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Experience on the Frontier: A Tiwanaku Colony's Shifts Over Time

A Thesis submitted in partial satisfaction of the requirements for the degree Master of  
Arts

in

Anthropology

by

Alicia M. Boswell

Committee in Charge:

Professor Paul S. Goldstein, Chair  
Professor Guillermo Algaze  
Professor Geoffrey Braswell

2008

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Chair

University of California, San Diego  
2008

## TABLE OF CONTENTS

Signature Page.....	iii
Table of Contents.....	iv
Acknowledgements.....	v
Abstract.....	vi
Introduction.....	1
Tiwanaku.....	5
Tiwanaku Peripheries.....	7
Tiwanaku Collapse.....	10
Theoretical Framework.....	12
Local Perspective and Household Archaeology.....	12
Middens.....	16
Populations in Diaspora.....	19
Frontier.....	22
Moquegua Valley.....	25
Research in the Moquegua Valley.....	26
Tiwanaku in the Moquegua Valley.....	27
Site Group Attributes.....	28
Rio Muerto.....	30
Primary Occupation.....	33
Secondary Occupation.....	40
Third Occupation.....	46
Material Culture of Units 1, 2, and 3.....	47
Faunal Remains.....	48
Ceramics.....	48
Temporal Change in Ceramic Assemblages.....	54
Discussion.....	57
Rio Muerto and Omo and Chen Chen Site Groups.....	57
Rio Muerto and the Tiwanaku Core.....	58
Conclusion.....	61
Appendix A: Tables.....	64
Appendix B: Figures.....	68
Appendix C: Photos.....	80
Appendix D: Maps.....	89
Works Cited.....	92

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## ABSTRACT OF THE THESIS

Experience on the Frontier: A Tiwanaku Colony's Shifts Over Time

By

Alicia M. Boswell

Masters of Arts in Anthropology

University of California, San Diego, 2008

Professor Paul S. Goldstein, Chair

This thesis investigates the relationships between Tiwanaku associated populations living in a colonial context in the Moquegua Valley, Peru through evidence of daily practices. It also examines the relationship of this colonial group to its homeland in the *altiplano* region and changes over time. The Tiwanaku polity dates from AD 500-1100, with the Moquegua Valley Tiwanaku associated population occupying the valley from around AD 600-1100. This thesis attempts to demonstrate the value of investigation of relationships within colonies from a domestic perspective and what this information can infer about a colony's relations with the homeland.

## **Introduction**

The Tiwanaku population in the Moquegua Valley is one of several colonies associated with the Tiwanaku polity of the altiplano, dating from AD 500-1150. This Tiwanaku colony has had the most extensive research of Tiwanaku colonies at this time. The Tiwanaku colony of the Moquegua Valley's situation is not unique. The Tiwanaku colony of the Moquegua Valley serves as a representative of a Tiwanaku colony as less information is known about other Tiwanaku populations in frontier contexts.

Examination of relations within the colony and with the core region provides an alternative perspective to traditional examination of colonies from the perspective of the core (ex. Algaze 2005). Information about relations within a colony and examination of relationships with the core polity from the periphery over time may serve as a representative example of what other colonies associated with Tiwanaku and other polities might have experienced through time.

Excavations at Río Muerto site M43 a Tiwanaku Chen Chen style site allows for study of relations of a population on the frontier from a "local perspective" (Bermann 1994) over time. Some questions to be asked when studying relations within a colony and with its associated polity core are (1) what can daily practices in a community in a frontier context reflect over time. (2) Can available evidence demonstrate the type of relationships this community has with other communities in the colony? (3) Can this evidence be tied to events in the homeland region allowing for inference of the colony's relationship with its associated state? (4) Can evidence of material culture reflect a colony's identity over time and does this identity remain associated with the homeland? And more specifically (5) what does the situation in the Moquegua Valley represent for



other Tiwanaku colonies? These are questions I wish to address through research at a Tiwanaku colony in the middle Moquegua Valley of southern Peru.

Material correlates from the archaeological record and site attributes can be used to attempt to answer these questions. (1) Site attributes of a community are strong indicators of its relationship with associated communities. If a site group within a colony has less desirable site attributes than its other colony site group members this is a strong indicator of a more subordinate social position and possibly dependent relationship among the other communities. If all site groups reflect similar site attributes a more egalitarian relationship between all is likely. (2) Similarities of domestic features and material culture within household contexts with other site groups in the region indicate strong uniformity of group identity and indicate a strong relationship and consistent interaction between groups, possibly tied to economic and cultural activities. Varying domestic features and material culture indicate more independent communities, with minimal group identity, reflecting a less associated relationship with one another and the homeland. (3) If domestic features and material culture remain consistent over time this indicates little to no change in relations between the colony and the core region. Changes within the domestic sphere in household features and material culture among communities in the colony could indicate changing relations both in the colony and in the core. However if all communities within the colony experience similar changes or no change at all over time in the domestic sphere and material culture in relation to events with the core region this may indicate strong relations within the colony that are tied to the state.

I attempt to answer these questions by investigating the domestic behavior and site attributes of the Tiwanaku colony in the Moquegua Valley. The Moquegua Valley is appropriate as a case study of relationships of communities that are part of a colony because of the extensive research that has taken place here. I will demonstrate the dependant relationship of the Río Muerto site group to two larger Tiwanaku site groups in the Moquegua Valley, tying depositional events in this Tiwanaku colony to events in the Tiwanaku core.

Excavations from 1998 and 2007 at Río MuertoM43 show a later initial occupation, AD 780-1030, than the Omo site group in the Moquegua Valley, which dates between 705-1030 (Goldstein 2005:Table 5.2), corresponding to the Late Tiwanaku IV and Early Tiwanaku V phases at the Tiwanaku core. Goldstein argues for a change in the Moquegua Valley as the original Tiwanaku population in the Moquegua Valley arrived in diaspora and shifted from more segmentary organization (2005:314) to a role of agricultural province of the Tiwanaku state. This is followed by collapse of the Tiwanaku state and abandonment of Tiwanaku sites in the core and periphery areas (2005:320). Río Muerto's stratigraphy shows three phases of occupation at Río Muerto with multiple events of deposition within several occupations. Río Muerto's initial occupation occurred prior to a change in the Moquegua Tiwanaku colony, a shift in organization and lifestyle is reflected in evidence from its second occupation transitioning to a more state-controlled agricultural province, followed by collapse, which coincides with events of the Tiwanaku core region by AD 1150. Río Muerto demonstrates the value to understand power relations within a colony and the possibility of the impact a state can have

upon a colonial population demonstrates the effects that events at the core may have upon an associated population in the periphery.

## **Tiwanaku**

The prehispanic polity, Tiwanaku had strong connections throughout much of the south-central Andes from AD 500-AD 1150. This is seen in the distribution of Tiwanaku material culture throughout the south-central Andes dating throughout this time period. Its capital was at Tiwanaku, a site located on the southern Lake Titicaca basin situated at 3800 meters above sea level (Janusek 2004: xvii). At this high altitude Tiwanaku and its neighboring city, Lukurmata served as the core region for the Tiwanaku polity. During the Tiwanaku IV (AD 500-800) and Tiwanaku V (800-1150) periods extensive urbanism took place at the sites of Tiwanaku in the Tiwanaku Valley and Lukurmata in the Katari Valley (Janusek 2003:31). Tiwanaku material culture is also found outside of this core region throughout the central Andes, it is unclear whether all of these populations identified as Tiwanaku, but they do reflect the extent of the Tiwanaku polity's sphere of access.

There is much debate over Tiwanaku's role in the south-central Andes. It is clear that it was an established polity and had associated populations located throughout the south-central Andes, but what type of polity was it? There are many varying views, but all theories that have been proposed fall within one of three categories. One view is that Tiwanaku was a ceremonial or pilgrimage center (Posnansky 1945; Lumbreras 1974; Wallace 1980). This is a long held view dating to Tiwanaku's first recorded discovery (Squier 1878). Another view of Tiwanaku is that it was an "autochthonous political state," (Janusek 2004:61). The extent of the control of the state and how it was run is debated as well. Max Uhle (1912), Bennett (1936), Ponce (1972), and Kolata (1993,

2003a) are researchers who have argued for this perspective. A final view is that Tiwanaku was a segmentary state “based on economic and social ties rather than political expediency,” (Browman 1981:416-417).

Despite the debate of what type of state Tiwanaku was, it is clear that within the Tiwanaku core that “groups at different scales maintained some degree of autonomy during periods of Tiwanaku hegemony,” (Janusek 2004: 71). This autonomy is seen throughout Andean history in the form of *ayllus*. Researchers in the Katari Valley show a major increase in urbanism in Late Tiwanaku IV period (AD 600-800) with Lukurmata expanding from about 20 hectares into 120 hectares, and over one hundred percent increase of Tiwanaku occupation since the Late Formative period (Janusek 2004: 169). In late Tiwanaku IV, Tiwanaku reached its most dense occupation of six square kilometers, possibly housing over 70,000 inhabitants (Janusek 2004:128). Survey of the Middle and Lower Tiwanaku Valley by Albarracin-Jordan and Mathews (1990) and McAndrews et al (1997) shows 100 sites dating to the Tiwanaku IV period. Most sites were fairly small indicating strong relationships with Tiwanaku, this pattern of urbanism continues into Tiwanaku V. The 100 sites in the Middle and Lower Tiwanaku Valley dating to Tiwanaku IV were surpassed by 339 sites dating to Tiwanaku V. There is a site hierarchy between .01 ha to 10.0 ha, with most of these sites dating to the Tiwanaku V period are larger than those dating to Tiwanaku IV period (Albarracin-Jordan and Mathews 1990; McAndrews et al 1997; Janusek 2004:204). These shifts in settlement patterns did not create any less of a population living in the rural areas in the core region, various researchers argue for these communities level of autonomy (Albarracin-Jordan 2003; McAndrews et al 1997; Janusek 2004:203). Even if these sites maintained some

independence, these shifts in settlement patterns clearly reflect the strength of influence and power that the Tiwanaku polity maintained during Tiwanaku IV and V periods (Janusek 2004:204).

Along with this shift in urbanism in Late Tiwanaku IV there is an increase in agricultural production detected at the household level in both the core area and the Moquegua Valley (Bermann 1997:102; Goldstein 1993; Goldstein and Owen 2001). Tiwanaku-style ceramic vessels show remarkable consistency over time (Janusek 2002:43; Goldstein 2005:224). Although varying distributions of vessel types are found in domestic contexts throughout the core region at Tiwanaku (Couture 2003; Janusek 2003) there is still strong uniformity in style and vessel types. Tiwanaku serving vessels are found in all domestic contexts (Janusek 2004; Goldstein 2005). Along with this Tiwanaku “corporate ceramic style [is] also a new formal assemblage that was associated with a culinary and beverage tradition,” beginning with Tiwanaku IV (Goldstein 2003:148), indicating Tiwanaku’s expansive influence.

### **Tiwanaku Peripheries**

Tiwanaku associated populations are found throughout the south-central Andes. Tiwanaku cultural material outside of the core region have been found in Cochabamba, Bolivia, Azapa and San Pedro de Atacama, Chile, and as far west as the Moquegua Valley (Osmore drainage) in southern Peru (Goldstein 2005). These Tiwanaku-associated populations reflect the extent of Tiwanaku influence during its height as an influential polity, despite knowing the exact type of relationship between these periphery populations.

Researchers working in the San Pedro region have documented Tiwanaku material culture, with the majority from mortuary contexts. These include exotic goods, such as snuff kits, pottery, four-point hats, carved wooden and gold drinking vessels, with the keros corresponding to Tiwanaku IV and V styles of the core area. Overall Tiwanaku goods are in the minority with most materials found of local culture, resulting with Tiwanaku goods to be considered very rare and of high value. This is also because no Tiwanaku associated domestic wares have been found at San Pedro de Atacama (Goldstein 2005: 93-94; Browman 1997). Despite the clear trade occurring between San Pedro de Atacama and Tiwanaku there does not appear to be a change in settlement patterns or household production, so it is unlikely that Tiwanaku populations were living in this area (Mujica 1996:93; Goldstein 2005). If they were, it is a small group that perhaps played a role in trade and lived among local communities. Yet Tiwanaku presence had immense value because of the high quality of Tiwanaku goods that have been found in mortuary contexts. There are two interpretations of this relationship between San Pedro and Tiwanaku, one that San Pedro was ruled by chiefs whom had close ties to Tiwanaku (Goldstein 2005: 98; Orellana 1985). Another interpretation is that San Pedro was a region of “segmentary political organization,” with groups tied to their ayllus (Goldstein 2005:98; Thomas et al. 1985). More research in this region is necessary to determine what San Pedro de Atacama’s relationship was with Tiwanaku.

Cochabamba, Bolivia and Azapa, Chile provide an environment very suited for agricultural production (Goldstein 2005:100). Ceramics found in Cochabamba are very similar to Tiwanaku models, of the core area but there is also a local “Cochabamba-style” kero with its own design (Goldstein 2005:99-100). Azapa maintains a local culture

ceramic style along with Tiwanaku (104-5). At Cochabamba because there has been limited domestic excavations and survey in this region the relationship between Tiwanaku and Cochabamba is undefined, with varying theories on the “intensity of Tiwanaku exploitation and integration of Cochabamba,” (103). Goldstein and Anderson have recognized there seems to be a similarity between the Tiwanaku affiliated Moquegua populations and Cochabamba populations, heading a joint session on mortuary research in both regions at the 72<sup>nd</sup> annual meeting of the Society for American Archaeology held in Austin, Tx in 2007. Future research in the Cochabamba region will help determine what role the Tiwanaku core had with populations living there. In the Azapa Valley systematic survey by Goldstein (1996) has not shown any large Tiwanaku habitation sites but location of Tiwanaku affiliated sites show desirable irrigable areas that were previously unoccupied suggesting perhaps a small agrarian population. It is clear through mortuary evidence that some Tiwanaku elite were living in the Azapa Valley (2005:107-111).

The Moquegua Valley has seen the most extensive research of all Tiwanaku associated populations. The Moquegua Valley was home to the largest Tiwanaku population outside of the core region, with radiocarbon dates placing the occupation from roughly 400-1100 AD, these dates corresponding to the Tiwanaku IV and V phases (Goldstein 2005:133). There is no doubt that the Tiwanaku population in Moquegua had a relationship with Tiwanaku, although the exact type of relationship between the core and Moquegua Valley’s Tiwanaku inhabitants is unclear. Goldstein classifies the Tiwanaku population of the Moquegua Valley as a population in diaspora and views them as a province of the Tiwanaku core (Goldstein 2005: 320). Owen agrees with



Goldstein's view of the Moquegua Valley housing a Tiwanaku colony viewing this original population movement identified as a labor/service diaspora (2005: 45-46).

Goldstein and Owen also view the Moquegua Valley Tiwanaku population being affected by the decline and fall of the Tiwanaku state (Goldstein 2005; Owen 2005; Goldstein and Owen 2001; Owen and Goldstein 2001).

### **Tiwanaku Collapse**

The fall of the state of Tiwanaku shares nearly as much debate as its organization. There is evidence for "residential decline as well as the abandonment and destruction of monuments and icons, in Tiwanaku and Lukurmata," (Janusek 2004:250). The decline began by AD 1000 (Janusek 2004) and by AD 1150, the Tiwanaku polity has disappeared (Kolata 2000:171). Periphery populations are affected as well, as demonstrated by the Moquegua Valley's settlement patterns (Goldstein 2005: 171). Janusek views the fall of Tiwanaku to be the result of social tensions in power relations that accrued over time in combination with environmental factors (2004:250). Kolata also favors this argument for Tiwanaku collapse (2000:171) agreeing with the research of Binford et al 1997 regarding the impact of climate change upon the Tiwanaku core region. Erickson (1999) criticizes this approach of what he refers to as a "neo-environmentalist" stance of Kolata and Binford. The role of the environment in Tiwanaku's fall is debatable. According to Owen, Berenguer (2000) sees Tiwanaku's fall as a "specific picture of revolt and destruction," (Owen 2005:71), not including the environment as a factor. There is also destruction of almost every Tiwanaku-style public architecture or ritual area, supporting Berenguer's argument of revolt, with the only non-Tiwanaku style temple in the core region untouched (Owen 2005: 71; Posnansky 1945). Whatever the direct reasons for the

fall of the Tiwanaku state it is clear that with its collapse most Tiwanaku sites were abandoned and there was a shift in settlement patterns and ceramic style (Janusek 2004:257; Goldstein 2005: 171).

## **Theoretical Framework**

### **“Local Perspective” and Household Archaeology**

Bermann introduces a concept of the "local perspective" in contrast to the "capital-centric view" that is part of the early history of Andean archaeology (1994:10). "Capital-centric" view is one of a "view from the top down" traditionally emphasizing the center of a state system, focusing on an "overarching regional system," and often times characterizing smaller sites as "passive recipients of political control," (10). A capital-centric view pays little attention to smaller sites' histories. In contrast, the "local perspective" allows the relationship between a state and smaller sites to be evaluated from the subordinate sites (11). "Implicit in the local perspective is the idea that the smaller site is an evolving settlement in its own right, with its own tradition, history, and pressures for change," (11).

In order for this evaluation from a "local perspective" to be successful Bermann argues for study at the household level to evaluate “significant processes in cultural evolution, the manner in which larger processes are manifested at the household level, and how the smallest units of society adapt to the sociopolitical setting,” (11). The use of the “local perspective” allows communities to have developmental histories separate from contact with expanding polities,” (11) permitting them to have their own additional history rather than lumping them with other sites that have been affected by a polity. This is valuable when evaluating the extent of influence a polity had upon a community. For instance Bermann uses the example that a “capital-centric” perspective would view the regional distribution of Tiwanaku style objects at Chilean, Peruvian, and Bolivian sites

conquest, or that the Tiwanaku state exported a limited range of artifacts to this region,” (12). This assumption is faulty because what do these artifacts indicate about the Tiwanaku state? Bermann argues a “capital-centric” archaeologist would have already decided what the presence of the Tiwanaku style artifacts meant, while the “local perspective” archaeologist might argue that the artifacts might say more about “local traditions and patterns of adoption at the smaller site, than the pottery does about the organization of the Tiwanaku state or ‘access’ to Tiwanaku products,” (12).

Household archaeology allows for investigation within a “local perspective” viewpoint (Bermann). It also can be used to attain information regarding a wide variety of interests about populations. Evidence of domestic behavior is common at most archaeological sites, and often described as the “basic units” of human societies (Bermann 1994; Stanish 1989; Wilk and Rathje 1982). Material culture from domestic contexts is considered the “basic units” of human societies because it can reflect daily activities of a population. There are theoretical and methodological problems within household archaeology but “it is the most successful analytical tool for unraveling the complex and economic and political relationships within and between settlements in the Central Andes,” (Stanish 1989:7; Deetz 1982).

One of these theoretical issues is what constitutes a household? A clear definition of what household archaeology is by researchers is always needed (Smith 1993:13; Smith and Schreiber 2005). The social boundaries within a community can vary extensively in time and also between members of different social status (Bermann 1994: 22). The best approach is to view the household as an “open system,” made up of many “dimensions production, transmission, and the rest as well as activities,” (23). The household is a

dynamic system that is continually changing and affecting others. Hastorf and D'Altroy (2001) adopt a definition of household similar to Netting (1989:231), "a socially recognized domestic group whose members usually share a residence and both organize and carry on a range of production, consumption, inheritance, and reproductive activities whose specific contents varies by society, stage in the life cycle, and economic status." The evidence of these activities within the household provides researchers to infer about social behavior both for the people living in that specific area of the site and also the community.

Besides expanding the definition of household outside of a single residence or kin structure, activities at the household level can be tied to social and economic patterns to a community, and at another level household production can be tied to the political economy of a state or polity (Hastorf and D'Altroy 2001: 10). Besides household activities, the composition of households' structures, symbolic meanings of household forms, and its variations are aspects that can be useful for researchers (10). Inspection of domestic area allows access to controlled and uncontrolled distributions of a group's social signatures, or cultural characteristics and tendencies in daily life. Household archaeology provides information from two spheres, the public or external domain and the internal or private domain (Kent 1990:2). An example of this is domestic architecture and the material evidence of activities occurring within the structure. Aldenderfer and Stanish argue that the study of domestic architecture allows for testing of zonal complementarity in the south-central Andes and resolution of other archaeological questions including "identification of ethnic groups, the causes of stability and change in household composition and size, and much more," (1993: 2). Their definition of

architecture includes at the simplest level a single structure, but also the “use of space, building materials, placement and location, and artifacts found within and near domestic structures,” (5). Building a domestic structure is a conscious construction and a public feature of a community. Within the structure there is evidence of daily activities occurring that are unconscious behaviors, which provide information about a community’s lifestyle.

