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CERAMIC TECHNOLOGY, WOMEN, AND SETTLEMENT PATTERNS IN LATE ARCHAIC

SOUTHWESTERN IDAHO

by

Jessica A. Dougherty

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Anthropology

Approved:

____________________	____________________
Steven Simms, Ph.D. Major Professor	Judson Finley, Ph.D. Committee Member
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David Byers, Ph.D. Committee Member	Mark McLellan, Ph.D. Vice President for Research and Dean of the School of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

2014

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ABSTRACT

Ceramic Technology, Women, and Settlement Patterns in Late Archaic Southwestern Idaho

by

Jessica A. Dougherty, Master of Science

Utah State University, 2014

Major Professor: Dr. Steven Simms
Department: Sociology, Social Work, and Anthropology

This research employs a sample of archaeological sites from three ecological zones to investigate the mobility strategies of hunter-gatherer groups in Late Archaic southwestern Idaho. The sample sites are organized into site types based on an independent evaluation of site components and existing site records. Ceramic assemblages at each site were analyzed to quantify the investment in ceramic technology, as a proxy for mobility. These measures were then compared to expectations generated from three proposed mobility patterns for hunter-gatherer groups in southwestern Idaho. Some of the predictions were met and these data allude to an archaeological record with a multitude of settlement patterns that may have changed over the course of seasons, years, and even decades.

(81 pages)

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Last but not least, I am forever grateful for my dad and sister Danielle, who taught me that the love of your family can get you through anything. I love you two with all of my heart and more.

Jessica

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INTRODUCTION

Ongoing debate has occurred in Southwestern Idaho regarding the form of settlement patterns among Late Archaic populations. Three settlement patterns are proposed in this research to model possible forms of settlement in Late Archaic southwestern Idaho:

1) Snake River Pattern: Residential bases along the Snake River anchored logistical mobility into the uplands and sagebrush steppe. Storage was at residential bases, especially during winter residence.

2) Seasonal Rounds Pattern**:** Hunter-gatherers moved in a seasonally transhumant pattern ranging from the Snake River into the uplands. Residential base location was dependent on proximity to important resources such as fish in the river and camas roots in the uplands.

3) Frequent Movement Pattern**:** Groups were mobile year-round and utilized minimal storage. The tempo (elapsed time between each move) was shorter than either the Snake River or Seasonal Rounds Pattern. Hunter-gatherers moved themselves to resources rather than moving resources to themselves.

Each model holds implications for ceramic technology, which will act as a proxy for mobility in this research. Implicit is the assumption that investment in ceramic technology is a reflection of expected use life, and thus mobility; increased ceramic investment occurs in situations of lower mobility, and vice versa. Ceramic assemblages can be used as a window through which we can explore hunter-gatherer mobility; measures of ceramic investment are used to understand the mobility choices of hunter-gatherers. Investment is not argued to be the only determinate of ceramic morphology. However, when viewed at a landscape level, patterns of ceramic morphology may illuminate mobility behavior.

Previous research employs various criteria to classify Late Archaic site types in southwestern Idaho (e.g Ames 1982; Pavesic and Meatte 1980; Plew 1985). This study applies an independent evaluation of site types from records of previously recorded sites to bring consistency to a comparison of the alternative models of settlement identified above.

In this study, previously recorded sites are re-evaluated using site location, size, features and chronology when possible, and assemblage composition. These site types are then organized by three ecological zones: the Snake River Corridor, the Sagebrush Steppe, and the Uplands. Each ecological zone contains its own unique set of resources and geography, which would have contributed to hunter-gatherer decision making and therefore contain different archaeological signatures.

Ethnographic data strongly support the inference that women were the producers of ceramics in the groups under investigation (Murphy and Murphy 1960; Steward 1941). This research thus traces the movements of women, and hence employs women's location and their pots to reconstruct elements of a settlement system organized by gender.

Alternative models and associated hypotheses include:

1) High quality ceramics tend to be manufactured at residential bases because of an expectation of longer use-life and varied applications (Bright et al. 2010). Where landscapes of short term camps and limited activity sites yield high quality ceramics, those sites may either be logistically associated with residential bases, or they reflect redundancy of occupation with high quality ceramics cached there, possibly transported from the residential bases that anchor the logistic system (Bright et al. 2010).

2) If settlement was logistically tethered to residential bases along the Snake River, then the highest frequency of high quality ceramics should occur at those sites. Lower frequencies of high quality ceramics should occur at residential bases in the upland camas meadows, and still lower frequencies with increasing distance from residential bases, such as the sagebrush steppe.

3) If mobility is higher, and a mapping-on strategy would be expected, or if settlement pattern varies over time (decadal or longer), then the relative frequencies of higher to lower quality ceramics would be less structured. The frequency of residential bases would also be lower, and their locations more variable. Lower quality ceramics and a less structured spatial patterning would be most expected for the sagebrush steppe, but it could apply to the uplands as well.

An evaluation of the existing site data and settlement pattern models for Late Archaic southwestern Idaho in terms of the hypotheses framed here is offered as a next step in understanding settlement choices during this period. The study employs existing data, considers one aspect of ceramic morphology that indicates aspects of settlement form and mobility, and incorporates gender into the modeling of settlement. The exercise can at a minimum stimulate additional research, and identify the limitations of the approach pursued here.

LATE ARCHAIC SETTLEMENT AND HUNTER-GATHERER

CERAMICS ON THE SNAKE RIVER PLAIN

The context of research begins with an introduction to the geography and geology of the research area. The topical focus of the study arises from previous work and hypotheses about Late Archaic settlement and mobility patterns in Southwestern Idaho. The general theoretical context of the study is found in a discussion of hunter-gatherer mobility, ceramic technology, and investment. Finally, the Direct Historical Approach and a review of regional ethnography narrows the theoretical context for application to the archaeological record of the Snake River Plain.

The Snake River Plain

The Snake River Plain is an extensive basaltic plateau that spans southern Idaho between Oregon and Wyoming. The bedrock of the western portion of the plateau dates to approximately 12 million years ago (ya) (Noe 1991). The Snake River was created as Lake Idaho emptied around 1 million years ago. In some places, deep canyons were created from the various rivers and streams eroding downward through the basalt (Hackett and Bonnichsen 1995).

The Bonneville Flood occurred approximately 14,000 years ago when Lake Bonneville broke through Red Rock Pass and flowed into the Snake River (Baker 1983). This event scoured the lands within the Snake River Canyon. Therefore, the baseline date for landforms within the canyon is 14,000 years (Baker 1983).

Located in southwestern Idaho, the research area of this thesis borders Oregon to the west and the Shoshone Falls to the east, which is historically the farthest reach of anadromous fish runs. To the north is the Boise River and to the south lies Nevada (Figure 1).

Previous Research and Late Archaic Southwestern Idaho Settlement Patterns

Archaeological research on Late Archaic (2,000-150 B.P) southwestern Idaho identifies alternative models of settlement pattern that are the subject of extensive debate. Pavesic and Meatte (1980) began discussion of Late Archaic settlement patterns with test excavations at the National Fish Hatchery Locality in Hagerman Valley, Idaho, where the major excavation findings were five or six buried features later deemed houses. One of the house features contained a single storage pit, which suggests to Pavesic and Meatte “semi-permanence or seasonal re-use of the site by aboriginal peoples” (1980:76). Furthermore, all recorded features at the site suggest an intensive prehistoric occupation, a residential base (Pavesic and Meatte 1980). Of note is the researchers’ discussion of anadromous fish migrations as the stabilizing force of Late Archaic populations in southern Idaho; utilizing fish as a main resource allowed hunter-gatherers to become more sedentary along the Snake River during the Late Archaic.

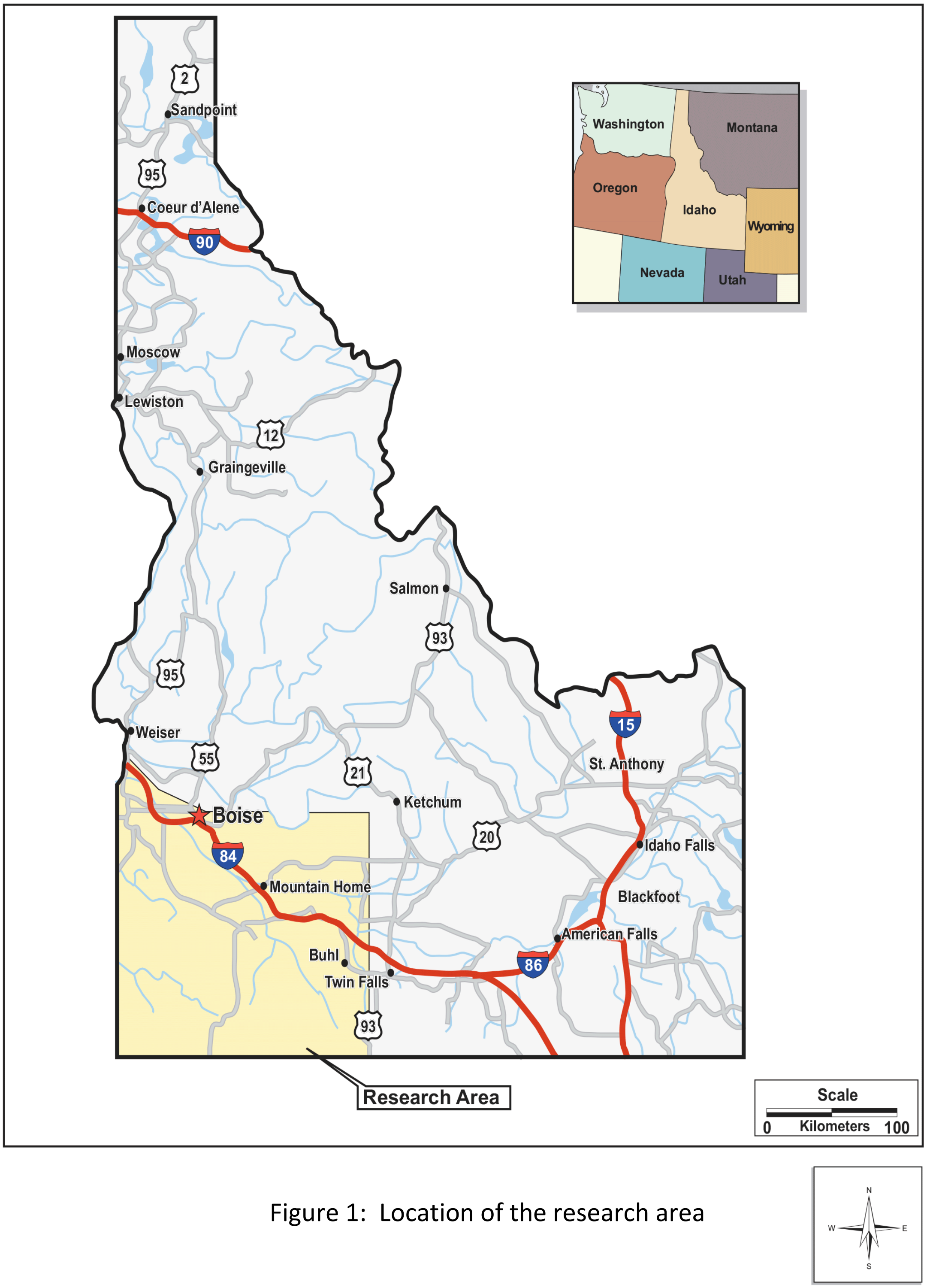

Figure 1: Location of the research area

Pavesic and Meatte generalize from this case to propose a degree of sedentary settlement not previously recognized for the Snake River Plain.

