic ceremonial zone, and to the space in front of the E-Group, bounded by Mounds 7, 12, and 13, the Mound 1 plaza was effectively blocked from direct line of site from the main body of the Guanacaste and Horcones phase settlement by the 2.7 m tall Mound 7 construction and further separated from the rest of the center by a gully to the east of Mound 5. The Horcones construction of the Mound 5 palace on the eastern boundary of this plaza would have effectively converted the plaza into an enclosed palace courtyard, a modification that suggests that the access to the Horcones, and possibly the Guanacaste phase Mound 1 plaza was more restricted than access to the northern complex.

This southern plaza, bounded by Mound 7 (a Francesa phase construction that may have been abandoned during the Guanacaste and Horcones phases(Lowe 1962:47)), the Mound 8 platform (Francesa and Guanacaste phases), and the Mound 1 and Mound 5 constructions (the first relatively modest stages of Mound 5 date to the Guanacaste phase), measured approximately 90m n-s by 60m e-w. Given these dimensions, this space could have held about 3600 people (allotting 1.5 m^2 per person). As Jerry Moore has pointed out (1996a; 1996b), the dimensions of plaza spaces strongly affect the kinds of communication that can take place in them, with verbal communication less effective in larger spaces. The bounded space of the Mound 1 plaza would have created a more effective setting for direct verbal communication between priests and/or rulers and their audience than the sprawling northern complex between Mounds 11,12, 13 and Mound 36. This space was larger than that outlined by the Escalera phase twin Mound 17 platforms, but more restricted from the view of the main body of the Chiapa de Corzo settlement.

The Guanacaste and Horcones phase constructions of two-room temples on Mound 1a in the southern ceremonial precinct at Chiapa de Corzo suggest an elaboration of religious rituals from previous phases. Marcus and Flannery, drawing from 16th century Spanish accounts of Zapotec temples, suggest that two-room temples were constructed to house full time priests who lived in the inner temple room (1996:182). They further argue that the development of full time priests would have taken a great deal of ritual out of the hands of laymen and restricted access to the supernatural. To date excavations have produced no evidence for two room temples outside of Mound 1a from the Guanacaste or Horcones phases. Mound 1 supported a one-room temple from the Guanacaste through the middle of the Horcones phase, when the partitioned structure, probably a two-room temple, was constructed in its place (Lowe and Agrinier 1960:22).

As noted above, construction continued over most of the earlier northern civic-ceremonial zone during the Guanacaste and Horcones phases, with the addition of cut-stone facings and plaster to many of the earlier constructions. Mound 36 at the northern terminus of the civic ceremonial complex appears to have been abandoned during the Guanacaste phase, and this abandonment likely reflects a change in the nature and possibly in the sponsorship of ceremonial activities in the plaza area to the north of Mound 17.

The Mound 32 platform, located about 100 meters to the northwest of Mound 17, and 150 meters to the southwest of Mound 36 was constructed during the Guanacaste phase (Figure 5.17), and supported a three room structure, interpreted as a temple due to its small size by Martinez and Lowe (n.d.:31). This structure is unlike the two-room temples from Mound 1 or the residential structures of Mound 3 and 5, in that the three rooms are situated next to each other, each facing eastward, directly onto the platform. The absence of an inner room in this structure suggests that the rituals associated with this temple were more visible and accessible to the participants than rituals associated with the Mound 1 temples.

The Horcones phase expansion and maintenance of Mounds 11, 12, 13, and 17 suggest that most of the older civic-ceremonial area to the south of Mound 17 continued to be utilized (Figure 5.18). The enlargements of Mound 17 in the Francesa and Horcones phases appear to have transformed this structure from a residential platform into a pyramid (Lee n.d.), which may have supported a temple. The Francesa through Horcones modifications of Mound 13 appear to have maintained its general shape. We do not know what Guanacaste phase superstructures on Mound 13 looked like, but the minimal evidence available for the Horcones phase superstructure suggests that a small temple may have been located on the platform summit (Hicks and Rozaire 1960:6).

The variation in temple form and the persistence of activities in the northern civic-ceremonial complex suggests that a variety of religious practices co-existed at Chiapa de Corzo during the Guanacaste and Horcones phases. The one and two-room temples of Mounds 1 and 1a may have hosted rituals conducted by full-time priests, while rituals in the northern civic-ceremonial complex may have been conducted by less specialized practitioners. The more bounded space of the Mound 1 plaza suggests that access to this space was more restricted than the relatively open northern civic-ceremonial zone. These data suggest that while ceremonies in the southern civic-ceremonial zone could have held more than the entire population of Chiapa de Corzo, access to this area was more tightly controlled by the ruling elite than in the northern zone. Ceremonies in the older northern complex likely continued to be widely accessible to the commoner population, fostering a sense of communitas within the polity (Clark 2003; Ringle 1999:199). Ceremonies in the southern civic-ceremonial zone may have enhanced the separation of elites and commoners within the Chiapa de Corzo polity, through demonstrating the privileged relation of rulers with the supernatural.

The layout of buildings in the southern civic-ceremonial precinct at Chiapa de Corzo, including Mounds 1, 5, 11, and 12, is very similar to the layout of contemporary civic-ceremonial complexes in the Maya lowlands, including the Central Acropolis of the Monos Group at El Mirador (Ashmore and Sharer 2002: Fig. 10), and to the Central Plaza at Calakmul (Folan et al 1995: Fig. 3), among others. It is likely that the earlier E-Group at Chiapa de Corzo was incorporated into a Maya cosmological template, reflecting the adoption of aspects[11] of religion and ideology common to many contemporary Lowland Maya polities. The contrasts between the northern and southern civic-ceremonial zones support the notion that novel Maya religious practices may have been adopted by the Chiapa de Corzo rulers, while Zoque religious practices continued to be practiced by lower tier elites and commoners.

[11] While there are strong similarities between the Chiapa de Corzo southern civic-ceremonial complex and those of the Maya area there are important differences in the constituent structures. Most notably, despite the presence of T shaped platforms at Chiapa de Corzo, the Lowland Maya emphasis on triadic architectural features (Taube 1998) is absent in the Guanacaste and Horcones phase architecture. This variation may reflect only a partial adoption of Maya religious precepts.

5.9.1 Public ceremony and religion in the hinterland

In the hinterland, the site of Ribera Amatal continued to be occupied and increased in population in both the Guanacaste and Horcones phases. As noted in Chapter 4, the scale and layout of mounds at this site closely parallel that of Mounds 73, 74, and 66 at Chiapa de Corzo. As proposed for the Escalera phase, this arrangement of mounds may have facilitated ceremonies linking leaders at this site to this house group at Chiapa de Corzo. The site of Flor de Nandalumí also continued to be occupied as a large hamlet during the Guanacaste phase, but appears to have been abandoned by the Horcones phase. The mound and modified landforms at this site do not outline a plaza area, nor do they closely parallel anything at Chiapa de Corzo. The mounds at El Recuerdo, as noted above, have alignments of stone that do not hold to a single orientation. As such the El Recuerdo mound group does not appear to form a coherent plaza arrangement and whatever ceremonies took place at this site differed from anything that took place at the main civic ceremonial precinct of Chiapa de Corzo.

5.10 SUMMARY

The projection of political power from Chiapa de Corzo into its hinterland in the Guanacaste phase appears to have been more direct, and probably weaker, than in the Escalera phase. All of the Escalera phase second tier centers within the study area except

Ribera Amatal experienced population declines and no new second tier centers emerged. The dispersal of the population out of villages and into hamlets noted for the Guanacaste phase suggests that hinterland leaders were less able to attract or force subordinates into their settlements. These changes may have resulted from suppression by Chiapa de Corzo rulers of the power of hinterland leaders.

During the Horcones phase the emergence of two new second tier centers with architectural parallels to Chiapa de Corzo, and the growth of the earlier second tier center of Ribera Amatal, support the notion that the Horcones phase political hierarchy within the study area was more tightly integrated with Chiapa de Corzo than in earlier phases. The greater degree of stability in the location of second tier centers and villages from the Guanacaste to Horcones phases, compared to the transition from the Francesa to the Guanacaste phase, supports the idea that the structure of the political hierarchy within the study area was more stable from the Guanacaste to the Horcones phases than from the Francesa to Guanacaste phases. Greater stability in the loci of villages in the hinterland may have allowed leaders at these settlements to accrue greater political power. This notion of increased power of hinterland leaders in the Horcones phase is supported by the concentration of population into villages, a trend that suggests that hinterland leaders had more power to attract or force subordinates into their villages than in the Guanacaste phase.

The Chiapa de Corzo elite appear to have maintained the agricultural reserve on the most productive agricultural lands within their district during the Guanacaste and Horcones phases. In contrast to the Escalera phase, this reserve may have been farmed by people living outside of Chiapa de Corzo, as a village was founded directly adjacent to this area. In the hinterland, the greater dispersal of Guanacaste population compared to the Escalera phase may have resulted, at least in part from a reduction in the power of community level organizations that controlled access to agricultural land. The concentration of people into villages during the Horcones phase may have resulted from a restoration of these powers to hinterland leaders or community level groups.

Access to obsidian was less tightly controlled by the Chiapa de Corzo elite and leaders at second tier centers during the Guanacaste phase than in the Escalera phase. The Chiapa de Corzo elite likely continued to be the primary sponsors of obsidian importation, as indicated by higher per-capita consumption rates at the capital. However there is evidence that obsidian from the SMJ and El Chayal sources were exchanged through different networks. The Guanacaste phase distribution of SMJ in the study area suggests that elite control of access to this obsidian may have been weaker than elite control over access to El Chayal. During the Horcones phase the Chiapa de Corzo elite appear to have exercised stronger control over obsidian access, as reflected in the more restricted distribution of obsidian in the hinterland, and a reduction in the differences between the distribution of SMJ and El Chayal.

Interference by the Guanacaste phase Chiapa de Corzo elite in the movement of people and goods through intersections of prominent trade and communication routes appears to have been minimal. While settlement in the hinterland did favor these intersections, Guanacaste phase second tier centers did not. The Horcones phase elites may have meddled with the movement of people and goods over communication routes to a greater degree than those of previous phases, as the two new Horcones phase second tier centers, El Recuerdo and Tehuacan are both situated in positions adjacent to potentially important nodes on transportation routes from contemporary political centers to Chiapa de Corzo.

Despite evidence from Guanacaste and Horcones phase elite burials at Chiapa de Corzo suggesting a greater emphasis on their role as warriors, the settlement data suggest no increase in the level of inter-polity from the Escalera phase. The Guanacaste phase population was slightly more dispersed than the Escalera phase population, which may reflect the exercise of lower levels of coercion by rulers at Chiapa de Corzo and by hinterland leaders. However, the persistence of an unoccupied buffer zone in the southern margins of the study area in the Guanacaste phase suggests that the threat of violence from interpolity warfare remained a factor in choice of settlement location. Outside of the study area, in between Chiapa de Corzo and Ocozocoautla, the Francesa phase second tier center of San Agustin also appears to have been abandoned (Navarrete 1959), an event that may have marked the formation of a vacant buffer zone in this area as well.

There was a slight increase in the number of people living in the southern outer hinterland during the Horcones phase, which may mark a decrease in the threat of interpolity conflict. On the other hand, the greater population nucleation of the Horcones phase may have been a reaction by common may have been a reaction to the threat of coercive force from Chiapa de Corzo rulers and hinterland leaders against commoners.

Status differentiation between elites and commoners and between rulers and other elites appears to have been more pronounced in the Guanacaste and Horcones phases than in earlier phases. These differences were manifested in the adoption of cut-stone and plastered architecture by elites, which, in addition to producing visually distinctive structures, demanded greater inputs of labor and a greater degree of specialization than earlier architectural techniques. During the Horcones phase the construction of a palace marks the development of more pronounced social differentiation between rulers and lower tier elites. Elite burial practices also appear to have become less accessible and more spatially segregated in the Guanacaste and Horcones phases than in the Francesa phase. This change in access is manifested in use of the Mound 1 plaza, which shifted in use from a Francesa phase cemetery to an elite residential/civic-ceremonial zone. The Guanacaste and Horcones phase reductions in the population of Chiapa de Corzo may also reflect the imposition of policies that made Chiapa de Corzo a more elite residential settlement as a whole than in previous phases.

Feasting and food serving practices at Chiapa de Corzo during the Guanacaste phase appear to have changed from earlier traditions of presenting f food for general consumption on platters, to the service of food in individual portions. Leaders in Guanacaste phase second tier centers appear to have been more conservative than the population as a whole, for while they adopted Sierra Red vessels, they tended to utilize vessels that were similar in size to the serving vessels of the Escalera and Francesa phases. This trend appears to have changed during the Horcones phase, where leaders at second tier centers utilized Sierra Red vessels that conformed more closely in size to those at lower tier settlements. The Horcones phase Sierra Red serving vessels utilized at Chiapa de Corzo were larger than those of the hinterland. The increase in serving vessel size at Chiapa de Corzo may reflect either the service of larger portions at Chiapa de Corzo feasts, or the modification of Maya serving traditions at Chiapa de Corzo with a return to service from platters.

The change in food serving practices was accompanied by evidence for the development of a more restricted setting for feasts at Chiapa de Corzo, in the establishment of the Mound 1 plaza as a civic-ceremonial zone. The establishment of this plaza as a royal courtyard, at least by the Horcones phase would suggest that this area was a more restricted civic-ceremonial zone than the earlier northern complex, and feasts held in this area may have been more exclusive, targeting primarily elites to the exclusion of commoners. However, the continued expansion and modification of structures in the older northern part of the civic-ceremonial zone suggests that ceremonies and feasts that were open to commoners did not end with the establishment of a more exclusive civic-ceremonial area.

While the Guanacaste phase adoption of Sierra Red serving vessels by hinterland leaders (and the population in general) suggests a degree of affiliation with leaders at Chiapa de Corzo, the lower frequency of decorated Sierra Red vessels, and adherence to earlier Zoque serving conventions at second tier centers suggests that the affiliation of hinterland leaders was weaker during the Guanacaste phase than in the Escalera phase. Sierra Red ceramics continued to be simpler in form at second tier center during the Horcones phase, but begin to conform more closely with the sizes of Lowland Maya serving vessels. A stronger affiliation of hinterland leaders with the Chiapa de Corzo elite during the Horcones phase is suggested by the style of architecture at the two new second tier centers that emerged during this phase.

With respect to control over public ceremony and religion, the continued expansion and elaboration of the northern civic-ceremonial complex at Chiapa de Corzo during the Guanacaste and Horcones phases suggests that there was continuity in the structure of religious ceremonies at the site. However, the construction of a new civic ceremonial zone to the south of the E-group, with a layout similar to contemporary civic ceremonial zones in the Maya Lowlands, suggests that Maya religious precepts may have been adopted by the Chiapa de Corzo elite. As the precinct was more bounded by architecture, and shielded from the line of sight from the main part of the Chiapa de Corzo settlement, religious ceremonies that took place within this complex may have been less accessible to commoners than those that took place in the northern complex. Thus, it is possible that traditional Zoque religious practices persisted at Chiapa de Corzo alongside the novel Maya practices of the ruling elite.

The adoption of two-room temples in this southern civic-ceremonial zone also suggests a greater degree of specialization in religious practices, possibly involving the development of a full-time priesthood. At least in the Guanacaste phase, however, the two-room temple structure was not the only form of temple at Chiapa de Corzo, as the Mound 32 temple had three rooms, each of which faced directly onto the platform. This contrast suggests that a variety of levels of religious specialization existed at Chiapa de Corzo during these phases.

Within the hinterland there is little evidence for religious activity, and while household scale rituals were undoubtedly present the data from this study are not suited to evaluating what these rituals were like, nor of how they changed from earlier phases. Hinterland architecture suggests that, as with the Escalera phase, there was little replication of settings for ceremonies performed at Chiapa de Corzo during the Guanacaste and Horcones phases. A possible exception is found in the layout of Ribera Amatal mounds, which closely correspond to a minor mound group at Chiapa de Corzo.

These data suggest minimal interference or sponsorship by Chiapa de Corzo rulers in the day-to-day religious life of hinterland communities in the Guanacaste and Horcones phases.

On the whole, the shift from the Escalera and Francesa phase to the Guanacaste phase suggests changes in variety of strategies employed by the Chiapa de Corzo rulers and by hinterland leaders. Through these phases the political hierarchy in the hinterland appears to have been relatively unstable, an instability that may have been caused by suppression of the power of hinterland leaders by Chiapa de Corzo rulers, or by conflicts within or between hinterland communities. While Chiapa de Corzo rulers appear to have maintained control over access to prime agricultural lands adjacent to the capital, their control over access to other limited resources, such as obsidian appears to have weakened in the Guanacaste phase. Hinterland leaders also appear to have been less able to attract followers in the Guanacaste phase compared to the Escalera and Francesa phases.

Despite these lines of evidence for a reduction in the power of Guanacaste phase elites over actions of the hinterland population during the Guanacaste phase, the divide between elites and commoners at Chiapa de Corzo appears to have grown wider. Elites appear to have adopted foreign religious practices, and constructed more restricted access settings for the ceremonies that accompanied these practices.