Access to remnants of daily practices in the private sphere of the household sectors of communities leaves unintentional information about lifestyle. This is in contrast to the evidence acquired from excavation of cemeteries for example. How individuals are buried, what they wear, and objects buried with them is a controlled environment for other members of a community or outsiders’ to view, with the individual reflecting the society he or she lived in. This context is completely controlled compared to domestic contexts. Valued information can be retained from mortuary studies but study of household and activities that take place within the domestic context provide information about individuals and communities that they are unaware of (Kent 1990:1). This allows for a more intimate perspective of a society and how they lived their daily life.

Another advantage of the use of household archaeology is its comparability. The household can be used as an analytical unit allowing for standardization and comparison between different sites and time periods. There is much variety in groups’ methods for “manufacture and distribution of artifacts” that are found in the archaeological record, yet the one consistency is the household (Aldenderfer and Stanish 1993:5). A few examples of the types of comparisons that can take place are within a culture group, over time

within a culture group, or even compared to other cultures. For instance, Vaughn uses household activities to evaluate craft consumption of both elites and non-elites in household contexts in Early Nasca AD 1-450 (Vaughn 2004). Vaughn evaluates various residences use and frequency of polychrome pottery as a status marker throughout early Nasca society, exposing the differences in lifestyle through the evidence of material culture. Despite previous belief that polychrome pottery served as a status marker, Vaughn's excavations of households indicates that both elites and commoners had access to polychrome pottery, and that it is certain vessel types that are reserved for elites (2004). Another example is Janusek's comparison of Tiwanaku households throughout the core region over time (1994, 2002, 2004) to demonstrate different activities and uses of various areas of sites changing over time. Comparisons between culture groups can also be valuable, especially if one is very well-documented, such as Goldstein's comparison of Tiwanaku domestic activities to known Inca domestic activities (2003).

### **Middens**

Excavation in midden areas within a domestic context provides an example of how daily activities can be researched, especially regarding change over time. Trash is found in three types of contexts according to Schiffer (1976:30) as primary refuse or discard at the location of use, secondary refuse or refuse discarded away from the area of use, or as de facto refuse or material abandoned at the use location but still having a perceived value. Schiffer (1987) adds another type of trash found in archaeological contexts as provisional refuse or stored refuse having a perceived re-use value. All trash goes through a "waste stream" according to Schiffer (1987) or a "refuse-cycle" according to Needham and Spence (1997). "An object's refuse-cycle ceases with incorporation or

burial, but may resume if it comes to be disturbed,” (77). With time and the environment playing key roles, trash piles often become middens.

Middens are very useful in informing researchers about site activities and site formation processes. Beck quotes Hayden and Cannon 1983, “The contents of household compound middens or neighborhood dumps may provide the best sample for reconstructing household material culture and activities,” (2006:27). This assemblage provides information deposited by site occupants. It is highly unlikely that certain refuse or evidence of household activities would be withheld from a neighborhood dump, especially if it is perishable or no longer of use. The accumulation of artifact types and frequencies within middens can provide information about site activities, it can also reflect the length of site occupation and be helpful in calculating a site’s population (Beck 2006:27; Varien and Mills 1997; Varien and Ortman 2005). The Kalinga, Philippines Ethnoarchaeology Study’s 2001 field season conducted at the community of Dalupa demonstrates the valuable information that can be derived from ceramics found within a midden context. This project focused on the ceramic assemblage formation, and the variety of artifacts found within a midden context. Because the study’s focus was the ceramic assemblages of middens they tracked the movement of discarded vessels into the archaeological context. This study found that although vessels might arrive at a midden in a fairly complete state, [they] eventually end up as small sherds by “cultural disturbance processes,” (Beck 2006: 29). Also further analysis by Beck (2007) reveals changing use of space as households are often found where middens had previously existed.

Middens tend to be used for secondary refuse deposits (Needham and Spence 1997). Once debris is deposited in middens it is rarely disturbed as recycled or reusable



goods can be assumed to be kept in provisional discard areas where they are more accessible (Schiffer 1987). However cultural disturbance can occur, often times by children's play, domestic animals, "extramural cleaning", and burning as documented by the Kalinga, Philippines study (Beck 2006: 44). The natural setting of the midden can also affect midden stability depending on the sediment and soil around it. At Dalupa for instance, despite terracing, because of the slope the community is built on most inactive middens are difficult to find because of the colluvial processes in the area. The slope of the community is so steep that their water system relies on gravity. Middens are buried or have moved downslope as they are no longer active. Middens that were active were no thicker than 66 cm and midden deposits were found within 5 cm of the surface (45). The rate of accumulation and burial of refuse also provides physical protection for discarded artifacts (46). Research in midden contexts, or refuse areas provides archaeologists with evidence of both private and public activities of a community. Also depending on the type of midden, whether it is household, local, or communal can be used to examine "intrasite comparisons of consumption, status, ethnicity, or activities," (Beck and Hill 2004: 297). This information that can be gathered from middens throughout the site can be just as valuable information as comparing domestic architecture within a site.

Household archaeology is very valuable in the Andes and specifically for Tiwanaku populations because of the inclusions of daily, ritual, and specialized activities all occurring in domestic space (Janusek 1999, 2003:268). This allows for inclusion of many aspects of Tiwanaku culture in a single context. The household serves as the "fundamental unit of social reproduction, as well as economic production.." (Goldstein 2005: 183). Household archaeology and its ability to give insight to social roles are

invaluable because of the extent of community activities taking place in this context, especially for Tiwanaku populations. Janusek believes, “Material patterns, representing multiple dimensions of practical consciousness and social activity, emphasize the central place of social boundaries in the formation and day-to-day reproduction of Tiwanaku society. Group identity is formed by this practical consciousness (2002: 36). Studying social identity from evidence found in a context that is the basis of Tiwanaku life, a perspective of both private and public spheres, allows for exposure of identities both intentional and unintentional. There is value in comparing a diasporic household with the core (Goldstein 2005:183), and also to other diasporic households in the periphery. This is important as well because of the unique situation and pressures frontier populations’ experience, possibly emphasizing the role of group identity in a community within the community itself and also with other culture groups within the area (Lightfoot and Martinez 1995). In the archaeological record this identity is expressed in material culture. The information gathered from domestic contexts can reflect the identity of the community being investigated.

### **Populations in Diaspora**

Goldstein uses James Clifford’s definitions of diaspora (2005:32) in classifying the Tiwanaku population living in the Moquegua Valley. Goldstein views populations in diaspora as “transnational communities with strong shared identities, expectation of return, and unwillingness, difficulty or inability to assimilate in host societies,” (2005:33), for a complete description see Clifford 1994. This group identity formation is expected to be dynamic rather than static, with boundaries potentially redefined through

time in “complex and dynamic networks of relationships, interests, and identities,” (Goldstein 2005: 33; Cohen 2000).

At Tiwanaku, Janusek views group identity as “critical in forming and maintaining these [social] boundaries,” (2002, 38). He also states that

A conjunction of material patterns, representing multiple dimensions of practical consciousness and social activity, emphasizes the central place of social boundaries in the formation and day-to-day reproduction of Tiwanaku society (38).

Janusek is discussing this in relation to the urban populations of the Tiwanaku core region, at Tiwanaku and Lukurmata, however this statement is also applicable to the periphery population of Moquegua. These differences could signify kin groups that have regional affiliations.

In the Andes a form of corporate group is the ayllu. Ayllu is kin-based in theory, members share common ancestors, sacred places, and resources (Abercrombie 1986: 24-101, 1998; Isbel 1997; Platt 1982: 50, 1987). An ayllu is both a social identity and political ideology (Janusek 2002:37). Janusek believes it is plausible that ayllu groups that have been documented during the Colonial Period and up until recent history could be antecedents of the Tiwanaku polity (2004: 164). Other evidence of ayllus comes from the Inca Empire. Although there is less direct evidence of ayllu groups prior to the Inca, ayllu groups are believed to have existed throughout pre-history in the Andes. The Inca Empire was composed of many different groups of varying sizes, “from acephalous villages to [previously] competitor states” (D’Altroy 2001:201). These groups were made up of ayllu members. Ayllus “tried to disperse their populations across ecozones in an effort to be as self-sufficient as possible,” (D’Altroy 2001:215; Murra 1972). D’Altroy

(214-216) further elaborates on the various skills of certain ayllu groups that the Incas valued, demonstrating that multiple ayllus can make up the members of a state or empire. Goldstein believes that in Tiwanaku society “group identities persisted beneath the veneer of state control” (2005:326), meaning although these ayllus may have been controlled by the state, like the Inca controlled many different communities, but ayllu identities did not fade. The ayllu groups that made up the Tiwanaku state did not lose this group identity either (Albarracin-Jordan 2003: 98; Kolata 2003b:456-458), which is shown through the diversity in domestic practices at Tiwanaku (Janusek 2003:268, 2004; Couture 2003:225) and in the colonies (Goldstein 2005: 236).

The geography of the Andes region is diverse. John Murra (1964, 1968, 1972, 1975) has proposed models of verticality, which are based on the nature of ecological resource areas in the Andes at various altitudes. Murra proposes a “vertical archipelago” of ethnic enclaves at various altitudes, which identify with each other, and produce resources for the home population, which resides presumably in the highlands and is therefore limited in economic resource diversity (1968, 1972). He used records of the 16<sup>th</sup> century Lupaqa kingdom located on the shore of Lake Titicaca which were recorded by a Spanish official Garci Diez de San Miguel (Murra 1968, 1972). This adaptation in the Andes exemplified by the Lupaqa population is to utilize altitude-defined resource zoning characterized by “resource access via nonmarket exchange systems” (Goldstein 2005: 41). These ethnic enclaves are composed of ayllu members, who migrate under direction of their ayllu leaders, in pursuit of resources that are not available in their homeland. According to Murra as these groups move about the landscape they remain connected to their ayllu, because they exchange agricultural products, as well as intermarry, and

practice traditional rituals with their fellow ayllu members (1968). There are criticisms to uses of Murra's model prior to the 16<sup>th</sup> century because of some of his "central assumptions" such as, viewing Andean groups as always stable, politically and economically (Van Buren 1996) and also because of the difficulty in identifying different ethnic populations in pre-Hispanic contexts (Stanish 1989:7). However, this model does provide motivation and explanation for why populations in the Andes migrate. These members of ayllu groups that migrate to different ecological zones form periphery populations. This migration away from the homeland or core region places these populations in a frontier environment. Murra's model has been used to explain the expansion of the Tiwanaku polity outside of the core region (Goldstein 1989, 2005; Stanish 2002; Owen 2005).

### **Frontier**

The relationship between a core and associated populations in the periphery is an issue in the study of archaic states. This concept was introduced by Wallerstein's World Systems theory (1974), it has been applied to archaeological theory by various researchers such as Algaze (2005), Champion (1989), and Andeanists as well, Dillehay et al (2006) and Jennings (2006) among others. There is also criticism of the use of the world systems theory and caution in its application to pre-history societies by Stein (1999, 2005a) and Kohl (1989). This is often in regard to concerns of utilizing an exclusive colonialist perspective (Lightfoot and Martinez 1995) which is attributed to World System's initial application to 16<sup>th</sup> century Western Europe. To discuss what Stein calls "colonial encounters" is difficult because there is no agreement among researchers about "1. what colonies are, 2. how and why colonies vary one from another, 3. how

colonies function as social, economic, and political entities, 4. what colonial relations are like with indigenous host communities, and 5. how ethnic identities are transformed in colonial situations,” (2005a: 4). If a colony cannot be clearly defined then there are issues regarding the best way of using theoretical frameworks like World’s Systems Theory. But rather than wait for a convincing framework exploration of some of these issues listed above might allow for a better definition of a colony. One question that has had limited research among populations in frontier environments is there a status hierarchy among the groups? Are there subordinate and dominant relations within these populations in colonial situations, and specifically those in diaspora? These questions are interesting to ask because of the unique situation of populations living in a frontier environment.

Populations living in a frontier environment often behave and react differently than a population within the core region. Frontiers can be defined “as zones of cultural interfaces in which cross-cutting and overlapping social units can be defined and recombined at different spatial and temporal scales of analysis,” (Lightfoot and Martinez 1995, 472). Colonial populations experience unique situations in cultural, economic, and political processes creating a dynamic environment with shifting boundaries on all of these levels. This is because of populations’ adjustments and exposure to new environments outside of a homogeneous homeland, exposure to other populations, and possibly facing challenges in dealing with new relationships with other groups (471-474). Lightfoot and Martinez believe “frontiers represent ideal places to study.. the construction, negotiation, and manipulations of group identities,” (474).

The Moquegua Tiwanaku population is a good case study for how colonies, specifically provinces, are organized because of its extensive population throughout the

middle Moquegua Valley. Do the site groups rely on each other? If so, how is this known? The Moquegua periphery also responds to events that take place in the core region as well, showing how events at the core can affect a periphery. Other Tiwanaku peripheries have had less research and their relationship with Tiwanaku is less clear than the Tiwanaku populations in the Moquegua Valley. Because limited research of the relationships within a colonial population between site groups, the correlates proposed here have been adopted from core/periphery models and adjusted for a frontier situation. Performing an evaluation of a periphery population from a top-down model only would be limited in scope, evaluation from a local perspective is used as well (Bermann 1994). This paper utilizes site group attributes and local perspective to evaluate relationships within a colony.

## **Moquegua Valley**

Why settle in the Moquegua Valley? Documents from the colonial period remark on how agriculturally productive the land in the Moquegua Valley is. With Spanish colonization most of the land was converted to vineyards for production of wine and pisco. The area has a year round growing season and is incredibly productive for both local and non-local products, such as avocados, maize, peppers, cotton, etc (Goldstein 2005:116). The Moquegua Valley has a very arid environment, as it is located in the north of the Atacama Desert. Because of its climate the preservation of materials (specifically at the site group Río Muerto) is remarkable with preserved organics, botanicals, and textiles found in excavations. The Moquegua Valley or Osmore Drainage is broken into three sectors. Water sources from the three rivers in the northern part of the valley come down from a much higher elevation. The upper valley's water sources are the Huaracane, Torata, and Tumulaca rivers, located just above the present-day city, Moquegua. The upper valley is incredibly steep, above 2000 meters (Goldstein 1989:50), but once into the middle Moquegua Valley the landscape is wide and flat relying on man-made irrigation canals from the Moquegua River for water resources. The coastal portion of the Osmore Valley is desolate (Goldstein 2005: 116). Flooding from 2 El Niño events occurred during the Tiwanaku occupation of the Moquegua Valley, during A.D. 700 and A.D. 1300 (Magilligan and Goldstein 2001; Goldstein 2005: 149)

The Moquegua Valley's first agriculturalists arrived during the Formative period. They were a group called the Huaracane believed to originally be from the coast (Goldstein 2005:123). Although Huaracane settlements qualify as hamlets or small villages, their population was large, with 169 sites found total in the valley (Goldstein



2005: 123). The relationship and reaction of Huaracane populations to Tiwanaku colonization is not clear. Until recently radiocarbon dates from Huaracane sites had not coincided with Tiwanaku occupation of the Moquegua Valley. However Costion's recent research at Yahuay Alta places the late phase of Huaracane sequence overlapping with the Tiwanaku occupation in the Moquegua Valley, AD 710-860 (2008). There is limited to no evidence of interaction between the groups, "different settlement patterns of the two groups leave no examples of on-site cohabitation, conflict, or reoccupation." Despite dates overlapping, limited evidence of cultural material exchanged between Tiwanaku and Huaracane indicates these two groups remained separated (132). This limited interaction in the Moquegua Valley contrasts with the situation of other Tiwanaku associated populations (San Pedro de Atacama and Cochabamba) in the Tiwanaku periphery who used Tiwanaku style and goods with local indigenous culture (132-133). Radiocarbon dates place Tiwanaku populations living in the Moquegua Valley during the Middle Horizon period, from AD 500-1100, with both Omo and Chen Chen styles living concurrently (2005: 132-134). The Tumilaca phase follows the Tiwanaku period in the Moquegua Valley, after Tiwanaku had collapsed in the core and abandoned sites in the Moquegua Valley. Tumilaca phase dates from around AD 770-1250 (Goldstein 2005: Table 5.2, 171). Tumilaca style sites shows stylistic influence from Tiwanaku and Chiribaya (from the coastal region) cultures, occupying parts of the Moquegua Valley, they also exhibit defensive architecture, and a refugee migration settlement pattern in comparison to Chen Chen and Omo style sites. (2005:171-2).

### **Research in the Moquegua Valley**

Archaeological research in the Moquegua Valley began in the early 1980's with a

Binational project, the Programa Contisuyo. Survey work by the Programa Contisuyo, led by Moseley, Feldman, Bawden, and Watanabe; MAS (Moquegua Archaeological Survey) led by Goldstein, and Owen's surveys of the Upper and Lower Osmore Drainage has revealed a valley very rich in archaeological history. The Middle Moquegua Valley which is referred to in this paper as the Moquegua Valley contains Tiwanaku 4 site groups. Excavations by Moseley, Goldstein and others over the years have provided a well-recorded evaluation of the pre-colonial history of the valley (Stanish 1989; Goldstein 1989, 2005; Moseley et al 1991; P.R. Williams 2000; Owen 2005).

### **Tiwanaku in the Moquegua Valley**

“Altiplano Tiwanaku settlement in Moquegua was restricted to densely populated enclaves in locations that were not inhabited previously,” (Goldstein 2005: 134). The MAS survey has shown that Tiwanaku sites occupied 141 hectares of the middle Moquegua Valley (134). Almost all Chen Chen and Omo style sites are located at one of four large site groups that contain almost exclusively Tiwanaku material culture. The site groups are Omo, Chen Chen/Los Cerillos, Río Muerto and Cerro Echenique (134), see Map 1. There are three different stylistic types of Tiwanaku sites within these site groups, classified by ceramics and other site characteristics, Chen Chen, Omo, and Tumilaca styles. Chen Chen and Omo styles overlap in time contemporaneous with Late Tiwanaku IV and Early Tiwanaku V in the altiplano, while Tumilaca dates to Early and Late Tiwanaku V in the core region. This paper focuses on Chen Chen style sites, which is associated with Tiwanaku agriculturalist populations, rather than pastoralists (Goldstein 2005). Goldstein has proposed that the main role of the Chen Chen style sites in the Moquegua Valley was agricultural production, specifically producing maize for the core

region (Goldstein and Owen 2001). Maize was used for making chicha (maize beer), which played an important role in Tiwanaku ritual consumption both in Moquegua and in the core region (2005:320).

### **Site Group Attributes**

The Tiwanaku site groups in the Moquegua Valley are located away from the valley edge. The Omo site group is the largest known Tiwanaku site group outside of the altiplano. It is located on a bluff top, “that overlooks and control a wide expanse of valley bottom land,” it also has access to what Goldstein refers to as the “region’s most productive springs,” (2005: 144). It is located on the east side of the Moquegua River and has five main settlement areas within a 2.5 km area, east of the floodplain of the valley. Omo contains both Omo and Chen Chen style sites, totaling 38 hectares in all, and 6 hectares of Tumilaca style sites. It also includes the only known Tiwanaku monumental architecture outside of the core. At Omo M10 there is a sunken Tiwanaku temple that is adjacent to domestic areas (282), its final stages of construction dates to the Early Tiwanaku V period, AD 885. There is a direct route from Omo to Chen Chen. This route is assumed to have been “part of an important Tiwanaku caravan route from the altiplano to the Pacific coast,” (146-147). Geoglyphs are visible along parts of the route to guide caravans. Chen Chen is the second largest site group with over 20 hectares of settlement area among 10 sectors and over 10 hectares of cemeteries (147-148). Cerro Echenique is the only site group located on the west side of the Moquegua River. It also has the only Chen Chen style sites with a defensive wall. It is made up of 6 hectares of settlement, built completely on a hillside with terracing (149-150). Out of these 3 site groups Omo and Chen Chen clearly have the more desirable location to support larger populations and

also have relatively simple access to each other. Monumental architecture and size of the site groups could also indicate Omo might have more of a leadership role than the Chen Chen. Cerro Echenique because of its location and size probably has very little influence among the other two site groups.