In response to Pavesic and Meatte, Gould and Plew (1996) argue that researchers place too much reliance on a single ethnographic account by Steward (1938) of salmon fishing and caching that creates a “tyranny of the ethnographic record” (Gould and Plew 1996:64). A sole ethnographic account of Snake River people, that of Steward’s 1938 discussion, has been used so often that a focus on salmon fishing and caching has become a defining characteristic that distinguishes southern Idaho groups from other Shoshonean groups in the Great Basin. Gould and Plew point out that Steward also wrote about root collection as a crucial resource and championed a broader look at variations in the resource use of both historic and prehistoric Snake River peoples. After examining tool diversity and faunal remains at seven Snake River sites, Gould and Plew discovered the assemblages did not contain specialized tools and demonstrated a level of continuity between the functional components of tool kits. In sum, the authors’ analysis reveals that groups were mapping on to resources, much as described by Binford (1980), in contrast to a logistic system anchored to one or more residential bases.

Plew (1985) notes that upland settings in the Owyhee Mountains of southwestern Idaho were used primarily during the summer, fall, and spring, while valleys were primarily used during the winter. The presence/absence of pottery in these areas indicates seasonality. Plew surmises that ceramics were more commonly associated with spring and summer activities, such as harvesting and processing camas and biscuitroot. Winter sites, on the other hand, contain fewer ceramics compared to spring and summer sites. Plew's study revealed settlement patterns similar to two of Ames' (1982) hypothetical settlement systems for southwestern Idaho: the first are small bands of hunter-gatherers living in small transitory camps exploiting a broad range of resources, and the other, a system of large aggregations wintering in valleys, dispersing widely during the summer, utilizing a varied array of resources but plants in particular. Plew then generated his own settlement pattern for the Owyhee Mountains, one characterized by small groups aggregating at residential bases in canyons during winter months near cached resources and then establishing seasonal yield camps within a restricted geographic area. The seasonality of resources constrained people's choices about utilizing the landscape. For instance, the deep canyons of the Owyhee River were used during the winter for shelter, wood, exploitation of the aggregation of animals, house construction, and fires. During other parts of the year, however, access to the canyons would have been an impediment to habitation. This pattern could accommodate the presence of residential bases, the occasional use of logistical mobility, while at other times groups may become more transhumant. Switching between these settlement patterns could occur over the course of a single year or over a span of many years.

Plew (1992) argues that camas (*Camasia quamash*) may anchor residential bases, as much or more so than salmon because camas, when procured in bulk, is less expensive to procure and process, and is therefore a higher ranked resource than salmon. If true, this would produce a bimodal settlement pattern anchored to both resources at different times. Plew (1992) framed this as an example of a transhumant settlement pattern that stood in contrast to the semi-permanent village pattern oriented around fish procurement proposed by Pavesic and Meatte (1980). Camas plays a large role in what Plew outlines as a transhumant seasonal round by Late Archaic hunter-gatherers. Movement occurred seasonally between upland locations and the Snake River. Subsistence activities focused on tubers for winter storage, harvesting camas seasonally and then moving the tubers to sites along the Snake River. While Plew's model is a useful addition to the salmon-based model of Pavesic and Meatte (1980), the conclusion that the resulting pattern was transhumant may not be the only alternative. It may be that both camas and salmon anchored logistic settlement patterns in a system that varied over seasons, and over spans of years and decades – the very scale of patterning that produces the archaeological record.

Plew (2009) employs the zooarchaeological record to argue for an increased use of riverine settings in response to Late Archaic aridity. He argues that this climatic shift caused artiodactyls to congregate near the Snake River, drawing the attention of hunter-gatherers. The zooarchaeological record indicates increasing abundance of artiodactyls during the Middle to Late Holocene, which attracted more human attention. Increased aridity could account for the ubiquity of artiodactyl and fish remains in the archaeological record during the Late Archaic.

Eastman (2011) adds to the discussion by undertaking two additional excavations at Three Island Crossing, a Late Archaic site in southwestern Idaho. The initial excavations in 1986 and 1987 recovered 19,000 fish remains, with a minimum number of individuals (MNI) around 300. A single structure and storage feature suggests a residential base. However, during the following excavations in 2008 and 2010, no additional storage features or structures were found. Furthermore few fish remains were recovered. Eastman analyzes the 1986-87, 2008, and 2010 assemblages using Kelly's (2001) Mobility Index. The Mobility Index uses fourteen different indicators to assess assemblage diversity and how it relates to high or low mobility. Eastman's analysis of the technological organization of the assemblages suggests that Three Island crossing was not occupied for long durations.

One way to view the debate over Late Archaic settlement patterns on the Snake River Plain is via Binford's (1980) distinction between foragers and collectors. Foragers "map on" to resources, while collectors employ a logistic system to organize settlement around resource availability (Figures 2 and 3). Plew (1990) notes that multiple settlement strategies may have been in effect during the Late Archaic, an important acknowledgement of variability and plasticity in behavioral response to different circumstances. The research here takes the perspective that multiple strategies may be in force, and directs attention toward improved chronologies that would enable the changing frequencies of alternative settlement strategies to be investigated.

In summary, the Late Archaic settlement debate in southwestern Idaho revolves around resource choices, anadromous fish in particular. The debate becomes a matter of whether people focused on anadromous fish as a main food source, which consequently lead to an intensified use of the Snake River, or whether they focused time and energy on other resources such as tubers and game animals, which subsequently lead to different settlement choices. However, it is entirely possible that multiple settlement patterns could be present in the archaeological record, and this research seeks to use ceramic variation as a means of recasting the debate and to test hypotheses about mobility on the western Snake River Plain.

Hunter-Gatherer Mobility and Ceramics

Mobility has long been a topic of discussion among archaeological researchers (e.g. Binford 1980; Kelly 2007). The use of hunter-gatherer analogy by these researchers formulates a means of understanding the complex nature of mobility.

Ethnographic research shows considerable variability in forager mobility, which goes beyond the familiar continuum of nomadic to sedentary, to include periods when foragers stay at residential bases, followed by periods when movement is frequent. Variations in mobility are often seasonal, in response to the abundance, cost, and storability of resources, but it can also fluctuate over spans of years and even decades (Kelly 2007).

A significant paper by Lewis Binford (1980) showed that the organization of mobility reflects the fundamental nature of forager settlement patterns. Binford distinguished between foragers, who move consumers to resources (Figure 2), and collectors, who bring resources to camp (Figure 3). This dichotomy distinguishes between residential mobility (mapping onto resources) and logistic mobility (sending out task specific groups from camp). Though Binford's work was important to exploration of hunter-gatherer mobility and archaeological consequences, mobility might be better conceptualized as a multidimensional spectrum (Kelly 2007).

Mobility also differs along gender lines, adding another dimension to the resulting settlement pattern beyond a consideration of a continuum of nomadic to sedentary that applies to whole cultures. Gendered division of labor affects why, when, and how people move to different locations on a landscape. Women typically do not hunt large game, as hunting is not conducive to breast-feeding children. Childbirth and the nursing of infants—as indicated in cross-cultural studies-- constrain gendered divisions of labor (Burton et al. 1977). Consequently, women gather rather than hunt in order to tend to the needs of their children. Gathering is an interruptible activity; children can be taken care of before gathering is resumed. However, in hunting, the prey controls the activity and tending to the needs of children becomes difficult (Kelly 2007). In turn women are tethered to residential bases, gathering food in close proximity (Zeanah 2004). Men move farther distances to procure game. Human remains from Stillwater Marsh, Nevada, demonstrate this division of labor (Larsen and Kelly 1995). The gendered division of labor leaves distinct patterns in the archaeological record according to gendered activities.