The Guanacaste to Horcones phase transition appears to have been much more politically stable. Chiapa de Corzo rulers appear to have reasserted control over access to obsidian. There was much greater stability in the location of villages, and leaders at these villages were better able to attract followers into their settlements. The emergence of two new second tier centers with architecture similar to that of Chiapa de Corzo suggests that some hinterland leaders were directly affiliated with the Chiapa de Corzo rulership. Within Chiapa de Corzo itself, there was continued elaboration of status differentiation, with the construction of the Mound 5 palace further distinguishing the ruling elite from second tier elites and commoners.

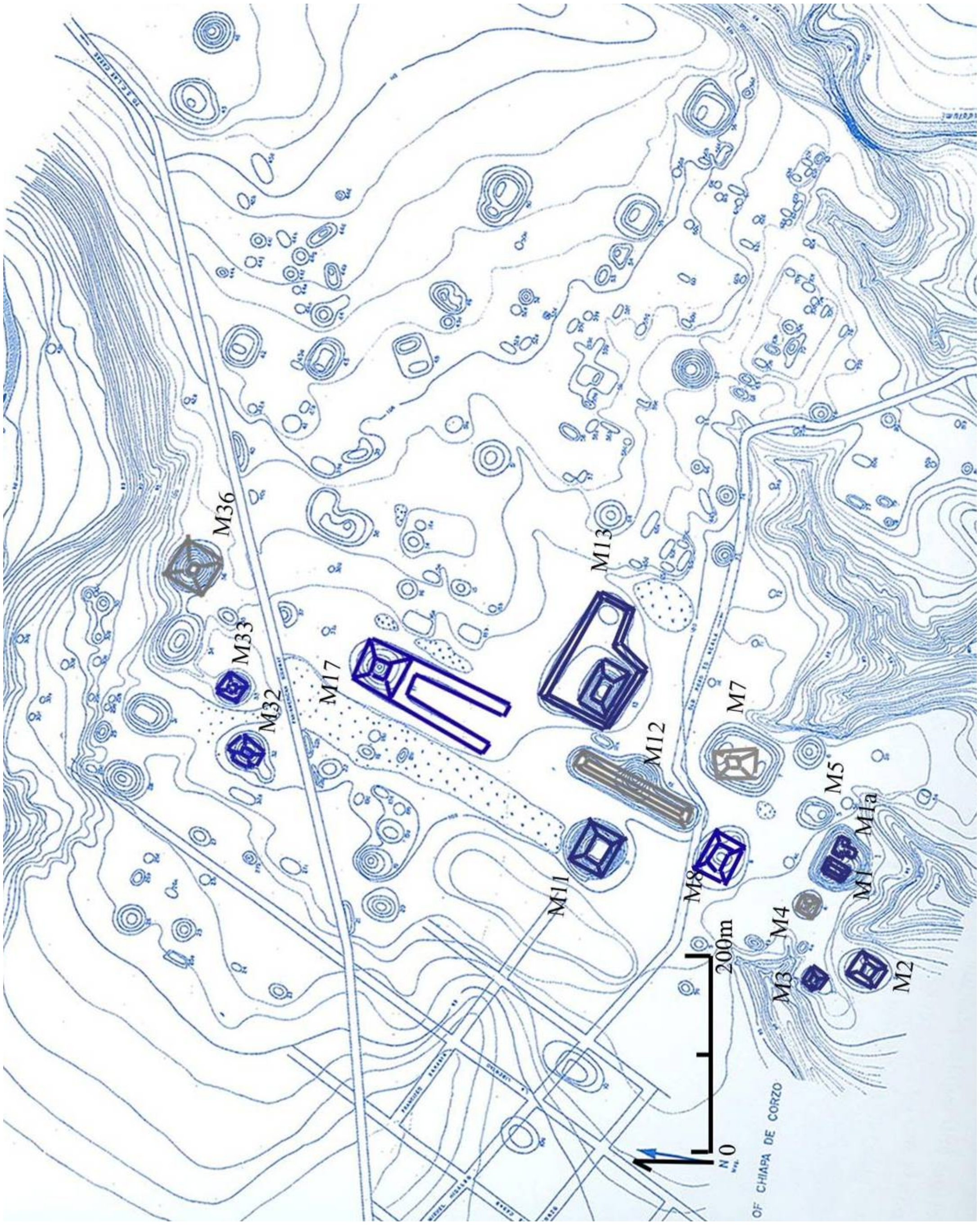

Figure 5.17 Chiapa de Corzo with Guanacaste phase constructions outlined in dark blue, pre-existing unmodified structures outlined in gray (after Clark 2001).

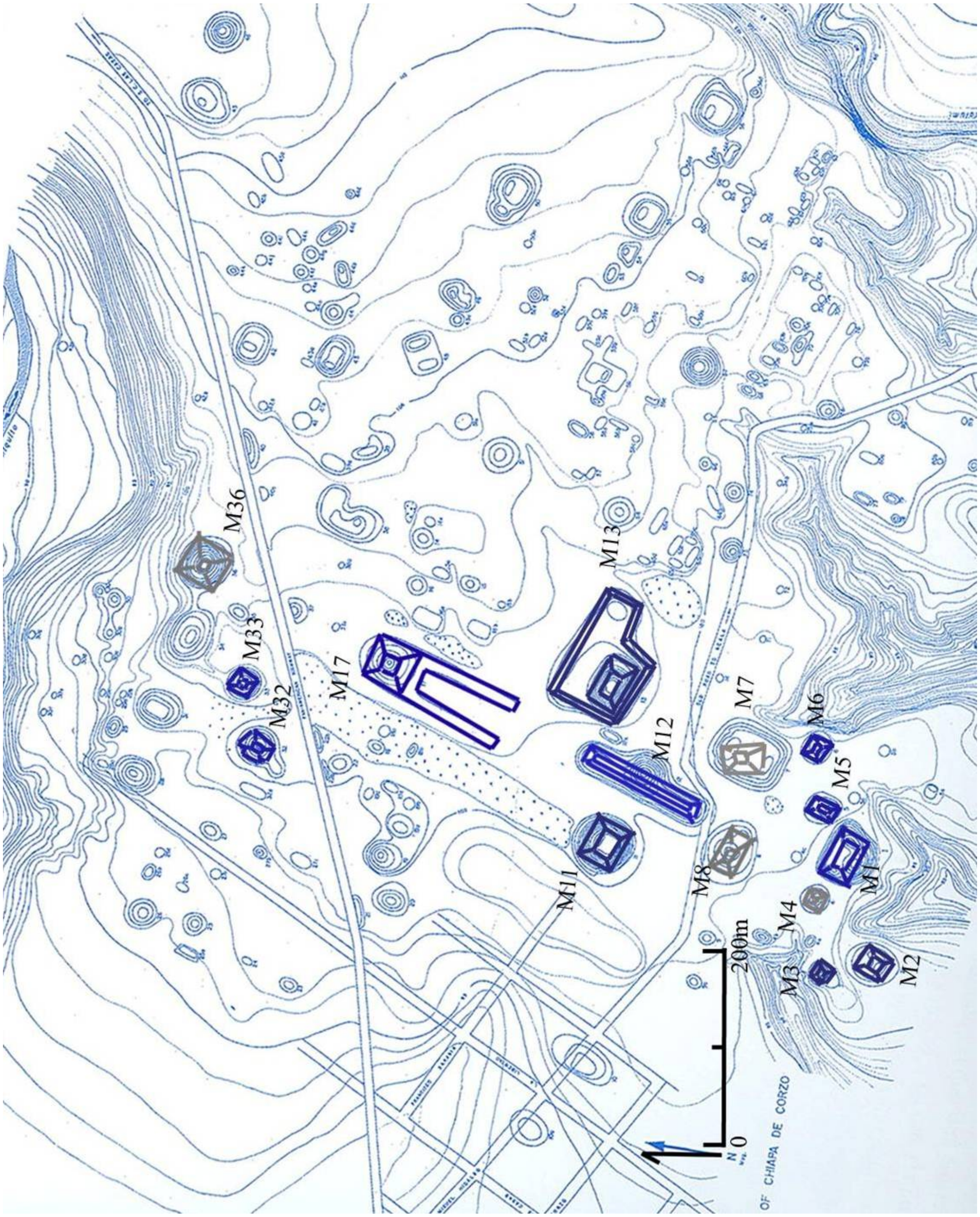

Figure 5.18 Chiapa de Corzo with Horcones phase constructions outlined in dark blue, pre-existing unmodified structures outlined in gray.

6. SUMMARY AND CONCLUSIONS

The goal of this study has been to provide an overview of stability and change in the strategies utilized by rulers, elites and hinterland leaders from the dawn of the Chiapa de Corzo polity in the Early to Middle Formative Jobo to Dili phase transition, up to the apparent overthrow of a ruling lineage at the end of the Late Formative Horcones phase[12]. In this chapter I compare how rulers, elites, and hinterland leaders worked with these eight strategic fields in each of the five phases considered in chapters three through five. Through this comparison, I provide an overview of changes in the interaction between rulers, lower tier elites, hinterland leaders, and commoners in each phase. Finally, I offer some general interpretations about what these changes tell us about Chiapa de Corzo political trajectory.

A concise summary of the evolution of the eight political strategies utilized by rulers at Chiapa de Corzo, and of the conditions of population distribution is presented in Table 6.1. This table demonstrates that the trajectory of socio-political evolution at Chiapa de Corzo when evaluated in terms of political strategies does not proceed neatly in terms of a generalized peaks and valleys model. Political organization does appear to become more complex over time, but this analysis of five phases of the Chiapa de Corzo

[12] The Horcones phase is by no means the end of the Chiapa de Corzo polity, as construction activity at the capital accelerated during the Istmo phase, with reconstruction and augmentation of the Mound 5 palace, continued elaboration of the Mound 1 platform, greater use of two-room temples, and continued construction of many of the mounds in the northern civic-ceremonial zone.

trajectory reveals some interesting variation in the ways that governance within the polity evolved. The strategies utilized by rulers appear to have evolved in jumps and starts, with some strategies generally considered to be associated with higher degrees of political complexity emerging at the same time that strategies associated with political integration appear to have diminished.

Table 6.1 Political Strategies at Chiapa de Corzo

Phases	Population nucleation in hinterland	Nucleation at CdC	Projection of political power into hinterland	Power of hinterland leaders
Horcones	high	med-low	Direct and indirect, affiliation of hinterland leaders with rulers, increase in status differences between hinterland leaders and subjects	Medium-to-low
Guanacaste	med	med	Direct and indirect, affiliation of hinterland leaders with rulers, possible reduction of power of hinterland leaders except at R. Amatal	Medium-to low
Escalera	med	high	Direct and indirect, affiliation of rural leaders with rulers, increase in power of rural leaders	Medium-to low
Dili	low	high	Direct, probably weak. Rural leaders mostly not associated with Chiapa de Corzo elite.	Low
Jobo	high	n/a	n/a	Medium-to low
Strategies	**Elite control over labor**	**Centralized control over access to Lands**	**Control over access to prestige goods**	**Warfare and violence**
Horcones	Med at CdC. Med to Low in hinterland.	Possible attached agricultural production by CdC over its district lands. Community level control in hinterland	Reassertion of elite control over obsidian access	Possible increase in frequency or intensity of interpolity warfare, Less use of force by CdC rulers against hinterland leaders, greater use of coercion against commoners in hinterland.
Guanacaste	Med at CdC Med low to low in hinterland	Possible attached agricultural production by CdC over its district lands. Community level control in hinterland	Development of two networks of obsidian access for SMJ and El Chayal. El Chayal controlled by CdC elite, SMJ access not monopolized by CdC elite or	Persistence of interpolity warfare, continued restructuring of hinterland political hierarchy, minimal use of coercion to resettle commoners

			hinterland leaders.	
Escalera	Med Low at CdC. Low in Hinterland	Direct control by CdC over acess to its district lands. Community level control in hinterland	Importation of obsidian controlled by CdC elites, access controlled by CdC elites and leaders at second tier centers	Intensification of inter-polity warfare- Forced restructuring of hinterland political hierarchy
Dili	Low at CdC. V. low in hinterland.	No centralized control over access to lands	Control by CdC rulers- not distributed through hinterland leaders	Territorial pacification(?), possibly accompanied by the practice of inter-elite warfare
Jobo	n/a	community level control	Minimal	Possible small scale inter-village raiding
Strategies	**Elite political identity**	**Feasting**	**Political affiliation with CdC among hinterland populations**	**Control over ritual and religion**
Horcones	Greater status differentiation between rulers and second tier elites.	Both restricted and communal feasts more prevalent at CdC than at second tier centers. Feasts at CdC larger scale or more lavish than feasts at second tier centers	Increased affiliation of hinterland leaders with CdC	Elite controlled reinforcement of divide between elite and commoner stages for public ceremonies.
Guanacaste	Status differentiation stronger than in Escalera phase	More restricted feasts at CdC, persistence of earlier serving practices at second tier political centers	Affiliation of hinterland leaders with CdC weaker than Escalera phase	Elite controlled possible development of separate elite and commoner public ceremonies.
Escalera	Status differentiation based on participation in emergent western Mesoamerican ceremonial tradition-Greater divide between elites and commoner	Larger scale and possible more frequent at CdC than hinterland sites	Stronger than Dili phase	Elite controlled large scale religion, incorporates large segments of population, more central and permanent association of elites with supernatural
Dili	Status differentiation based on participation in emergent western Mesoamerican ceremonial tradition	Not much different between feasts at center and hinterland sites	Minimal and patchy	Elite controlled, incorporates large segments of population
Jobo	Absent	n/a	n/a	n/a

6.1 THE EVOLUTION OF POLITICAL STRATEGIES AT CHIAPA DE CORZO

6.1.1 Settlement hierarchy and political hierarchy

The Dili phase foundation of Chiapa de Corzo as a large population center was accompanied by a reduction in the size of hinterland villages and the dispersal of population in the hinterland. Contrary to earlier speculations of the rise of Chiapa de Corzo as a gradual phenomenon (Marcus and Flannery 1996:194), the survey data suggest that this population center grew relatively rapidly during the 250 years of the Dili phase, drawing population out of earlier hinterland villages. The site of Chiapa de Corzo was preceded only by a pair of Jobo phase hamlets. In this sense the foundation of Chiapa de Corzo bears greater similarity to the later foundation of Monte Alban in the Valley of Oaxaca, than to the slow growth of its contemporary, San Jose Mogote.

The reduction in size of villages and the dispersal of the hinterland population from the Jobo to the Dili phase suggests that the authority of hinterland leaders was reduced from the Jobo phase. Some functions of community integration and conflict mediation that had been served by hinterland leaders or local community organizations may have been taken over by the emergent Chiapa de Corzo rulers. The survey data suggest the presence of a two tiered political hierarchy, with Chiapa de Corzo at the top, and four small and architecturally modest second tier centers at the bottom. Leaders at second tier centers were not strongly distinguished from followers and do not appear to have had the authority to mobilize labor much beyond the level of their own extended households or kin groups.

The alignment of architecture at only one of the four second tier centers, a hamlet, conforms to that of Chiapa de Corzo. This lack of conformity suggests that to the extent that hinterland leaders maintained authority over their local districts, this authority was not strongly backed by affiliation with the Chiapa de Corzo rulers. While the authority of hinterland leaders appears to have decreased in terms of the ability to attract followers, and possibly with respect to functions involving control over access to agricultural land and warfare, in other respects hinterland communities and the positions of leadership within these communities appear to have maintained a high degree of autonomy through the Dili phase.

During the Escalera phase the authority of hinterland leaders appears to have increased, reflected in the greater nucleation of the hinterland population into villages, and a greater amount of labor investment in elite residential/civic-ceremonial architecture. Two of the four second tier political centers had architecture that conformed to the dominant orientation at Chiapa de Corzo, supporting the notion that more hinterland leaders were affiliated with the Chiapa de Corzo elite. At one of these second tier centers the mound group strongly resembles a minor mound group at Chiapa de Corzo, which suggests that leaders at this site were connected to a lineage from the capital.

The labor estimates for architecture at second tier political centers suggest the development of a three tiered political hierarchy during the Escalera phase, with Chiapa de Corzo at the top, Ribera Amatal representing the second tier, and three other settlements with labor investments comparable to the second tier centers of the Dili phase. There is a slightly closer correspondence of the political hierarchy to the settlement hierarchy during the Escalera phase; Ribera Amatal had roughly twice the population of the next largest village and four times the population of the next largest political center. Only one of the four hinterland political centers had a hamlet sized population (although this center, San Isidro/Cupía, had the second largest labor investment in architecture).

None of the Dili phase second tier centers were occupied in the Escalera phase, nor did any of the Dili phase hinterland villages maintain populations over 100 into the Escalera phase. The high degree of instability in the location of villages in the transition from the Dili to Escalera phase relative to the Jobo to Dili transition suggests that the Chiapa de Corzo rulers were interfering with political development in the hinterland. This notion finds further support in the increase in the number of second tier centers with architectural alignments that conform to that of Chiapa de Corzo, suggesting that more hinterland leaders were directly affiliated with the Chiapa de Corzo elite in the Escalera phase than in the Dili phase.