## **Río Muerto**

The Río Muerto site group was discovered in 1993 by the MAS project. It is the southernmost Tiwanaku site group in the middle Moquegua Valley, just over 16 hectares in size (Goldstein 2005: Table 5.3). Río Muerto is made up of M43, M48, and M70. M43 and 48 are both Chen Chen style sites, while M70 has Omo style characteristics (2005:140). At Río Muerto, M43 and M70 sites are located adjacent to each other, with M43 slightly south and to the west of M70. M48 is located to the south of both M43 and M70 with a hill that contains multiple cemeteries separating M43 and M48, see Map 2 and 3 for M43 and M70.

Río Muerto is located in a very dry quebrada that is over a “kilometer east of the limits of modern canal irrigation,” (149). Goldstein sees Río Muerto’s “proximity to springs may have been a significant factor in Tiwanaku site location,” access to the natural springs in the area would not have been sufficient for irrigation, except for when flooding occurred (Goldstein 2005: 149; Magilligan and Goldstein 2001), suggesting Río Muerto might have had more difficulty than the other site groups in accessing water for agriculture. This suggests that Río Muerto may not have been continuously occupied if the amount of water available was insufficient; that its inhabitants had to travel further to their fields in the floodplain, and that at least part of its population may have been pastoralists. As Río Muerto is smaller in size than Omo and Chen Chen, it is possible that these more marginal resources required the population living at Río Muerto to rely on other site groups for certain resources or assistance in access to resources.

Chen Chen style domestic areas are characterized by dense middens, covered thickly with materials, and also what Goldstein describes as a “rockpiling” phenomenon

(2005:159). This rockpiling phenomenon is not a natural site formation. Shortly before or after abandonment Chen Chen style sites were heavily disturbed, Goldstein suggests by the Tiwanaku themselves, destroying site architecture with deep irregular pitting and mounding, with surface rockpiles forming as a result (159). At the Río Muerto site group the soil matrix is much sandier than other Tiwanaku sites in the area, so there is minimal rockpiling compared to Chen Chen, but dense midden debris covers the entire M43 site and there is clear evidence of disturbance of the midden.

Proyecto MAS mapped and performed a systematic surface collection in 1998 at Río Muerto. Table 1 compares Río Muerto M43's surface sherd density to some of the Omo site group's sites. Ceramic density and distribution results for Río Muerto M43 and M70 are shown in Map 2 and 3. It is clear that the most densely covered area in ceramics of the two is M43, specifically its southwest sector.

To test the relationship with Chen Chen style sites at Omo and Chen Chen site groups in the valley, these three units have been excavated in this southwest sector of M43. Units 1 and 2 were excavated in 1998 as part of Proyecto MAS and Unit 3 was excavated in 2007 as part of Proyecto Río Muerto. All of the units were within 61m x 43m area creating a substantial data set for domestic activities in this area of the site. All 3 units were oriented North-South, Unit 1 was 3x1 meters, Unit 2 was 2x2 meters, and Unit 3 was 2x2 meters. The units' southwest corners' locations are:

Unit 1: N 8085347.85 E 289429.94 UTM: N 5186, E 2021 (local grid)

Unit 2: N 8085409.01 E 289398.68 UTM: N 5247, E 1990 (local grid)

Unit 3: N 8085352.85 E 289387.01 UTM: N 5191, E 1978 (local grid)

These units all provide valuable information regarding Tiwanaku domestic activities at Río Muerto M43, allowing comparison of Chen Chen style sites at the Omo and Chen Chen site groups, and evaluation of these site groups' relationship. I will compare domestic activities at Río MuertoM43, to other Chen Chen style sites of Omo and Chen Chen M1, as well as demonstrating how events in the core region affected Río Muerto through its occupation.

All three of the units excavated at Río Muerto M43F produced dense, well-preserved midden deposits, allowing insight to Río Muerto's Chen Chen style populations' lifestyle. Two radiocarbon dates from M43 from Unit 1 and 3, date to AD 888-982 and AD 970-1020, 1 sigma calibrated. Unit 1's sample was taken from specimen number 1067 which was a carbon sample from Feature 3, the lower floor found in the unit which is associated with the primary occupation of the site. Unit 3's sample was also associated from the initial occupation. It was taken from specimen number 2497 which is associated with Feature 5, a hearth. Other radiocarbon dates from Chen Chen style sites at Omo and Chen Chen fall within the range of AD 785-1017, including the Omo temple at Omo M10, Omo M10 domestic structures Structure 11, and 13 (Goldstein 2005: Table 5.2) These radiocarbon dates also correspond with Late Tiwanaku IV and Early Tiwanaku V periods in the core region (Janusek 2004).

The population at Río Muerto adjusted use of domestic space over time. The three units that have been excavated show similar patterns throughout the site's occupation. All units follow very similar stratigraphy, reflecting three different occupations at Río Muerto, with multiple events within each. The initial occupation in each unit is characterized by at least one domestic floor slightly above sterile surface. The second

occupation shows a shift in site formation processes to dense middens of refuse deposits indicating a significant increase in population. A final event within this second occupation is evidence of pitting and then abandonment, which corresponds to the same actions, described by Goldstein at Chen Chen style sites at Omo (2005: 225) and also events at the Tiwanaku core discussed by Janusek (2004:252-253). Evidence for a third occupation is found only in Unit 1, which contains characteristics associated with the Colonial Period.

### **Primary Occupation and Discussion**

Each of the units at Río Muerto M43 contains floors directly above sterile soil, indicating that this occupation was the first to occur at Río Muerto and are contemporaneous with those at other Chen Chen style sites in the Moquegua Valley. Chen Chen-style homes at Omo M10 were “rectangular, multiroom structures with walls built of mud-daubed river cane set into wall trenches,” which is a predecessor to the use of quincha in the later Tumulaca phase (2005:212), and evidence of similar construction has also been found at Chen Chen M1 (Goldstein 1995) and Omo sites as well (2005). Excavations so far at Río Muerto are small in area and do not present any evidence of the use of quincha, increasing the importance of floors, posts and domestic features found in excavation.

M43's Units 1, 2, and 3 provide similar features indicating similar uses of domestic areas during the primary occupation of Río Muerto M43. The domestic features echo the characteristics of other Chen Chen sites including Omo M10, specifically Structures 13 (see Goldstein 1989: 185) in postholes, floors, and ceramics. The initial occupations of Units 1, 2, and 3 all contain domestic floors, although of varying



description. All of the floors found in each unit were directly above sterile surface. Unit 1 and Unit 3 both have two floors (features 1 and 3; and levels 8 and 9). There is sediment clearly separating the floors of Units 1 and 3, indicating each is associated with separate events within the occupation (see Photos 1 and 2 for an example from Unit 3).

Unit 1's primary floor is described as brown-gray in color, the sediment silty in texture and botanicals found throughout the level. It is very compact, with the only discrepancy between the first and second floor being color. Unit 1's second floor is light-grayish brown in color.

Unit 3's floors indicate separate events with the first floor (level 9) concentrated in only the northwest sector of Unit 3, while the second floor (level 8) was found throughout almost the entire unit. Both floors were compact, greenish-gray in color and were clay-like and somewhat silty in texture.

The floor of Unit 2 is questioned as being a true floor. In comparison to the floors of the other units it seems to contain more organics and lacks a detailed description of color and texture, however level forms indicate that is a plausible floor, with sterile soil beneath it. The sediment above it is noted as having a different texture, but is not described in notes. It may be similar to Occupation floor "A" at Omo M10, Structure 13 that is the initial floor of the structure that "appears to have been formed through the trampling of cultural accretion above the original sterile surface," (1989:185). Omo M10, Structure 13 contains two major construction phases with some minor modifications as well.

All three units at Río Muerto contain at least one posthole, associated with a floor, see Table 2. Postholes give indications about probable domestic architecture. Each unit

contains postholes that are at least 10 cm in diameter, with varying depths below the floor. The variety of posts' diameters and depths are an average of 10-12 cm in diameter and 7-12 cm in depth; 10-15 cm in diameter and 17-18 in depth; 13-15 in diameter and 26-28 in depth; and a final type of post found is 25 cm in diameter and 16 cm in depth. Some of the postholes' locations clearly indicate they are associated with domestic architecture, perhaps part of a wall or corner depending on the group of postholes. This is because of their close proximity and position in relation to each other. Unit 1 contained 3 postholes, 2 associated with the older floor (Features 10 and 11), and one with the younger (Feature 2). Features 10 and 11 are located next to each other in the south east corner of the unit, with Feature 11 ten centimeters west of Feature 10. They are also in close proximity to a pit filled with trash, Feature 12, located just east of Feature 10. The postholes are 10 and 15 centimeters in diameter respectively and could have been used contemporaneously as part of a wall or perhaps served the same purpose at different times during the floor's occupation. Records of Unit 1 associate Feature 2 with the younger floor of the unit. Its location in the unit in the north-west corner is at a diagonal across from Features 10 and 11, suggesting although each is associated with different floors that Feature 2 and Features 10,11 could possibly have been corners for a structure, or the diagonal line between Features 2, 10, and 11 could indicate the postholes were part of a wall. Although they are associated with separate floors this also could suggest that the previous occupation might have maintained the same structure location and style.

Unit 2 contains several postholes that are part of domestic architecture. Features 6, 7, and 8 are postholes next to each other, east-west across the unit and are all similar in diameter between 11-15 cm. From the west to east side of the unit Features 8 and 7 are 20

cm apart, with Feature 6 about 70 cm west and 15 cm south of Feature 7. As seen in Unit 1, these postholes indicate probable wall or roof construction for a structure. The final posthole of Unit 2, Feature 9 is much wider in diameter than the other postholes. It could have the same use as a echoes a large “massive central pillar,” for roof support like Goldstein found in Omo M10 Structure 13 in its later phase after it had been remodeled (2005:214). The other postholes are also very similar to the domestic architectural characteristics of Omo M10. Large, wide-spaced peripheral posts are used for frame and roof supports, with the walls composed of quincha (210-14). Although there is no quincha found so far at Río MuertoM43 it seems that postholes’ locations indicate domestic architecture similar to that found at Omo M10 and other Chen Chen style sites.

Other notable household features at Río Muerto are a dog burial in Unit 2 and a hearth in Unit 3, feature 5 providing more evidence of the use of area of these units. The dog burial was found in the northwest corner of the unit, beneath the floor and above sterile ground. This could have been an offering associated with household construction, as a subfloor. Camelid and guinea pig offerings have been found in household contexts at Omo and Chen Chen (Goldstein 2005:214). Although so far there is no other dog burial found at Tiwanaku sites in the Moquegua Valley its location under the floor above sterile ground indicates its use as an offering.

Unit 3 contains the first hearth, Feature 5, to be found at Río MuertoM43. It is in the north profile of Unit 3, and associated with both floors of the primary occupation. It was found below the floors of Unit 3, and above sterile soil. The hearth is also associated with a posthole, Feature 6, which is only associated with the later floor. This indicates that over time new construction of household architecture was necessary, but the hearth’s

location and use continued. Three small rocks (possibly retaining rocks) were found associated with the hearth, two were stacked on top of each other and the third next to the other two. This was directly below the center of the hearth seen in the North profile. The hearth is a lenticular shape similar to a Tiwanaku fuente. Its boundaries that are seen in the North profile of the unit show the bottom of the hearth as its most narrow point, 20 centimeters below the top of the hearth. The top of the hearth is the widest section, about 65 centimeters total. It is characterized by gray soil, with streaks of red that contains pieces of charcoal. Other hearths found at Chen Chen style sites have been inside domestic structures and also outside in patio areas (Goldstein 2005:214). At Omo M10 structure 13 the hearth found in the "A" floor seems to be the same shape as Feature 5 (1989: 186).

All 3 units at Río Muerto contained small pits filled with trash that are associated with at least one floor for each unit. These trash pits were all small in size and would have been used as a local location for refuse by occupants. A variety of materials were found including: ceramics, botanical materials, animal bones, textiles, and coprolites. Unit 2 also contained shell and Unit 3 had artifacts. These remains indicate diversity of domestic activities occurring in these areas. The artifacts found on top of Unit 3's trash pit may have been a ritual offering. See the Material Culture section for more details.

Unit 3, Feature 2 is the only pit whose entire dimensions can be determined. Unit 1, Feature 12 and Unit 2, Feature 5's dimensions within their respective units are 25 cm x 40 cm and 27 cm in depth and 40 cm x 35 cm and 23 cm in depth. The pit found in Unit 3 that contained trash is not consistent in shape and has various depths. It is oriented north-south, 65 cm x 180 cm total, with 5 cm in depth throughout the southern part of the pit.

The north part of the pit seems to have been the original location of the pit is 65 x 60 cm total and 38 cm in depth. This part of the pit is also the location where many artifacts were found together, superficially perhaps indicating a ritual offering. It seems this may have been an intentional trash pit that with time overflowed into the southern part of the feature.

The trash pits at Río Muerto M43 are similar in size to those found at Omo M10, Structure 13, R15 and R31 (1989:327) described by Goldstein but do not serve the same function. The trash pits found at Omo M10 Structure 13 could have been dug for either storage or construction material and later refilled with “organic fill and trash,” which later were packed down and had posts planted on (1989:187). This is plausible for the pits at Río Muerto but limited inference can be made because of unknown complete dimensions of Units 1 and 2. Unit 3 probably was constructed as a trash pit, as the pit was intentionally cut through the floors of the unit to sterile ground and its consistent shape in the deepest part of the pit. These pits containing refuse differ from those found at Omo M10 Structure 13 because their limited size would have been impractical for storage use and the sandy matrix of Río Muerto would not have been useful for construction purposes. These trash pits could not have been used for storage features because of their size and the shape of Unit 3, serving mainly as a location for deposit of domestic refuse.

Storage units are important features that are necessary for all agriculturalist populations, production and storage of surpluses are essential. Storage areas would also have been very important to an agricultural province, like the Tiwanaku Colony in the Moquegua Valley (Goldstein 2005:320). Excavations so far at Río Muerto show no evidence of storage units. This indicates that storage must have taken place somewhere

else besides Río Muerto. Storage has been found at both Omo and Chen Chen site groups, with Chen Chen style sites containing stone-lined storage cists typically located in patio areas close to individual household groups or in “specialized warehouse locations,” (Goldstein 2005:218). Omo M10 contained storage cists (223) and Goldstein also notes that the availability of storage found at Chen Chen described by Bandy et al (1996) exceeds what would have been necessary for the site’s inhabitants. Based on area excavated in 1995 excavations, Bandy et al (1996) estimates an average of one storage cist per  $4\text{m}^2$ . Across 6.1 hectares of similar topography, there would be 7,500 storage cists in total, with a storage capacity of  $5,140\text{m}^3$  at Chen Chen (2005:218). The area excavated so far at Río Muerto is  $11\text{m}^2$  ( $2\times 2\text{m}$ ,  $2\times 2\text{m}$ , and  $1\times 3\text{m}$ ). Assuming the density of storage units found at Chen Chen of one storage cist every  $4\text{m}^2$ , two or three storage units should have been found in excavation at Río Muerto M43. However, no storage cists have been found. This suggests that Chen Chen had a different role than Río Muerto when it comes to agricultural production and this lack of evidence of storage areas at Río Muerto indicate dependence on Omo and Chen Chen for storage of agricultural products, and that these other two sites may have had control over labor activities at Río Muerto.

The domestic features found in this primary occupation are consistent with features at other Chen Chen style sites in the Moquegua Valley. The evidence of domestic floors above sterile ground indicate original occupation of the area is characteristics of Chen Chen and Omo site groups indicating initial occupation of the area. The similarity in architecture styles determined through postholes is similar to Chen Chen style site groups. Structures at Omo M10 have served as the principle structure for

comparison. This affinity indicates that there is clearly a relationship between populations occupying Chen Chen style Tiwanaku in the Moquegua Valley. The absence of storage units is important as Goldstein believes this population to subsist through agriculture. The lack of storage areas at Río Muerto indicates that Río Muerto M43's population must have had a close relationship with the other two site groups.

Radiocarbon dates from Río Muerto M43 and Omo M10 correspond with Late Tiwanaku IV and Early Tiwanaku V in the core region. During this period is when there is an increase of urbanism in the core area, which could be related to the establishment of the Moquegua Chen Chen style sites, as there are groups moving to the core area of Tiwanaku there are also Tiwanaku associated populations moving to frontier environments. The Moquegua Valley is appealing because of its agricultural potential, which it is believed the Chen Chen style sites' populations took advantage of (Goldstein 2005). With the onset of the second occupation at M43 there is a change in use of space in the domestic sector although cultural material style remains consistent.

### **Second Occupation and Discussion**

Refuse behavior and midden formation is generated by the "nature of the occupation, status of inhabitants, population size, duration, and the kind of activities engaged," (Needham and Spence, 81). Examination of middens in context, structure, and content allows for assessment and characterization of site activities. The second occupation of Río Muerto M43 is characterized by middens and pitting. Each unit at M43 contains dense middens. These units serve as a sounding of site-wide patterns. They are completely different than the trash pits associated with the domestic floors of the primary occupation. There are clear depositional layers in the middens, especially in Unit 3, see

Figure 12. These middens are located superficially for each unit, see Figure 10, 11, and Photo 6. Although they may not span the entire unit they are all extensive both in width and depth extending outside the unit. Unit 1's midden is visible in level 2 of its West Profile, Figure 9 is about 60 cm in depth. Unit 2's trash midden is also throughout much of the unit, in level 3 of the west profile, Figure 11. It makes up about 22 cm in depth overall. In Unit 3, the entire west side of the unit, from level 1 to above the floor in level 8 make up the trash midden, about a total of 60 cm in depth, see Unit 3 North Profile, Figure 12. The stratigraphy of these middens, especially in Unit 3 show that they have accumulated over time, with varying layers of density of organic materials indicating much depositional history of the site, like other Chen Chen style sites. These middens at Chen Chen style sites indicate long-term and dense occupation (Goldstein 2005).

Janusek has recorded Tiwanaku trash disposal behavior at Tiwanaku and Lukurmata (1994, 2004). Middens have been found in both domestic (1994: 203, 2004: Ch. 5) and mortuary contexts (2004:174). Middens have been found associated with different time periods at Tiwanaku some are found in patio areas and some trash pits were intentionally constructed with adobe walls surrounding them (1994:133). Because Tiwanaku and Lukurmata became large urban centers over time, refuse middens are often formed in areas that had had previous uses, such as storage areas or domestic space (2004: 179, 188). Janusek dates various middens in domestic contexts at Tiwanaku and Lukurmata ranging from the Early Tiwanaku IV phase, through Late Tiwanaku V (1994, 2004). These midden deposits include single dumping events (2004: 143-144), and accumulation over time (2004: 139). Janusek believes the single dumping events can be tied to feasting activities in domestic areas, with members of communities gathering for



ritual and communal events (143-144). It is clear these dumping events are from single events because they contain few depositional layers. Also according to Janusek the variety of ceramic types within the midden are too varied to be from only one residential context and also many cases pieces of a vessel “were strewn about different levels of the same pit or stratum,” (142-144). This is very different from the clear depositional layers found in the middens at Río Muerto; the description of dense middens at Tiwanaku and Lukurmata outside of domestic compounds (Janusek 1994:143, 203) is very similar to the stratigraphy found at Río Muerto. Middens formed both from accumulation over time and dumping events in the core region often formed in areas that had previous uses, such as ritual activity areas (1994:138). Middens were also built over, as use of space changed over time, such as at Akapana East M-1 where a midden was built over and used as patio space (1994:138). At Río Muerto M43 this behavior is clearly demonstrated in Unit 3 as the midden is clearly associated with a secondary occupation, accumulating over time above the domestic floors of the primary occupation.