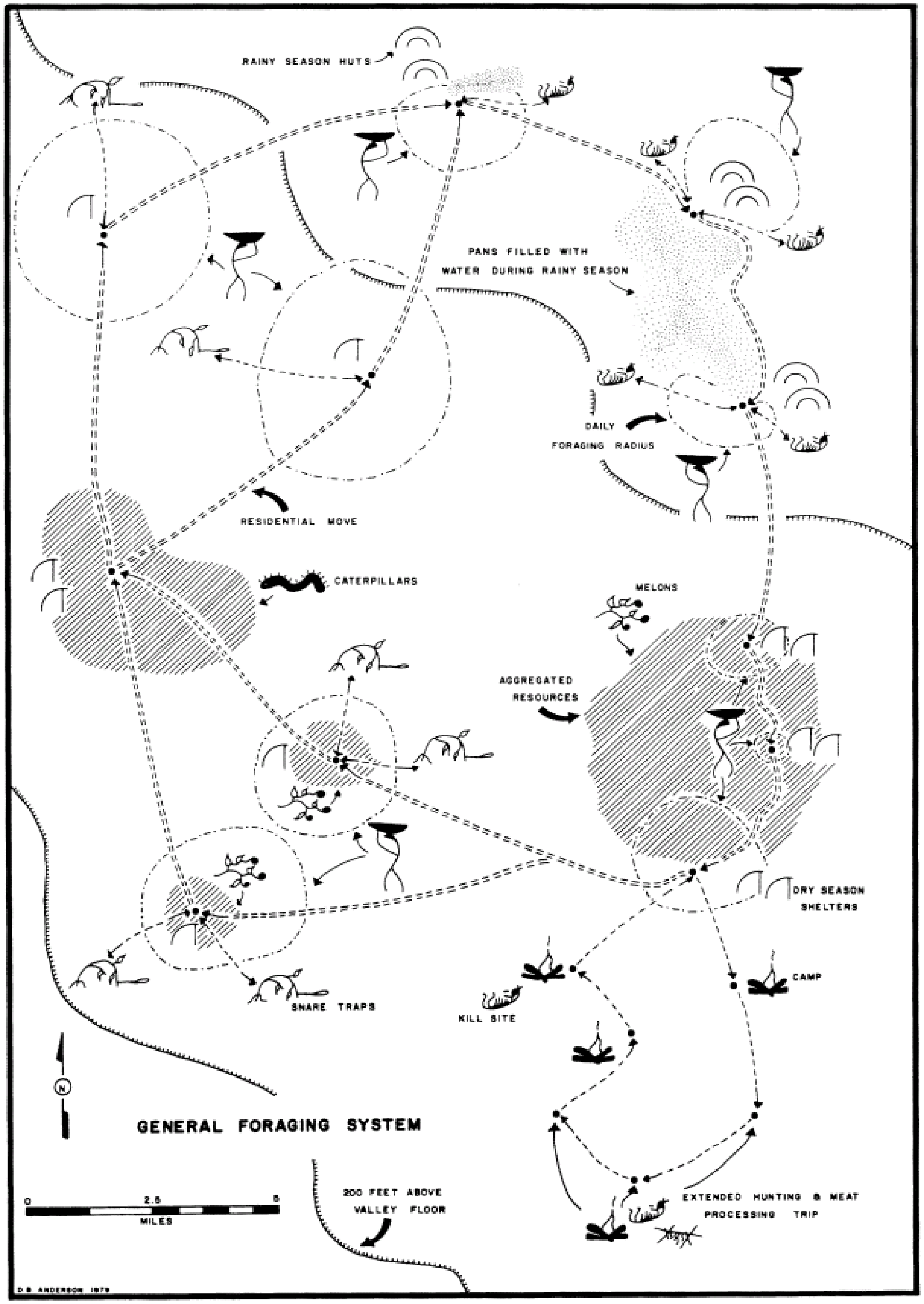

Figure 2: Characteristics of a foraging subsistence-settlement system (Binford 1980:6)

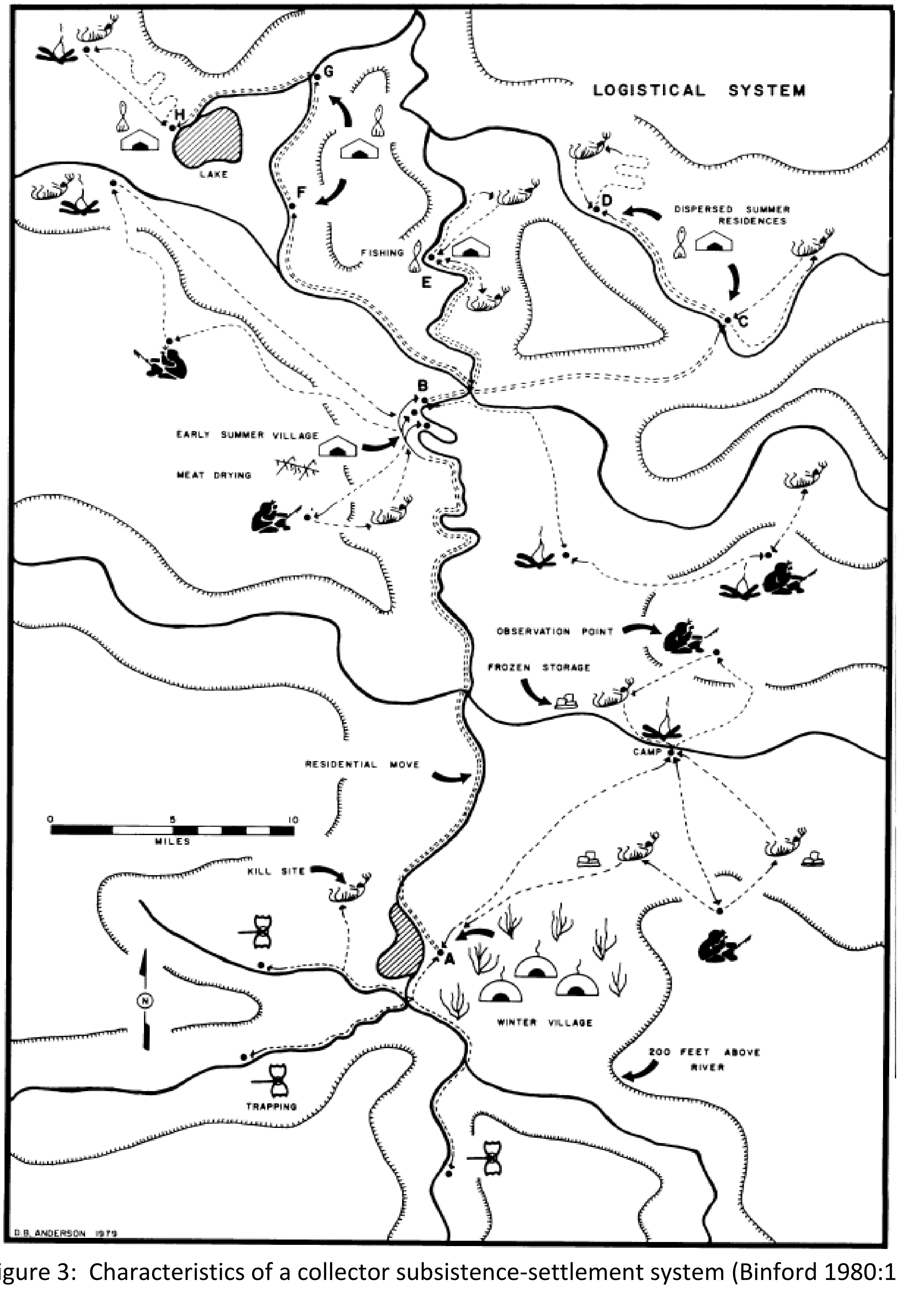

Figure 3: Characteristics of a collector subsistence-settlement system (Binford 1980:11)

Southern Idaho Ceramics: *Archaeology and Ethnography*

Ceramic containers become common at Late Archaic sites on the Snake River Plain about 1,000 years ago (Plew 2008). However, the ethnographic record indicates that ceramic use was limited among Snake River Plain hunter-gatherers because the size of groups was small, and ceramics were only used under some conditions (Murphy and Murphy 1960, 1987; Plew 2008; Steward 1938). Therefore, ceramic assemblages are typically small at Snake River Plain archaeological sites.

Tuohy (1956, 1990) described ceramics from southwestern Idaho as “flower pot” vessels. Pollen and phytolith analysis of some sherds yielded cool season grasses, but the precise use of the ceramics remains unclear. Elsewhere in the region, ceramics are used for stewing a variety of foods. As more ceramics were found, variability in the attributes of southern Idaho ceramics and their cultural affiliation became a topic of interest during the late 1970s and early 1980s (Butler 1979; Plew 1979, 1980). The fragmented nature of southern Idaho ceramics makes determining form difficult and attempts at attributing ceramics to a specific culture speculative at best (Plew and Bennick 1990:108). In an attempt to understand the range of this variation, Plew and Bennick (1990) began analyzing ceramic collections found in southwest Idaho. Using standard descriptions of form, surface and core color, hardness, temper type and size, Plew and Bennick find that—in general—there is more variation in rim form, vessel form, and surface treatment than previously noted.

The ethnographic record can help understand the nature of this variability, although as Pippin (1986) notes, ethnographers paid little attention to ceramics resulting in only a vague understanding of their role in daily life.

Available ethnographic literature frames questions about how and why people made, used, and moved with ceramics. The ethnographic record for southern Idaho—though relatively sparse—contains some information about the utilization of ceramics. The Snake River Plain is here considered an extension of the Great Basin. The Great Basin has a relatively rich ethnographic record, and while the ethnographic record contains little on ceramic production, the region provides an analogy for possible ceramic use on the Snake River Plain. Additionally, a look at ethnographic studies from around the world reveals some consistent observations regarding women and ceramic technology.

Julian Steward's ethnographic work in the Great Basin discusses many aspects of prehistoric hunter-gatherer lifeways (Steward 1938, 1941). The bulk of his work was conducted during the 1930s - 1940s and researched four main groups in Idaho: Shoshone or Northern Paiute of the Western Snake River Plain, Shoshone along the Boise River, the Lemhi Shoshone of Central Idaho, and the Shoshone-Bannock of Fort Hall (southeastern Idaho).

The greatest amount of information on historic ceramic production in Idaho comes from Steward's (1941) cultural element distribution surveys. During these surveys, Steward notes that the Great Basin Shoshone generally employed coiling as a method of construction. The Lemhi Shoshone of Idaho, however, had a unique method of ceramic construction. Holes were dug in the earth and served as a mold for "pats" of clay that formed the vessel.

During the winter, families camped along the Snake River near salmon caches. During the summer, individual families traveled northeast to Camas Prairie to gather camas and other roots. Steward (1938:167) notes, "Camass [*sic*] was gathered in great quantities and preserved for winter either by boiling in clay pots, grinding on metates...or by merely drying without cooking." Camas may have been preserved near where it was gathered or moved to caching locations. Cooking pots would be needed where the preservation was occurring.

Ethnography around the world shows women typically manufactured ceramics (Arnold 1985; Crown and Wills 1995; Murdock and Provost 1973; White et al. 1977). Ceramics enabled gruels to be cooked more easily, which led to earlier weaning of children (Crown and Wills 1995). Women who wean their children early contribute more to the subsistence activities (Nerlove 1974), typically near residential bases because of child rearing demands. In turn, women anchored residential bases, a pattern demonstrated in the Stillwater area of the Great Basin (Larsen and Kelly 1995; Zeanah

2004), and this tether only further stimulated the use of ceramics where settlement tethering occurred.

This pattern is consistent with findings in southwestern Idaho. Butler (1978:79) notes that “(there) was a division of labor along gendered lines. Women...were responsible for collecting plant foods, cooking and housekeeping, and they made the pots in which the foods were cooked.” Butler later notes (1986) that ceramics in eastern Idaho are found 90 percent of the time along the Snake River Plain and are rarely present in the uplands. He attributes this to the gendered division of labor; women, and thus ceramics, remained closer to residential bases while men made forays into the mountains to hunt. His conclusions are similar to the hypotheses of the Snake River Pattern of this research; residential sites are situated near the river where women are utilizing ceramics.