The Guanacaste phase, starting some 200 years after the end of the Escalera phase, demonstrates marked changes both between the Escalera and its preceding Francesa phase. There was a relatively high degree of instability in the persistence of villages, although less so than in the Dili to Escalera transition, with three of the ten Francesa phase villages persisting into the Guanacaste phase. The population was more dispersed than in the Escalera phase, suggesting a reduction in the ability of hinterland leaders to attract followers into their settlements.

All of the four hinterland political centers were carryovers from the Francesa phase, and all but one of these settlements, Ribera Amatal, lost population in the Guanacaste phase. The general political structure in the hinterland was similar to that of the Escalera phase with the persistence of a three tiered political hierarchy, but Ribera Amatal is the only hinterland settlement with architecture that conforms to the Chiapa de Corzo alignment. On the whole these data suggest a reduction in the power of most hinterland leaders, with the significant exception of Ribera Amatal.

The Horcones phase marks another change in the structure of the hinterland political hierarchy. There was a return to a more nucleated settlement pattern, with a greater percentage of the population located in villages than any previous phase after the foundation of Chiapa de Corzo. Despite this increase in nucleation the population of Chiapa de Corzo itself declined. There was a much greater degree of stability in the location of villages than in the Dili to Escalera or Francesa to Guanacaste phase transitions, with five of the eight Guanacaste phase villages maintaining populations over 100 into the Horcones phase, and none of the eight fully abandoned.

One Guanacaste phase third tier political center was abandoned, and two new third tier centers were founded in the Horcones phase. Each of the two new third tier centers had larger scale architecture than the earlier third tier settlements. One of these, El Recuerdo shared the Chiapa de Corzo orientation, the other, Tehuacan, did not, but did share the cut-stone and plaster finished architectural style of elite Chiapa de Corzo architecture from this phase. These lines of evidence suggest the Horcones phase emergence of a more powerful class of leaders at the third tier of the political hierarchy, and a tighter integration of the lower levels of the political hierarchy with the Chiapa de Corzo rulers.

6.1.2 Elite Control over Labor

The notion that social differentiation between elites and commoners during the Dili phase was not strongly pronounced is supported by the relatively modest scale of labor investment in the first stage of this civic-ceremonial precinct relative to subsequent construction, and by the relatively minor investment of labor into the elite residential platform compared to that invested in public architecture.

The greater Escalera labor investment in elite residential architecture vs. public architecture within the civic-ceremonial zone suggests that the status divide between elites and commoners increased during this phase. During the Dili phase 22%, or less, of the labor was invested in elite residential constructions, compared to 40% of the Escalera phase labor.

The adoption of cut-stone and plaster faced architecture at Chiapa de Corzo during the Guanacaste and Horcones phases suggests a further expansion of the power of elites and the distinction between elites and commoners. This cut-stone architecture, in addition to being visually distinctive from the clay platforms characteristic of earlier phases, also required greater inputs of labor for construction and maintenance, as well as higher degrees of craft specialization. The presence of a cut-stone platform at the hinterland center of Tehuacan suggests that status distinctions between elites and commoners were also increased within the hinterland.

6.1.3 Control over Access to Agricultural Lands

An important manifestation of power in early political organizations is control over access to agricultural lands. During the late Early Formative Jobo phase agriculture may not have been a central component of the subsistence base (Arnold 2000; Rust and Leyden 1994) but nonetheless the high degree of nucleation suggests that community level control over access to lands was a central feature of political organization. This Jobo phase nucleation may have been a strategy used by people to defend hunting and fishing ranges as well as agricultural land from encroachment by neighboring communities. The dispersal of population noted in the Dili phase suggests that access to agricultural lands was managed at the individual and household level, and the community level organizations of Jobo phase became less important.

In the Escalera phase settlement disappeared from the prime agricultural lands directly below Chiapa de Corzo, suggesting that rulers began to exercise control over the use rights to this zone, and redefined it as an agricultural reserve. This vacant agricultural reserve persisted through the Guanacaste and Horcones phases, with the difference that a small village emerged adjacent to the prime agricultural lands. Population declined at Chiapa de Corzo in both of these phases, despite overall growth in the study area. Correspondingly, the individuals farming this agricultural reserve may now have been residing outside of the boundaries of the capital.

In the hinterland the Escalera phase increase in population nucleation suggests a greater degree of village level control over access to agricultural land than existed in the Dili phase. Despite a greater overall dispersal of hinterland population in the Guanacaste phase, the population on prime agricultural lands was more nucleated than in the Escalera phase indicating the persistence of village centered control over access to agricultural land. The Horcones phase saw the highest degree of population nucleation within the study area since the Jobo phase, a trend which suggests that leaders or community level organizations were exercising tighter control over access to agricultural lands than in the Guanacaste phase.

6.1.4 Control over Access to Obsidian and Prestige Goods

Very little obsidian was imported during the Jobo phase. The notion that early rulers at Chiapa de Corzo sponsored the importation of this good is supported by the 360% rise from the Jobo phase in the quantity of obsidian found within the study area in the Dili phase. While obsidian importation was likely supported by Chiapa de Corzo elites, they may not have maintained a monopoly over access to this material, as the two hinterland villages with obsidian had higher per-capita consumption rates than Chiapa de Corzo. Nonetheless, the hinterland population does not appear to have accessed obsidian through second tier leaders as obsidian is no more frequent at villages or second tier centers than at hamlets in the study area. Obsidian appears to have become more important in general during the Dili phase, constituting 20% of the lithic assemblage, compared to 15% in the Jobo phase.

The importation of obsidian appears to have grown in the Escalera phase, where the quantity of increased by 26%, constituting 40% of the lithic assemblage. Per-capita obsidian consumption was higher at Chiapa de Corzo than at any hinterland villages, suggesting an increase in the control over access to obsidian by the Chiapa de Corzo elite. Leaders at lower tier political centers appear to have assumed a greater role in controlling access to obsidian than in the Dili phase, as obsidian frequencies at these settlements are higher than at ordinary villages or hamlets.

Obsidian importation continued to grow in the Guanacaste phase, increasing 21% from the Escalera phase and about 3% from the Francesa phase, but its importance as a material relative to chert and quartzite decreased to 30% of the lithic assemblage. During the Horcones phase rates of obsidian importation increased by 5% but the importance of obsidian to other lithics appears to have decreased further, with obsidian constituting 26% of the lithic assemblage.

While Chiapa de Corzo elites continued to sponsor the importation of both SMJ and El Chayal during the Guanacaste phase, as suggested by higher per-capita consumption rates at Chiapa de Corzo relative to the hinterland for obsidian from both sources, the distribution of SMJ suggests that the hinterland population may have had accessed this material through a village without higher level political functions. Control over access to El Chayal on the other hand, appears to have remained predominantly in the hands of the Chiapa de Corzo elite.

This pattern did not continue into the Horcones phase when rulers appear to have reasserted control over access to both sources of obsidian. Importation of SMJ declined by about 16% from the Guanacaste phase, while El Chayal imports increased by 18%. There is much less variation in the distribution of obsidian from these two sources in the Horcones phase compared to the Guanacaste, and obsidian is more scarce in the hinterland than in the Guanacaste phase. Higher obsidian values at lower tier political centers in the Horcones phase suggest that access to obsidian in the hinterland was also controlled by lower tier political leaders.

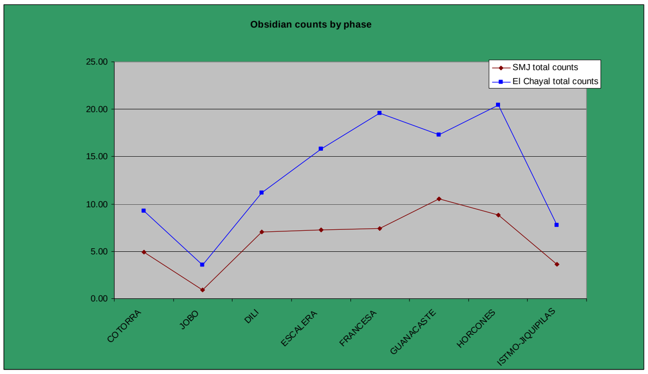

Figure 6.1 Phase by phase counts of SMJ and El Chayal

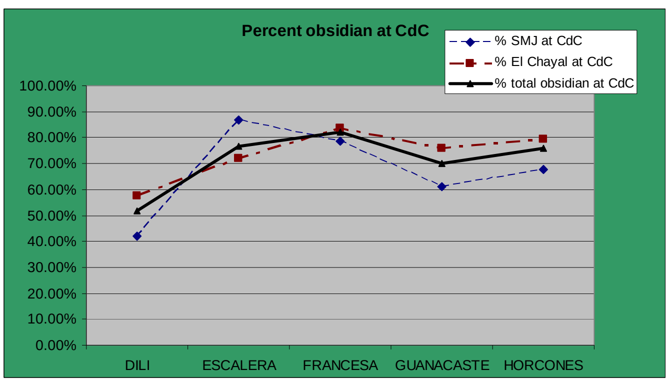

Figure 6.2 Percent obsidian at Chiapa de Corzo.

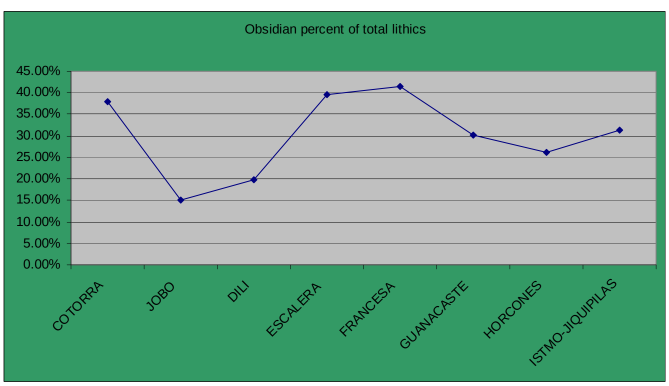

Figure 6.3 Obsidian as percent of total lithic assemblage (including chert and quartzite).

6.1.5 Control over Routes of Trade and Communication

As Lowe (1962:1) and others have pointed out, Chiapa de Corzo was located adjacent to a relatively easily forded section of the Grijalva River, near its navigable terminus. Historically this location was an important nexus of routes of trade and communication (Navarrete 1978: 85), and it is likely that this position figured prominently in the emergence and persistence of Chiapa de Corzo as a political center. The tradition of mock naval combat, still part of the annual January festival, was observed by Thomas Gage as early as 1624 (Navarrete 1966:21). Gage attributed this activity to training by the Spaniards, but it is possible that naval (canoe based) control over the movement of traffic through this confluence was an important source of political power throughout the Chiapa de Corzo trajectory. Further into the hinterland the evidence for control over the movement of people through communication routes is less strong but suggestive of change over time.

There is some evidence that during the Dili phase leaders affiliated with Chiapa de Corzo at the second tier centers of America Libre South were controlling the movement of goods and people through a communication route in the southern portion of the survey area. Through the Escalera and Guanacaste phases there is no evidence of elite control over routes of trade and communication in the hinterland. In the Horcones phase, the third tier center of Tehuacan may have emerged where it did, at least in part, to control traffic moving along the Suchiapa River into the Santo Domingo, and from political centers in the Northern Chiapas Pacific sub-region toward Chiapa de Corzo. Likewise, the Horcones phase third tier center of El Recuerdo may have emerged to control traffic moving down the Grijalva River to Chiapa de Corzo from Santa Cruz and other political centers upstream.

6.1.6 The Use of Warfare and Coercion

The transition from the Jobo to the Dili phase appears to be characterized by a relative degree of pacification. I interpret the high concentration of the Jobo phase population in villages as a response to conditions of relatively frequent inter-community raiding. The dispersal of population noted in the Dili phase suggests that the risk from intercommunity violence decreased with the establishment of Chiapa de Corzo. This dispersal, combined with the relative stability in the location of villages also suggests that the early rulers of Chiapa de Corzo did not rely heavily on the threat of coercive force in establishing or maintaining their power over the hinterland. There is also little evidence for the formation of vacant buffer zones on the frontiers of the Dili phase polity, with evidence for continued occupation in the southeastern margins of the study area and in the frontier zone between Chiapa de Corzo and Mirador (outside of the study area). Correspondingly, to the extent that the Dili phase rulers of Chiapa de Corzo were engaged in inter-polity warfare, the hinterland population does not appear to have been a target of this form of violence.

During the Escalera phase the notion that inter-polity conflict had a greater effect on hinterland populations is supported in evidence for the formation of vacant buffer zones in the outer hinterland. There was also greater nucleation of population in the Escalera phase, and many of the Dili phase settlements on routes of transportation between Chiapa de Corzo and contemporary political centers were abandoned or suffered population losses. Provisional support for the idea that Chiapa de Corzo rulers increased there use of coercive force against the subject population in the Escalera phase lies in the relatively high degree of instability in the location of villages and second tier political centers in the transition from the Dili phase; four of the eleven Dili phase villages were abandoned and the remainder were reduced to hamlets, and none of the Dili phase second tier political centers survived into the Escalera phase. These changes may have resulted from Chiapa de Corzo rulers disrupting the power of emergent hinterland leaders through the destruction of villages or forced resettlement through other threats of coercive force.

The Guanacaste and Horcones phases both have direct evidence for the presence of inter-polity warfare in the form of destruction of elite residences or temples by fire at Chiapa de Corzo. Within the hinterland the evidence for inter-polity warfare is less direct. Settlement continued to favor agriculturally productive areas rather than defensible locations in both phases. On the other hand the vacant buffer zones of the Escalera phase persisted through the Guanacaste phase, and to a lesser extent in the Horcones phase[13]. The Guanacaste phase population was more dispersed than either the Escalera or Horcones phases, but the persistence of the vacant buffer zone through this phase suggests a decrease in the threat of coercive force from the Chiapa de Corzo elite rather than a change in severity of external threats. Nonetheless, there was a high degree of instability in the location of villages from the Francesa to Guanacaste phase transition,

[13] The vacant buffer zone between Chiapa de Corzo and Ocozocoautla disappeared during the Francesa phase, with the establishment of San Agustin , a second tier center with architecture that adhered to the Chiapa de Corzo orientation (Navarrete 1959). The conformance of architecture at this site to the Chiapa de Corzo canons suggests that its leaders may have been subordinate to Chiapa de Corzo. Settlement in the outer hinterland of the study area also increased.

suggesting that rulers at Chiapa de Corzo may have continued to meddle in the political organization of the hinterland.

Population in the outer hinterland increased slightly in the Horcones phase, which suggests that the intensity of inter-polity warfare may have decreased from the Guanacaste phase. There was also a great degree of stability in the location of villages in the transition from the Guanacaste phase, which in contrast to the earlier transitions, suggests that Chiapa de Corzo rulers were no longer disrupting political organization in the hinterland through the application of coercive force against existing second tier political centers. The Horcones phase saw the highest degree of population nucleation since the Jobo phase, which may have been a response to a higher risk of violence, but the increase in population in the outer hinterland supports the notion that this threat did not come from outside polities, but from policies of forced resettlement implemented by the Chiapa de Corzo elite.

6.1.7 Elite Political Identity

A close look at the excavation data from Chiapa de Corzo suggests that an elite political identity developed as early as the Dili phase. There is, however, very limited evidence for pronounced status differentiation during the Dili phase at Chiapa de Corzo, but recent excavations at the site uncovered one richly furnished burial dating to Dili or early Escalera phase, which likely represents a member of the elite (Bachand et al 2008:113). Earlier excavations at Chiapa de Corzo provide evidence that the layout of the civic ceremonial precinct was established during the Dili phase in a style that closely paralleled the layout of the Olmec site of La Venta (Clark and Hansen 2001). Despite the attribution of most of the constructions within the civic-ceremonial precinct to the Escalera phase and later (Cheetham and Lee 2004), I contend that a close examination of the excavation reports from Mounds 12 and 13 (Mason 1960a, b; Hicks and Rozaire 1960) supports the notion that their construction was begun during the Dili phase.

The construction of this civic-ceremonial precinct closely followed the layout of the La Venta civic-ceremonial zone, and at least one Dili phase mound at Chiapa de Corzo, Mound 36, shared the architectural style of contemporary constructions at La Venta (Clark and Hansen 2001:7). These data support the idea that a group of people at Chiapa de Corzo distinguished itself from others through participation in a broad network of cultural and ritual interaction which included the elites of the Gulf Coast center of La Venta. Part of this civic-ceremonial layout included what appears to have been a residential platform outlining the eastern margin of the civic-ceremonial zone (Clark and Hansen 2001:7).

The richly furnished Escalera phase Mound 17 burial of a female, accompanied by a number of vessels likely imported from La Venta, contrasts strongly with the more modest and local burial goods found in contemporary elite residential and non-elite contexts at Chiapa de Corzo, suggesting an increase in the status distinctions between royalty and lower ranked elites. Within the hinterland we have provisional evidence for the development of increasingly pronounced status differentiation between leaders and followers in the relatively large scale of architecture at the second tier political center of Ribera Amatal during the Escalera phase.