At Tiwanaku some middens have specific shapes because they fill in pits that had been previously had another purpose, such as a bell-shaped storage pit at Akapana East M-1 (1994:142) or were intentionally placed in pits constructed for refuse deposit, sometimes lined with adobe walls (1994:133). The middens found at Río Muerto do not seem to have an intentionally constructed shape. However they do have various depths and clear depositional layers of varying organic densities, indicating accumulation over time, see Unit 3’s north profile for an example, Figure 12. The middens found in each unit are clearly separated from any of the domestic features of the primary occupation of M43. At M43 there is no evidence that the middens originally were formed in holes for

trash pits or for other purposes, and then later used as for refuse as seen at Omo and Chen Chen site groups (Goldstein 2005:225). There are no clear structures confining the boundaries of these middens at Río Muerto M43, as described by Janusek at Tiwanaku (2004:133). It is assumed that at least Unit 3's midden, which is the most extensive of the three, would have probably been in a patio area, or formed in a very large structure whose boundaries are not apparent within the unit. These middens are typical throughout M43 and Chen Chen style sites at Omo and Chen Chen. Goldstein's description of the midden at Omo M10, Structure 11 (Goldstein 1989:179-181) could also be used to describe Unit 3's midden except for the difference in soil matrix. Omo M10 has much more rocks and there is evidence of volcanic ash while M43 is predominately sandy and contains no evidence of volcanic ash.

Another characteristic of Chen Chen style sites associated with the middens is "rockpiling" and "pitting," (2005: 226-227). At M43 Unit 3 a pit has been dug into the midden, which has since filled in with sand (this area in excavation was referred to as Area 'A'). The pit runs from 1 meter west of the east boundary of the unit. This is seen in the north profile and south profile, Figures 12 and 13. It cuts almost perfectly straight down vertically through the midden, like it has been sliced with a knife. The midden stops above the floor, avoiding disturbance of the hearth and posthole of Unit 3's north profile. Unit 3's midden was found throughout the entire unit, north to south and extends beyond the unit in to the west as well. This pitting type of behavior has been found at other Chen Chen style sites in the Moquegua Valley such as at Omo M10, Structures 13 and 11. It often times disturbs architectural and domestic features leaving pits in domestic floors, etc (2005:225). However at M43, Unit 3 the pitting does not disturb domestic

features. The exact dimensions of the pit dug through the midden of Unit 3 extends beyond the unit to the east. There are plans to continue excavating to the north of Unit 3 in the future.

Goldstein views the pitting of these middens at Chen Chen style sites as “intentional site destruction,” (226-227). Goldstein describes this site destruction to have been performed by Tiwanaku members because no materials are found to reflect intruders’ presence, also the sites are abandoned after pitting activities (226-227). He describes this destruction as “domestic areas [were] deliberately pitted, mounding stones and cultural fill in irregular piles,” with “churning and piling midden and building materials,” making up this trash accumulation (225-226). Because of Río Muerto M43’s sandy soil matrix there is less rockpiling than that found at Chen Chen style sites at Omo and Chen Chen. There are remains of construction materials such as braided cane mats and also wood and organic material within the middens described by Goldstein that are found at Omo (1989; 2005). In addition M43 Unit 3’s midden contained ceramics, lithics, artifacts, organic, and botanical materials. M43 is made up completely of mounds, some higher than others, but all between about .5 m and 4 m in height above the surface. Unit 3 was set up over part of one of these mounds that was in the shape of the donut with the lowest point in the middle. The west side of Unit 3 was set up on the high point of the mound, while the east side was much lower in the donut hole area. This area where the pitting has taken place (Area “A”) while the high (west) side of the unit contained the midden (referred to as Area ‘B’ during excavation). Unit 3 provides clear evidence that M43 is made up of pitted middens. These mounds of various sizes and heights cover the entire site, reflecting pitting activities, like those of other Chen Chen style sites.

Following this pitting Goldstein describes abandonment at Chen Chen style sites; Río Muerto M43 follows this pattern too. Besides destruction of domestic features at Omo, Goldstein also relates pitting events to the defacing of the Omo Temple at Omo M10 (2005:226). Similar destruction is seen in residential contexts at Tiwanaku (Janusek 2004:253) and at almost every Tiwanaku monumental complex at the core as well as abandonment by Late Tiwanaku V (Janusek 2004: 253-255). Events in the Moquegua Valley probably occurred shortly after or concurrently with these events at Tiwanaku. Although there are no available carbon dates for this second occupation at Río Muerto at this time, all radiocarbon dates for Chen Chen style sites range from 785 AD (Omo M10 Temple) to 1017 (Omo M10, Structure 11), (Goldstein 2005: Table 5.2) which coincides with Late Tiwanaku IV and Early Tiwanaku V.

Although excavations at Río Muerto have not found household features associated with this second occupation, these middens reflect intensive occupation at Chen Chen style sites (Goldstein 2005:159). According to Janusek there is an increase in urbanism during Tiwanaku IV in the core region (as referred to during the discussion of Late Tiwanaku IV). Dating that has been done at Chen Chen style sites in the Moquegua Valley all fall within the Late Tiwanaku IV/Early Tiwanaku V phase, so it is plausible that this change in site use during the second occupation at M43 is occurring while there is an increase in the number and size of sites in the core region.

The appearance of middens throughout M43 during the second occupation at Río Muerto and other Chen Chen sites could also be evidence for shift to a more state-controlled agricultural province that Goldstein believes occurs shortly before the Tiwanaku state's collapse and much of the Moquegua Valley's Tiwanaku population

disappears (Goldstein 2005: 318). Goldstein proposes that this shift was to increase maximize corn or maize production which was used for making chicha, a beer that is key for rituals and political, social, and economic relations (319) emphasizing an “increasingly specialized agrarian colony [in] contrast with the informal ayllu-organized archipelago of herding and farming communities,” of the Moquegua Valley (320). This hypothesis is supported by the shift in activities at M43 and other Chen Chen style sites with the appearance of a large number of middens and also with the destruction abandonment of Tiwanaku sites both in the Moquegua Valley and the core area. In the Moquegua Valley after almost all Chen Chen style sites are abandoned and settlement patterns within the Moquegua Valley shift, Tumilaca style sites emerge occupying only 42 hectares in the valley in mostly defensive location (Goldstein 2005:227). Besides the colonial architecture found on the surface of Unit 1, Río Muerto follows this pattern of pitting and abandonment, with both of its occupations occurring during Late Tiwanaku IV and Early Tiwanaku V periods. Evidence found at Río Muerto supports Goldstein’s hypothesis of the Moquegua Valley shifting to an agricultural province, forcing close ties with the state, collapse and abandonment would be a logical action when the Tiwanaku state itself dissipates.

### **Third Occupation**

M43’s third occupation is found at Unit 1. Unit 1 is the only unit to have visible architecture on its surface at M43. Unit 1 was 3 x 1 meters containing two rows of rocks, forming a possible corner of a structure, creating an L shape. It was oriented north-south, in between the rows of rocks see Photo 5. Between the large rocks Goldstein notes that there is a matrix that possibly is melted adobe, which would be the only evidence of

adobe anywhere at Río Muerto. The construction technique includes adobe and stones, which is not seen during the Tiwanaku period at M43. Excavation did not reveal any features associated with this structure, nor were any cultural materials that were identified as non-Tiwanaku were found in excavation. The assumption that this structure is associated with the Colonial Period is because the structure does not exhibit any Tiwanaku or modern household construction tendencies, and a few colonial glazed sherds have been found nearby. Because of the lack of household features or floor related to this occupation, it appears to be a superficial modern construction that was temporarily occupied or used as there is minimally disturbance of the material culture of the occupations that preceded it.

### **Material Culture of Units 1, 2, and 3**

Similar artifacts are found throughout all units, with Tiwanaku material culture found in each of the occupations, reflecting both the Moquegua region and the core area. The only exception is a fragment of a Huaracane bowl found in level 6B of Unit 3, which is associated with the first occupation. Material culture collected included ceramics, lithics, faunal remains, botanical and organic remains. Lithics were found throughout all units (see Photo 14). It is important to note the excessive number of worked batanes scattered on the surface at M43 (Goldstein 2005). Seed varieties include corn, corn cobs, molle, and beans among many others. Botanical analysis is planned for the future. Organic remains include coprolites of various sizes, probably including guinea pig, camelid, and possibly human feces. There are many varieties of wood, including small branches, and vegetable fiber. Some of the vegetable fiber and cane fragments were woven into mats; and artifacts including shell beads, a bracelet, cane tools, a small leather

bag, textile fragments, and a fragment of tapestry (see Photo 12) among others. The artifacts found on top of Unit 3's trash pit may have been a ritual offering.

### **Faunal Remains**

Jennifer Roland analyzed what was available of the faunal remains of Río Muerto's domestic excavations during the summer of 2007. Faunal analysis at Río Muerto has been performed for all specimens in Units 1 and 2, and all specimens up to level 3B in Unit 3. Because the analysis is incomplete only a very general comparison is possible. But all units contain camelid, rodent, guinea pig, and fish remains. Cut marks are found on camelid bones in all 3 units. A mandible tool was found in the midden of Unit 2. Camelid mandible tools are found to be associated with the Tiwanaku IV/V periods (Bermann 1997:101) and have been found at Omo (Goldstein 1989) and in the core region (Bermann 1997; Janusek 1994). They have been interpreted to have agricultural or hide scrapers, although their purpose is not clear (Goldstein 1989; Bermann 1994). They are distinct to Tiwanaku culture and household production (Goldstein 2005:199-200).

### **Ceramics**

All ceramics of Units 1, 2, and 3 (8,740 sherds) underwent analysis during the summer of 2007. Sherds were analyzed using a diagnostics classification system created by Professor Paul Goldstein of UCSD (1985;1989;2005). All non-diagnostic sherds were classified by minimum and maximum thickness, counted, and weighed. Information recorded about each diagnostic sherd includes: ware type, form type (vessel type), morphological element (rim, body, etc), and measurements, which vary depending on the morphological element. All element types include the minimum and maximum thickness

of the sherd. Form variants such as shape or presence of handles were noted, and exterior/interior motifs were described and recorded. Other information recorded included modification of the sherd (burnt or not). This system has provided ample information about the ceramic assemblage of Río Muerto and allows for comparison to other ceramic assemblages following this system that have undergone detailed analysis. Excavations in domestic sectors of Chen Chen M1, Omo M10 Structure 11, and Río Muerto have been examined using this system. To date, despite extensive excavation of Tiwanaku sites in the Moquegua Valley, a ceramic production workshop has not been located. Goldstein believes that serving vessels of the Chen Chen style in Moquegua are indistinguishable from pottery from Tiwanaku itself, and many were probably imported from the *altiplano* (Goldstein 2005:223). Tiwanaku ceramics display strong uniformity even outside the *altiplano* region (2005:224). If ceramics found in Moquegua were imported from the *altiplano* (at least the fine ware pieces), the distribution of vessel types and frequencies of the ceramic assemblage at site groups indicates access to certain vessel types, activities at each site, availability of vessels, the system of distribution of material wealth, and information regarding that site group's relationship to others. Increasing demands for agricultural products from the Tiwanaku core can be seen through a comparison of Occupation One and Occupation Two at Río Muerto. Goldstein (2005:216-218) has noted an increase in agricultural production through time at Chen Chen style sites.

Tiwanaku ceramic vessels fit into one of two categories, serving/ceremonial vessels and cooking/storage vessels. There are three Tiwanaku ware types found at Tiwanaku sites in Moquegua, red ware, black ware, and plain ware. Red and black wares



are considered fine ware while plain ware is more utilitarian. Serving vessels are made from both fine and plain wares, although the majority are fine wares. Cooking/storage vessels are made of plain ware. Fine ware serving vessel types include keros, tazones, and pitchers. Serving vessels found that might be made of plain ware include keros, bowls, fuentes, and escudillas but the majority of the time are made of red ware vessels. Cooking/storage vessels include ollas and tinajas. All three units excavated at Río Muerto are located in the area of M43, which is the most densely covered in ceramics of all areas at the site (Map 2 and 3). As mentioned earlier all of the units are located within a 61m x 43m area, in close proximity to each other.

Figure 1 shows Río Muerto's overall ware distribution from M43 excavations, Table 3 displays the ware distribution broken down by number of sherds. The three units reflect expected distributions of ware types for domestic contexts with the majority comprised of plain ware, however it has a higher percentage of plain ware than other domestic contexts of Tiwanaku site groups in the Moquegua Valley. Goldstein reports "plain ware ollas, tinajas and storage vessel fragments comprised roughly 90 percent of the sherds in all Chen Chen-style domestic contexts (2005:223). Río Muerto M43 has a much higher percentage of plain ware, 98%. Red ware makes up 1.45% of the Río Muerto assemblage. Black ware and Huaracane sherds are very rare, making up less than .05 % of the total number of sherds found in M43 excavations 98% is a significantly higher percentage of plain ware than found at other site groups.. The paucity of Huaracane sherds reflects very limited interaction with Huaracane populations in the valley, and supports Goldstein's argument of little involvement with the Huaracane (Goldstein 2005:132). The low number of black ware sherds is also typical of Chen Chen

style sites compared to the high frequencies found at Omo style sites (Goldstein 2005:198). The high percentage of plain ware sherds found at Río Muerto M43 is appropriate for a domestic sector. It is assumed that more utilitarian vessels would be in use in this area of the site for cooking and storage rather than rarer fine ware pieces. However such a higher percentage of utilitarian ware sherds than other Tiwanaku site group domestic areas might indicate less serving and ceremonial vessels were available to the population at Río Muerto. If less serving and ceremonial vessels were available to the population living at Río Muerto this may indicate a subordinate position within the hierarchy of site groups in the Moquegua Valley colony. Investigation of the distribution of vessel types at the sites can be used to examine this by comparing rim frequencies (the number of rims found of that vessel type divided by the number of rims overall) from collections.

Figure 2 shows Río Muerto's ceramic assemblage by vessel types using rim frequencies compared to Omo M10, Structure 11 and domestic excavations from Chen Chen M1 (Goldstein 1989, 2005; Goldstein et al 2008). These do not include all vessel types found at Río Muerto, but only serving, cooking, and storage vessels. Figure 3 shows these vessel types lumped into Serving and Cooking/Storage categories. Figure 4 provides a more in-depth comparison between the rim frequencies of tinajas, ollas, and keros of the three sites.

All sites show there is a greater number of cooking/storage vessel rims compared to serving vessel rims (see Figures 2 and 3). This distribution is expected as there are generally a greater number of cooking and storage vessel types in domestic contexts compared to non-domestic contexts. In Figure 2 categories included in the

cooking/storage vessel class are Olla, OT, and Tinajas. The OT category contains sherds that are either ollas or tinajas. It could not be determined which category they belong to. The vessel types included in the serving ware class of Figure 3, include Kero, KT, Pitchers, Tazones, Fuentes, and Bowls. KT sherds cannot be identified as kero or tazone, but are one of the two. In Figure 4 OT sherds are not included in the frequencies.

Figures 2 and 3 show Chen Chen M1 contains a higher frequency of fine serving vessels to utilitarian vessel rim sherds than the Omo M10 Structure 11 and Río Muerto M43. This higher frequency of serving ware vessels could indicate that higher status behaviors such as feasting and ceremonial activities were undertaken at Chen Chen M1. Alternately, this high frequency of keros or tazones could be related to the area where excavations took place, compared to excavation areas of the other two sites. Tiwanaku ritual activity is noted to have taken place in domestic contexts (Janusek 2004:153), and the Chen Chen material may exemplify this.

Figure 4 shows a more in depth examination of Kero and KT rim frequencies compared to Olla and Tinaja frequencies among the 3 sites. The kero/kt frequencies indicate that there is less ritual and feasting activities occurring at Río Muerto M43 than Omo M10 Structure 11 and Chen Chen. This suggests that Río Muerto's population may have had less access to fine ware vessels, indicating a relatively lower status than populations at Omo and Chen Chen.

Besides higher frequency of Kero/Kt fragments, Chen Chen also shows a higher frequency of tinaja rim sherds compared to the other two sites (Figure 2,3,4), especially in comparison to Río Muerto which contained only 5 tinaja rim sherds. Chen Chen M1's high frequency of tinaja rim sherds adds evidence for the argument that there is a high

degree of storage activity occurring at Chen Chen. Chen Chen seems to have served as a key storage location for Tiwanaku populations in the Moquegua Valley. Río Muerto's total of 5 tinaja rim sherds in addition to its absence of storage areas suggests that less storage took place at Río Muerto. Chen Chen probably functioned as the main repository for agricultural products in the valley.

Goldstein's classification system separates ollas into two categories. Using an arbitrary division, all olla rims that are less than or equal to 12 centimeters in diameter are classified as small ollas, while ollas whose rims are 13 centimeters or greater in diameter are large ollas. At Río Muerto there is a range in diameter of olla rim sherds ranging from 4-46 centimeters in diameter. Figure 5 illustrates the distribution of rim diameters found at Río Muerto. The mean rim diameter in the Río Muerto assemblage is 13.81 cm. Ollas fall within the 5 to 26 cm range. It is possible with the addition of diameters of ollas from Chen Chen and Omo M10 Structure 11, standard sizes of Tiwanaku ollas can be derived.

Figure 6 compares Río Muerto M43, Omo M10 Structure 11, and Chen Chen's small, large, and OT/miscellaneous olla frequencies. About 23% of the rim sherds found at Chen Chen were ollas. Fifty five percent of rim sherds at Omo M10 Structure 11 were ollas; Río Muerto M43 had eighty-one percent. Of the 3 ceramic assemblages, Río Muerto contains a very high number of small olla rims. Both Omo M10 Structure 11 and Chen Chen have very few small olla rim sherds. The majority of olla rims found at these two sites are from large ollas. The ratio of small ollas to large ollas is fairly close to being equal at Río Muerto, with the other two sites having much fewer small ollas. The OT category inclusion in the small or large olla categories would not change the distributions

significantly among any of the sites. This indicates a behavioral difference at Río Muerto compared to the other two site groups. Perhaps there are less communal activities at M43, compared to the other two site groups. Food preparation might have been for smaller groups of people compared to the other site groups, resulting with a greater frequency of smaller ollas than the other two sites. It could also have to do with what types of foods are being produced. At this time there is no available evidence of difference in diets between the populations of site groups.

The high percentage of plain ware vessels found at M43 in addition to the highest frequencies of cooking and storage vessels among the three site groups indicates that Río Muerto had less access to serving and fine ware vessels than the other two site groups. This indicates less ritual activity taking place at Río Muerto. In addition the lack of tinajas and high frequency of small ollas indicates a behavioral difference at Río Muerto compared to the other two site groups. This ceramic data indicates there are some lifestyle differences between Río Muerto and the populations at Omo and Chen Chen. This evidence infers that Río Muerto held a lesser position within the colony compared to the other two site groups.

### **Temporal Change in Ceramic Assemblages**

There are two clear occupations at Río Muerto M43, Occupation 1 (floors) and Occupation 2 (midden). Occupation 1 includes all ceramics from floors, while Occupation 2 includes all ceramics from middens. Unit 3 had the most obvious division between occupations. Table 4 shows the ware distribution for Río Muerto M43 by occupation and unit. Figure 7 shows the ware distribution of M43 for each occupation. Although each unit contains over 94% plain ware in both occupations, there are small

changes in red ware frequencies. Units 2 and 3 show a decrease in red ware. Unit 2 shows a decrease of almost 5% while Unit 3 shows a 1% decrease in red ware. Unit 1 contains the most red ware of any of the units in its second occupation with 4.36%, an increase of 3.48%. Although Unit 1 does not show a decrease in red ware as Units 2 and 3 this could be because the assemblage has been disturbed by its third occupation (colonial structure). However, as seen in Figure 7, overall there is very little change in red and plain ware distribution between Occupation 1 and Occupation 2. To look for behavioral changes within the ceramic assemblages of Occupation 1 and 2 vessel distributions will be useful.

Figure 8 contains the distribution of keros and ollas in Occupations 1 and 2 from Unit 3. Only Unit 3's rim sherds have been included because this unit had the clearest distinction between Occupations 1 and 2 and contained the largest midden. Frequencies were determined by the total number of rim sherds within each occupation. There is an increase in kero frequencies between occupations, along with a 40% decrease in large ollas and over 40% increase in small ollas. As noted in the intersite comparisons, tinaja rims are notably lacking at Río Muerto M43. No tinaja sherds are associated with this second occupation at Unit 3. This complete absence of tinaja rims in addition to the lack of storage units at Río Muerto suggests that Río Muerto relied on other site groups to store their agricultural products and food supplies. This dramatic shift indicates a change in behavior. Rey craft notes that evaluating behavioral change over time through utilitarian ceramics can be more significant than changes in fine ware vessels which tend to occur more quickly (2005:4). The change in size of cooking pots is not something that occurs unconsciously, most likely, there is a functional rationale behind the shift in vessel size. Perhaps small ollas became mass produced and distributed during the second

occupation, similar to bevel-rimmed bowls in Mesopotamia. This change in frequency of olla size could reflect state control as Río Muerto began to increase agricultural production. At this time a comparison of olla sizes over time from the other sites is not available.