Ceramic Technology, Investment, and Mobility

The variability in ceramics used by hunter-gatherers in the Great Basin and nearby regions is explored in some research in terms of economic models of investment as an alternative to traditional classification systems (Bright et al. 2010; Dean and Heath 1990; Eerkens et al. 2002; Simms et al. 1997). A consideration of use-life, raw material availability and the costs of constructing ceramic technology do not replace ceramic types based on morphological, functional, and stylistic variability, but rather directs attention to attributes of ceramics that may inform behavior. Of particular interest here is mobility behavior as a proxy for understanding aspects of settlement pattern. Studies of this interest can be traced back to a general treatise by Dean Arnold (1985) using general processual theory, and examples of ceramic manufacture from around the world.

Arnold (1985) considers multiple variables that can either constrain or encourage the production of ceramics: quality and distance to resources, weather and climate, scheduling conflicts, population pressure, demand, and degree of sedentariness. Using a sample of 60 societies from the HRAF (Human Relations Area Files), Arnold demonstrated that full sedentariness is not crucial to the emergence of ceramic production; poor weather and climate constrain ceramic production more than degree of sedentariness. The Great Basin has ideal climatic conditions for the production of ceramics as humidity is low and temperatures are warm, particularly between the months of May and September. Arnold notes that ceramic production in the Great Basin is limited not by climate, but rather presence of resources and the length of residences. Arnold further demonstrates that even partial sedentism can mitigate these constraints. Arnold’s research not only informs on the origins of ceramic production but on what factors condition investment in ceramics production. The illumination of these factors is foundational to subsequent archaeological studies of ceramic variation.

Ceramic variation studies began to move beyond ascription to particular cultures based on morphological attributes alone. Dean and Heath (1990) note in the northeastern Great Basin researchers have suggested two distinct pottery making traditions: the Shoshonean and Fremont. However, they find the traits attributed to either Shoshonean or Fremont ceramics have never been clearly stated. In a preliminary study, Dean and Heath find that the separation of ceramics into different wares is not warranted; the ceramics share the same residue categories, the same raw material categories, and the same shaping techniques. Dean and Heath moved Great Basin ceramic studies in a new direction by considering variation.

Great Basin researchers began to ask new questions of ceramic data beginning with Simms et al. (1997), who explore the extent to which the morphology of ceramic vessels and the distance of raw material procurement reflect residential mobility in the eastern Great Basin. One basic premise is followed: potters tended to invest more time and energy into vessels that are intended for a long use life. The same premise is utilized in this research.

Two main propositions are tested: (1) a greater investment in ceramic technology correlates with decreasing mobility, and (2) more sources of raw materials are utilized for ceramic production by peoples with higher mobility (Simms et al. 1997). Basic measures are used to assess 5,345 sherds including temper size, surface preparation, and wall thickness. To assess variation of different sources being used at a given site, X-ray diffraction (XRD) is used on 120 sherds. This method identifies the minerals present in a temper sample by shooting x-rays at the minerals and measuring the angles at which the rays diffract. The actual sources of the raw material cannot be deduced from this method. However, the sherds could, and were, analyzed for variability between one another once the mineral compositions of individual sherds were realized through XRD.

The results of the Simms et al. (1997) study support the hypothesis that greater investment in the quality of ceramic manufacture correlates with increasing residential stability, in addition to occupational redundancy (possible caching of pottery involved), a point that Bright et al. expand on in their work at Camel's Back Cave (2010). Logistic systems where high quality ceramics are moved to short-term camps may also be present. Temper size data fit best with the hypothesis, while wall thickness data generally fit. Surface finish data showed mixed results. The x-ray diffraction study demonstrates that increased mobility is reflected in the amount of various tempers present in sherds. Mobile people are likely to come across a wider range of resources and this is reflected in the results of the x-ray diffraction study. The authors show that an expectation to return to a site mimics sedentism in its effects on ceramic investment.

The broader implications of these studies include the importance of the ceramic-mobility relationship in addressing food production transitions. Also, assuming that ceramic production is a gendered activity in the area, there are implications for studying gender since ceramics may map on to the movements of women. Importantly, Bright et al. (2010) note that understanding variability within plain utilitarian ceramics is another line of evidence to describe adaptive diversity among human populations.

Eerkens et al. (2002) continue to explore the variability in plain ceramics by testing a proposition of Julian Steward; potters in the Owens Valley were female ceramic specialists who “owned” certain clay sources, made ceramics, and distributed them regionally. Using instrumental neutron activation analysis, the authors examine nearly 400 ceramic and clay samples in the southwest region of the Great Basin. The research suggests that the pots were produced and used locally. There was little exchange of pots and the production of ceramics was organized at a family level. These findings do not support Steward’s observations.

Bright et al. (2002) illuminate the effect of handling time on subsistence technology by introducing their “Tech Investment Model.”The Tech Investment Model demonstrates that three variables are important in discovering the optimal amount of time that should be invested in tool production: total time spent searching for food, frequency of encounters with a resource, and the base handling time of a resource. Improving a tool occurs when it is for the sake of time reduction of handling prey. Ceramics, as tools, can be an expensive investment in terms of time. These costs are worth the effort if the ceramics have a sufficiently long use life and reduce the amount of work put into processing resources (e.g. boiling or stewing roots or seeds).

These studies inform this research by highlighting innovative ways of using ceramic variation as a window to mobility and in a larger way, settlement patterns. A key component of exploring the connection between ceramics and settlement patterns is examining the role of women in hunter-gatherer societies.

Women, Mobility, and Ceramics

Zeanah (2004) explores the gendered division of labor among hunter-gatherers using a human behavioral ecology model. Zeanah suggests that men and women have different fitness goals that are expressed through subsistence choices. Natural selection favors reproductive strategies where women focus on provisioning their existing children, while men invest in mating opportunities. Women focus on low risk, close-by resources in order to provision children. Therefore, women were more tethered to a central location and have a smaller foraging radius than men. If women made and utilized ceramics, then this will have further implications as to where we would expect to see pottery in the archaeological record. For the purposes of this research, women will be assumed to be the makers and primary users of ceramics. Due to separate foraging strategies, women may have focused on different resources, utilized different tools, and moved in different ways. If we accept that ceramics were made and used almost exclusively by women, then this research could contribute to tracking the movements of women in the Late Archaic Period.

Larsen and Kelly (1995) conducted a bioarchaeological analysis using stable carbon and nitrogen isotopes in skeletons found near Stillwater Marsh in Nevada. Researchers found that diets emphasized marsh resources and there was a notable lack of upland resources (mainly pinion). Osteoarthritis was common among the men; mostly in their hips, shoulders, and ankles. The cross sections of long bones were sexually dimorphic. Male long bones were more robust than womens, thus suggesting greater male mobility. This evidence leads Larsen and Kelly to conclude that these populations were logistically mobile; women anchored the bases near the marshes while men were going on forays. A similar system may have occurred in southwestern Idaho.

SETTLEMENT PATTERNS, HYPOTHESES, AND DATA EXPECTATIONS

Three settlement patterns are proposed for this research. Hypotheses are then outlined for each of these models and data expectations are presented.

Alternative Models of Late Archaic Settlement Patterns on the Snake River Plain

This section discusses the hypotheses and then the methods used to test and explore western Snake River Plain settlement variability in a systematic way. Exploration of settlement patterns of Late Archaic peoples of southwestern Idaho requires outlining the archaeological signatures of the proposed settlement patterns. The results of archaeological studies on the western Snake River Plain are organized here into three models of mobility and settlement. These three models represent the variability in interpretations concerning mobility in the archaeological record of the research area.

Each of these settlement models hold implications not only for the degree of mobility from sedentary to mobile, but for the nature of mobility as it varies over time. Some patterns feature periodic sedentism, some feature redundancy, some feature period logistics, and some feature tethering to residential bases with a logistic system. Furthermore, each model tends to reflect the role of women in the settlement system, since ceramics are the proxy measure of mobility employed here. Evaluating the fit of these models to the archaeological evidence requires hypotheses identifying the archaeological signatures of the contrasting models.

Three settlement patterns are proposed in this research to model possible forms of settlement in southwestern Idaho:

1) **Snake River Pattern**: Residential bases along the Snake River anchored logistical mobility into the uplands and sagebrush steppe. Storage was at residential bases, especially during winter residence.

2) **Seasonal Rounds Pattern:** Hunter-gatherers moved in a seasonally transhumant pattern ranging from the Snake River into the uplands. Residential base location was dependent on proximity to important resources such as fish in the river and camas roots in the uplands.

3) **Frequent Movement Pattern:** Groups were mobile year-round and utilized minimal storage. The tempo (elapsed time between each move) was shorter than either

the Snake River or Seasonal Rounds Pattern. Hunter-gatherers moved themselves to resources rather than moving resources to themselves.

Hypotheses and Data Expectations for Site Types, Locational Patterns, and Ceramics

Each model of Late Archaic settlement enables hypotheses for data expectations. These hypotheses are summarized below and in Table 1.

1) Snake River Pattern:

This pattern is characterized by logistical mobility. Residential bases are along the Snake River corridor and anchor short term sites in the sagebrush steppe and upland zones. Women would maintain a regular presence in the residential bases, hence ceramics would be more frequent at those sites. Those ceramics should reflect greater investment: a lower ratio of wall thickness to vessel circumference (WT: VC), fine and homogeneous tempers, and a large percentage of vessel smoothing. Smaller assemblages of ceramics would be expected in the sagebrush steppe and upland zones, and could reflect greater variability in morphology. Short term camps logistically associated with residential bases on a redundant basis may include high investment ceramics similar to those at residential bases. In contrast, some ceramics may be made only for expedient use at short term camps. The variability in ceramic investment at short term camps would reflect the different activities of women. On a landscape scale, this pattern would produce the highest frequencies of higher investment ceramics, not only because the pattern features residential bases, but because travel from those bases, with pots, may shape ceramic assemblages at short term camps in other ecozones.

2) Seasonal Rounds Pattern:

This pattern is characterized by seasonal transhumant mobility. Residential bases are located in the uplands zone and adjacent to the Snake River near key resources, such as salmon and camas. Sites could be longer term residential bases and redundantly occupied. The sagebrush steppe zone contains short term sites and could be part of a logistic system anchored by residential sites near the river or in the uplands, depending on the time of year. Women spend most of their time by the river and in the uplands; therefore, ceramics are found more frequently in these locations. Smaller ceramic assemblages will be found in the sagebrush steppe. Higher investment ceramics would be found in higher frequencies in the uplands and near the Snake River compared to the sagebrush steppe.