The status distinctions between rulers, lower ranking elites and commoners appear to have diminished somewhat in the Francesa phase, where richly furnished burials were found alongside undistinguished burials in the Mound 1 plaza cemetery. This trend appears to have changed in the Guanacaste and Horcones phases, when rulers appear to have reinforced distinctions between royalty and lower tier elite in burial practices. The presumably royal burials from the temple platform of Mound 1 (Lowe and Agrinier 1960) were generally more richly furnished than burials from the elite residential platform of Mound 3 (Tucker 1970), or the smaller temple platform of Mound 32 (Martinez and Lowe n.d.). Two of the Mound 1 burials (one from each phase) were also accompanied by large numbers of imported vessels (Lowe and Agrinier 1960). Imported vessels do not occur in burials known from other elite contexts of the Guanacaste and Horcones phases (Martinez and Lowe n.d.; Tucker 1970).

6.1.7.1 Political Identity and Feasting : Only weak differences are suggested by the survey data in the size or frequency of feasts between Chiapa de Corzo and hinterland settlements during the Dili phase. However there do appear to be differences in the nature of feasting vessels at Chiapa de Corzo and second tier centers. The double-line break motif occurs more frequently (but not universally) on fancy serving vessels at second tier centers than at Chiapa de Corzo. I suggest that the use of this motif may reflect participation in an ideology that legitimated status differences between elites and commoners. Correspondingly, the absence of this motif on fancy serving vessels at sites in the Nucatilí and Betania districts, along the Grijalva to the east of Chiapa de Corzo, may indicate that people in these areas were not fully incorporated into the polity. In the

Escalera phase the notion that larger scale feasts were held at Chiapa de Corzo than at hinterland settlements is supported by the wider mean diameter of the dominant fancy serving vessel of this phase at Chiapa de Corzo, Nicapa Resist. Nicapa Resist vessels were also more frequent at Chiapa de Corzo and at lower tier political centers, suggesting that rulers and hinterland leaders hosted larger or more frequent feasts than individuals on the bottom ranks of the political hierarchy. This suggests a change from the Dili phase, where comparisons of the size and frequency of fancy serving vessels between Chiapa de Corzo and the hinterland do not support the idea that there was much difference in the scale or frequency of feasts between Chiapa de Corzo, lower tier political centers, and ordinary settlements.

The Guanacaste and Horcones phases are marked by the adoption of Lowland Maya style Sierra Red fancy serving vessels, both at Chiapa de Corzo and at hinterland sites. In the Guanacaste phase Sierra Red serving vessels at Chiapa de Corzo and most hinterland sites are roughly equivalent in size to those of the Maya Lowlands, about 25.6 cm in diameter, a size well suited to the service of individual portions (LeCount 2001:945). This decrease in serving vessels diameter suggests a change in food serving practices from those utilizing the Nicapa serving vessels of the Escalera phase, which had a mean diameter of 32.6, better suited to use as platters. This change was not universal, as leaders at lower tier center continued to use Sierra Red serving vessels that were closer in diameter to the larger serving vessels of the Escalera and Francesa phases (29.5 compared to 24.8 at Chiapa de Corzo). This difference suggests that new serving practices were adapted more rapidly by the Chiapa de Corzo elite than by hinterland leaders, who may have been more resistant to changing their food serving traditions.

This contrast is also noted in the distribution of flanged decoration on Sierra Red serving vessels, which was significantly less common at lower tier political centers than at Chiapa de Corzo. Flanged Sierra Red was also more frequent at hamlets than at either second tier centers or villages. This contrast may mark the adherence of hinterland leaders to more conservative Zoque ceramic forms despite the adoption of Sierra Red ceramic styles, while ordinary commoners more readily adopted the forms utilized by individuals at Chiapa de Corzo.

During the Horcones phase the Guanacaste trend toward higher frequencies of flanged Sierra Red vessels at Chiapa de Corzo and hamlets continued but was less pronounced. The diameters of Sierra Red serving vessels at lower tier political centers also decreased to 24 cm while those at Chiapa de Corzo increased to a (trimmed) mean of 27.54 cm. The increase in vessel size at Chiapa de Corzo may indicate a return to the use of platters in serving, or the service of larger portions of food. The decrease in vessel size at political centers in the hinterland suggests that serving practices introduced earlier at Chiapa de Corzo were eventually adopted by hinterland leaders.

Within Chiapa de Corzo itself, the construction of a more enclosed civic-ceremonial precinct in the plaza surrounded by the Mound 1 and Mound 5 platforms suggests the introduction of a potentially more exclusive setting for feasts during the Guanacaste and Horcones phases. However, continued expansion and maintenance of the older northern civic-ceremonial zone suggests that at least some aspects of the older more inclusive feasting practices continued at Chiapa de Corzo through these phases.

6.1.8 Control over Public Ceremony and Religion

By the Dili phase, the construction of an expansive civic-ceremonial precinct at Chiapa de Corzo that closely conformed to the layout of the civic-ceremonial precinct at La Venta, as well as numerous other political centers in Chiapas, suggests the adoption of standardized large scale religious practices that were shared through much of southeastern Mesoamerica. The replication of the 28˚ orientation of the Chiapa de Corzo civic-ceremonial precinct in at least eight contemporary sites in the Chiapas Central Depression suggests the presence of a cosmological template shared throughout much of the Central Depression, although not by Chiapa de Corzo's closest neighbors.

The open layout and large scale of the early civic-ceremonial precinct suggests that it was designed to accommodate large groups of people, likely in processional ceremonies. The association of a large residential platform with this precinct suggests that one group of individuals was more closely involved with the organization and performance of rituals that took place within this precinct than the rest of the population. The sponsorship of the construction of an extensive civic-ceremonial space, and of rituals involving the participation of large groups of people within them, may have been an important source of political power from the inception of Chiapa de Corzo as a large population center.

The extent to which the development of a large scale civic-ceremonial precinct at Chiapa de Corzo affected religious practices in the hinterland is not at all clear, as we have little data on these practices from any of the phases considered in this study. Nonetheless, the scale of the civic-ceremonial precinct at Chiapa de Corzo was much larger than anything that had previously existed in the study area, which suggests that the religious practices that took place at the center complemented rather than replaced the religious practices of individuals in hinterland communities.

Escalera phase rulers at Chiapa de Corzo appear to have elaborated ceremonial practices of the Dili phase. The main plaza area was interrupted by the construction of the Mound 17 platform, which faced onto a plaza or ball-court, which was enclosed by two parallel low platforms extending to the south of the platform. This platform may have supported the royal compound of a female from La Venta (Cheetham and Lee 2004). If this was a royal compound, then the ruling lineage of Chiapa de Corzo now resided in the center of the civic-ceremonial space, possibly situating them in a position of the axis mundi, which would have provided them with a privileged relationship with the different levels of the cosmos (Reilly 1990, 1994:7, 1995:37; Taube 1998: 454).

Ceremonies that took place within the twin platforms of Mound 17 may have been more restricted to the general public than those that took place within the more open Dili plaza, but the space outlined by these platforms could have easily contained the entire population of Chiapa de Corzo plus a substantial number of individuals from the hinterland. Furthermore the platforms were relatively low, suggesting that whatever activities took place in the space they enclosed were open to the view of outsiders.

Rulers in the Guanacaste and Horcones phases made important changes to the structure of the civic-ceremonial precinct at Chiapa de Corzo. The Mound 1 plaza, which during the Francesa phase was a cemetery, evidently utilized by both commoners and elites (Lowe 1964:68), was transformed into an elite-residential and ceremonial space, which while larger than the space outlined by the twin Mound 17 platforms, was more enclosed and less visible from the main body of the Chiapa de Corzo settlement. Textual elements were added to elite architecture during the Horcones phase, and epi-Olmec writing may have been utilized by elites as early as the Francesa phase (Justeson and Perez de Lara 2006).

Two-room temples were constructed on the Mound 1a platform (Agrinier 1975) in the Guanacaste and Horcones phases, suggesting a higher degree of religious specialization than existed in the previous phases (Marcus and Flannery 1996:182). Following Marcus and Flannery (996) this may indicate the establishment of a state religion with full-time attached priests. However, as construction continued in the older, more open civic-ceremonial zone, these changes may not have strongly affected the religious practices of commoners and lower tier elites, and older religious traditions may have persisted alongside a newer state religion in which participation was more exclusive.

6.2 POLITICAL EVOLUTION AT CHIAPA DE CORZO

6.2.1 Dili Phase

These findings provide us with some clues as to why Chiapa de Corzo emerged as a political when it did and where it did. The survey data suggest that the initial development of Chiapa de Corzo was very different from the early political centers of San Jose Mogote, in the Valley of Oaxaca (Blanton et al 1993, 1999; Marcus and Flannery 1996) and La Venta, on the Gulf Coast (Raab et al. 2000; Rust and Sharer

1988), which were founded as clusters of hamlets or small villages in the Early Formative and grew into political centers in the Middle Formative. In contrast, Chiapa de Corzo appeared relatively suddenly as a full blown large village and political center in the early Middle Formative.

What were the factors that led to the formation of Chiapa de Corzo in an area previously occupied by a pair of undistinguished hamlets? The increasingly productive strains of maize developed during the Middle Formative may have provided more favorable conditions for the emergence of a religious and political center in this hot sub-humid zone. The fact that Chiapa de Corzo was founded adjacent to some of the most productive lands in the study area supports the notion that an advantage in agricultural production may have featured prominently in the initial success of this settlement. Nonetheless, control over access to agricultural lands does not seem to have been a prevalent strategy among the early rulers of Chiapa de Corzo, and the potential for the production of greater agricultural surpluses by itself does not offer a convincing explanation for the emergence of this population center.

Dili phase elites at Chiapa de Corzo appear to have sponsored the importation of obsidian, and exercised some control over access to this resource. Control over access to obsidian, and other exotic materials traveling along the same routes of exchange may have afforded these individuals a degree of prestige, but it should be noted that obsidian was a luxury good, as reasonably high quality chert and quartzite are locally available for utilitarian tools. While control over prestige goods may have enhanced the power of early rulers, it seems doubtful that this was an important factor in the emergence of Chiapa de Corzo.

The settlement data do not support the notion that Chiapa de Corzo was founded as a response to external or local threats, as has been suggested for Monte Alban (Marcus and Flannery 1996:146). While a relatively high degree of inter-village conflict may have characterized the Jobo phase, and the emergence of Chiapa de Corzo may have mitigated this conflict, Chiapa de Corzo is not situated in a highly defendable location, nor did it develop from a previously existing village. Furthermore there is no evidence for the use of coercive force, or of an elevated risk of violence to the hinterland population during the Dili phase. The organization of civic-ceremonial and elite residential space from Chiapa de Corzo (a single elite residential structure, and a single large scale civic-ceremonial zone) does not support the notion that it was founded as a confederacy between leaders from earlier villages, which has also been suggested for Monte Alban (Blanton 1978; Blanton et al. 1993).

The location of Chiapa de Corzo on an important crossroad of routes of communication and exchange likely contributed to its success as a political and religious center. But if the location of Chiapa de Corzo was central to its emergence as a political center, why did it not develop earlier? I suggest that the development of Chiapa de Corzo as a political center was closely tied to earlier developments in neighboring sub-regions. The contemporary political centers of Finca Acapulco and San Isidro were both founded earlier than Chiapa de Corzo (Lowe 1999, 2007). The formation of a peer-polity interaction network between these centers likely increased the frequency of people moving through the area immediately surrounding the site of Chiapa de Corzo. I suggest that either a group from one of the local villages, or a group of disaffected elites from San Isidro, Finca Acapulco, or possibly from another more distant center, made the decision to take advantage of this transportation node by constructing a new settlement at this location and expending a good deal of energy in attracting followers from the hinterland. Rather than a political center forming from an already nucleated population, the rapid growth of Chiapa de Corzo can be attributed to its foundation as a political center. The fact that the layout and orientation of Dili phase architecture at Chiapa de Corzo differs from both Finca Acapulco and San Isidro suggests that from its inception, elites at the site were operating independently of these two neighbors, likely drawing legitimacy from an association with elites from the more distant center of La Venta.

The survey data suggest that the Dili phase foundation of Chiapa de Corzo was accompanied by the formation of a two tiered political hierarchy, consisting of Chiapa de Corzo at the top, and four hinterland centers within the study area. The very modest scale of architecture at these centers suggests that hinterland leaders were not strongly distinguished from commoners. Furthermore, the reduction in village size from the Jobo phase suggests that many of the functions that had been served by leaders or communal institutions (e.g. control over trade networks, community defense, religious functions) were relocated to Chiapa de Corzo. Community based institutions that controlled access to agricultural lands in the Jobo phase also appear to have atrophied with the foundation of Chiapa de Corzo.

6.2.2 Escalera Phase

What direction did political evolution take at Chiapa de Corzo, and in what ways did rulers control the hinterland through the next few centuries? Rulers at Chiapa de Corzo appear to have enhanced their status through a hypogamous marriage into a lineage from La Venta during the Escalera phase, and at the same time positioned a new royal residence, the Mound 17 platform in the center of the plaza that had been established in the Dili phase (Cheetham and Lee 2004). The placement of a royal residence in this position suggests that the Chiapa de Corzo rulers portrayed themselves as positioned at the *axis mundi*, thereby assuming the duty and status of privileged intermediaries between the different levels of the cosmos.

The elevated status of rulers is suggested by the much greater investment of labor into residential constructions within the civic ceremonial zone. In absolute terms, the estimated labor costs of Escalera phase residential constructions within the civic-ceremonial zone were over three times that of the total estimated for the Dili phase. While still constituting less than 40% of the labor investment within this zone, the percent of labor invested in residential construction vs. civic construction was more than double that of the Dili phase.

We have provisional evidence for the development of a three tiered political hierarchy and stronger evidence for the development of a four tiered settlement hierarchy during the Escalera phase. Architectural investment at three of the four Escalera phase lower tier centers was three to 14 times that of the largest Dili phase second tier center. The scale of labor investment at these three centers suggests the recruitment of labor beyond the extended households of leaders. This increase in labor investment suggests a general trend towards more powerful hinterland leaders, at least in terms of their ability to mobilize labor.

A higher incidence of politically oriented feasts at Chiapa de Corzo and at second tier centers in the Escalera phase is suggested by greater frequencies of fancy Nicapa Resist serving vessels at these settlements than at settlements on the bottom of the political hierarchy. The smaller size of Nicapa Resist serving vessels at second tier centers relative to Chiapa de Corzo suggests that feasts at second tier centers were of a smaller scale, and possibly more exclusive than those at the capital, involving either the service of individual portions, or service of smaller portions of food than at Chiapa de Corzo. These data do not support the idea that hinterland leaders relied heavily on large scale feasts to attract followers from the commoner population.

Chiapa de Corzo rulers appear to have exercised control over access to agricultural lands immediately adjacent to the settlement, in the form of an agricultural reserve. Within the hinterland the concentration of population into villages and the decrease in the number of hamlets suggests that access to agricultural lands was more centrally controlled than in the Dili phase. Obsidian importation continued to be sponsored by the Chiapa de Corzo elite, but increasingly access was controlled by leaders at some hinterland centers as well as by the Chiapa de Corzo elite. This suggests that Chiapa de Corzo rulers included hinterland leaders in long distance exchange networks, and thereby may have had greater involvement in supporting the authority of these leaders.

The formation of vacant buffer zones in the polity frontiers with other centers suggests that inter-polity warfare may have affected hinterland populations to a greater degree than in the Dili phase. The use of coercive force by rulers in consolidating control over the hinterland population is suggested by the much higher degree of instability in the location of hinterland villages compared to the Jobo to Dili transition, and by the decrease in the frequency of hamlets.

On the whole these changes suggest more pronounced status differences between rulers and subjects, and greater political integration of the hinterland than in the Dili phase. Data from the hinterland provide preliminary support for the notion that rural leaders were more powerful than in the Dili phase. There is also some support for the notion that the power of hinterland leaders was based, at least in part, on their relation to the Chiapa de Corzo ruling elite, rather than exclusively on the attraction of followers through feasts.

6.2.3 Guanacaste and Horcones Phases

During the Guanacaste phase the first signs of state-like institutions appear at Chiapa de Corzo, in the form of a two room temple which may indicate the adoption of full-time religious specialists. The adoption of cut-stone and lime-plaster faced architecture also suggests the presence of more specialized labor than in previous phases, and correspondingly, elites with the capacity of supporting such specialists. The construction of a new, more enclosed elite residential/civic-ceremonial precinct at the southern end of the older civic-ceremonial precinct also suggests that the divide between Chiapa de Corzo rulers and subjects was larger than in previous phases.

Despite these developments, evidence from the hinterland suggests that the Guanacaste phase was not a period of unimpeded consolidation of power and increasing political integration. Guanacaste phase rulers at Chiapa de Corzo continued to exercise control over populations in the immediate hinterland, however data from the hinterland suggest that more distant parts of the hinterland were less integrated into the polity than in the Escalera or Francesa phases.