Ceramic data from Río Muerto indicates it relied on both Omo and Chen Chen site groups. The high plain ware frequencies and lack of fine ware vessels in comparison to Omo and Chen Chen's ceramic assemblages shows its subordinate status amongst the three site groups. The absence of tinaja rims suggests it may have been dependent upon the other two site groups for storage purposes. The increase in frequency of small ollas during the Second Occupation of M43 suggests a possibility of mass production indicating more centralized control over M43, among other options. This in combination with evidence of increased agricultural production from Chen Chen style sites suggests that the Moquegua Valley colony at this time could be under state control, in the form of an agricultural province.

## **Discussion**

### **Río Muerto and Omo and Chen Chen site groups**

Clearly there are intimate relationships among the populations of the Chen Chen style sites throughout the Moquegua Valley. Their similarities in domestic characteristics, material culture, and pitting and abandonment activities indicate that they could all have been members of the same ayllu group or have a relationship similar to ayllu members. Despite these similarities in site characteristics there is a clear hierarchy of the Omo and Chen Chen site groups in comparison to those at Río Muerto. Dates from Omo and Chen Chen reflect earlier occupation than Río Muerto, with Chen Chen style sites containing a range of dates consistent with Río Muerto settlement. Although all Chen Chen style sites are fairly contemporaneous in dates, Omo and Chen Chen have longer site occupations than Río Muerto, with Omo style sites preceding Chen Chen style sites slightly around AD 535-633 (at Omo M12). The earliest date for the initial occupation of Río Muerto M43 is AD 780-1030. It is possible that Río Muerto's populations arrived from the alitplano after the populations from Omo and Chen Chen style sites or and probably more likely, that Río Muerto's occupants were former occupants of Omo and Chen Chen site groups that were sent south to increase agricultural production during the Early/Late Tiwanaku IV period. Río Muerto's founders were probably sent here by the state. Río Muerto's later initial occupation strongly indicates its role among Omo and Chen Chen site groups. Of these three site groups, Río Muerto has the least desirable location in the valley, further away from Omo and Chen Chen, which had a direct route between the two site groups. Both sites are in a considerably more comfortable location in the valley than



Río Muerto. Río Muerto is more isolated from the two, it also has less direct access to water resources.

Omo and Chen Chen both are larger site groups with unique characteristics suggesting importance, such as Omo's monumental architecture at Omo M10 and Chen Chen's extensive storage areas. Río Muerto does not contain qualities like these, in fact it lacks important characteristic, storage areas, indicating it would be dependent upon other site groups. Because of these unique characteristics at Omo and Chen Chen, Río Muerto's population would have visited these site groups often, perhaps for ceremonies at the Omo M10 temple, and for management of agricultural products at Chen Chen. Excavations at this time do not reveal any characteristics that would have drawn the populations at Omo and Chen Chen to Río Muerto. The location and characteristics of Omo and Chen Chen site groups indicate the management of the colony took place within these two site groups, with Río Muerto serving as a more subordinate role in the colony.

### **Río Muerto and the Tiwanaku Core**

There is a clear link between the Moquegua Valley Tiwanaku population and the Tiwanaku core. Both experience a population increase, which could be one of the reasons Río Muerto was founded, during the Late Tiwanaku IV and Early Tiwanaku V period. The core region experienced destructive activities shortly before abandonment during Tiwanaku V. Although dates are lacking for this period rockpiling and pitting activities followed by abandonment at Chen Chen style sites, including Río MuertoM43 indicate that these similar activities in the Moquegua Valley are connected to the core region. However the change in use of domestic areas at Chen Chen style sites between Occupation 1 and 2 suggests a shift in domestic behavior that could coincide with a

transition to an agricultural province. This is evident in the presence of middens in the second occupation at M43, especially in comparison to the initial occupation, where there is an absence of this type of behavior. At the core during this time Tiwanaku populations are reaching an all-time urban height. The demand for agricultural products, particularly maize would increase and explain the intensive agriculture production in the Moquegua Valley as described by Goldstein. Tiwanaku is a polity characterized by Janusek as dependent upon their community identity which is reinforced by communal rituals such as feasting (2004:Chap. 4) the demand for maize would be expected (Goldstein 2003). If the Tiwanaku population of the Moquegua Valley not been an agricultural province controlled by Tiwanaku then perhaps the pitting and abandonment contemporaneous with activities at Tiwanaku would not have occurred. If the Moquegua colony had been a population in diaspora disassociated with the state and remained so throughout its occupation of the Moquegua Valley it may not have experienced the same events.

Dates for the abandonment of Chen Chen and Omo style sites and the emergence of Tumilaca style sites are concurrent with the fall and abandonment of the Tiwanaku core (Goldstein 2005: Table 5.2). The Tumilaca style sites in the Moquegua Valley appear in defensive locations or are protected by walls (Goldstein 1989; 2005:227; Owen 2005:53), following the abandonment of Chen Chen style sites is part of what Owen categorizes as a victim/refugee diaspora (Owen 2005). Clearly politics throughout the south central Andes are shifting at this time with the fall and disappearance of the Tiwanaku polity. As a site connected to the Tiwanaku agricultural province in the Moquegua Valley, M43's abandonment coincides with its more prominent site groups and the core region. Evidence of destruction and pitting seems to also be less extreme

than other locations but this is perhaps because Río Muerto does not contain any monumental architecture or evidence of a managerial role in the regulation of the agricultural province of Río Muerto.

Further research, specifically botanical analysis at Río Muerto and other Tiwanaku site groups in the Moquegua Valley is needed to determine the extent of this increased intensity of agricultural production that was occurring during the second occupation for additional evidence of the Moquegua Valley's Tiwanaku colony as an agricultural province. Excavations must continue at M43 and M48, another Chen Chen style site at Río Muerto, in search of possible storage structures, as only a minimal area at M43 has been excavated so far. This is important to continue examining the relationship between Río Muerto and Omo and Chen Chen site groups and to continue to research about this second occupation at M43. In addition ceramic sourcing and continual comparison of ceramic vessel frequencies between site groups will provide valuable information, as well as eventually extending this comparison to Omo style sites as well, examining whether there is also a change in domestic behavior at Omo style sites over time as well. Continuing to investigate Tiwanaku social identity within the Moquegua Valley and the connections to the core region over time.

## Conclusion

This case study at Río Muerto demonstrates the importance of studying communities in frontier environments. Populations who live in foreign environments may react by assimilating or adapting local cultures or, alternatively, by reinforcing their own identity in response to exposure to foreign cultures (Lightfoot and Martinez 1995). The Tiwanaku colony in the Moquegua Valley followed the latter course of action in response to the new social environment. This is attested by the lack of evidence of assimilation with local cultures; only recently have radiocarbon dates produced evidence that Huaracane and Tiwanaku populations occupied the Moquegua Valley at the same time (Costion 2008). Returning to my original questions posed at the start of this paper I reconstruct the unique ways of life and social adaptations of the Tiwanaku colony in the Moquegua Valley.

What can daily practices in a community in a frontier context reflect over time? Can available evidence demonstrate the type of relationships this community has with other communities in the colony? Can evidence of material culture reflect a colony's identity over time and does this identity remain associated with the homeland? Utilizing Bermann's "local perspective" and household archaeology, Río Muerto M43 displays a clear site history. It has two occupations related to the Tiwanaku polity in the *altiplano*. Using information about domestic practices and changes over time at M43, and comparing it to the characteristics and depositional history at other Chen Chen style sites within the Moquegua Valley demonstrates the subordinate relationship that Río Muerto had with the Omo and Chen Chen site groups. Evidence from these site groups shows that group identity among the Chen Chen style site populations was strong, as there is

great uniformity in domestic practices, material culture, and events at the sites. These characteristics indicate that Chen Chen style site inhabitants were probably ayllu members or part of a group similar to ayllu structure. However site attributes and unique characteristics at Omo and Chen Chen (monumental architecture and storage) indicate Río Muerto had a more subordinate role compared to these other site groups and was probably managed by them.

Can this evidence be tied to events in the homeland region allowing for inference of the colony's relationship with its associated state? Changes in the domestic practices and evidence of intensified agricultural production at Chen Chen style sites in the Moquegua Valley indicate a transition to an agricultural province during the Late Tiwanaku IV/Early Tiwanaku V period in the core region. Río Muerto and the Moquegua Valley would have been responsible for providing products such as maize, which played an important role in Tiwanaku ritual activity and communal consumption. This shift in the Moquegua Valley colony is coincident with an increase in evidence of *chicha* production in the core region, indicating more feasting taking place, possibly to reinforce Tiwanaku identity. What does the situation in the Moquegua Valley represent for other Tiwanaku colonies? The Moquegua Valley colony was probably not the only Tiwanaku colony undergoing these experiences at this time. Of all Tiwanaku associated populations outside of the core area the Moquegua Valley has received the most extensive research. It is possible that similar activities are occurring in Cochabamba and other locations as well, however more research is necessary to determine this. It would seem unlikely that the Moquegua Valley was the only population producing agricultural products for the core region.

Evaluating the interactions of periphery populations with a “local perspective” from a site that provides a bottom-up perspective rather than a top-down model provides valuable information about the experiences of this population group, its relationship with each other, and its social responses in a frontier environment. Colonies living in frontier environments are faced with a unique situation. Examining relationships within the colony and the core are can help explain material culture, settlement patterns, changes in behavior over time, and how the colony was organized. The Moquegua Valley’s Tiwanaku population retained much strong uniformity in material culture throughout the valley. This is indicated by the standardization of Chen Chen style sites throughout the valley and its parallels to the core. This demonstrates the state’s influence since group identity remained a strong characteristic through time. Additionally, it provides evidence for the intimate relationship between the various Moquegua Valley population site groups. The Tiwanaku state even affected the Moquegua Valley colony at the most local level (in use of the size of cooking pots). The Moquegua Colony’s experience is not unique among colonies in prehistory. Ultimately, the colony’s relationship with the state changes over time. Nevertheless, other Tiwanaku associated populations may have had different relationships within the colony as well as with the core. The evidence from Río Muerto M43 serves as an example of the information that can be discovered by examining relationships within a colony over time and how this may relate to the core region providing a more holistic understanding of the complex social, economic, and political processes of the entire polity.

## Appendix A: Tables

**Table 1: Sherd Densities in Surface Collections**

	Units	Unit size	Areal coverage	Total sherds collected	Avg. sherd density
Río Muerto M43, M48, M52, M70	139	100 m2	4%	55,429	3.99/ m2
Omo M10, M11, M12, M16	204	100 m2	4%	54,149	2.65/ m2

From Goldstein 2005: 190

**Table 2: M43F- Postholes**

Unit	Feature #	Diameter	Depth	Floor Associated
1	2	13	26	younger
1	10	10	12	older
1	11	15	28	older
2*	6	12	7	yes
2*	7	11	7.5	yes
2*	8	15	17	yes
2*	9	25	16	yes
3	6	10	18	older

\*Unit 2's postholes are all associated with its floor, but it is not as clear a floor as Units 1 and 3.

**Table 3: Rio Muerto M43 Ceramic Ware Distribution**

M43F ceramics	Plain	%	Red	%	Black	%	Huaracane	%	Total
Unit 1	1906	97.344	52	2.656	0	0	0	0	1958
Unit 2	3336	99.079	30	0.891	1	0.030	0	0	3367
Unit 3	3366	98.565	45	1.318	3	0.088	1	0.029	3415
Totals	8608	98.49	127	1.453	4	0.0458	1	0.011	8740

**Table 4: Chen Chen, Omo M10 Structure 11, and Rio Muerto M43 Vessel Distribution\***

	Chen Chen all	% of total rims	Omo M10 Structure 11	% of total rims	M43 totals	% of total rims
Bowls	8	1.02	1	0.26	4	1.34
Fuentes	12	1.52	1	0.26	2	0.67
Kero	71	9.01	19	4.97	5	1.67
KT rim	276	35.03	92	24.08	20	6.69
Ollas, large	156	19.80	177	46.34	113	37.79
Ollas, small	8	1.015	6	1.57	119	39.80
OT	28	3.55	32	8.38	12	4.01
Pitchers	6	0.76	2	0.52	7	2.34
Tazon	15	19.04	12	3.14	1	0.33
Tinaja	183	23.22	33	8.64	5	1.67
unidentified rims	11	1.40	6	1.57	10	3.34
Total Rims (from units)	788		382		299	

\*Does not include all vessel types found



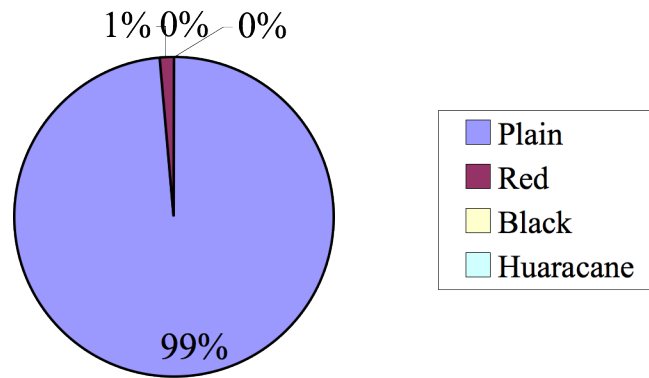
**Table 5: Serving Vessel Rim Frequencies vs Cooking/Storage Rim Frequencies**

	Chen	% of rims	Omo M10	% of rims	M43	% of rims
Serving Vessel Types	388	49.238	133	34.817	49	16.388
Cooking/Storage Vessel Types	375	47.588	248	64.921	249	83.278

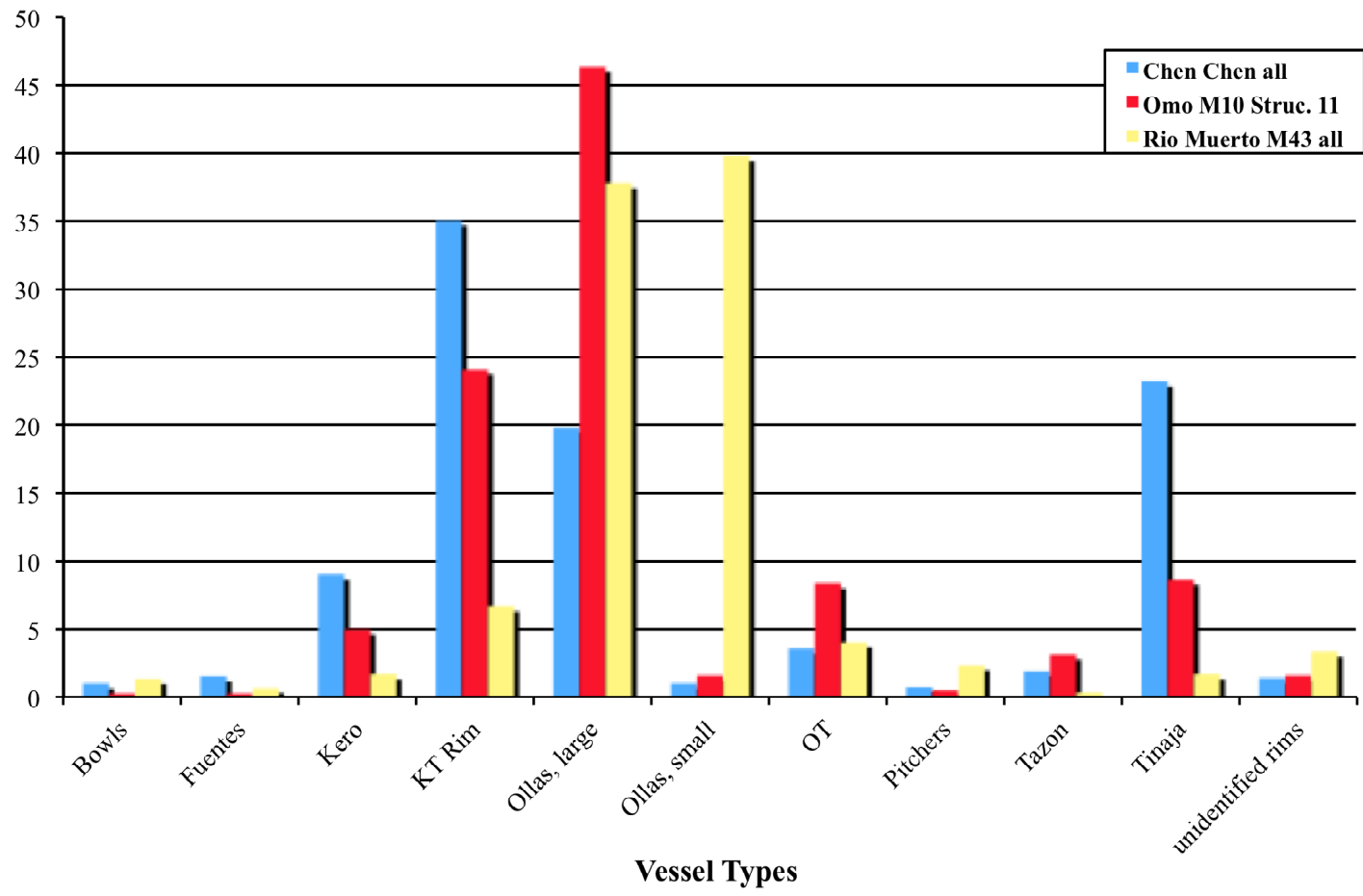
**Table 6: Rio Muerto M43 Ceramic Ware Distributions by Occupation**

First Occupation's Ceramic Ware Distribution										
	Unit	Plain	Red	Total %	Red	Black	Total %	Black	Huaracane %	Huaracane Total Sherds
Unit 1	785	99.12	7	.88	0	0	0	0	0	792
Unit 2	17	94.44	1	5.56	0	0	0	0	0	18
Unit 3	489	97.60	11	2.20	0	0	1	.20		501
Second Occupation's Ceramic Ware Distribution										
	Unit	Plain	Red	Total %	Red	Black	Total %	Black	Huaracane %	Huaracane Total Sherds
Unit 1	285	95.64	13	4.36	0	0	0	0	0	298
Unit 2	2154	99.08	19	0.87	1	0.05	0	0	0	2174
Unit 3	1697	98.44	24	1.39	3	0.17	0	0	0	1724