3) Frequent Movement Pattern:

General trends for this pattern are overall smaller ceramic assemblages and lower frequencies of high investment sherds. High investment sherds can be present but are rare across the landscape. No logistic system is present; hunter-gatherers move themselves to resources. Sites in all three zones consist of short-term camps. Ceramics are highly variable in both degree of investment and the number of raw material sources used in production.

Table 1: Hypothesis Matrix		
	Site Location	*Ceramic Investment Pattern*
Snake River Pattern	Residential sites are primarily adjacent to the Snake River. Short term sites are in the sagebrush steppe and upland zones	Ceramic assemblages from Snake River sites exhibit higher investment indices than sites away from the river. Assemblages from sagebrush steppe and upland zones exhibit less ceramic investment
Seasonal Rounds Pattern	Residential sites are primarily found adjacent to the Snake River and in the upland zone. Short term sites are in the sagebrush steppe zone	Ceramic assemblages from Snake River and upland sites exhibit higher investment indices than sites in the sagebrush steppe zone
Frequent Movement Pattern	Sites are primarily short-term camps in all three ecozones	Ceramic assemblages will not exhibit high investment indices along the Snake River, in the sagebrush steppe, or in the uplands

METHODS

Several tasks are necessary to evaluate the hypotheses about Late Archaic mobility and settlement patterns on the Snake River Plain, including sample size, the ascription of site type, the classification of the study area into ecozones, and the methods to evaluate ceramic investment and temper variability.

Sample and Site Typology

Thirty-seven site reports were gathered from Idaho's Western Archaeological Repository, Boise State University, the Idaho Army National Guard, the Bureau of Land Management, and Idaho Power. Each site was evaluated and placed in two categories: residential bases and short term camps. Residential bases contain evidence for one or more of the following: dwelling structures, storage facilities, midden deposits, and contain diverse artifact assemblages. Diverse here means more than two types of artifact classes. Short term camps lack all of the above indicators and are small scatters of a limited amount of artifact classes besides ceramics.

Ecozones

The analysis of mobility and settlement patterns are evaluated by comparing site data in three ecozones within the study area in southwestern Idaho: the Snake River

Corridor, the Sagebrush Steppe, and the Uplands (Figure 4). The archaeological signatures for each model of settlement pattern will be classified by ecozone. The

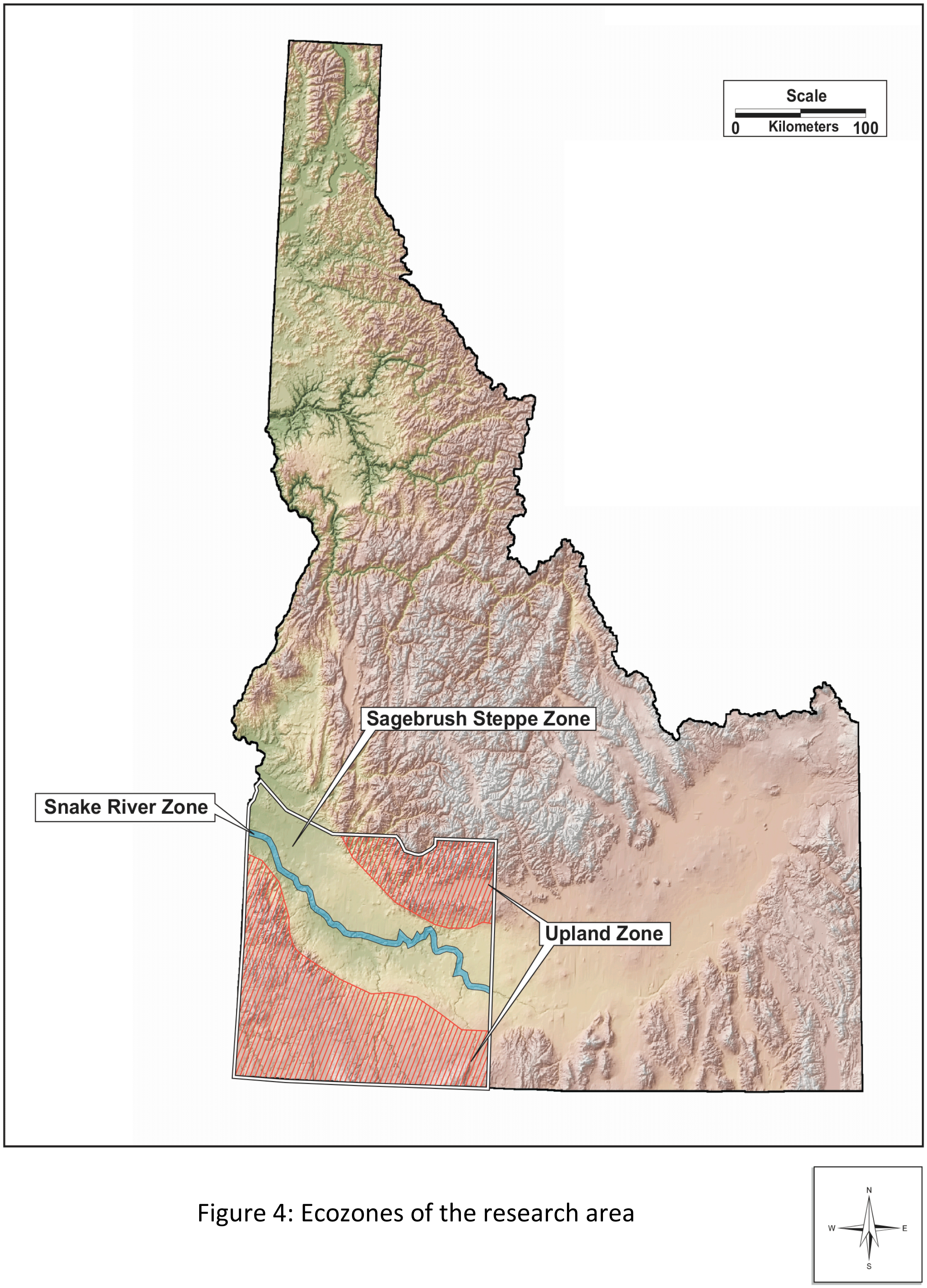

Figure 4: Ecozones of the research area

eastern boundary of the research area is Shoshone Falls, historically the farthest reach of anadromous fish runs. The western and southern boundaries are along the

Nevada/Idaho and the Oregon/Idaho borders. The northern border of the project area will be the Boise River.

Snake River Corridor. The Snake River winds its way through steep canyon walls and is flanked by sagebrush steppe. Flowing from east to west, the Snake River begins in western Wyoming and converges with the Columbia River in Washington. This area is distinguished from the Sagebrush Steppe and the Uplands ecozones due to the presence of the Snake River itself. Shoshone Falls acted as a major natural barrier historically to fish resources, such as salmon, chinook, and steelhead.

The Sagebrush Steppe. The Sagebrush Steppe is a xeric landscape covered by gently rolling hills and plains. Natural vegetation in this ecozone mainly consists of sagebrush and saltbush-greasewood. Streams are generally of a lower gradient, have finer grained substrates, and are warmer than montane streams. Annual precipitation in the Sagebrush Steppe is approximately eight inches.

The Uplands. The Upland ecozone in the research area is characterized as mountainous, deeply dissected, and characteristically underlain by granitic rocks. Grand fir, Douglas fir, western larch, subalpine fir, and Engelmann spruce forests are spread over the mountains. The Owyhee Mountains of the southern portion of the research area contain shear walled canyons cut into extrusive rocks. Woodland is scattered and grows on rocky uplands. High desert wetlands also occur in these mountains and are a critical habitat for nesting and migratory birds.

Evaluating Ceramic Investment and Temper Variability

Ceramic investment is assessed using the technique outlined in Bright et al. (2010). Some assumptions are made regarding ceramic construction and use. First, people would have invested more time and effort in making ceramics that would need to have a greater use-life. Second, ceramics that contain fine, homogeneous tempers exhibit greater investment than ceramics that contain coarse, heterogeneous tempers. Finally, ceramic surfaces that have been intentionally smoothed are considered to be vessels that exhibit greater investment. Burnishing, brushing, or polishing the vessels takes more effort than leaving the vessel rough. Importantly, ceramic investment is not here expected to be fully measured by these methods. Investment is not itself a typology but a concept about something that varies across and within types.

Four hundred and thirty-one sherds from 37 sites were analyzed from across the southwestern Snake River Plain. Each sherd was analyzed for three different measures of investment: temper fineness/homogeneity, maximum sherd thickness in relation to vessel circumference, and whether or not the vessel had been smoothed. Temper type for each sherd will also be recorded as it might allude to where the vessel originated. Temper type and fineness/homogeneity were assessed using a Fisher Scientific Microscope at 10x power.

Temper fineness is measured because fine, homogenous tempers would be carefully selected for or ground by hand. Finer tempers are important in ceramics as they increase resistance to cracking and spalling that can occur from repeated heating and fast cooling (Rye 1976).The use of auxiliary tools such as grinding implements are an additional investment . Temper fineness and homogeneity for each sherd are categorized on an ordinal scale from very fine/very homogenous to very rough/very heterogeneous. Fineness and homogeneity were determined by examining the sherds under a microscope. Tempers smaller than 1/16mm were considered very fine, 1/16mm to 1/2 mm were considered fine, 1/2 mm to 1 mm were considered coarse, and tempers larger than 1mm were considered very coarse. If more than 75 percent of the visible temper inclusions fell within one fineness category it was considered very homogenous. If more than 50 percent fell within one fineness category it was considered homogenous. If three size categories were present than the sherd tempers were considered heterogeneous. If all four size categories were present than the sherd tempers were considered very heterogeneous. The effort invested in temper selection and preparation contributes to the overall investment in ceramic production.

Rim sherds are measured for maximum thickness and vessel circumference. Each sherd is measured in five different locations using digital calipers to determine maximum thickness. Vessel circumference is measured by simple mathematics; chord length (L) and middle ordinate (M) are measured and these numbers are plugged into the following formula and solved for the radius.

$r = (L^2/8M) + (M/2)$

This number is then used to determine the circumference.

$C = 2\pi r$

Maximum sherd thickness and vessel circumference is expressed as a ratio (WT: VC). High investment vessels are indicated by a small numerator and a large denominator. A ratio with a small numerator and a large denominator is indicative of a large, thin walled vessel. These numbers are then divided by 100 for ease of comparison; smaller numbers equate to vessels that demonstrate higher investment. Body sherds are measured only for maximum sherd thickness but are not used in the analysis, as vessel circumference is impossible to extrapolate.