While there is provisional evidence that the three tiered political hierarchy persisted into the Guanacaste phase, all of the third tier political centers decreased in population, and one was abandoned. Elite control over access to SMJ obsidian (but not El Chayal) appears to have weakened during the Guanacaste phase. Control over the movement of people over communication routes in the hinterland continued to be weak or absent. Inter-polity warfare continued to affect the choice of settlement location as an unoccupied buffer zone persisted in the outer hinterland. The moderate degree of stability in the location of villages and in second tier centers, paired with the greater dispersal of population suggests that Chiapa de Corzo rulers did not rely heavily on coercion in maintaining control over the hinterland during the Guanacaste phase.

These lines of evidence suggest that despite (or perhaps because of) the emergence of new manifestations of rulership, status, and specialization at Chiapa de Corzo, the control of rulers over the hinterland population beyond the area immediately around Chiapa de Corzo may have decreased during the Guanacaste phase. This runs contrary to the expectations of most models of early state formation, which tend to predict that the development of more complex political institutions within a capital will be accompanied by greater control by rulers over the hinterland population (Flannery 1972, Sanders and Price 1968:43; Spencer 1990; Wright 1977). Despite the adoption of state-like institutions at Chiapa de Corzo, Guanacaste phase rulers neglected to implement state-like systems of governance on the hinterland population. I suggest that the adoption of new practices and institutions by Chiapa de Corzo rulers did not mark a new, more efficient form of governance, but was instead an inter-polity strategy of rulers, directed at enhancing the status among other elites and rulers in and around the Chiapas Central Depression.

Nonetheless, the adoption of these practices and the accompanying enhancement of the status of rulers appear to have facilitated the development of a more integrated polity during the Horcones phase. An increase in the status divide between rulers and subjects is attested to for the Horcones phase by the construction of the Mound 5 palace, and continued expansion of the Mound 1 platforms and the temples they supported.

The three tier political hierarchy continued to be present, but with two new third tier centers with architecture that either conformed to the Chiapa de Corzo orientation, or shared the cut-stone and plaster faced elite architectural styles of the capital. The labor investment at architecture at third tier centers also increased from earlier phases, suggesting that leaders on the lower tier of the political hierarchy were more powerful than in earlier phases. Elites reasserted control over access to SMJ obsidian, with access to obsidian from both sources controlled through Chiapa de Corzo and through leaders at second tier centers. The presence of two new third tier centers on key points of trade and communication routes suggests a greater degree of elite control over the movement of people and goods through the hinterland. Some forced resettlement may have taken place, as the dispersed population of the Guanacaste phase was relocated into villages. The notion that this resettlement was directed from the top down rather than a response of hinterland populations to external threats is supported by the Horcones population increase in the outer hinterland, which suggests a d ecrease in the risk of violence from neighboring polities.

In sum, the establishment of Chiapa de Corzo as a political center in the Dili phase was a secondary phenomenon, the product of ambitious individuals taking advantage of the interaction networks that emerged between earlier political centers. Based on the behavior of elites in modern “traditional” societies (e.g. Hayden 2007:247) we have grounds to speculate that the strategic goal of these individuals was not to solve problems that existed in Jobo phase society, but rather to attract followers and increase their status vis-à-vis elites from neighboring centers. Status differences between elites and commoners within Chiapa de Corzo were downplayed, and status differences between hinterland leaders and followers were minimal. As greater opportunities for prestige enhancement emerged at Chiapa de Corzo, hinterland leaders migrated to the capital, and many of the political functions that had been performed by the community organizations of the Jobo phase migrated with them.

The Guanacaste phase adoption of state-like trappings of rulership likewise appears to be a secondary phenomenon, with the Chiapa de Corzo elite adopting practices from the Maya Lowlands, where the site of El Mirador was developing into a powerful capital. Like the Dili phase founders of Chiapa de Corzo, one of the principal goals of Guanacaste phase rulers appears to have been increasing their status vis-à-vis elites in neighboring polities. Unlike the Dili phase elites the Guanacaste phase rulers already had a large population at the capital and did not need to attract great numbers of followers. The strategies employed by these rulers emphasized the status difference and separation between rulers and subjects, with the consequence, intended or unintended, of a population loss at the center, possibly caused by a decrease in the opportunity for advancement among lower tier elites. The power of hinterland leaders to attract followers also appears to have decreased and the political integration of the hinterland weakened.

The strategies employed by Chiapa de Corzo rulers in the Escalera and Horcones phases were also directed, at least in part of enhancing their prestige in the view of elites from other polities. However in contrast to rulers in their immediately preceding phases the Escalera and Horcones phase rulers appear to have placed a stronger emphasis on establishing control over the hinterland population through the development of a political hierarchy. I suggest that in contrast to the trappings of rulership, the strategies employed in increasing the control over the hinterland were essentially local innovations, developed in response to the problems, needs and ambitions of rulers defined by their historical circumstances.

The reader will note that up to this point I have avoided the use of social evolutionary categories such as Service's (1962) seminal bands, tribes, chiefdoms, states. These categories remain useful in cross-cultural comparisons, but they are much more useful if we consider the differences between societies that are placed within these categories. The forms of social organization considered in this study can be placed into tribe (Jobo phase), chiefdom and arguably, state. The distinction between chiefdom and state is not particularly important for the purposes of this study, but for purposes of comparison I offer some observations on how the phases considered in this study fit into social evolutionary taxonomies.

The rulers of the Dili phase appear to have lived in a residence that was qualitatively different than subjects, in the respect that it was located on a platform, and directly associated with an easily accessible civic-ceremonial zone. This platform was modest, both in terms of absolute labor costs, and relative to Dili phase civic-ceremonial constructions. The very limited sample of burials from the Dili phase suggest minimal status distinctions between rulers and commoners. Political power was concentrated at the capital, with hinterland leaders possessing low levels of authority. Status differences between hinterland leaders and followers were minimal. Following these lines of evidence the Dili phase polity fits neatly into the category of chiefdom.

The category of chiefdom fits the Escalera phase polity less neatly. Social stratification, in the sense of rulers residing apart from subjects appears to have developed as early as the Escalera phase. The presence of a lavishly furnished female burial, likely from La Venta suggests the development of a ruling lineage claiming a different line of descent from subjects. Other evidence for Escalera phase institutions characteristic of the state can be found in the development of a three tiered political hierarchy and a four tiered settlement hierarchy (Wright and Johnson 1975). Nonetheless, the data suggest that the lower tier members of the political hierarchy were relatively weak and not all of these leaders were strongly affiliated with the Chiapa de Corzo rulership.

The Guanacaste phase data from excavations at Chiapa de Corzo suggest the development of full time religious specialists associated with an elite residential zone, which was more enclosed than the earlier elite residential and civic-ceremonial zone. The enclosure of this elite residential and civic-ceremonial zone suggests greater separation of elites from commoners than in previous phases. Likewise the burial data suggest greater distinctions between royalty, second tier elites, and commoners than in the previous phase. Nonetheless, the political hierarchy in the hinterland appears to have atrophied during the Guanacaste phase, with a reduction in the population of most second tier centers. Furthermore, elite control over access to one source of obsidian also appears to have decreased in this phase. Both of these factors suggest that the political integration of the hinterland decreased with the initial adoption of state-like institutions.

The construction of a palace during the Horcones phase, frequently taken as a hallmark of state development state (Flannery 1998; Flannery and Marcus 2000; Sanders 1974:109), suggests stronger social stratification than in the Guanacaste phase. Within the hinterland the Horcones phase data suggest the presence of more powerful leaders on the third tier of the political hierarchy, and the evidence suggests that these leaders were more strongly affiliated with the Chiapa de Corzo rulers than in previous phases. In these senses, the Chiapa de Corzo polity in the Horcones phase fits better into the category of state than earlier forms of organization, although the scale of the polity appears to fall short of many definitions of the state (e.g. Yoffee 2005).

Through this study I hope to have demonstrated that a focus on the strategies employed by rulers at the capital and leaders at lower levels of the hierarchy in early political formations is useful in providing a more detailed sense of what kind of control rulers exercised over hinterland subjects under different forms of social organization within the capital, and a better understanding of how the hinterland population was integrated into the polity. While many of the conclusions I provide in this study are provisional, I submit that they provide us with important directions for future research in archaeology and specifically in the Chiapa de Corzo sub-region.

6.3 DIRECTIONS FOR FUTURE RESEARCH

Specific to Chiapa de Corzo and its hinterland, we need excavations at second tier political centers within the study area to establish an understanding of the construction sequences of architecture at these centers in order to gain a more accurate picture of changes in the political hierarchy over time. Excavation data from hinterland villages in general are needed to better address changes the nature of social and political organization at settlements on different levels of the political hierarchy. An especially promising candidate for investigation within the hinterland is the site of Ribera Amatal, which was an important village from the Escalera phase through the Middle Classic Laguna phase. From Chiapa de Corzo itself we need community scale data in order to gain a better understanding of how social organization within the capital changed over time. There is a moderate degree of urgency in this respect, as despite the protections offered by the INAH within most of the ancient settlement, the modern city of Chiapa de Corzo continues to grow, threatening to impact areas of the site.

More generally, the analysis of socio-political evolution from a perspective of the strategies employed by rulers and the responses to these strategies by commoners and leaders in the hinterland should provide a fruitful ground for future comparative research. Through focusing on differences and changes in strategies utilized by rulers in the evolution of early polities, I suggest that we can arrive at a better understanding of the nature of and the reasons for variation in early political trajectories. In the early stages of preparing this dissertation I investigated several lines of evidence amenable to the analysis of variation in strategies utilized by early rulers from a variety of recent surveys in Mesoamerica. There are some problems of compatibility in the data from surveys conducted in different environments and by researchers with different investigative goals. Nonetheless I suggest that utilizing data from recent surveys in Mesoamerica to compile a volume on the evolution of early polities in this region will be a useful step in advancing our knowledge of how and why different forms of political organization developed and dissipated.

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APPENDIX A. CERAMIC CLASSIFICATION SYSTEM

Table A 1 Ceramic classification key. (Modified from Pool 1995)

basic forms		side wall		lip		other attributes	
11	comal	11	insloping-straight	10	direct, rounded	0.11	labial ridge or flange
12	annular base comal	12	insloping-convex	21	direct, tapered, interior	0.12	sidewall ridge or flange
20	plate	13	insloping concave	22	direct, tapered, symmetrical	0.13	basal ridge or flange
30	sarten/ frying pan censer	14	insloping-carinated	23	direct, tapered exterior	0.21	loop or strap handle
40	dish	21	vertical straight	24	direct, tapered, interior concavity	0.22	stirrup handle
41	dish simple sillouette	22	vertical convex	31	direct, beveled, interior	0.23	stirrup handle and spout
42	dish composite sillouette	23	vertical-concave	32	direct, beveled flat	0.24	lug handle
50	bowl	31	outsloping-straight	33	direct, beveled exterior	0.25	mango-U-shaped
51	bowl-simple sillouthette	32	outsloping-convex	34	direct bolstered exterior	0.31	nubbin support
52	bowl composite silhouette	33	outsloping-concave	35	direct bolstered interior	0.32	solid conical support
53	basin-simple sillouhette	34	outsloping everted	41	everted, rounded	0.33	hollow conical support
54	Basin-Complex-Sillouette	41	necked jar-insloping	42	everted, flat	0.34	slab support
55	miniature bowl	42	necked jar-vertical	43	everted, tapered interior	0.35	hollow rectangular support
60	vase	43	necked jar-outsloping	44	inverted, rounded	0.36	loop support
70	necked jar	44	necked jar-outcurved	45	inverted, flat	0.37	zoomorphic support
71	necked jar-miniature	45	necked jar, outcurved, break at neck	46	inverted, bolstered	0.38	rattle support
72	necked jar standard	46	necked jar outsloping convex neck	47	everted, tapered	0.39	annular base
73	necked olla (bean pot)	47	necked jar outsloping,	48	inverted, tapered	.40-.49	other supports

			channeled neck				
74	pinchancha	48	necked jar-composite neck	50	everted,missing lip	0.4	mammiform support
75	necked water jar	49	Necked jar vertical-channeled	51	inverted, missing lip	0.41	circular support attachment (support missing)
76	hemispherical olla	50	teco straight	61	thikened, interior, rounded	0.51	spike
81	tecomates	51	teco convex	62	thickened, interior tapered	0.52	adorno
82	miniature tecomates	52	teco concave	63	thickened, interior, beveled,	0.53	stick/fingernail impressed appliqué band (appliqué filleting)
91	censer	53	concave censer handle	64	thickened, symmetrical, rounded	0.54	horizontal ridges on body
92	censer ladle	54	solid censer handle	65	thickened, symmetrical, tapered	0.55	stick punctations
93	censer lid	91	Orientation indeterminate straight	66	thickened, symmetrical, beveled	0.56	incisions on body
94	jar lid	92	orientation indeterminate-convex	67	Thickened, exterior, rounded	0.61	spout
95	sherd disk	93	orientation indeterminate concave	68	thickened, exterior, tapered,	0.7	reduced lip
96	Malacate/ spindlewhorl	94	aspect indeterminate insloping	69	thickened, exterior beveled	0.71	.lip adornment unidentified
97	mushroom stand	95	aspect indeterminate outsloping	70	Thickened, exterior, flattened	0.81	lip channel
98	other	99	sidewall missing	71	thickened, interior, flattened	0.82	interior rim channel
99	indeterminate			72	thickened symmetrical flattened	0.83	exterior rim channel
				80	recurved	0.84	rim encircling incisions
				99	Lip missing	0.85	post slip incised ext body
						0.86	interior rim incision

Table A 2 Ceramic types utilized in the analysis. Based Primarily on Clark and Cheetham 2005 and Bryant et a.l 2005. The varieties are drawn primarily from Cheetham's type divisions of the NWAF Chiapa de Corzo collections.

Cotorra		**Jobo**		**Dili**		**Vistahermosa**	
1000	Unslipped	2000	Unslipped	3000	Tapalapa Unslipped	4000	Negries Unslipped
1100	Tilapa red-on-white	2100	Xquic Red	3100	Pantepec composite-censer	4100	Yutan Unslipped
1200	Cotorra white	2110	Red-and White	3200	Vista Gray	4200	Nascano Red-on-white
1300	Pampas Black-and-white	2120	Xquic Red-smudged var	3300	Vergel White-to-buff	4300	Teonguy Red-on-white
1400	Limon Incised	2300	Siltepec White	3400	Padre Black	4400	Cotzeok White
1500	Calzadas Carved	2399	Siltepec white-pink tone	3500	La Venta incised black and white import	4500	White-on-brown
1111	indeterminate	2999				4600	Arreiera white-gray bichrome
1600	Samaro Coarse (Clark et al 2005:94)					4700	Pilitas Impressed

Escalera		**Francesa**		**Guanacaste**		**Horcones**	
5000	Gray Unslipped	6000	Pahuitz red-on-unslipped (Miller et al 2005:248)	7000	Utilitarian-	8000	Nambiyugua Unslipped
5010	Unslipped Censer	6100	Belgica Brown			8100	Tecpetan Red-onWhite (fine orange paste)
5011	Copoya Unslipped (Cheatham's 2003 typology)	6110	Vincente Brown	7010	Burnished Brown Bowls (Sanders 1961:37)	8101	Tecpetan fine orange paste
5200	Nicapa Orange-resist	6200	Teopisca White	7020	Same as above but with burnish on exterior	8110	Betania Red-on-white
5210	Nicapa Orange Plain var (esc red slipped)	6210	Teopisca Coarse (needs to be	7100	Vista Red-on-buff	8300	Horcones Red

			verified)				
5220	Escalera Red-Slipped-utilitarian vessels (Cheatham's 2003 esc typ)	6300	Mundet Red	7110	Vista Red-on-orange	8310	Sierra Red :Unijab var (coarse ash temper)(Bryant and Clark 2005:292-3)
5221	Escalera Red-Paintd	6310	Mundet self slipped	7200	Imported Fine-gray	8320	Horcones Red with smudged black int or ext
5300	Escalera White	6320	Nandayapa double slip -orange on white	7300	Sierra Red	8400	Nuca Orange
5400	White-and-Gray	6400	Nawa specular red and cream (Miller et al 2005:252)	7310	Kino two tone	8420	Nuca Red-on-orange
5500	Llomo			7400	Polvero Black	8500	Guajunguti Burnished
5510	Libertad Black-brown			7410	Stucco	8600	San Jacinto Black-Brown
5600	Imported Fine-gray			7500	Tila white-rimmed)	8999	eroded horc looking form
5610	imported white			7510	Tila Plain		
5700	Uka red			7999	eroded guanacaste looking form, w med fine to fine paste		

APPENDIX B. COST DISTANCE ANALYSIS

In calculation estimates of polity size and least cost paths in this study I experimented with two cost surfaces. The first experiment was based exclusively on slope utilizing the assumption that the speed of foot travel is a direct function of slope. The second calculation, and the one employed by the calculations in this study converted the slope by the inverse of Waldo Tobler's hiking function (1993:3), which provides a more accurate estimate of the effect of slope on walking speed.