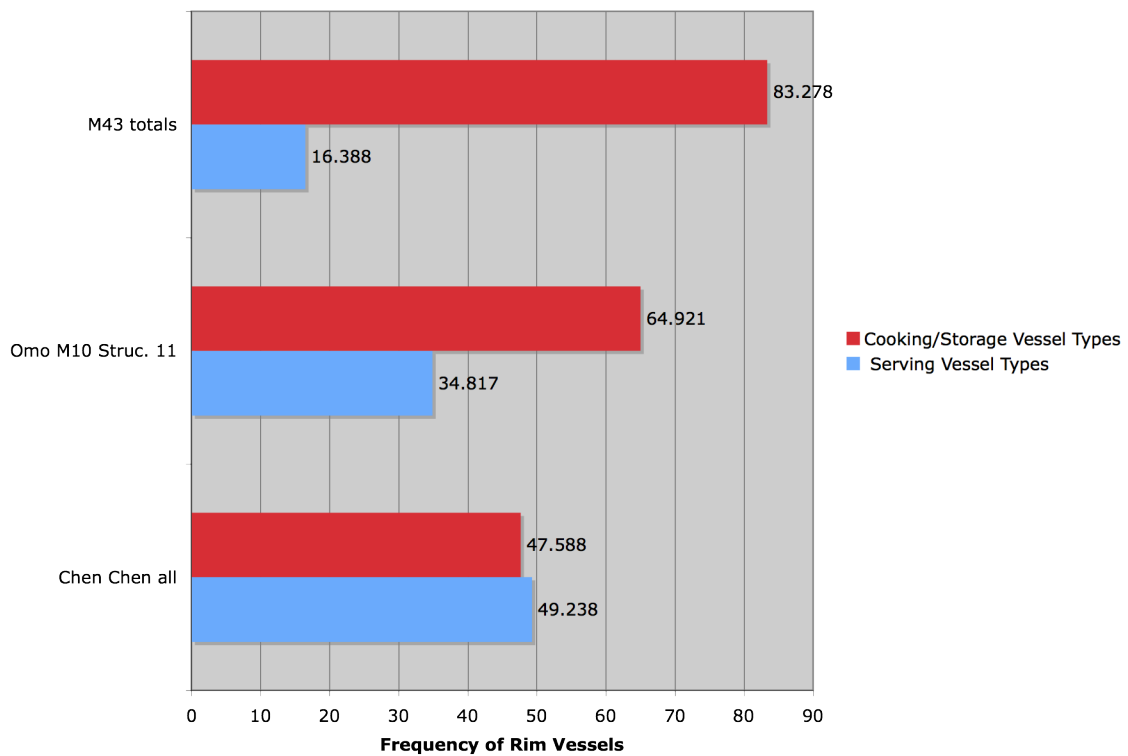
**Appendix B: Figures**



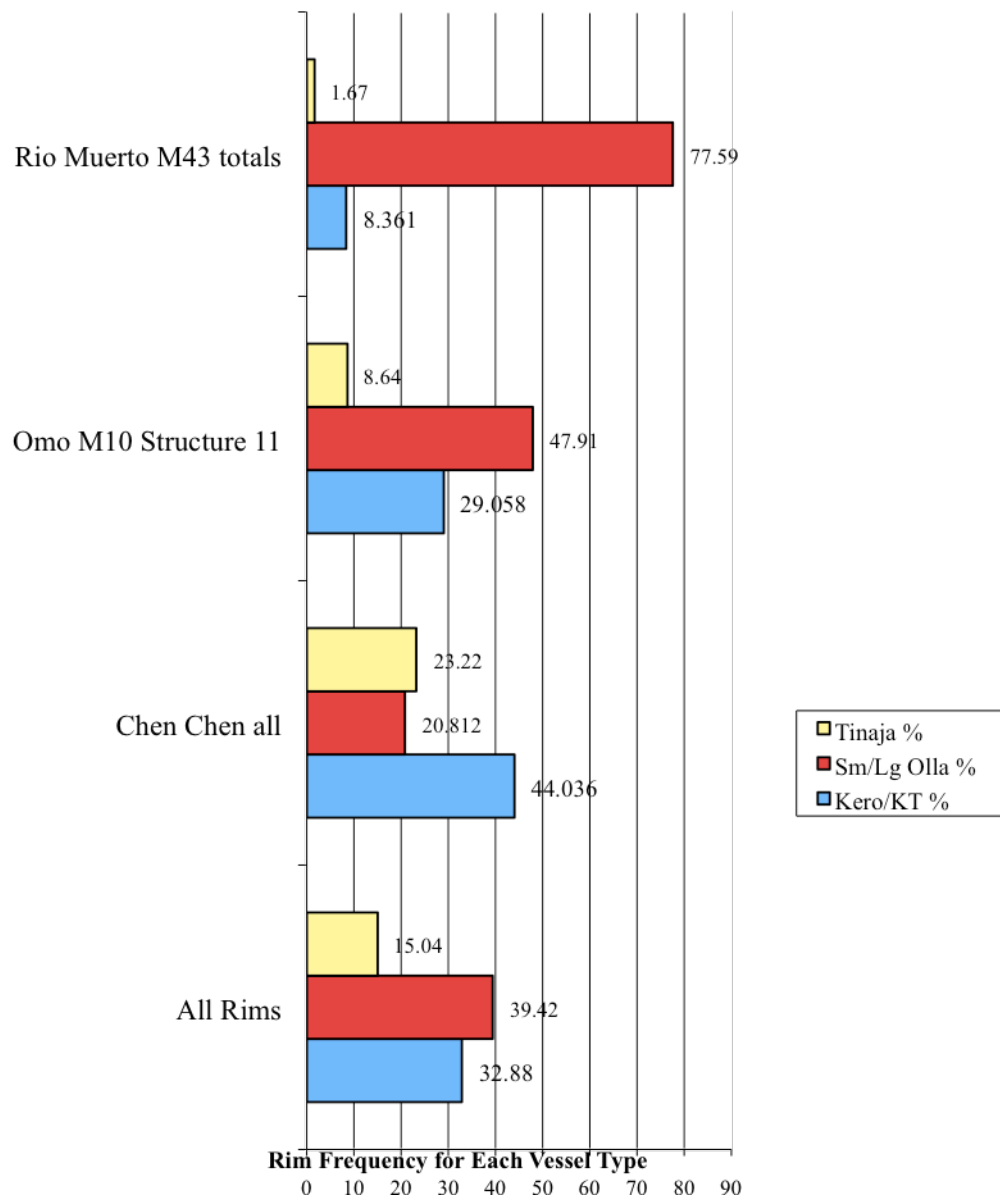
**Figure 1: Rio Muerto M43 Ceramic Ware Distribution**



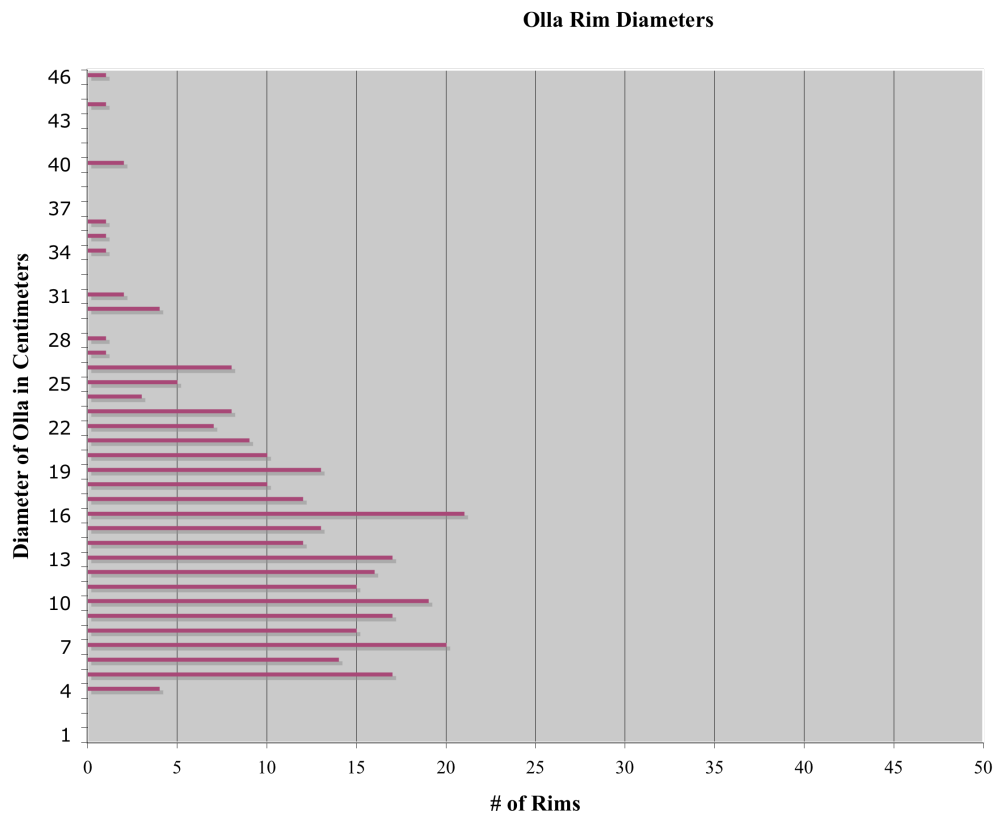
**Figure 2: Chen Chen, Omo M10 Structure 11, and Rio Muerto Vessel Distributions**



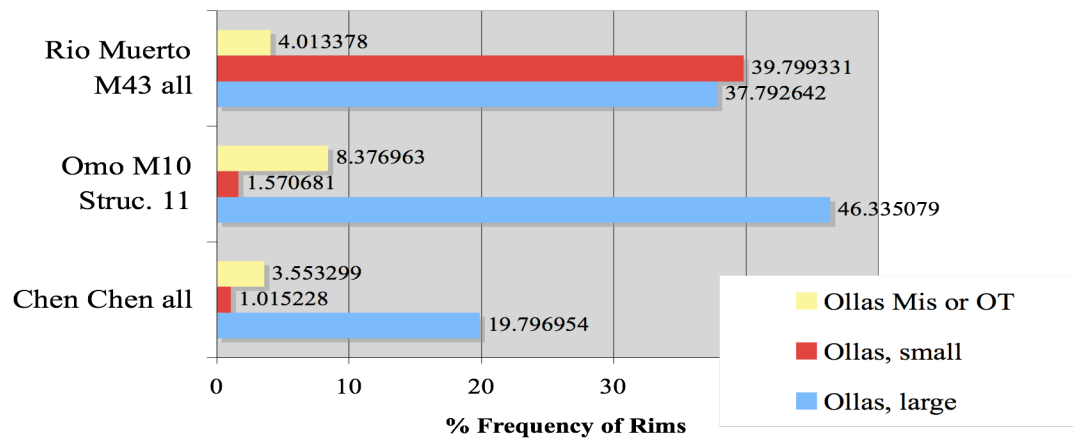
**Figure 3: Serving Vessel Rim Frequencies vs Cooking/Storage Rim Frequencies**



**Figure 4: Rim Frequencies for Tinajas, Small and Large Ollas, and Keros/KTs**

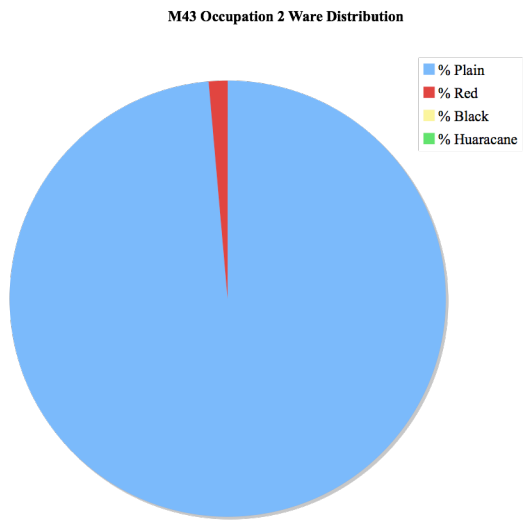
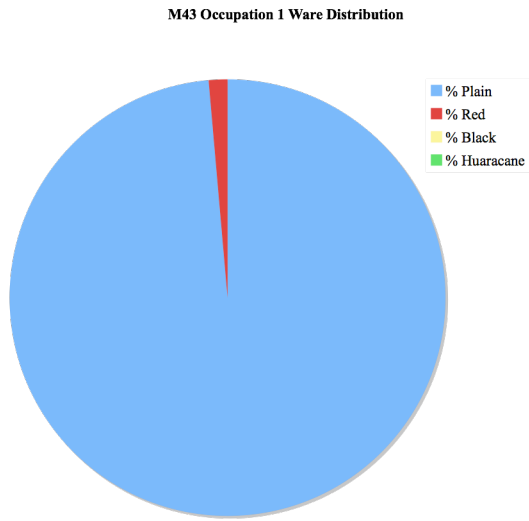