The smoothing variable is determined as present (indications of burnishing, brushing, etc.) or absent for each sherd. Sherds with evidence of smoothing are considered higher investment.

The above measurements will be used to evaluate the hypotheses about ceramic investment at the 37 sites sampled for this study.

RESULTS

Four hundred and thirty-one sherds from 37 sites were analyzed from across the southwestern Snake River Plain: 21 sites adjacent to the Snake River, seven sites in the sagebrush steppe, and nine sites from the uplands (Figure 5 and Table 2). Of the 37 sites, 23 were categorized as short-term camps while 14 were residential bases.

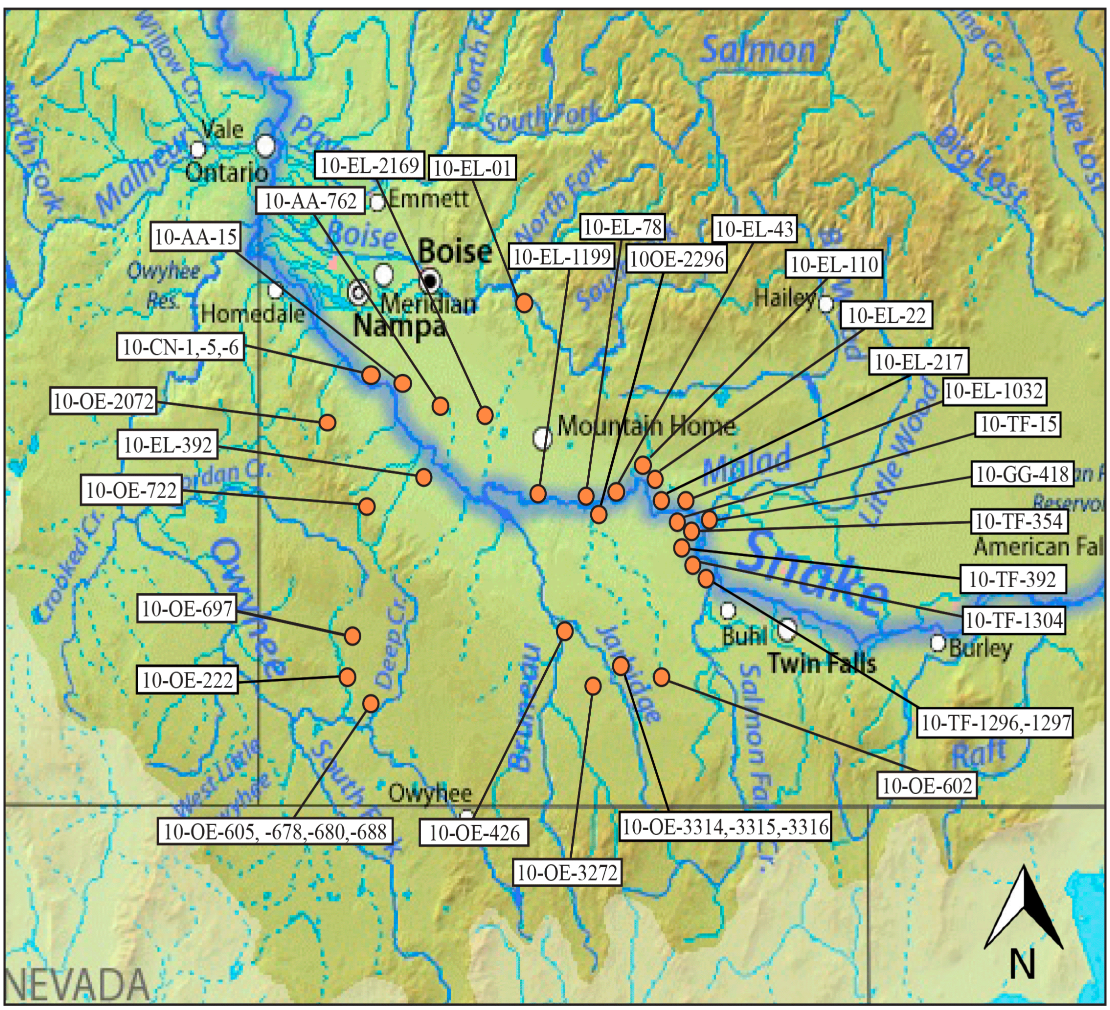

Figure 5: Sites employed in this analysis

Table 2: Site Ecozone Location and Number of Ceramics Analyzed		
Site Number	*Ecozone*	*Number of Analyzed Ceramic Sherds*
10AA15	River	13
10AA762	Sagebrush Steppe	7
10CN1	River	15
10CN5	River	5
10CN6	River	37
10EL01	Uplands	47
10EL1032	River	1
10EL110	River	30
10EL1199	River	24
10EL2169	Sagebrush Steppe	5
10EL217	River	11
10EL22	River	25
10EL392	River	16
10EL43	River	11
10EL78	River	13
10GG418	River	1
10OE2072	Uplands	6
10OE222	Uplands	7
10OE2296	River	7
10OE3272	Sagebrush Steppe	6
10OE3314	Sagebrush Steppe	5
10OE3315	Sagebrush Steppe	7
10OE3316	Sagebrush Steppe	31
10OE426	Sagebrush Steppe	4
10OE602	Sagebrush Steppe	4
10OE605	Uplands	1
10OE678	Uplands	1
10OE680	Uplands	8
10OE688	Uplands	22
10OE697	Uplands	10
10OE722	Uplands	31
10TF1296	River	2
10TF1297	River	2
10TF1304	River	1
10TF15	River	1
10TF354	River	1
10TF392	River	5

Residential bases were most frequent adjacent to the Snake River. Eleven sites along the Snake River were categorized as residential bases. One site in the sagebrush steppe and two sites in the uplands were categorized as residential bases (Table 3).

Table 3: The Distribution of Site Types in each Ecozone			
Ecozone	*Residential Site*	*Short-Term Camp*	*Total*
Snake River	11 Sites	10 Sites	21 Sites
Sagebrush Steppe	1 Site	6 Sites	7 Sites
Uplands	2 Sites	7 Sites	9 Sites

Thus, the site typology supports the presence of the Snake River pattern for the study area. Consistent with the interpretations of some previous research, semi-sedentary occupation along the Snake River for at least part of the year was one feature of the Late Archaic settlement pattern. This bias appears to be an artifact of sampling to some degree, given that only three residential bases can be identified in the Sagebrush Steppe and Upland zones. Regardless, the Snake River pattern is in evidence.

The ceramic investment analysis tells a more complicated story. Ceramic investment exhibits high variation across each of the biotic zones. Some sherds came from well-crafted, high investment ceramics while others appeared to come from more expedient and crude vessels. High variation in southwestern Idaho ceramics was previously noted by Plew and Bennick (1990). The ceramics were variable among sites, and within sites, although the assemblages of measured ceramics from individual sites are very small in many cases.

Full ceramic data is presented in the Appendix.

Ceramic investment was then examined within each biotic zone by categorizing the temper in one of four categories along a continuum from coarse to fine. Percentages of each temper fineness category were then calculated for each zone (Figure 6).

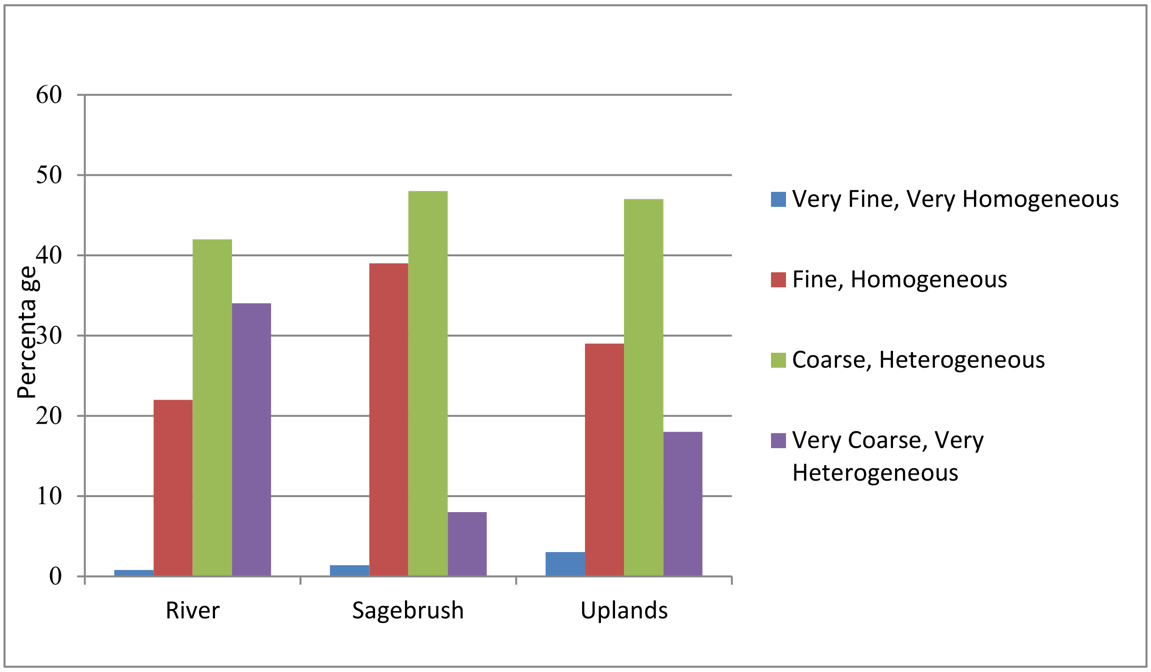

Figure 6: Temper Fineness in each Ecozone

Sherds with coarse and heterogeneous temper were the most dominant across all three zones. Very fine, homogeneously tempered sherds, which indicate the greatest amount of investment, were scarce across all of the biotic zones.

Of note is the higher percentage of fine, homogeneously tempered sherds in the sagebrush steppe zone in relation to the other two biotic zones. In the sites adjacent to the Snake River, very coarse and very heterogeneous tempers are relatively high compared to the other zones.

Upon closer inspection, we find that the comparison of the proportions of all the differences among all the zones were statistically significant, and not likely due to the vagaries of sampling (χ^2=25.303, df= 3, p =.001) among the sherd assemblages. This result could indicate that Late Archaic settlement patterns were causing a relatively homogenous distribution of various kinds of ceramics across the environment, at the intensity and scale of sampling available for this study.