Before calculating the Tobler Hiking Function, in ArcMap (or any other ESRI product), slope must be calculated in degrees, then converted to radians utilizing the following procedure drawn from the ESRI support message board:

1. Determine what the middle latitude of the area of interest in.
2. Convert that degree value to radians: 1 degree =0.0174532925 radians
3. use the value in radians in the following equation: Z factor= 1 / (113200 * Cos(<input latitude in radians>))
4. Use this calculated Z factor in the hillshade or slope tool

http://support.esri.com/index.cfm?fa=knowledgebase.techArticles.articleShow&d=29366 accessed Aug 21st 2009.

Without this conversion I was unable to get any productive results from the Tobler Hiking Function.

The formula for the Tobler Hiking Function, as entered into the map calculator tool in Spatial Analysis of ArcMap 9.1 is as follows:

6 * Exp(-3.5 * Abs(Tan((SLOPE_DEG) * (3.141592654 / 180) + .05))

This formula provides the hiking speed for each cell. In a perfect world dividing 1 by this value should provide the impedance cost of slope on walking speed, however I was unable to convince the map calculator in ArcMap to perform this function. Consequently, in order to convert this speed to an impedance cost, the resulting calculation was reclassified (this calculation has too many values for ArcMap 9.1 to render into a histogram), into 50 values. As the ArcMap reclass function allows only for integer values, and the values of the Tobler function calculation range from 0 to 5.04, a reclass with 50 value slots provides a rough approximation of the relative values from the Tobler function. By dividing 1 by these values, we can arrive at the impedance cost for each cell in the study area. In order for the tobler hiking function values to serve as the impedance cost values, this file must then be reclassified utilizing the tobler cost values. A cost surface analysis is then conducted on these values.

In calculating the least cost paths to Chiapa de Corzo I ran a cost distance analysis in ESRI ArcGIS 9.1 Spatial Analysis tools on a single point shape file marking the location of Chiapa de Corzo utilizing the cost surface file from the above process. In this step I also calculated a backlink raster . The resulting cost distance and backlink files were then utilized as the cost file for an analysis of least cost paths from the center points of neighboring polities to Chiapa de Corzo.

Not too much interpretive weight should be placed on the exact location of these least-cost paths as true communication routes, as the least-cost analysis presumes overland travel, and does not (and could not, with changing river patterns) take into account the location of possible dry season fords over the Grijalva (none of the routes cross modern fords). A number of other cultural factors such as the presence of agricultural fields, markets, sources of raw materials, or antagonistic populations could also alter the routes preferred by travelers.

In order to calculate polity area I ran a cost distance analysis on a file with the center points of polities in each phase utilizing the same cost surface file discussed above. Political centers that have been covered by lakes created by modern dams were marked with points on either side of the modern lakes, as the surfaces of lakes were not given a cost distance value (a more accurate solution would be to extrapolate elevation values for the lake bottoms, but these calculations are currently beyond my GIS capacities). The resulting outlines are somewhat arbitrary, reclassified to provide a balance that minimizes overlap between polity boundaries, while capturing the extent of the area that may have been dominated by each political center.

APPENDIX C. SOIL CLASSIFICATION

Soils in this study were classified into three categories, high, medium, and low productivity based primarily on soil type. Soil types were identified from INEGI soil maps for the region and from field observations made by myself and my field workers, all of whom were at least part-time farmers. The terminology I employ follows the FAO-UNESCO guidelines (1998). The classification of soils into categories of productivity was made following descriptions of soil characteristics provided by Stoking and Murnaghan (2001:116-117).

Table C 1 Soil Classification Modified from Stoking and Murnaghan (2001:116-117)

Soil Type	Soil Class	Soil description
Cambisol	1	Tropical 'brown earth'. Relativley good structure and chemical properties. Not greatly affected by degradation processes and moderately sensitive to yield decline.
Luvisol	1	The tropical soil most used by small farmers because of its ease of cultivation. Moderate resilience to degredation and moderate to low sensitivity to yield decline.
Phaeozem	2	Good structure and generally resistent to erosion. Once eroded the effect on yields is great. High resilience and high sensitivity.
Regosol	3	Low inherent fertility. Classified as weakly developed mineral soil in unconsolidated materials by the FAO.Characteristic of eroded landscapes. Productively cultivated in Jocote.
Vertisol	4	Soils with 30% or more clay. Clays usually active, cracking when dry and swelling when wet. Extremely difficult to manage (hence easily degraded) but very high natural chemical fertility if physical problems overcome.
Fluvisol	5	Widely variable in the study area, with the majority better classified as arenosols. Productivity of floodplain soils is highly variable and unpredictable.
Rendzina	5	Characterized by extreme shalowness. Degradation potential serious. Severe limitations imposed by depth and high permeability.
Lithosol	5	A suborder of the FAO classification Entisol. Very young soils with incompletely weathered fragments of parent rock. Low fertility.

APPENDIX D. LITHIC CLASSIFICATION

Lithics in this study were divided into 12 categories of materials (Table D.1). The most common lithic material found in the study was obsidian with 479 pieces. Despite the prevalence of obsidian, materials of local origin were more common, with a collection of 426 pieces of chert and 300 pieces of quartzite. All of the chert and quartzite is presumed to be local, as several areas with cobbles of quartzite and chert were noted within the study area. Five varieties of obsidian were identified in the study, with El Chayal most common obsidian, followed by San Martin Jilotepeque, with minor quantities of Tajamulco, Pachuca, and obsidian from unidentified sources. Ilmenite was present both as unworked pebbles and as multi-perforate cubes, most of them broken, suggesting manufacture rather than consumption.

Table D 1 Lithic Classification

	Material		Form		Platform attributes
10	San Martin Jilotepeque	10	flake core	0.1	platform, unabraded
11	el Chayal	11	Retouched/utilized flake	0.2	platform, abraded
12	Pachuca	12	bifacial thinning flake	0.3	utilized/retouched
13	unidentified opaque black	13	primary reduction flake	0.5	platform, crushed
14	Tajamulco	14	secondary reduction flake		
20	chert	15	bipolar flake		
21	quartzite	16	blocky frag		
30	ilmenite	17	step fracture removal flake		
31	hematite	18	potlid		
50	slag	20	blade or blade fragment		
60	other igneous or metamorphic	21	blade with retouch/use		
99	Other	22	prismatic core flake		
		30	prismatic core fragment		
		31	golf club core frag		
		50	formal biface		
		51	bifacial frag		
		52	informal bifacial tool		
		53	unifacial scraper		
		54	projectile point		
		55	other unifacial tool		
		60	small flake		
		70	hacha frag		
		80	perforated cube		
		81	perforated rough piece		
		82	raw material		
		91	river smoothed pebble		
		99	other		

APPENDIX E. LIST OF SITES

Sites in this list are defined by sherd scatters with boundaries outlined by consolidating the overlapping site boundaries produced by the kernel density quartic function used to delimit settlement area by phase. In different phases some of these sites contained more than one settlement. I provide statistics on the diagnostic ceramic counts, settlement area, and mean estimated population of settlements in each phase of occupation for each site. Sites with collections that were adjusted for differences in taphonomic context (e.g. from quarry sites) are marked with an asterisk. The number of sites and estimated populations for the Laguna phase are likely too generous, as this classification of the phase includes all of the Classic looking sherds that could not be attributed with confidence to the Jiquipilas or Maravillas-Paredon phases. The UTM coordinates mark the centroids of the achronous sherd scatters, recorded utilizing the WGS_84 datum (UTM Zone 15).

The 38 historic sites documented in the survey consist of sherd scatters, ruined house foundations, and a cemetery. No attempt was made to estimate dates for the approximate 500 year period of post-Hispanic occupations.

Table E 1 List of Prehispanic archaeological sites

Site name and phase of occupation	Centroid e	Centroid n	Area ha	Mean estimated population	Diagnostic sherd count
RCDC 1 Chiapa de Corzo	499901	1846909	197.0		
Postclas RCDC 1 (est. Colonial bounds)			90.3	9630	190
Postclas RCDC1b (Huerto)			2.9	18	2
Postclas RCDC1c (Flor)			1.2	9	1
Postclas RCDC1d (Nestle mnd 13 plat)			1.2	9	1
Postclas RCDC1e (Nestle/Flor)			7.9	47	5
Late Clas RCDC1a			20.4	311	28
Late Clas RCDC1b (Las Palmeras)			7.4	187	16
Late Clas RCDC1c ((Dili Calvario)			4.1	48	4
Late Clas RCDC1d (CdC/Flor de Nandalumi)			6.0	48	4
Late Clas RCDC1e (Huerto)			6.8	70	6
Late Clas RCDC1f (Mound 10)			4.1	48	4
Late Clas RCDC1g (Conalep)			2.9	23	2
Lag RCDC1			12.1	189	9
Ist-Jiq RCDC1a			38.4	377	34
Ist-Jiq RCDC1b (Las Palmeras)			2.9	36	3
Ist-Jiq RCDC1c (Dili Calvario)			4.2	18	2
Horc RCDC1a			56.3	1450	75
Horc RCDC1b (Las Palmeras)			2.8	40	2
Horc RCDC1c (Dili Calvario)			1.1	21	1
Guan RCDC1a			62.3	1640	86
Guan RCDC1b (Las Palmeras)			2.8	42	2
Guan RCDC1c (Dili Calvario)			1.1	21	1
Fsa RCDC1a			68.8	1740	90
Fsa RCDC1b (Dili Calvario)			4.1	99	5
Fsa RCDC1c (Las Palmeras)			5.2	49.3	4
Esc RCDC1a			67.6	1448	91
Esc RCDC1b (Dili Calvario)			8.7	117	7
Dili RCDC1a			71.1	1091	69
Dili RCDC1b (Dili Calvario)			2.9	34	2
Dili RCDC1c (Las Palmeras)			1.3	13	1
Jobo RCDC1a			1.2	28	1
Jobo RCDC1b			1.2	28	1
Cotorra CdC1			1.2	28	1
RCDC 2 Conquista Obrera	500650	1847681	3.7		
Posclas RCDC2			1.2	9	1
Franc RCDC2			3.7	63	3
RCDC 3 Rancho Betania 1	502271	1847506	7.5		
Postclassic RCDC3			7.6	93	10

RCDC4 Rancho Betania 2	512093	1848200	4.4		
Horc RCDC4			4.4	105	5
Guan RCDC4			1.1	28	1
RCDC5 Nandalumí	502125	1846988	59.1		
Posclas RCDC5a			37.0	915	82
Posclas RCDC5b			5.8	205	22
Posclas RCDC5b			6.6	56	6
Lt Clas RCDC5a			7.0	60	3
Lt Clas RCDC5b			21.7	397	35
Lag RCDC5a			1.1	21	1
Lag RCDC5b			7.5	105	4
Lag RCDC5c			1.1	21	1
Esc RCDC5			2.9	34	2
Dili RCDC5			1.2	17	1
RCDC6 Flor de Nandalumi1	501342	1846510	59.2		
Posclas RCDC6			6.1	49	6
Lt Class RCDC6			11.6	115	10
Guan RCDC6			4.1	62	3
Fsa RCDC6			8.8	187	3
Esc RCDC6			8.2	131	9
RCDC7 Flor de Nandalumi2	501030	1847003	1.1		
Lt Clas Flor d N2			1.1	12	1
RCDC8 Flor de Nandalumi3	502109	1846521	8.7		
Posclas RCDC8			4.2	37	4
Lt Clas RCDC8			1.1	23	2
Lag RCDC8			3.9	60	2
Ist-Jiq RCDC8			1.3	12	1
Esc RCDC8			1.1	17	1
RCDC9 Parque Ind	502743	1846569	14.4		
Lt Clas RCDC9			6.9	85	7
Lag RCDC9a			1.2	21	1
Lag RCDC9b			1.1	21	1
Lag RCDC9c			1.1	21	1
Guan RCDC9			1.1	21	1
Esc RCDC9			1.1	17	1
Dili RCDC9			8.8	117	7
RCDC 10 La Haciendita1	502356	1846093	9.7		
Posclas RCDC10			5.7	177	19
Lag RCDC10			3.6	63	3
Dili RCDC 10			3.7	50	3
RCDC11 Parque Ind2	502948	1846103	17.4		
Postclas RCDC11			10.3	223	25
Lt Clas RCDC11a			4.6	71	6
Lt Clas RCDC11b			4.0	275	23
RCDC12 Rancho Betania3	503188	1846677	1.1		
Lt Clas RCDC12			1.1	28	
Guan RCDC 12			1.1	21	

RCDC13 Rancho Nandalumí	500592	1846360	6.0		
Postclas RCDC13			1.1	28	1
Dili RCDC13			6.0	151	9
Jobo RCDC13			2.9	43	2
RCDC14 Rancho Reynosa	501459	1845811	5.9		
Lt Class RCDC14			5.9	71	6
RCDC15 La Haciendita2	501764	1845731	1.1		
Horc RCDC15			1.1	21	1
Esc RCDC15			1.1	16	1
RCDC16 La Haciendita3	501860	1845633	1.2		
Lag RCDC16			1.2	21	1
RCDC17 La Haciendita4	501262	1845447	6.5		
Postclas RCDC17			2.9	19	1
Lt Clas RCDC 17			4.1	48	4
Lag RCDC 17			4.1	83	4
RCDC18 Vecino S. Pascual	499849	1846210	11.1		
Posclas RCDC18			8.6	134	10
Lt Clas RCDC 18			1.1	12	1
Horc RCDC18			1.1	21	1
Fsa RCDC18			1.1	21	1
Esc RCDC18			2.8	33	2
Dili RCDC18			5.4	59	4
RCDC19 Culatí	499052	1846054	4.5		
Esc RCDC19			1.1	17	1
Dili RCDC19			4.5	66	4
RCDC20 El Silencio-Culati	499364	1845292	44.5		
Posclas RCDC20a			6.7	43	5
Posclas RCDC20b			17.7	132	15
Lt Clas RCDC20a			1.1	12	1
Lt Clas RCDC20b			27.9	940	92
Lt Clas RCDC20c			4.6	72	6
Lag RCDC20a			2.7	38	2
Lag RCDC20b			3.6	63	3
Lag RCDC20c			3.6	63	3
Ist-Jiq RCDC20a			6.5	53	3
Ist-Jiq RCDC20b			1.2	12	1
Ist-Jiq RCDC20c			1.2	12	1
Horc RCDC20			10.9	680	35
Guan RCDC20a			8.2	140	7
Guan RCDC20b			1.1	21	1
Fsa RCDCa			4.6	93	5
Fsa RCDCb			2.8	42	2
Esc RCDCa			2.9	34	2
Esc RCDCb			2.9	34	2
Dili RCDC20a			4.4	60	4
Dili RCDC20b			3.0	34	2
Dili RCDC20c			1.3	17	1

Dili RCDC20d			1.3	13	1
RCDC 21 Rancho Betania4	503289	1846356	5.0		
posclas RCDC21	503289	1846356	5.0	19	2
RCDC22 El Silencio2	499879	1845533	1.1		
Guan RCDC22			1.1	21	1
RCDC23 El Silencio 3	499335	1844502	4.5		
Lt Clas RCDC23			4.5	60	5
Lag RCDC23			1.1	21	1
RCDC 24 Playa Grande 1	500278	1845115	34.5		
posclas RCDC24a			1.2	9	1
posclas RCDC24b			10.2	186	20
Lt Clas RCDC24a			6.0	169	14
Lt Clas RCDC24b			1.2	12	1
Lag RCDC24a			8.2	126	6
Ist-Jiq RCDC24			1.1	12	1
Horc RCDC24a			4.4	104	5
Horc RCDC24b			3.7	63	3
Horc RCDC24c			2.9	41	2
Guan RCDC24			1.1	21	1
Esc RCDC24a			1.1	17	1
Esc RCDC24b			1.1	17	1
Dili RCDC24a			4.8	67	4
Dili RCDC24b			2.9	34	2
Dili RCDC24c			2.9	26	2
Dili RCDC24d			1.3	17	1
Jobo RCDC24			6.8	257	13
Cotorra RCDC24			4.9	88	9
RCDC 25 Playa Grande 2	501278	1844560	6.6		
Posclas RCDC25			6.6	83	10
Lt Clas RCDC 25			1.1	12	1
RCDC 26 El Recuerdo	501920	1844599	13.0		
Posclas RCDC26			7.6	139	18
Lt Clas RCDC 26			12.9	231	27
Lag RCDC 26			6.5	77	5
Ist-Jiq RCDC26			7.0	72	6
Horc RCDC26			1.1	21	1
Guan RCDC26			1.1	21	1
Dili RCDC26			1.1	17	1
RCDC 27 El Recuerdo 2	501583	1844864	1.1		
Lt Clas RCDC 27			1.1	12	1
RCDC 28 El Recuerdo 3	502142	1845062	12.3		
Posclas RCDC28			1.1	9	1
Lt Clas RCDC 28			8.5	129	11
Lag RCDC 28			6.9	120	6
Ist-Jiq RCDC28a			1.2	12	1
Ist-Jiq RCDC28b			2.9	24	2
Horc RCDC28			3.6	63	3