**Figure 5: M43 Olla/OT Rim Diameter Distribution**

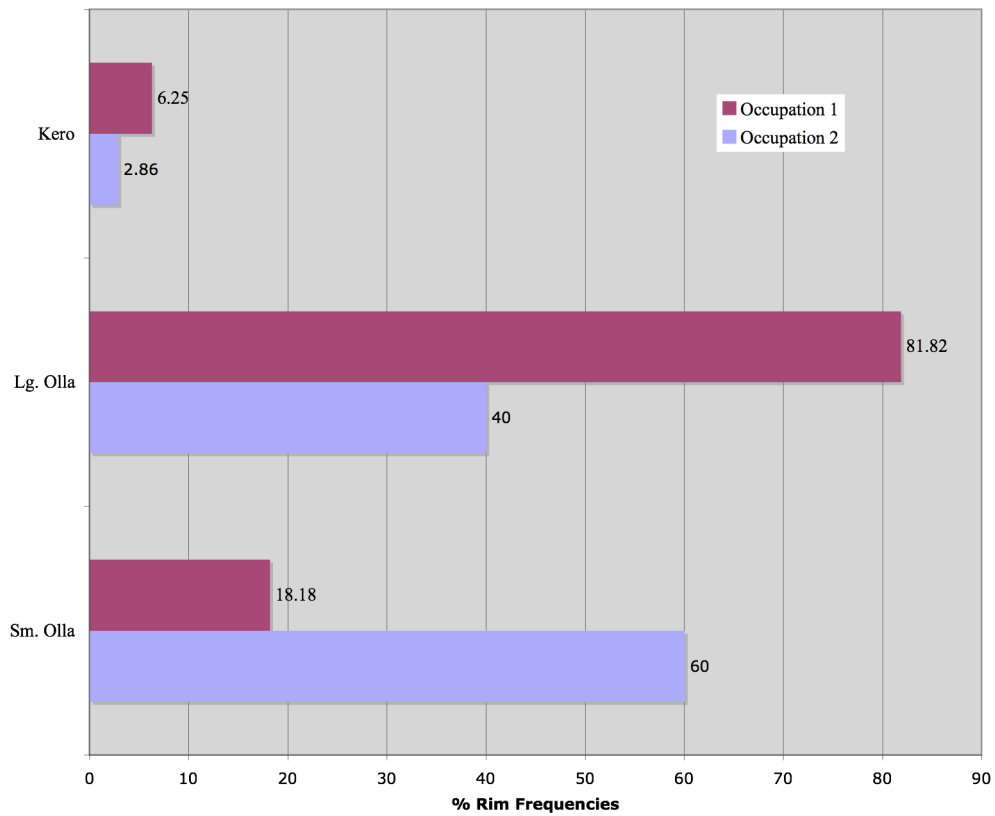


**Figure 6: Olla Rim Distribution: Chen Chen, Omo M10 Structure 11, Rio Muerto M43**



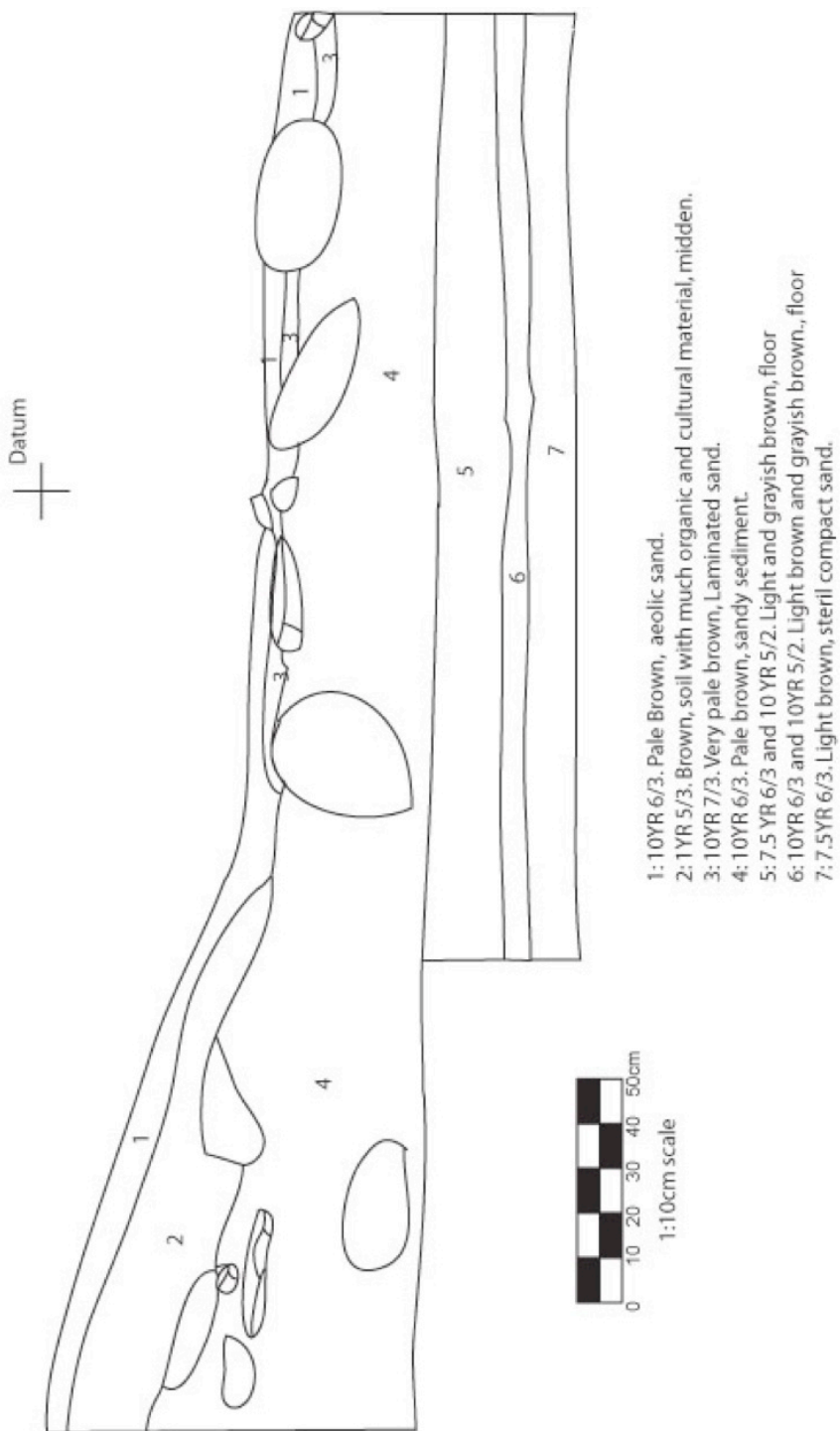


**Figure 7: Rio Muerto M43 Occupation 1 and Occupation 2 Ware Distributions**

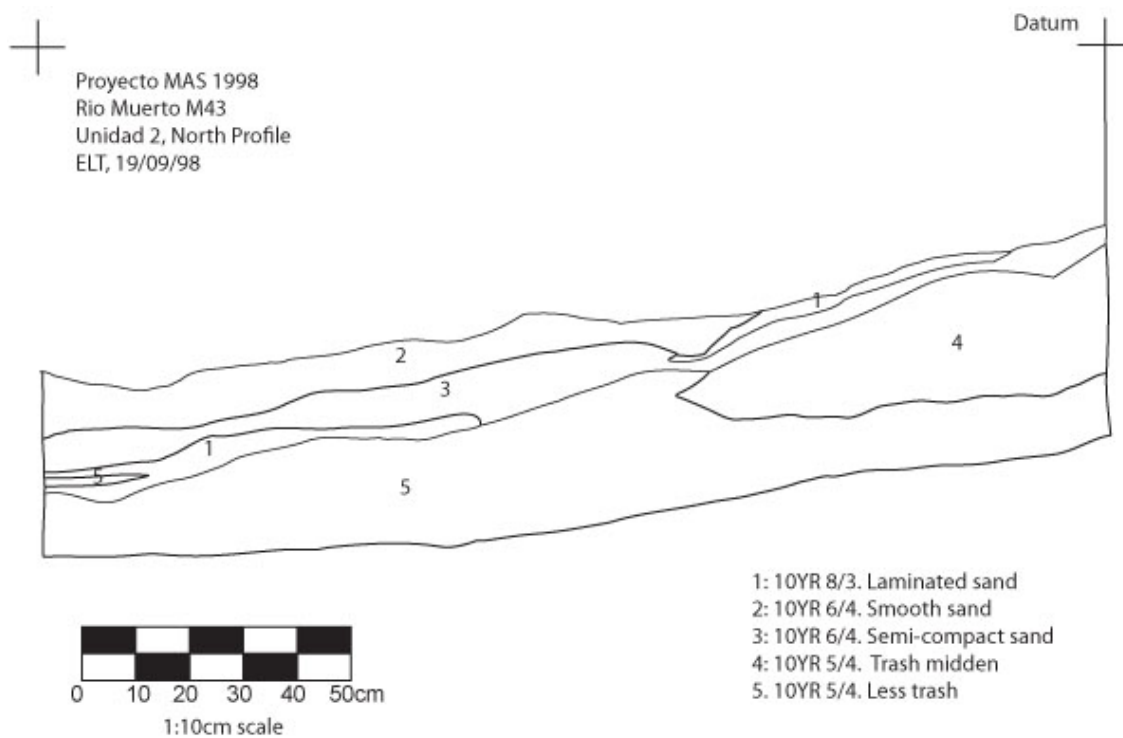


**Figure 8: Rio Muerto M43 Unit 3 Kero and Olla Distributions by Occupation**

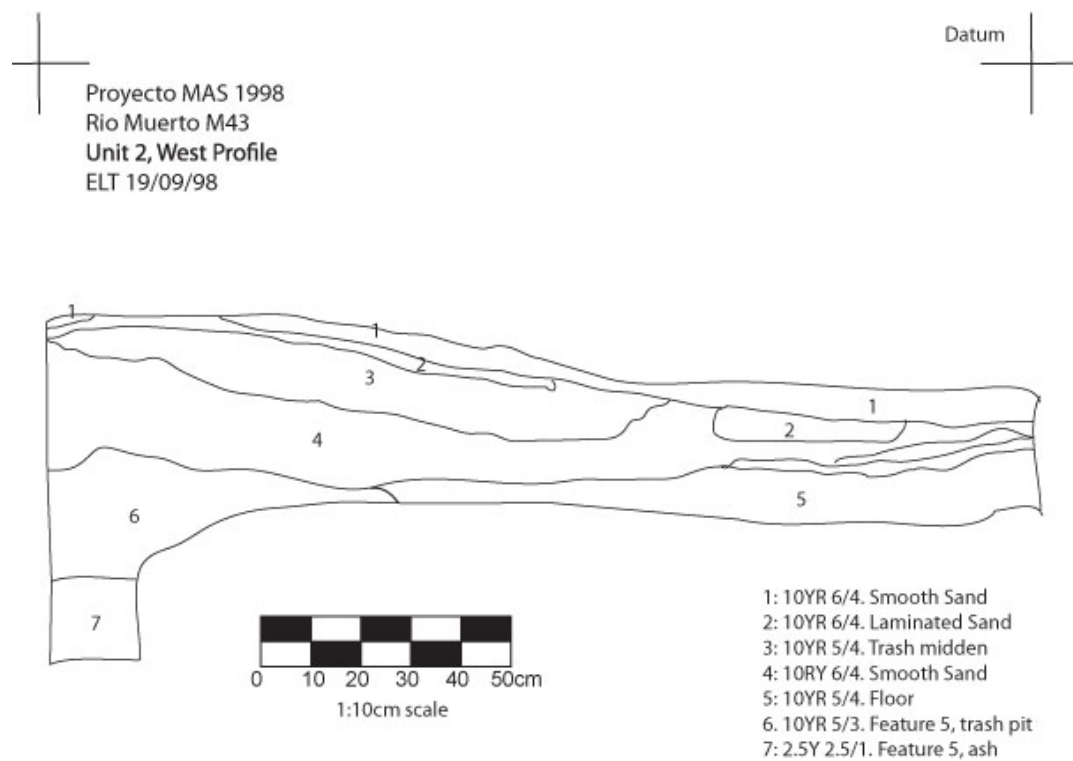
Proyecto MAS  
 Rio Muerto M43  
 Unit 1, West Profile  
 AGM 22/09/98



**Figure 9: Unit 1, West Profile**

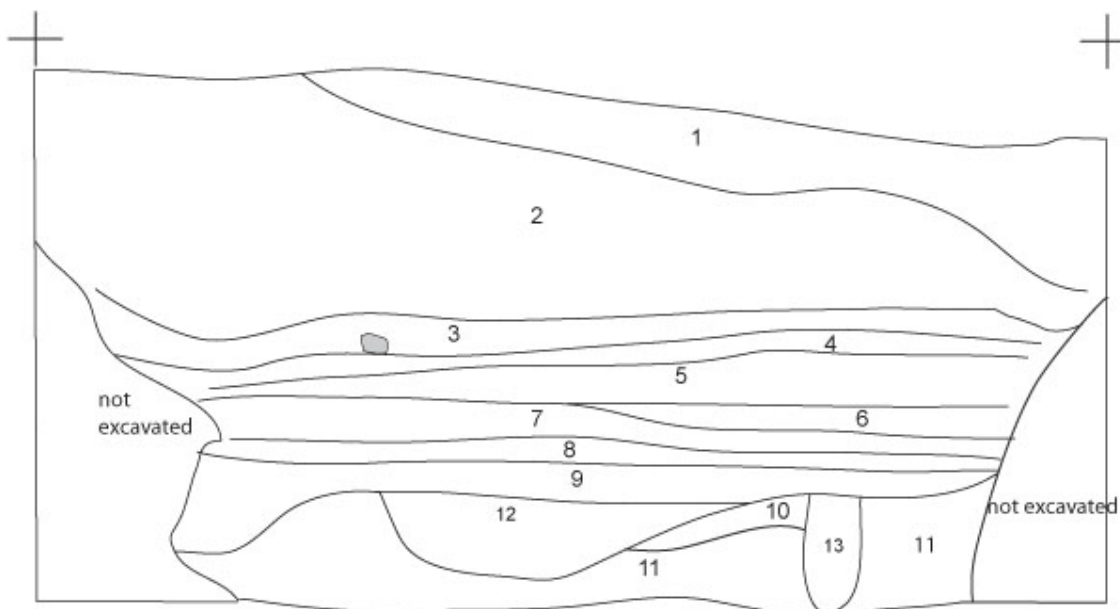


**Figure 10: Unit 2, North Profile**

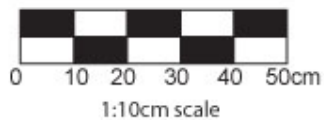


**Figure 11: Unit 2, West Profile**

Proyecto Rio Muerto  
 Rio Muerto M43  
 Unit 3, North Profile  
 AMB BMP 16/08/07

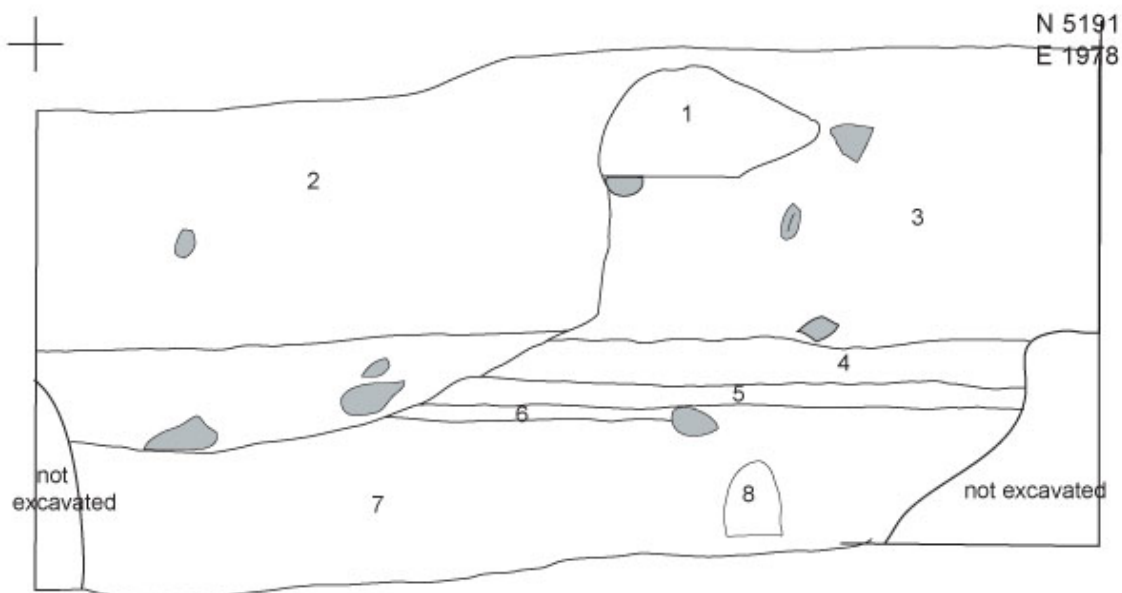


- 1: light brown sand, few organics
- 2: dens organics
- 3: brown sand
- 4: dense organics
- 5: brown sand with organics
- 6: dense organics
- 7: gray sand, with organics
- 8: dense organics
- 9: green-gray floor, clay-like with some silt
- 10: red sand, sterile, part of hearth (feature 5)
- 11: brown compact sand, sterile.
- 12: Feature 5, a hearth associated with Floors of Unit 3 (#9)
- 13: Feature 6, a posthole, organic deposit, associated with the lower floor of Unit 3 (seen in level 9).

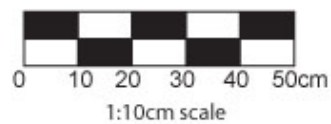


**Figure 12: Unit 3, North Profile**

Proyecto Rio Muerto  
 Rio Muerto M43  
 Unit 3, South Profile  
 AMB, BMP 17/08/07



- 1: dense organics
- 2: light brown, laminated sand
- 3: light brown sandy with some organicos
- 4: brown sand with some organics
- 5: dense organic
- 6: green-gray floor, claylike with some silt
- 7: brown, compact sterile sand
- 8: organic



**Figure 13: Unit 3, South Profile**

**Appendix C: Photos**



**Photo 1: Rio Muerto M43F, Unit 3, Level 8 (floor)**

Photo by AMB



**Photo 2: Rio Muerto, M43F, Unit 3, Level 8 (floor)**  
Photo by AMB





**Photo 3: Rio Muerto, M43F, Unit 3, Feature 2 (trashpit), Surface Level**  
Photo by AMB



**Photo 4: Rio Muerto M43F Unit 3, Feature 2 in progress, (trashpit associated with both floors)**

Photo by AMB

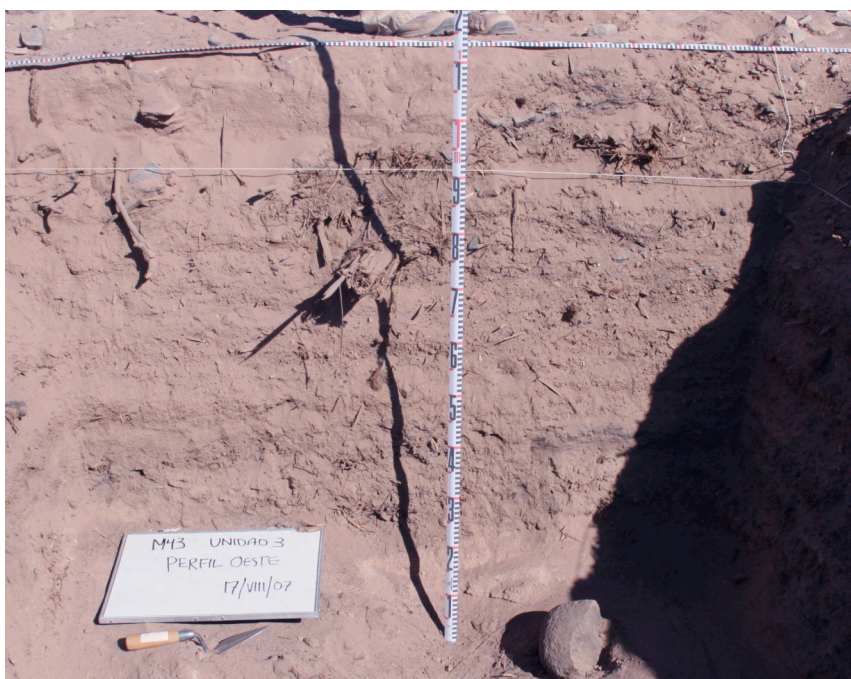


**Photo 5: Rio Muerto M43F Unit 1**

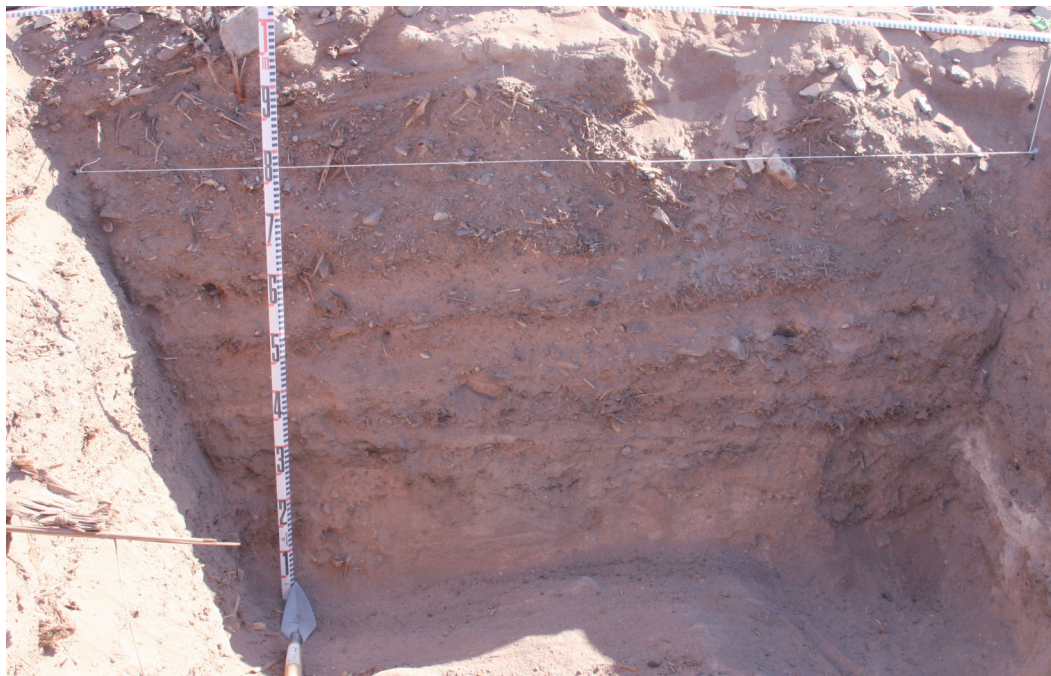
Photo by PSG



**Photo 6: Rio Muerto M43F, Unit 3, Area B, Level 3**  
Photo by AMB



**Photo 7: Rio Muerto M43F, Unit 3, West Profile**  
Photo by AMB



**Photo 8: Rio Muerto M43F, Unit 3, North Profile**  
Photo by AMB



**Photo 9: Specimen #2178, Leather Sandal, Rio Muerto M43F, Unit 3, Level 4B**  
Photo by AMB



**Photo 10: Specimen #2321, cane sticks with string, Rio Muerto M43F, Unit 3, Feature 2, Level 1**  
Photo by AMB



**Photo 11: Rio Muerto M43F, Unit 3, Feature 2, Level 1, Specimen #2466, Bracelet**  
Photo by AMB



**Photo 12: Rio Muerto M43F, Unit 3, Level 4B, tapestry fragments**

Photo by AMB



**Photo 13: Rio Muerto M43F, Unit 2, Level 3 Area B, Specimen #1278, Small and Large Olla Rims**

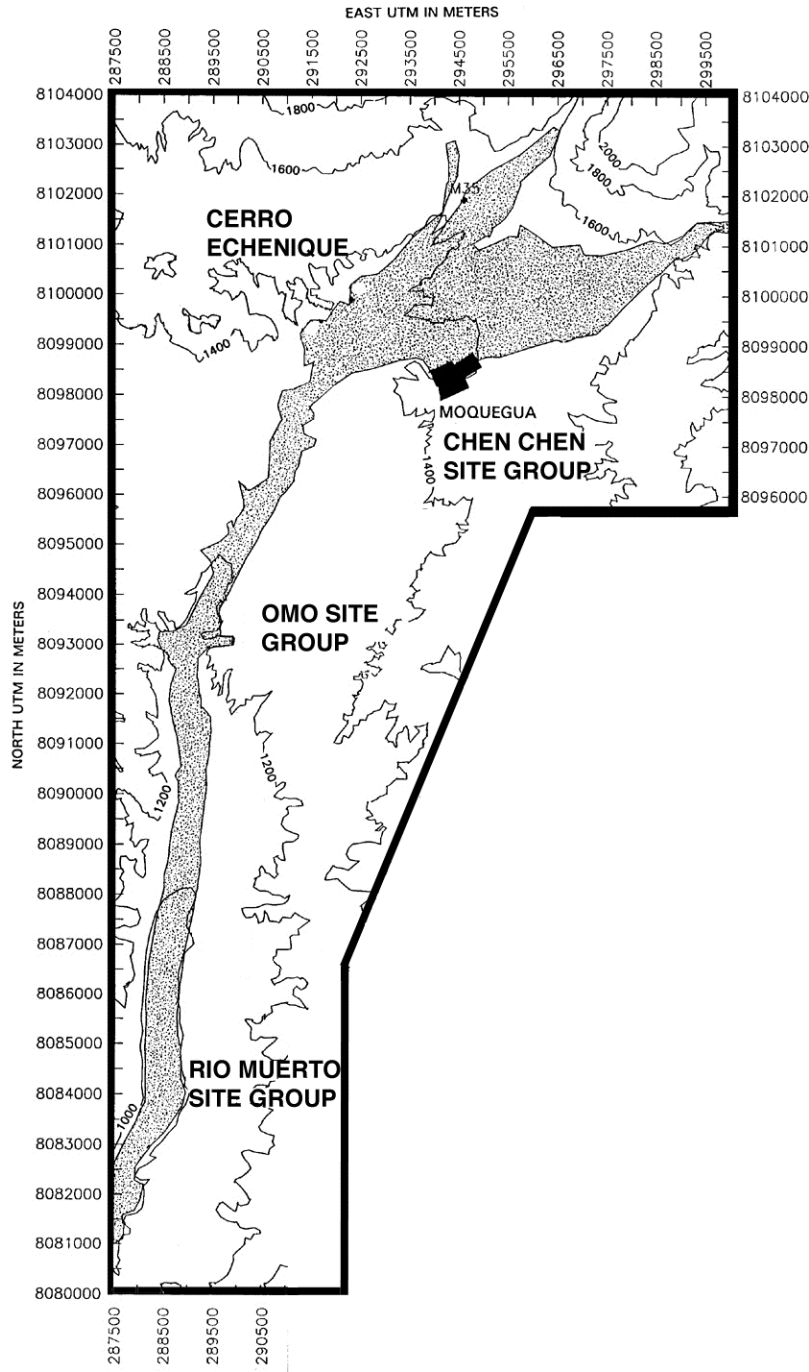
Photo by AMB



**Photo 14: Rio Muerto M43F, Lithics associated with the surface around Unit 3.**

Photo by

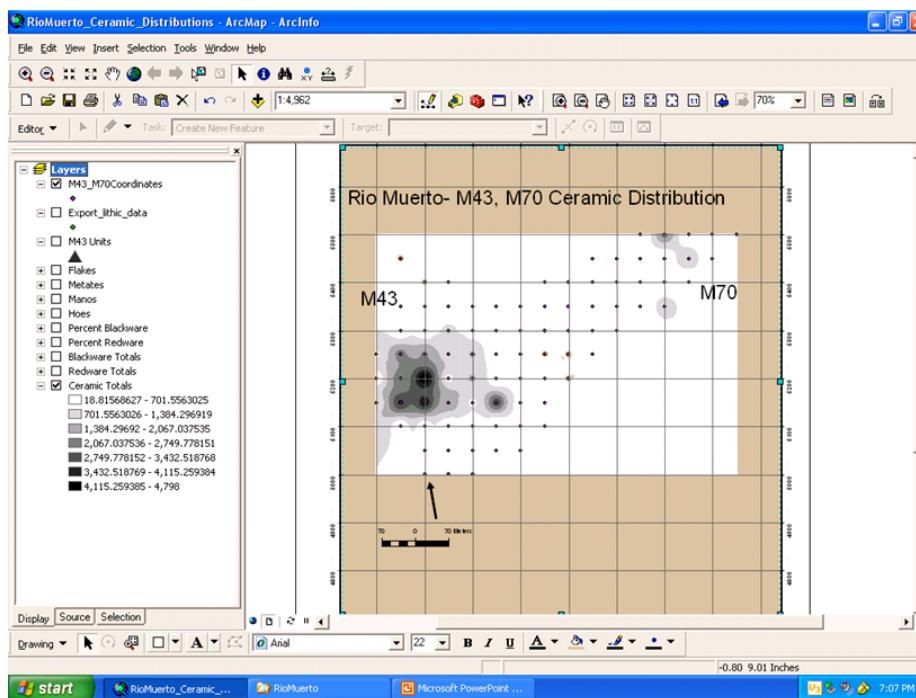
**Appendix D: Maps**



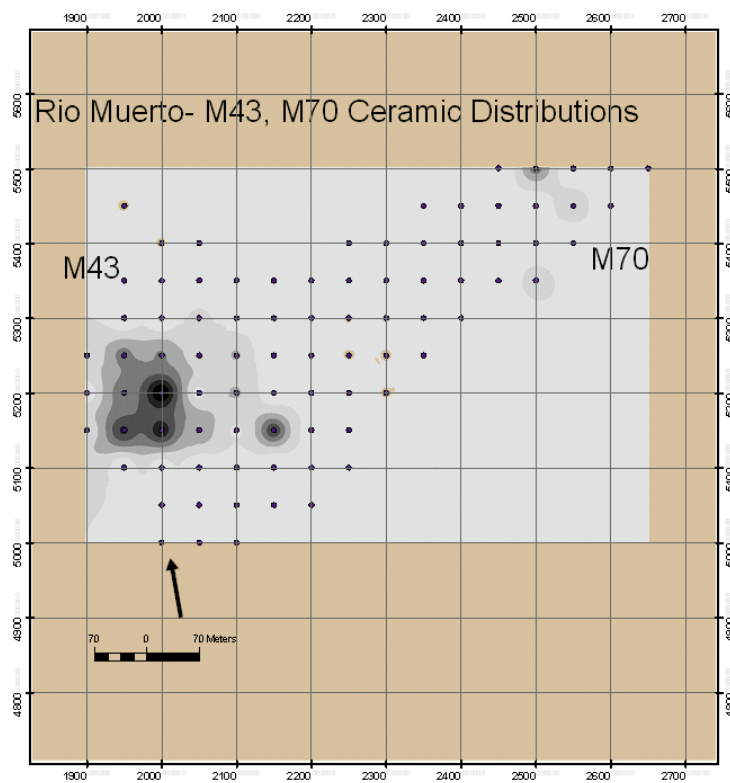
**Map 1: Moquegua Valley, Peru (Goldstein 2005: Figure 5.1)**



# Ceramic Densities



**Map 2: Rio Muerto M43 and M70 Ceramic Distribution**



**Map 3: Rio Muerto M43 and M70 Surface Ceramic Distribution**

## Works Cited

Abercrombie, T.A.