Central to this research is the notion that higher investment ceramics should be found at residential sites compared to short-term sites, except where short term sites are logistically associated with residential bases. Temper fineness in this case is not consistent with this expectation, but then very fine temper does not characterize any ceramic assemblage in the region regardless of site type (Figure 7). The percent of sherds found in each temper fineness category were similar when short-term sites are compared to residential sites, and those differences are not statistically significant (χ^2=3.429, df =3, p= .975). This result hints at an association between residential bases and some short term camps.

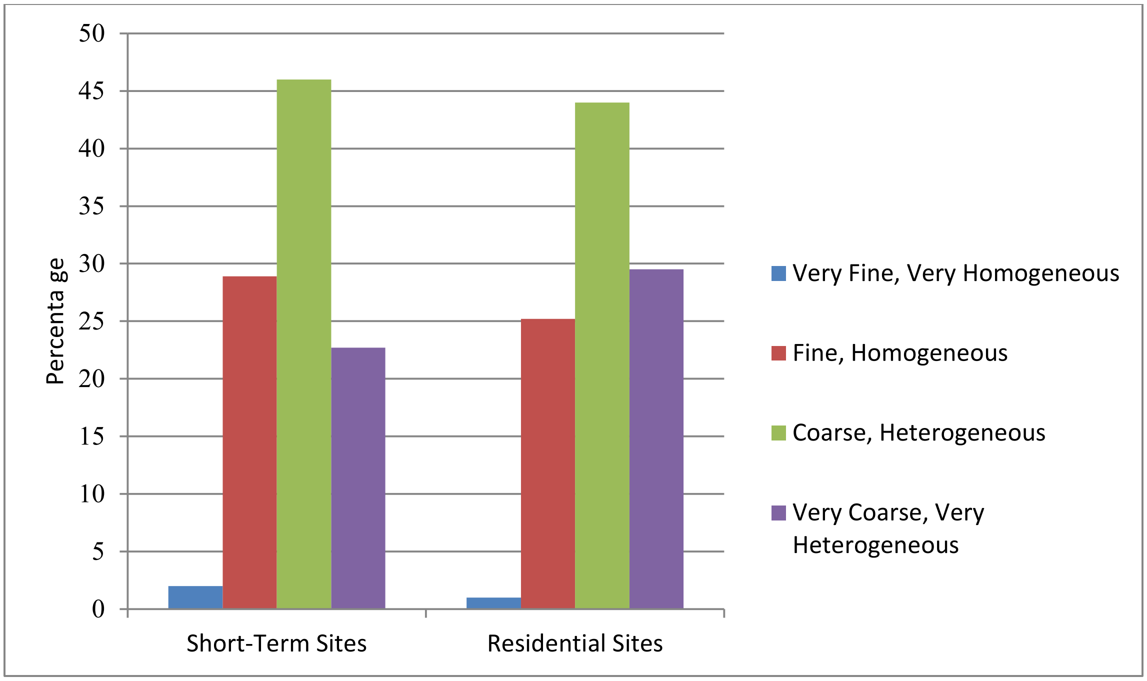

Figure 7: Temper Fineness at Short Term Vs. Residential Sites

The next measure of ceramic investment, wall thickness in relation to vessel circumference, indicates something different than temper fineness. Not every site had rim sherds present. For the sites that did contain rim sherds, measurements were taken for maximum thickness and vessel circumference to control for vessel size. These numbers where then divided and multiplied by 100 to produce a ratio for ease of interpretation. Each of these ratios reflecting wall thickness/vessel size was then averaged against other sherds in the same ecozone (Figure 8). Smaller ratios indicate thinner wall/vessel size, and imply increased investment. Rim sherds from near the Snake River exhibit the most investment while sherds from the sagebrush steppe exhibit the least. The ratios of sherds from near the Snake River and those in the uplands are similar. These data are consistent with the Seasonal Rounds pattern and may reflect some transhumance between the uplands of southwestern Idaho and the Snake River.

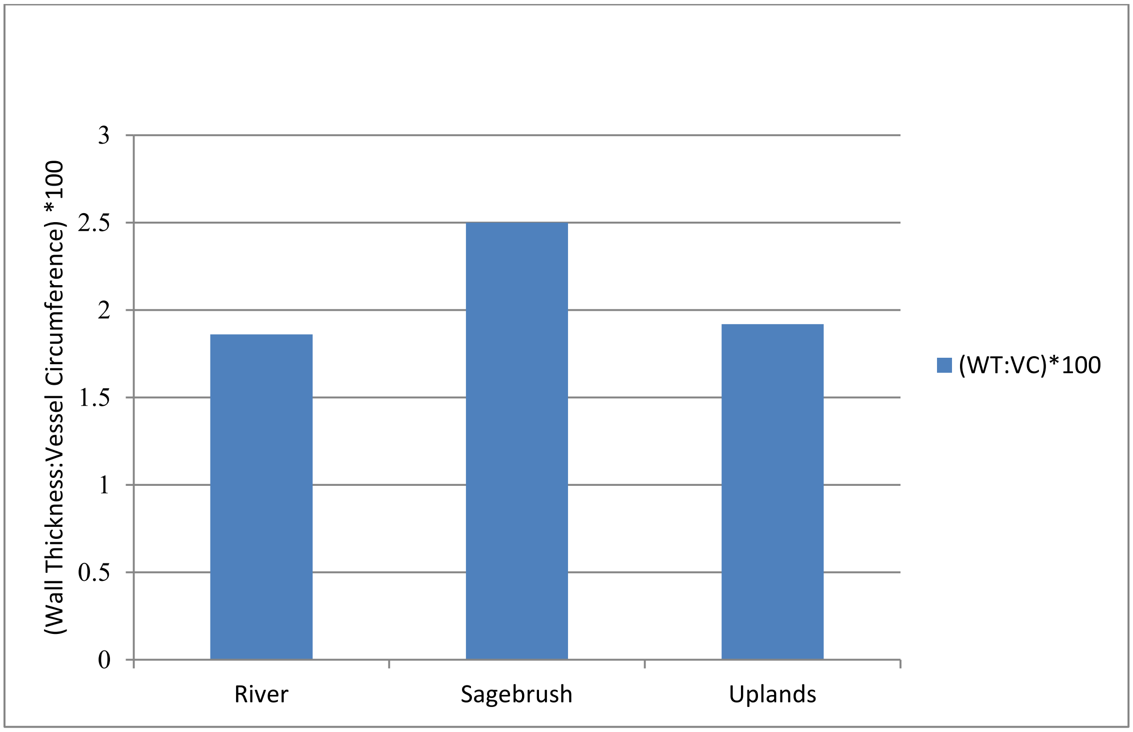

Figure 8: Rim Sherd Investment Measurements in each Ecozone

Despite the apparent differences in the ratios, the differences across samples from all three zones was not statistically significant, determined by one-way analysis of variance (ANOVA) ((F (2, 27) = 1.196, p= .3143)). ANOVA tests whether or not the means of several groups are equal.

When the ratio of wall thickness/vessel size is compared by site type, such as residential bases and short term camps (Figure 9), there is little difference, and this is confirmed by a t-test showing no significant difference (t=.3866, p = .05).

The measures of temper fineness and wall thickness both imply that the investment in ceramics does not vary statistically between the different biotic zones, despite the difference in site type, most notably the higher frequency of residential bases in the Snake River corridor.

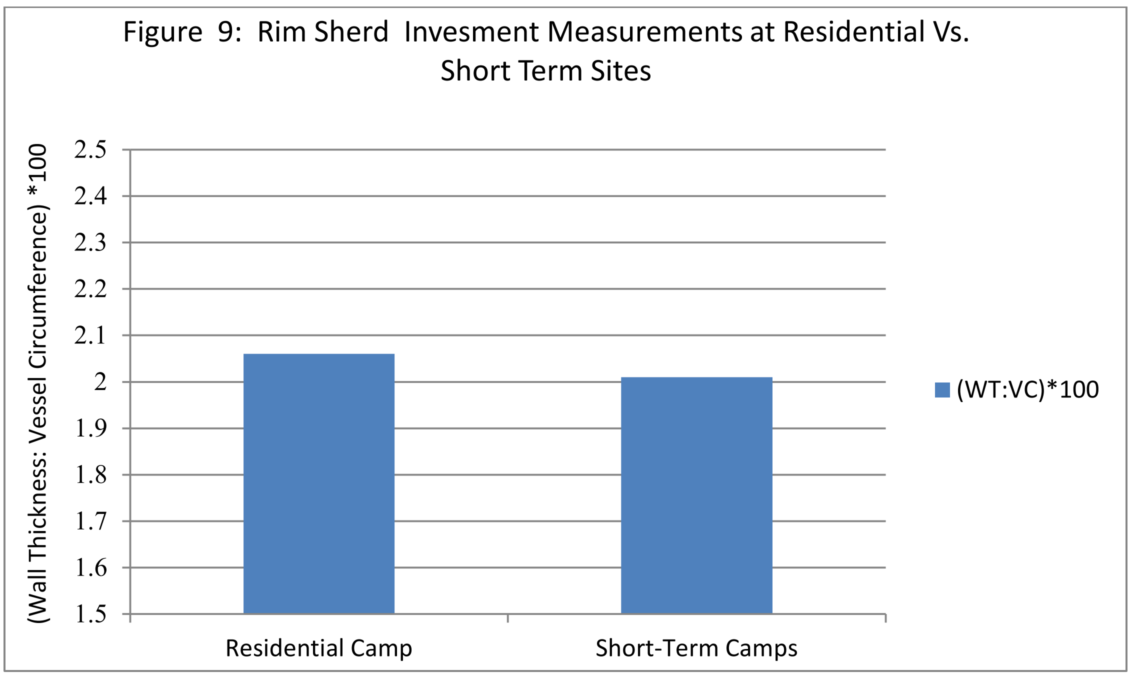

Figure 9: Rim Sherd Investment Measurements at Residential Vs. Short Term Sites

The final measurement of investment used was the presence or absence of surface preparation (Figure 10). This measure of investment is consistent with the results of the rim thickness: vessel circumference ratio among biotic zones. Sherds from sites near the Snake River and in the uplands exhibit more surface preparation than those in the sagebrush steppe zone. These differences are statistically significant when evaluated by a chi-square test (χ^2 =12.48, df=2, p= .001). This result could imply a connection between residential bases and short term camps; quality ceramics may be manufactured at residential bases near the Snake River and carried to short-term camps in the uplands as part of a logistics system.