Guan RCDC28			4.3	105	5
Fsa RCDC28			2.8	42	2
Esc RCDC28			1.1	17	1
RCDC 29 Vivero Grijalva	502446	1844485	16.4		
Posclas RCDC29a			1.2	9	1
Posclas RCDC29b			4.5	27	3
Lt Clas RCDC 29			16.0	479.0	42
Lag RCDC 29			8.5	119	6
Ist-Jiq RCDC 29			2.9	24	2
Horc RCDC 29			1.1	21	1
Dili RCDC29			1.1	17	1
RCDC 30 La Haciendita 5	503016	1845627	2.9		
Lt Clas RCDC 30			2.9	24	2
RCDC 31 Hermanos	503381	1845480	2.9		
Dili RCDC 31			2.9	34	2
RCDC 32 Hermanos 2	503736	1845311	3.7		
Lt Clas RCDC 32			3.7	36	3
Lag RCDC 32			1.1	21	1
RCDC 33 San Jorge Nandambua1			3.0		
Lt Clas RCDC 33			1.1	12	1
Guan RCDC 33			2.9	42	2
Fsa RCDC 33			1.1	21	1
Dili RCDC 33			2.9	34	2
RCDC 34 Hermanos 3	503501	1844938	2.8		
Lt Clas RCDC 34			1.1	12	1
Lag RCDC 34			2.6	42	2
RCDC 35 Vivero Grijalva 2	503240	1844727	4.4		
Lt Clas RCDC 35			4.4	59	5
Lag RCDC 35			1.1	12	1
Ist-Jiq RCDC 35			2.9	24	2
RCDC 36 Rancho Borrás	502796	1844156	3.7		
Lt Clas RCDC 36			3.7	30	3
Lag RCDC 36			1.1	21	1
RCDC 37 San Jorge Nandambua 2	504215	1844837	2.9		
Lt Clas RCDC 37			2.9	23.9	2
Esc RCDC 37			1.1	16.7	1
RCDC 38 San Jorge Nandambua 3	504357	1844537	2.9		
Lt Clas RCDC 38			2.9	24	2
Dili RCDC 38			1.1	17	1
RCDC 39 San Jorge Nandambua 4	504432	1844128	5.7		
Posclas RCDC 39			3.7	28	3
Lt Clas RCDC 39			1.2	12	1
Dili RCDC 39			3.7	50	3
RCDC 40 San Jorge Nandambua 5	504577	1843861	1.3		

Guan RCDC 40			1.1	21	1
Jobo RCDC 40			1.1	28	1
RCDC 41 Nucatilí 1	506519	1844541	29.5		
Posclas RCDC 41a			4.5	37	4
Posclas RCDC 41b			3.1	9	1
Lt Clas RCDC 41a			10.5	196	17
Lt Clas RCDC 41b			2.8	33	3
Lag RCDC 41a			1.1	21	1
Lag RCDC 41b			1.1	21	1
Ist-Jiq RCDC 41			2.9	24	2
Horc RCDC 41a			7.5	105	5
Horc RCDC 41b			1.1	21	1
Guan RCDC 41a			4.4	63	3
Guan RCDC 41b			3.8	63	3
Fsa RCDC 41			2.9	42	2
Esc RCDC 41a			5.0	151	9
Esc RCDC 41b			1.1	17	1
Dili RCDC 41			4.4	50	3
RCDC 42 Nucatilí 2	506625	1845137	6.7		
Dili RCDC 42			6.7	149	9
RCDC 43 Nucatilí 3	506344	1845148	4.2		
Posclas RCDC 43			4.2	37	4
RCDC 44 Nucatilí 4	506054	1844766	2.8		
Guan RCDC 44			2.8	42	2
Fsa RCDC 44			1.1	21	1
RCDC 45 Nucatilí 5	505505	1844422	1.1		
Dili RCDC 45			1.1	17	1
RCDC 46 Nucatilí 6	505594	1844327	1.1		
Lt Clas RCDC 46			1.1	24	2
RCDC 47 Nucatilí 7	506182	1844197	5.1		
Lt Clas RCDC 47			2.9	24	2
Fsa RCDC 47			1.1	21	1
Esc RCDC 47			3.6	50	3
RCDC 48 Nucatilí 8	506543	1844147	6.0		
Ist-Jiq RCDC 48			1.1	12	1
Horc RCDC 48			4.1	48	4
Dili RCDC 48			3.0	34	2
RCDC 49 Nucatilí 9	505750	1844075	3.0		
Lag RCDC 49			1.1	21	1
Dili RCDC 49			3.0	34	2
RCDC 50 R. Borrás-50	503675	1843698	45.1		
Posclas RCDC 50a			11.6	84	9
Posclas RCDC 50b			2.9	19	2
Posclas RCDC 50c			1.2	9	1
Posclas RCDC 50d			4.1	18	2
Lt Clas RCDC 50a			23.5	484	43
Lt Clas RCDC 50b			13.8	227	19

Lag RCDC 50a			5.8	168	8
Lag RCDC 50b			3.0	42	2
Lag RCDC 50c			1.1	21	1
Ist-Jiq RCDC 50			1.1	12	1
Horc RCDC 50a			3.7	63	3
Horc RCDC 50b			1.1	21	1
Guan RCDC 50a			4.3	63	3
Guan RCDC 50b			1.2	21	1
Fsa RCDC 50			1.1	21	1
RCDC 51 S. Jorge Nandambua 6	504620	1843227	4.5		
Posclas RCDC 51			1.2	9	1
Lt Clas RCDC 51			4.5	60	5
Lag RCDC 51			3.6	63	3
RCDC 52 Zapata	505127	1842981	12.8		
Lt Clas RCDC 52			10.5	152	13
Lag RCDC 52			1.1	21	1
Ist-Jiq RCDC 52			1.2	12	1
Horc RCDC 52			4.9	63	3
Guan RCDC 52			1.1	21	1
Esc RCDC 52			1.1	17	1
Dili RCDC 52			5.0	95	6
RCDC 53 Zapata 2	504702	1842707	45.2		
Postclas RCDC 53a			17.0	412	47
Postclas RCDC 53b			4.4	19	2
Lt Clas RCDC 53			36.6	844	74
Lag RCDC 53a			1.1	21	1
Lag RCDC 53b			10.0	180	9
Ist-Jiq RCDC 53a			5.8	92	8
Ist-Jiq RCDC 53b			1.1	12	1
Ist-Jiq RCDC 53c			1.2	12	1
Ist-Jiq RCDC 53d			4.2	36	3
Horc RCDC 53a			5.5	103	5
Horc RCDC 53b			1.1	21	1
Horc RCDC 53c			1.1	21	1
Horc RCDC 53d			1.1	21	1
Horc RCDC 53e			1.1	21	1
Guan RCDC 53a			3.6	62	3
Guan RCDC 53b			3.6	62	3
Fsa RCDC 53a			2.8	42	2
Fsa RCDC 53b			1.1	21	1
Esc RCDC 53a			1.1	17	1
Esc RCDC 53b			3.6	50	3
Esc RCDC 53c			1.1	17	1
Dili RCDC 53			1.1	17	1
RCDC 54 Zapata 3	505331	1841711	14.3		
Posclas RCDC 54			8.1	130	14
Lt Clas RCDC 54a			3.6	36	3

Lt Clas RCDC 54b			1.2	12	1
Ist-Jiq RCDC 54			1.2	12	1
Fsa RCDC 54			2.8	42	2
Esc RCDC 54			4.1	67	4
Dili RCDC 54			5.8	101	6
Jobo RCDC 54			4.2	112	4
RCDC 55 Zapata 4	505293	1841227	5.6		
Lt Clas RCDC 55			4.3	35	3
Lag RCDC 55			1.1	21	1
Ist-Jiq RCDC 55			4.2	36	3
Horc RCDC 55			2.7	34	2
Jobo RCDC 55			1.2	28	1
RCDC 56 Zapata 5	505373	1840966	1.2		
Posclas RCDC 56			1.2	9	1
RCDC 57 Zapata 6	506836	1841708	10.2		
Posclas RCDC 57			7.4	65	7
Lt Clas RCDC 57			1.1	12	1
Lag RCDC 57			1.1	21	1
Dili RCDC 57			2.9	34	2
RCDC 58 Zapata 7	507130	1841797	5.1		
Posclas RCDC 58			5.1	84	9
RCDC 59 Nucatilí 10	508261	1845136	1.3		
Posclas RCDC 59			1.3	9	1
RCDC 60 Nucatilí 11	508404	1844780	2.9		
Horc RCDC 60			2.9	42	2
RCDC 61 Nucatilí 12	508687	1845114	2.9		
Lt Clas RCDC 61			2.9	47	4
RCDC 62 Nucatilí 13	511559	1844368	1.1		
Lt Clas RCDC 62			1.1	12	1
RCDC 63 Nucatilí-Iglesia Vieja	511397	1845239	39.2		
Postclas RCDC 63a			3.0	19	2
Postclas RCDC 63b			1.2	9	1
Lt Clas RCDC 63			39.2	1033	108
Lag RCDC 63			1.1	21	1
RCDC 64 Monterico 1	502267	1843717	7.2		
Lt Clas RCDC 64			4.8	72	6
Lag RCDC 64			4.8	147	7
Ist-Jiq RCDC 64			5.6	180	15
Horc RCDC 64			2.8	42	2
Guan RCDC 64			2.8	42	3
Dili RCDC 64			4.6	101	6
Jobo RCDC 64			3.7	84	3
RCDC 65 Monterico 2	500734	1843402	6.9		
Dili RCDC 65			4.5	50	3
Jobo RCDC 65			6.9	140	5
RCDC 66 Nandachuco	500104	1843177	11.2		
Lt Clas RCDC 66			7.3	52	5

Horc RCDC 66			5.6	199	11
Guan RCDC 66			4.2	109	6
Fsa RCDC 66			6.0	155	8
Esc RCDC 66			4.6	100	6
Dili RCDC 66			5.7	203	8
RCDC 67 Ribera Amatal 1	499750	1842002	86.0		
Posclas RCDC 67a			4.7	37	4
Posclas RCDC 67b			3.7	28	3
Posclas RCDC 67c			1.2	9	1
Posclas RCDC 67d			1.2	9	1
Lt Clas RCDC 67a			32.7	755	64
Lt Clas RCDC 67b			7.0	130	11
Lt Clas RCDC 67c			5.0	48	4
Lt Clas RCDC 67d			1.1	12	1
Lt Clas RCDC 67e			1.1	12	1
Lag RCDC 67a			10.2	291	4
Lag RCDC 67b			4.8	146	7
Ist-Jiq RCDC 67a			16.7	214	18
Ist-Jiq RCDC 67b			1.2	12	1
Ist-Jiq RCDC 67c			1.2	12	1
Ist-Jiq RCDC 67d			1.2	12	1
Horc RCDC 67a			21.9	825	40
Horc RCDC 67b			2.9	42	2
Horc RCDC 67c			1.1	21	1
Horc RCDC 67d			1.1	21	1
Guan RCDC 67a			27.7	717	35
Guan RCDC 67b			2.9	42	2
Guan RCDC 67c			1.1	21	1
Fsa RCDC 67a			23.2	525	26
Fsa RCDC 67b			3.6	63	3
Fsa RCDC 67c			1.1	21	1
Esc RCDC 67a			27.8	641	40
Esc RCDC 67b			4.8	106	4
Esc RCDC 67c			1.1	17	1
Dili RCDC 67a			8	119	9
Dili RCDC 67b			6.4	86	6
Dili RCDC 67c			4.7	79	6
Dili RCDC 67d			1.3	17	1
Dili RCDC 67e			1.3	13	1
Dili RCDC 67f			1.2	17	1
Jobo RCDC 67a			4.7	132	6
Jobo RCDC 67b			6.2	126	9
Jobo RCDC 67c			4.1	112	4
Jobo RCDC 67d			2.9	56	2
Cotorra RCDC 67a			5.8	483	22
Cotorra RCDC 67b			4.5	110	5
Cotorra RCDC 67c			3.6	84	3

Cotorra RCDC 67d			1.2	56	2
Cotorra RCDC 67e			1.2	28	1
RCDC 68 Ribera Amatal 2	500196	1842793	5.1		
Guan RCDC 68			1.1	21	1
Dili RCDC 68			5.1	151	9
RCDC 69 Nandachuco 2	500689	1842745	4.9		
Dili RCDC 68			2.9	34	2
Jobo RCDC 68			4.6	223	8
RCDC 70 Nueva Palestina 1	502360	1842825	1.2		
Guan RCDC70			1.1	21	1
Cotorra RCDC70			1.2	28	1
RCDC 71 Rio Grande	502607	1843279	14.0		
Posclas RCDC 71			4.5	47	5
Lt Clas RCDC 71			11.0	407	34
Lag RCDC 71			2.8	42	2
Ist- Jiq RCDC 71			4.5	60	5
Guan RCDC 71			4.5	104	5
Fsa RCDC 71			1.1	21	1
Esc RCDC 71			5.1	150	9
Dili RCDC 71a			3.0	34	2
Dili RCDC 71b			1.2	17	1
RCDC 72 Veracruz	502962	1843279	8.2		
Posclas RCDC 72			4.2	37	4
Lt Clas RCDC 72			3.5	48	4
Esc RCDC 72			6.5	101	6
Dili RCDC 72			3.7	50	3
Jobo RCDC 72			5.4	364	13
Cotorra RCDC 72			3.0	56	2
RCDC 73 Veracruz 2	503199	1843273	2.8		
Horc RCDC 73			1.1	21	1
Guan RCDC 73			2.8	42	2
Fsa RCDC 73			2.8	42	2
Esc RCDC 73			1.1	17	1
RCDC 74 Santiago Buenavista	503585	1843314	39.3		
Posclas RCDC 74a			4.5	19	2
Posclas RCDC 74b			1.2	9	1
Posclas RCDC 74c			1.2	9	1
Lt Clas RCDC			13.2	586	59
Lag RCDC 74a			1.2	21	1
Lag RCDC 74b			1.2	21	1
Lag RCDC 74c			1.2	21	1
Lag RCDC 74d			1.2	21	1
Horc RCDC 74			1.1	21	1
Fsa RCDC 74			5.4	104	5
Esc RCDC 74			2.8	34	2
Dili RCDC 74			5.2	45	4
RCDC 75 Santiago Buenavista 2	504217	1842731	4.6		

Postclas RCDC 75			2.9	19	2
Ist-Jiq RCDC 75			2.9	24	2
Esc RCDC 75			1.2	17	1
RCDC 76 Santiago Buenavista 3	504456	1842427	7.3		
Postclas RCDC 76a			1.2	9	1
Postclas RCDC 76b			1.2	9	1
Lt Clas RCDC 76			7.3	72	6
Lag RCDC 76			1.1	21	1
Guan RCDC 76			1.1	21	1
Dili RCDC 76			1.1	17	1
RCDC 77 Santiago Buenavista 4	504662	1841943			
Postclas RCDC 77			1.1	9	1
Lt Clas RCDC 77			4.6	72	6
Lag RCDC 77			2.8	42	2
Ist-Jiq RCDC 77			1.2	12	1
Horc RCDC 77			4.4	104	5
Guan RCDC 77			2.8	42	2
RCDC 78 Barranca Honda 1	504860	1841528	8.1		
Lt Clas RCDC 78			8.1	311	26
Guan RCDC 78			4.0	84	4
Fsa RCDC 78			1.1	21	1
Esc RCDC 78			5.2	168	10
RCDC 79 Barranca Honda 2	504136	1841438	3.6		
Lt Clas RCDC 79			3.6	60	5
RCDC 80 Barranca Honda 2	505347	1840344	3.7		
Dili RCDC 80			3.7	50	3
RCDC 81 Barranca Honda 3	505599	1840236	1.3		
Dili RCDC 81			1.3	17	1
RCDC 82 Barranca Honda 5	505978	1840423	4.1		
Posclas RCDC 82			4.1	37	4
RCDC 83 Barranca Honda 6	506361	1839911	1.1		
Lt Clas RCDC 83			1.1	12	1
RCDC 84 Barranca Honda 7	506591	1839827	1.2		
Posclas RCDC 84			1.2	9	1
RCDC 85 Barranca Honda 8	506324	506324	1.1		
Lt Clas RCDC 85			1.1	12	1
RCDC 86 Barranca Honda 9	506779	1839639	4.4		
Lt Clas RCDC 86			4.4	72	6
RCDC 87 Barranca Honda 10	507033	1839518	2.9		
Posclas RCDC 87			2.9	19	2
Lt Clas RCDC 87			1.1	12	1
RCDC 88 Barranca Honda 11	506869	1839397	1.1		
Guan RCDC 88			1.1	21	1
RCDC 89 Verdolago	507360	1839346	5.1	Difficultly accessed ridgetop site with surface measuring under 1 ha	