1986 *The Politics of Sacrifice: An Aymara Cosmology in Action*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Chicago.

1998 *Pathways of Memory and Power: Ethnography and History Among an Andean People*. Madison: University of Wisconsin Press.

Albarracín-Jordan, J.V.

2003 Tiwanaku, A Pre-Inca Segmentary State in the Andes. In *Tiwanaku and its Hinterland: Archaeology and Paleoecology of an Andean Civilization*, A. Kolata, ed. Vol. 2, pp 95-111. Washington D.C.: Smithsonian Institution Press.

Albarracín-Jordan and Mathews

1990 *Asentamientos Prehispanicos del Valle de Tiwanaku*, Vol. 1, La Paz, Bolivia: Producciones CIMA.

Aldenderfer, M. and C. Stanish

1993 Domestic architecture, household archaeology and the past in the south-central Andes. In *Domestic architecture, ethnicity, and complementarity in the south-central Andes*, edited by M. Aldenderfer, pp. 1-12. Iowa City: University of Iowa Press.

Algaze, G.

2005 *The Uruk World System*. Chicago: University of Chicago Press

Bandelier, A.F.

1911 The Ruins at Tihuanaco. *Proceedings of the American Antiquarian Society*, 21:218-65.

Bandy, M. A. Cohen, A. Cardona, A. Oquiche, and P.S. Goldstein

1996 The Tiwanaku Occupation of Chen Chen (M1), Report on the 1995 Salvage Excavations. Paper presented at the Society for American Archaeology 61<sup>st</sup> Annual Meeting, New Orleans.

Beck, M.E.

2006 Midden Ceramic Assemblage Formation: A Case Study from Kalinga, Philippines. *American Antiquity* 71(1), 27-51.

2007 Midden formation and intrasite chemical patterning in Kalinga, Philippines. *Geoarchaeology* 22(4): 453-475

Beck, M.E. and M.E. Hill

2004 Rubbish, Relatives, and Evidence: The Family Use of Middens. *Journal of Archaeological Theory and Method* 11(3): 297-333

Bennett, W.C.

1936 Excavations in Bolivia. *Anthropological Papers of the American Museum of Natural History*, 35:329-5

Berenguer, J

2000 *Tiwanaku, Lords of the Sacred Lake*. Santiago: Museo Chileno de Arte Precolombino.

Bermann, M

1994 *Lukurmata: Household Archaeology in Prehispanic Bolivia*. Princeton: Princeton University Press.

1997 Domestic Life and Vertical Integration in the Tiwanaku Heartland. *Latin American Antiquity*, 8 (2): 93-112.

Binford, M.W., A.L. Kolata, M. Brenner, J.W. Janusek, M.T. Seddon, M. Abbott, and J.H. Curtis. Climate Variation and the Rise and Fall of an Andean Civilization. *Quaternary Research* 47:235-48.

Browman

1981 New Light on Andean Tiwanaku. *American Scientist*, 69:408-419.

1987 Political Institutional Factors Contributing to the Integration of the Tiwanaku state. In *Emergence and Change in Early Urban Societies*. L. Manzanilla, ed, pp 229-243. Plenum. New York: Plenum.

Clifford, J.

1994 Diaspora. *Current Anthropology* 9(3): 302-338.

Champion

1989 *Centre and Periphery*. London: Unwin Hyman.

Cohen, A.P.

2000 *Signifying Identities: Anthropological Perspectives on Boundaries and Contested Values*. Routledge, London.

Costion, K.

2008 Formative Period Social Differentiation in the Middle Moquegua Valley: A View From the Huaracane Site of Yahuay Alta. Paper presented at the Society for American Archaeology 61<sup>st</sup> Annual Meeting, Vancouver.

D'Altroy, T.

2001 Politics, resources, and blood in the Inka empire. In *Empires*. S. Alcock, T. D'Altroy, K. D. Morrison, C.M. Sinopoli, eds. pp.201-226. Cambridge: Cambridge University Press.

Deetz, J.

- 1982 Households: A Structural Key to Archaeological Explanation. *American Behavioral Scientist* (special edition), 25(6): 717-724

Dillehay, T., V.I. Williams, and C.M. Santoro

- 2006 Áreas Periféricas y Nucleares, Contextos de Interacciones Sociales Complejas y Multidireccionales. *Chungara, Revista de Antropología Chilena*, 38(2): 249-256.

Goldstein, P.S.

- 1989 *Omo, A Tiwanaku Provincial Center in Moquegua, Peru*. Ph.D. dissertation. Chicago: University of Chicago.
- 1993 House, community, and state in the earliest Tiwanaku colony: Domestic patterns and state integration at Omo M12, Moquegua. In *Domestic architecture, ethnicity, and complementarity in the south-central Andes*, M. Aldenderfer, ed., 25-41. Iowa City: University of Iowa Press.
- 1996 Tiwanaku Settlement Patterns of the Azapa Valley, Chile: New Data, and the Legacy of Percy Dauelsberg. *Diálogo Andino* 14-15 (Prehistoria del norte de Chile y del desierto de Atacama: Simposio homenaje a Percy Dauelsberg Hahmann, pp 57-73. Arica, Chile: Universidad de Tarapacá.
- 2003 From Stew-Eaters to Maize Drinkers, The Chicha Economy and the Maize Expansion. In *The Archaeology and Politics of Food and Feasting in Early States and Empires*. Tamara Bray, ed., pp. 143-172. New York: Kluwer Academic Publishing/Plenum Publishers.
- 2005 *Andean Diaspora*: University of Florida Press, Gainesville.

Goldstein, P.S., M. Barrionuevo A., A. Gamonal Medina, and E. Lázaro T Torres

- 1998 *Informe de Prospección Arqueológica de Moquegua (MAS)*.

Goldstein, P.S., A. Boswell, and E. Plunger.

- 2008 Tiwanaku Diaspora Revisited: Domestic Practices at Rio Muerto, Moquegua, Peru. Paper presented at the Society for American Archaeology 61<sup>st</sup> Annual Meeting, Vancouver.

Goldstein, P.S. and B. Owen

- 2001 Tiwanaku en Moquegua: Las colonias altiplánicas. *Boletín de Arqueología, Pontificia Universidad Católica del Perú* 5: Huari y Tiwanaku: Modelos vs, Evidencias, pp. 139-168.

Hastorf, C.A. and T.D. D'Altroy

- 2001 Empire and Domestic Economy. In *Empire and Domestic Economy*, T. N. D'Altroy and C. A. Hastorf, eds. New York: Plenum Publishing Corporation, pp 3-25.

Hayden, B. and A. Cannon

1983 Where the Garbage Goes: Refuse Disposal in the Maya Highlands. *Journal of Anthropological Archaeology* 2:117-163.

Isbell, W.

1997 *Mummies and Mortuary Monuments*. Austin: University of Texas Press.

Janusek, J. W.

1994 *State and Local Power in a Prehispanic Andean Polity: Changing Patterns of Urban Residence in Tiwanaku and Lukurmata, Bolivia*. Unpublished dissertation, Chicago: University of Chicago.

1999 Craft and Local Power: Embedded Specialization in Tiwanaku Cities. *Latin American Antiquity* 10(2): 107-31.

2002 Out of Many, One: Style and Social Boundaries in Tiwanaku. *Latin American Antiquity* 13(1): 35-61.

2003 The Changing Face of Tiwanaku Residential Life: State and Local Identity in an Andean City. In *Tiwanaku and its Hinterland: Archaeology and Paleoecology of an Andean Civilization*, A. Kolata, ed. Vol. 2, pp 264-295. Washington D.C.: Smithsonian Institution Press.

2004 *Identity and Power in the Ancient Andes*. Routledge, New York.

Jennings, J.

2006 Core, Peripheries and the Regional Realities in Middle Horizon Peru. *Journal of Anthropological Archaeology*, 24(3): 346-370.

Kohl

1989 "The Use and Abuse of World Systems Theory: The Case of the Pristine West Asian State." In *Archaeological Thought in America*. C.C. Lamberg-Karlovsky, ed., Cambridge: Cambridge University Press.

Kent S.

1990 Activity areas and architecture: an interdisciplinary view of the relationship between use of space and domestic built environments. In *Domestic Architecture and the Use of Space: An Interdisciplinary Cross-Cultural Study*, S. Kent, ed. pp. 1-8. Cambridge: Cambridge University Press.

1999 The Archaeological Visibility of Storage: Delineating Storage from Trash Areas *American Antiquity* 64(1): 79-94.

Kolata, A.L.

- 1993 *Tiwanaku: Portrait of an Andean Civilization*. Cambridge: Blackwell.
- 2000 Environmental Thresholds and the “Natural History” of an Andean Civilization. In *Environmental Disaster and the Archaeology of Human Response*. G. Bawden and R.M. Reycraft, eds. pp 163-223. Albuquerque: Anthropological Papers No. 7. Maxwell Museum of Anthropology.
- 2003a Introduction to the Proyecto Wila Jawira Research Program. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization*, A.L. Kolata, ed., Vol. 2, pp. 3-17. Smithsonian Institution Press, Washington, D.C.
- 2003b The Social Reproduction of Tiwanaku: Political Economy and Authority in a Native Andean State. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization*, A.L. Kolata, ed., Vol. 2, pp. 449-472. Smithsonian Institution Press, Washington, D.C.

Kolata and Ponce Sanginés

- 1992 Tiwanaku: the City at the Center. In R.F. Townsend (ed) *The Ancient Americas, Art from Sacred Landscapes*. Chicago: Art Institute of Chicago, pp.317-334.

Lightfoot K.G. and A. Martinez

- 1995 Frontiers and Boundaries in Archaeological Perspective. *Annual Review of Anthropology* 24:471-92.

Lumbreras, L.

- 1974 *The Peoples and Culture of Ancient Peru*. Washington, D.C.: Smithsonian Institution Press.

Magilligan, F.J. and P.S. Goldstein

- 2001 El Niño Floods and Culture Change: A Late Holocene Flood History for the Rio Muerto Moquegua, Southern Peru. *Geology* 29(5): 431-434.

McAndrews, T., J. Albarracin-Jordan, and M. Bermann.

- 1997 Regional Settlement Patterns in the Tiwanaku Valley of Bolivia. *Journal of Field Archaeology*, 24:67-84.

Moseley, M.E., R.A. Feldman, P.S. Goldstein, and L. Watanabe M.

- 1991 Colonies and Conquest: Tiahuanaco and Huari in Moquegua. In *Huari Administrative Structure: Prehistoric Monumental Architecture and State Government*, W. Isbell and G. McEwann, eds., pp. 91-103. Washington D.C., Dumbarton Oaks.

Mujica, B

- 1985 Altiplano Coast Relationships in the South Central Andes: From Indirect to Direct Complementarity. In *Andean Ecology and Civilization*, S. Masuda, I. Shimada, and C. Morris, eds., pp. 103-140. Tokyo: University of Tokyo Press.
- 1996 La integración surandina durante el periodo Tiwanaku. In *La integración surandina cinco siglos despue*, X. Albo, M. Arratia, J. Hidalgo, L. Nuñez, A. Llagostera, M. Remy, and B. Revesz, eds. pp. 81-116. Centro de Estudios Regionales Andinos Bartolome de Las Casas, and Universidad Católica del Norte, Cusco and Antofagasta.

Murra, J.V.

- 1964 Una Apreciación Etnológica de la Visita. In *Garci Diez de San Miguel: Visita Hecha a la Provincia de Chucuito*. pp. 421-44. Casa de la Cultura, Lima.
- 1968 An Aymara Kingdom in 1567. *Ethnohistory* 15:115-51.
- 1972 El 'control vertical' de un máximo de pesos ecológicos en la economía de las sociedades andinas. In *Visita de la Provincia de Leon de Huanuco en 1562 por Inigo Ortiz de Zuniga*, pp. 427-476. *Documentos para la historia y etnología de Huanuco y la selva central*, vol. 2. Universidad Nacional Hermilio Valdizan, Huanuco.
- 1975 Formaciones Económicas y Políticas del Mundo Andino. Instituto de Estudios Peruano, Lima.
- 1978 Los Límites y Limitaciones del Archipiélago Vertical en los Andes. *Avances* 1:75-80. La Paz.

Needham S. and T. Spence

- 1997 Refuse and the formation of middens. *Antiquity* 71: 77-90.

Ortloff, C.R. and A.L. Kolata.

- 1993 Climate and Collapse: Agro-Ecological Perspectives on the Decline of the Tiwanaku State. *Journal of Archaeological Science*, 20:195-221.

Owen, B.

- 2005 Distant Colonies and Explosive Collapse: The Two Stages of the Tiwanaku Diaspora in the Osmore Drainage. *Latin American Antiquity* 16(1):45-80.

Owen, B. and P.S. Goldstein

- 2001 Tiwanaku en Moquegua: interacciones regionales y colapso. *Boletín de Arqueología, Pontificia Universidad Católica del Perú* 5: Huari y Tiwanaku: Modelos vs, Evidencias: 169-188.



Platt, T.

- 1982 Estado boliviano y ayllu andino: tierra y tributo en el norte de Potosí. Lima: Instituto de Estudios Peruanos.
- 1987 Entre ch'axwa y muxsa: para una historia del pensamiento político Aymara. In *Tres reflexiones sobre el pensamiento andino*. T. Bouysse-Cassagne, O. Harris, T. Platt, and V. Careceda, eds. Pp. 61-132. La Paz: Hisbol.

Ponce, C Sanginés

- 1972 *Tiwanaku: Espacio, tiempo, cultura*. La Paz: Academia Nacional de Ciencias de Bolivia.

Posnansky

- 1945 *Tiwanaco: The Cradle of American Man*, vols. 1,2. New York, American Museum.

Reycraft, R.M.

- 2005 Introduction. In *Us and Them: Archaeology and Ethnicity in the Andes*, R.M. Reycraft, ed. pp. 1-11. Los Angeles: Cotsen Institute of Archaeology, University of California, Los Angeles.

Schiffer, M.B.

- 1976 *Behavioral Archaeology*. New York: Academic Press.
- 1987 *Formation Processes of the Archaeological Record*. Santa Fe, University of New Mexico Press.

Smith, M.E.

- 1993 New World Complex Societies: Recent economic, social, and political studies. *Journal of Archaeological Research*. 1:5-41.

Smith, M.E. and K.J. Schreiber

- 2005 New World States and Empires: Economic and Social Organization. *Journal of Archaeological Research*, 13(3): 189-229).

Stanish, C.

- 1989 Household Archaeology: Testing Models of Zonal Complementarity in the South Central Andes. *American Anthropology*, New Series, 91 (1): 7-24.
- 2002 Tiwanaku Political Economy. In *Andean Archaeology I*, W. Isbell and H. Silverman, eds., pp. 169-198. New York: Kulwer Academic/Plenum Publishers.

Stein, G.

1999 *Rethinking World Systems*. Tucson: University of Arizona.

2005a Introduction: The Comparative Archaeology of Colonial Encounters. In *The Archaeology of Colonial Encounters*. G. Stein, ed. pp. 3-32. Santa Fe: School of American Research.

2005b The Political Economy of Mesopotamian Colonial Encounters. In *The Archaeology of Colonial Encounters*. G. Stein, ed. pp. 143-172. Santa Fe: School of American Research Press.

Squier, E.G.

1878 *Peru: Incidents of Travel and Exploration in the Land of the Incas*, New York: Harper Brothers.

Thomas, C., M. Benavente, and C. Massone

1985 Algunos efectos de Tiwanaku en la cultura de San Pedro de Atacama. *Dialogo Andino 4* (La problemática Tiwanaku Huari en el contexto panandino del desarrollo cultural), M. Rivera, ed. pp. 259-276. Universidad de Tarapacá, Arica, Chile.

Torres, E. C. Clement, N.R. Clark, and J.C. Tello

1984 Entierro precerámica doble en Ilo, Peru: Reporte preliminary. In *Trabajos Arqueológicos en Moquegua, Peru*, vol. 1, L.K. Watanabe, M.E. Moseley, and F. Cabieses, eds. Museo Peruano de Ciencias de la Salud, Southern Peru Copper Corporation, Lima.

Uhle, M.

1912 'Review of A. Posnansky, Guía general ilustrada para la investigación de los monumentos perihistóricos de Tihuanacu e Islas del Sol y la Luna,' *Revista de la Sociedad Chilena de Historia y Geografía*, 2:467-79.

Van Buren, M

1996 Rethinking the Vertical Archipelago: Ethnicity, Exchange, and History in the South Central Andes. *American Anthropologist* 98(2): 338-351.

Van Gijseghem, Hendrik

2006 A frontier perspective on Paracas society and Nasca ethnogenesis, *Latin American Antiquity* 17 (4): 419-444.

Varién, M. and B. Mills

1997 Accumulations Research: Problems and Prospects for Estimating Site Occupation Span. *Journal of Archaeological Method and Theory* 4:141-191.

Varién, M and S.G. Ortman

2005 Accumulations Research in the Southwest United States: Middle-Range Theory for Big-Picture Problems. *World Archaeology* 37:132-155.

Vaughn, K.

2004 Early Nasca Craft Consumption. *Latin American Antiquity* 15(1): 61-88.

Wallace

1980 Tiwanaku as a Symbolic Empire. *Estudios Arqueológicos. Homenaje al VII Congreso de Arqueología Chilena*, 5:133-144.

Wallerstein, I.

1974 *Capitalist agriculture and the origins of the European world-economy in the sixteenth century*. New York: Academic Press.

Wilk, R.R. and W.L. Rathje

1982 Household archaeology. *American Behavioral Scientist*, 25(6): 617-640.

Williams, P.R.

2000 Empires of the Andes: A Majestic Frontier Outpost Chose Cooperation Over War. *Discovering Archaeology* 8.