Posclas RCDC 89			1.0	84	9
RCDC 90 Barranca Honda 12	505950	1839428	3.6		
Fsa RCDC 89			3.6	63	3
RCDC 91 America Libre 1	504864	1838488	1.2		
Dili RCDC 91			1.2	17	1
RCDC 92 America Libre 2	504468	1838976	2.9		
Lt Clas RCDC 92			2.9	24	2
RCDC 93 America Libre 3	504447	1838612	5.1		
Lag RCDC 93			2.9	41	2
Dili RCDC 93			3.0	34	2
RCDC 94 America Libre 4	504065	1838567	4.5		
Lt Clas RCDC 94			2.9	24	2
Dili RCDC 94			4.5	84	5
Cotorra RCDC 94			1.2	28	1
RCDC 95 America Libre 5	503975	1839119	5.9		
Lt Clas RCDC 95			4.3	35	3
Lag RCDC 95			2.8	42	2
Dili RCDC 95			1.3	17	1
RCDC 96 Amp. Zapata	503342	1839115	5.6		
Posclas RCDC 96			5.6	140	15
RCDC 97 Amp. Zapata 2	503155	1839469	1.1		
Lt Clas RCDC 97			1.1	12	1
RCDC 98 Ejido Amatal	502673	1838860	1.2		
Ist-Jiq RCDC 98			1.2	12	1
RCDC 99 Ejido Amatal 2	502275	1839185	4.9		
Posclas RCDC 99			4.9	65	7
RCDC 100 Ejido Amatal 3	502171	1838820	1.2		
Posclas RCDC 100			1.2	9	1
RCDC 101 Ejido Amatal 4	501507	1838772	1.3		
Dili RCDC 101			1.3	17	1
RCDC 102 Ejido Amatal 5	501307	1838881	2.9		
Ist -Jiq RCDC 102			2.9	24	2
RCDC 103 Ejido Amatal 6	501112	1840051	1.2		
Dili RCDC 103			1.2	17	1
Jobo RCDC 104			1.2	28	1
RCDC 104 Ejido Amatal 7	500705	1839929	4.9		
Lt Clas RCDC 104			1.1	12	1
Dili RCDC 104			4.9	50	3
RCDC 105 Ejido Amatal 8			4.7		
Lt Clas RCDC 105			1.2	12	1
Lag RCDC 105			2.9	42	2
Guan RCDC 105			4.1	84	4
Fsa RCDC 105			4.7	126	6
Dili RCDC 105			3.0	34	2
RCDC 106 Desengaño 1	501528	1838061	3.0		
Lt Clas RCDC 106			1.1	12	1

Lag RCDC 106			2.9	42	2
RCDC 107 Desengaño 2			2.9		
Dili RCDC 107			2.9	34	2
RCDC 108 Desengaño 3	501344	1837673	3.7		
Posclas RCDC 108			1.2	9	1
Lag RCDC 108			2.9	42	2
RCDC 109 Desengaño 4	500827	1837672	8.0		
Posclas RCDC 109			4.5	27	3
Lt Clas RCDC 109			2.8	24	2
Lag RCDC 109			7.1	189	9
Ist-Jiq RCDC 109			3.7	36	3
Guan RCDC 109			1.1	21	1
RCDC 110 Desengaño 5	500789	1837414	5.2		
Posclas RCDC 110			4.2	19	2
Ist-Jiq RCDC 110			2.9	24	2
Dili RCDC 110			4.7	66	5
RCDC 111 America Libre 6	501928	1836907	2.9		
Esc RCDC 111			1.1	17	1
Dili RCDC 111			2.9	34	2
RCDC 112 America Libre 7	504465	1837703	1.2		
Cotorra RCDC 112			1.2	28	1
RCDC 113 Las Limas 1	500809	1836250	28.1		
Posclas RCDC 113a			8.3	121	13
Posclas RCDC 113b			1.2	9	1
Lt Clas RCDC 113			15.1	204	6
Lag RCDC 113a			3.6	63	3
Lag RCDC 113b			1.1	21	1
Ist-Jiq RCDC 113a			3.9	34	3
Ist-Jiq RCDC 113b			3.0	18	2
Horc RCDC 113a			5.7	125	5
Guan RCDC 113			9.3	146	7
Fsa RCDC 113			2.8	42	2
Esc RCDC 113a			1.1	17	1
Esc RCDC 113b			1.1	17	1
Dili RCDC 113a			9.8	118	8
Dili RCDC 113b			1.2	17	1
RCDC 114 Las Limas 2	502145	1836344	4.4		
Lt Clas RCDC 114			4.1	48	4
Fsa RCDC 114			4.4	105	5
RCDC 115 El Novillero	504183	1836211	1.1		
Esc RCDC 115			1.1	17	1
RCDC 116 La Union 1	501221	1835596	6.9		
Fsa RCDC 116			5.8	168	8
Esc RCDC 116			4.4	84	5
Dili RCDC 116			3.9	47	3
RCDC 117 La Union 2	500931	1835581	2.9		
Lt Clas RCDC 117			2.9	24	2

RCDC 118 La Union 3	500864	1835140	7.2		
Posclas RCDC 118			1.3	9	1
Lt Clas RCDC 118			6.3	173	16
Lag RCDC 118			1.1	21	1
Horc RCDC 118			5.1	133	7
Guan RCDC 118			1.1	21	1
Dili RCDC 118			4.2	67	4
RCDC 119 Saraín Ruiz	501102	1834732	1.2		
Lag RCDC 119			1.2	21	1
RCDC 120 La Gloria	503238	1835526	12.4		
Posclas RCDC 120			3.0	19	2
Lt Clas RCDC 120			9.7	127	13
Lag RCDC 120			1.1	21	1
Horc RCDC 120			5.8	83	5
Guan RCDC 120			2.9	42	2
Fsa RCDC 120			2.8	42	2
RCDC 121 El Zapote	503527	1835495	1.2		
Ist-Jiq RCDC 121			1.2	12	1.2
RCDC 122 El Zapote2	503674	1835275	2.9		
Jobo RCDC 122			2.9	56	2
RCDC 123 El Zapote 3	503661	1835048	4.4		
Horcones RCDC 123			3.6	63	3
Dili RCDC 123			1.1	17	1
RCDC 124 El Zapote 4	504236	1835081	9.3		
Posclas RCDC 124			9.0	42	9
Lt Clas RCDC 124a			3.6	36	3
Lt Clas RCDC 124b			1.1	12	1
RCDC 125 El Zapote 5	504288	1834902	1.1		
Horc RCDC 125			1.1	21	1
RCDC 126 El Zapote 6	504462	1834872	1.2		
Lag RCDC 126			1.1	21	1
RCDC 127 El Zapote 7	504777	1834833	3.7		
Posclas RCDC 127			2.9	19	2
Lt Clas RCDC 127			3.7	48	4
Lag RCDC 127			1.1	21	1
RCDC 128 Cruz Chiquita	505895	1833873	3.5		
Posclas RCDC 128			1.1	9	1
Dili RCDC 128			2.9	34	2
RCDC 129 Cruz Chiquita 2	506270	1834366	10.1		
Lt Clas RCDC 129			2.9	24	2
Dili RCDC 129			9.2	109	7
RCDC 130 Cruz Chiquita 3	507380	1834110	3.3		
Esc RCDC 130			1.1	17	1
Dili RCDC 130			2.9	34	2
RCDC 131 Cuautiño	509133	1838122	2.9		
Posclas RCDC 131			2.9	19	2
RCDC 132 Oscar Cruz	499308	1835266	7.0		

Fsa RCDC 132			3.7	42	3
Esc RCDC 132			4.4	84	5
Jobo RCDC 132			3.7	84	4
RCDC 133 S. Agustin	498441	1835424	4.8		
Jobo RCDC 133			4.8	154	7
RCDC 134 S. Antonio	498308	1835606	2.9		
Lt Clas RCDC 134			2.9	36	3
RCDC 135 Bulmaro Abadilla	499002	1839745	29.0		
Posclas RCDC 135a			3.4	53	6
Posclas RCDC 135b			1.1	9	1
Lt Clas RCDC 135a			12.3	237	21
Lt Clas RCDC 135b			2.8	24	2
Lag RCDC 135a			1.1	21	1
Lag RCDC 135b			1.1	21	1
Lag RCDC 135c			1.1	21	1
Ist-Jiq RCDC 135			5.8	84	7
Horc RCDC 135a			11.0	460	23
Horc RCDC 135b			1.1	21	1
Guan RCDC 135a			10.7	444	22
Guan RCDC 135b			1.1	21	1
Fsa RCDC 135a			8.6	190	12
Fsa RCDC 135b			2.4	49	3
Esc RCDC 135			12.2	269	21
Dili RCDC 135a			4.5	53	3
Dili RCDC 135b			2.9	33	4
Jobo RCDC 135a			8.8	351	16
Jobo RCDC 135b			7.6	156	11
Cotorra RCDC 135a			5.1	116	6
Cotorra RCDC 135b			4.7	102	4
RCDC 136 El Vergel 1	498983	1840416	11.1		
Posclas RCDC 136			4.7	28	3
Lt Clas RCDC 136			7.3	120	10
Lag RCDC 136			2.9	42	2
Ist-Jiq RCDC 136			1.2	12	1
Horc RCDC 136			4.7	147	7
Guan RCDC 136			10.9	291	16
Fsa RCDC 136			4.2	63	3
RCDC 137 El Vergel 2	497666	1840225	6.9		
Dili RCDC 137			1.3	17	1
Jobo RCDC 137			6.9	140	5
Cotorra RCDC 137			2.9	56	5
RCDC 138 El Vergel 3	497540	1840644	2.9		
Lt Clas RCDC 138			2.9	24	2
RCDC 139 El Vergel 4	496385	1841321	3.7	50	3
Dili RCDC 139					
RCDC 140 Saraín Mendoza 2	495512	1841521	12.6		
Posclas RCDC 140			7.9	74	8

Lt Clas RCDC 140			5.7	91	8
Lag RCDC 140			1.1	21	1
Ist-Jiq RCDC 140			3.0	24	2
Guan RCDC 140			1.2	21	1
Fsa RCDC 140			5.0	87	5
Esc RCDC 140			3.7	42	3
RCDC 141 Saraín Mendoza 3	495976	1841686	4.3		
Dili RCDC 141			2.9	33	2
Jobo RCDC 141			3.7	84	3
RCDC 142 Saraín Mendoza 4	497362	1841851	1.1		
Lt Clas RCDC 142			1.1	24	2
RCDC 143 Saraín Mendoza 1	497842	1841867	7.3		
Lag RCDC 143			1.1	21	1
Ist-Jiq RCDC 143			2.9	24	2
Esc RCDC 143			4.1	67	4
Dili RCDC 143			6.9	218	18
Jobo RCDC 143			5.5	307	11
RCDC 144 Saraín Mendoza 5	498504	1841546	4.2		
Posclas RCDC 144			1.1	9	1
Lt Clas RCDC 144			3.6	35	3
Lag RCDC 144			1.1	21	1
Ist-Jiq RCDC 144			2.9	24	2
Esc RCDC 144			2.8	26	2
DiliRCDC 144			4.2	53	3
RCDC 145 Saraín Mendoza 6	498354	1841947	3.6		
Posclas RCDC 145			1.2	9	1
Lt Clas RCDC 145			2.9	24	2
Lag RCDC 145			1.1	21	1
Guan RCDC 145			2.9	42	2
Fsa RCDC 145			3.6	63	3
Esc RCDC 145			2.8	34	2
RCDC 146 Cupía 2	495588	1842378	7.5		
Posclas RCDC 146			1.1	9	1
Lt Clas RCDC 146			5.0	107	9
Ist-Jiq RCDC 146			1.3	12	1
Horc RCDC 146			5.5	118	6
Guan RCDC 146			5.1	98	5
Fsa RCDC 146			1.1	21	1
Esc RCDC 146			1.4	17	1
Dili RCDC 146			4.5	65	4
RCDC 147 Cupía 3	498106	1842448	4.4		
Lt Clas RCDC 147			4.4	132	11
RCDC 148 Cupía 4	497971	1843244	13.7		
Lt Clas RCDC 148			13.7	407	34
RCDC 149 Cupía 5	497923	1843651	23.3		
Posclas RCDC 149			5.8	65	7
Lt Clas RCDC 149			22.2	1101	108

Lag RCDC 149a			2.9	42	2
Lag RCDC 149b			7.5	230	11
Ist-Jiq RCDC 149			4.4	36	3
Dili RCDC 149			1.3	13	1
RCDC 150 Cupía/San Isidro	498480	1844350	20.7		
Posclas RCDC 150			3.7	28	3
Lt Clas RCDC 150			20.2	519	55
Ist-Jiq RCDC 150a			4.7	72	6
Ist-Jiq RCDC 150b			2.8	23	2
Horc RCDC 150			2.9	42	2
Guan RCDC 150			4.1	84	4
Fsa RCDC 150			5.2	210	10
Esc RCDC 150			8.5	84	6
Dili RCDC 150			2.9	21	2
Jobo RCDC 150			4.2	112	4
Cotorra RCDC 150			6.1	590	25
RCDC 151 Rancho Ruiz 1	497977	1844355	2.9		
Jobo RCDC 151			2.9	56	2
RCDC 152 Rancho Ruiz 2	497715	1844538	1.1		
Lt Clas RCDC 152			1.1	12	1
RCDC 153 Frac. Las Flechas 1	497307	1844730	1.2		
Ist-Jiq RCDC 153			1.2	12	1
RCDC 154 Frac. Las Flechas 2	497082	1845119	2.9		
Jobo RCDC 154			2.9	56	2
RCDC 155 Frac. Las Flechas 3	496928	1845365	1.3		
Lt Clas RCDC 155			1.1	12	1
Dili RCDC 155			1.3	17	1
RCDC 156 Luis Diaz	496747	1845057	1.1		
Lag RCDC 156			1.1	21	1
RCDC 157 S. Rafael	495952	1844173	4.6		
Esc RCDC 157			4.6	101	6
Dili RCDC 157			1.2	17	1
RCDC 158 Rancho Esequiel	496369	1843649	2.9		
Posclas RCDC 158			2.9	19	2
RCDC 159 Ribera Amatal	500172	1841163	1.1		
Lt Clas RCDC 159			1.1	12	1
RCDC 160 Rio Grande 2	502537	1843711	1.2		
Lt Clas RCDC 160			1.1	12	1
Lag RCDC 160			1.1	21	1
Ist-Jiq RCDC 160			1.2	12	1
Jobo RCDC 160			1.2	28	1
RCDC 161 San Jorge Nandambua 7	504525	1844860	1.1		
Lt Clas RCDC 161			1.1	12	1
Lag RCDC 161			1.1	21	1
RCDC 162 Betania 2	502271	1848535	7.5		
Posclas RCDC 162				93	10

Table E 2 List of Historic archaeological sites

Historic sites				
RCDC H1 Chiapa de Corzo	498845	1846826	98.3	
RCDC H2 Betania North	502259	1848496	5.23	
RCDC H3 Nandalumí	501780	1846968	1.1	
RCDC H4 Flor de Nandalumí	501276	1846370	1.1	
RCDC H5 Betania 2	503357	1846349	2.8	
RCDC H6 Las Palmeras	499335	1846379	11.0	
RCDC H7 La Haciendita 1	503076	1846041	2.8	
RCDC H8 Vivero Grijalva	503235	1844731	1.1	
RCDC H9 Nucatilí 1	506802	1844713	1.1	
RCDC H10 Nucatilí 2	506240	1844667	1.1	
RCDC H11 Playa Grande	500810	1844708	8.1	
RCDC H12 El Recuerdo	501973	1844580	1.1	standing hist house
RCDC H13 Playa Grande 2	501362	1844527	1.1	
RCDC H14 Rancho Borrás	503997	1843466	3.0	foundations
RCDC H15 S. Jorge Nandambua	504448	1843060	1.1	
RCDC H16 Santiago Buenavista	503287	1842893	1.1	
RCDC H17 E. Zapata 1	504878	1842864	2.8	
RCDC H18 Cupía-Pedro Molina	495666	1842419	1.1	
RCDC H19 E. Zapata 2	506738	1841637	1.1	
RCDC H20 El Vergel- Montero 1	495475	1841430	1.1	
RCDC H21 El Vergel Montero 2	498965	1840341	1.1	
RCDC H22 Abadilla	498924	1839769	1.1	
RCDC H23 Rcho Desegaño	500078	1837622	4.0	
RCDC H24 Las Limas	500649	1836384	1.1	foundations
RCDC H25 El Castaño	500808	1836098	3.0	
RCDC H26 El Zapotal1	504113	1835051	1.1	
RCDC H27 Casa Vieja Nueva Palestina	502258	184880	foundation	
RCDC H28 Rcho Desegaño1	501257	1837688	foundation	
RCDC H29 Rcho Esequiel	497051	1845030	foundation	
RCDC H30 Buenos Aires	504923	1842846	foundation	
RCDC H31 El Castaño 2	500841	1837833	colonial añil dye tanks	
RCDC H32 Rcho Reynosa	502782	1844076	rock lined path	
RCDC H33 Ejido Amatal	500685	1839065	Buldozed str- in ruins by at least 1902 per local informant	
RCDC H34 Cruz Chiquita1	503444	1834980	foundation	
RCDC H35 El Zapotal2	503619	1835803	foundation	
RCDC H36 Rancho San Antonio	498862	1835747	str in ruins > 100 yrs per 104 yr old local informant	
RCDC H37 La Haciendita 2	501294	1845284	foundation in soccer field	
RCDC H38 Prop. Guillermo Ruiz	497621	1840529	Hist. cemetery	

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