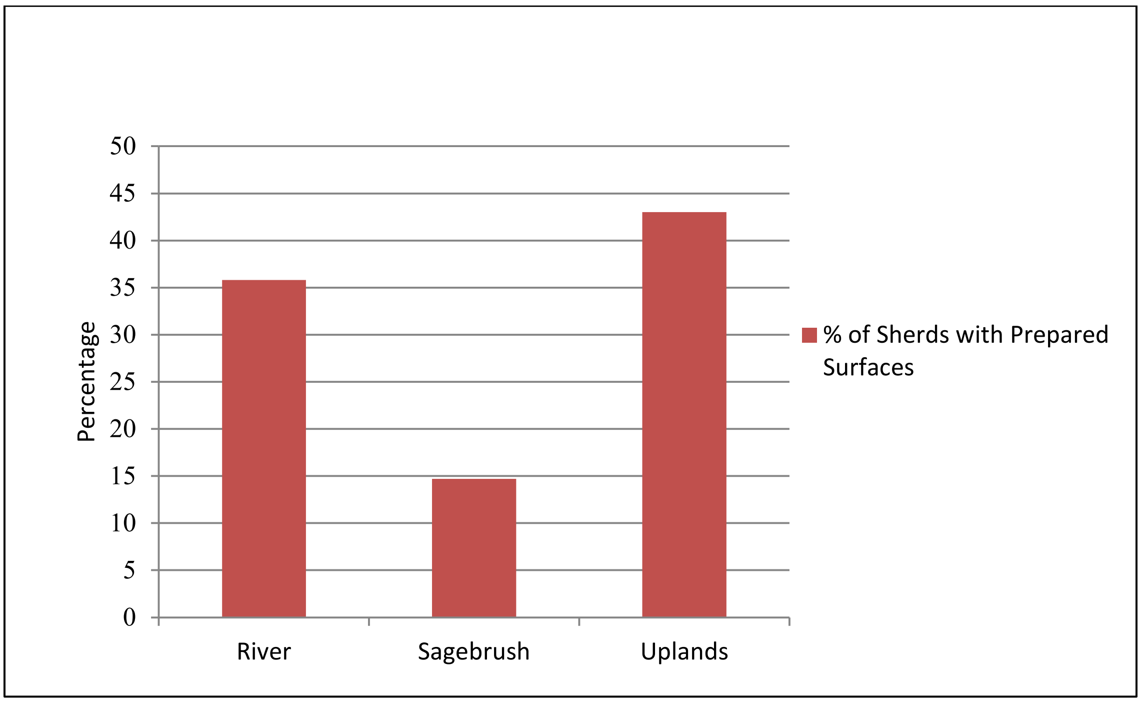

Figure 10: Percentage of Prepared Surfaces in each Ecozone

However, when surface preparation was compared by site type, residential bases and short-term camps, some unexpected results are found (Figure 11). Surface preparation is present in over half of the sherds from short- term camps, whereas only thirty percent of the sherds from residential camps exhibited evidence of prepared surfaces. Sample size may be a factor here, as a chi-square test found these differences are not statistically significant (χ^2 =1.74, df =1, p= .20)

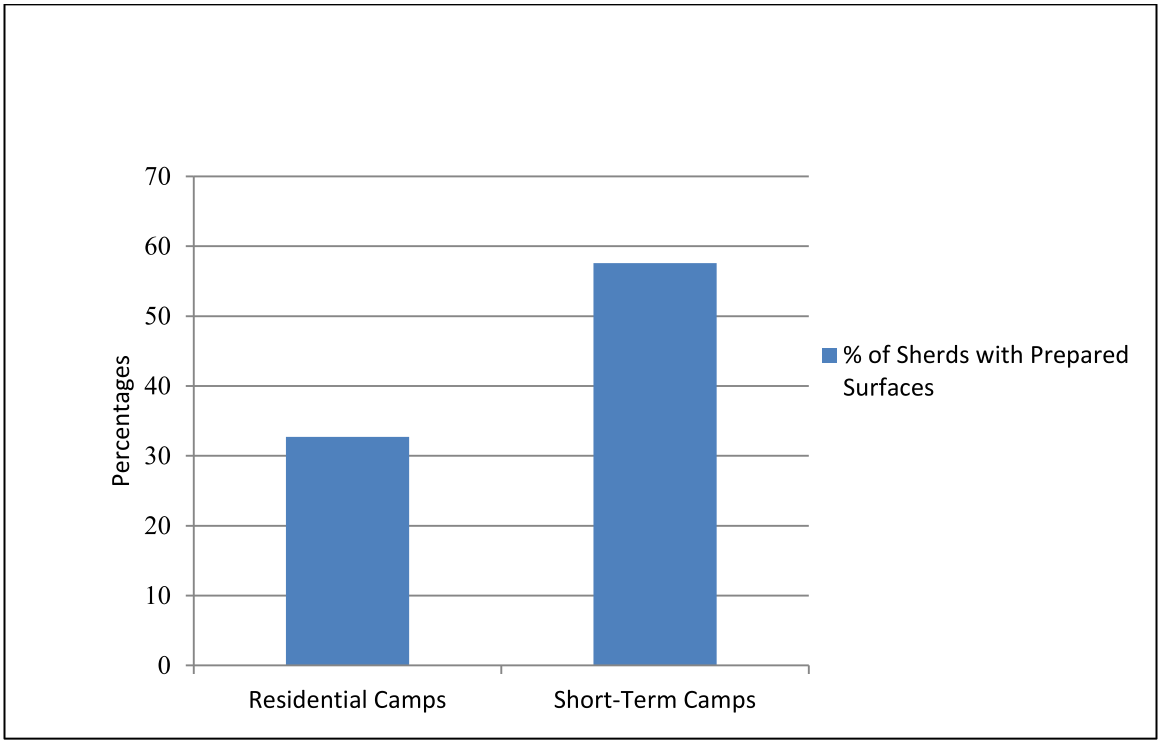

Figure 11: Percentage of Prepared Surfaces at Residential Vs. Short-Term Sites

The use of the ceramic investment measurements as a means of evaluation of the hypotheses demonstrates the inter-relatedness of the research predictions. Predictions were met for each of the three proposed mobility patterns, which may indicate that a multitude of settlement patterns were occurring along the western Snake River Plain, and patterns may have shifted due to need and suitability during different times. However, it is also possible that the ceramic attributes utilized here are demonstrably not a good proxy for mobility.

DISCUSSION AND CONCLUSION

Given the ceramic investment results, when considered in terms of the hypotheses, site types, and ecozones, what appears to be occurring are multiple settlement patterns across the landscape, jumbled together as the archaeological record. The small sample of sherds overall, and the asymmetry in the sample of residential bases, makes it difficult to tease out specific settlement patterns. These data indicate there were variable settlement strategies in use in the Late Archaic Snake River Plain.

This research utilized intentionally simple measures of ceramic investment to act as a means of reconstructing mobility systems on a landscape level. Two main premises were used to guide this investigation. The first, women produced ceramics, and the second, hunter-gatherers will tend to invest more into ceramics intended for a long use-life or where transported and cached for redundant use. Some expectations of ceramic investment in relation to site type and location were met. However, whether between sites, ecological zones, or within sites themselves, the ceramics analyzed for this study were highly variable in their form, presence/absence of smoothing, color, and the size of temper inclusions.

As previously noted by Bright et al. (2010) during their similar study of ceramic investment, greater than expected investment at short term sites may be due to logistic mobility. Ceramics may have been constructed at residential sites and moved to field camps. Conversely, ceramics may have been made at short-term locations with the intention to cache for later use or would be transported to more settled locations. Bright and his colleagues posit that this may be why archaeologists find ceramics that are better quality than expected at short-term locations. This study reflects this notion; ceramics exhibiting signs of high investment were found at short-term sites more often than expected. These data suggest the presence of a logistics system.

As with Bright and Ugan's (1999) findings this study demonstrates a slight trend towards less investment with increased mobility. However, not all of the findings are statistically significant, which may be due to small sample sizes. Small ceramic assemblages are typical of hunter-gatherer campsites, and it is unsurprising that this is found at the majority of sites in southwestern Idaho.

The use of only two site type categories may have had strong influence on the outcomes of this study. Initially, three site types were utilized following the categorizations of Bright et al. (2010): residential bases identifiable by the presence of multiple dwelling structures, numerous storage facilities, midden deposits, and diverse artifact assemblages; residential camps identifiable by presence of no more than one simple dwelling structure and a range of artifact classes but no middens; and short-term camps, which lack all of the above indicators and only contain a limited number of artifact classes besides ceramics. As none of the sites utilized in this research fit the criteria for inclusion in the residential base category it was dropped from analysis. The lack of this type of site is due to limited excavations of its kind and the limitations of access to data. Many of the sites used for analysis are unexcavated. Therefore the presence of dwelling structures, storage facilities, and middens are unknown and site categorization relied heavily on the interpretation of the initial researchers and surface artifact diversity. Patterns between site type and ceramic investment may have been more apparent if all sites utilized in this research had undergone some level of excavation. Artifact diversity may not alone justify distinguishing a site as residential.

In order to delineate a settlement system using predictions of ceramic investment in southwestern Idaho it had to first be demonstrated that different site types contained ceramics exhibiting different levels of investment. Sites were categorized into two site types: residential sites and short-term camps. Findings indicated that the two different site types exhibited very similar amounts of investment in ceramics. What this suggests is that these two site types, though they can be distinguished by variables such as variety of tool types, cannot be distinguished by ceramic investment alone.

It is important to reiterate that ceramic investment was not here argued to be the sole determinant for ceramic morphology. This research attempted to explore ceramic variation at a landscape level to tease apart patterns that reflect behaviors in the archaeological record. These patterns were not clear, which may have to do with the methods involved in this research, but may also point to an archaeological record flush with various settlement patterns that may have changed over the course of seasons, years, or even decades or longer.

Temper type was recorded for each sherd in this study. These data were not utilized here. However, if one were to take this research further, an interesting step would be an analysis of the temper types between sites that appeared to be logistically connected. If sites were logistically connected, it may be reflected in the temper types used in ceramic construction. If so, tempers at some short term camps may appear to come from a similar source as tempers from residential bases, alluding to the movement of ceramics from one location to the other as part of a logistical settlement pattern. Once sites are identified, a sample of sherds could be taken for geochemical characterization to compare similarities and differences among the sherds. This type of research may produce a finer-grained look at where ceramics were made and where they were moved, and may also identify logistic systems in the archaeological record.

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APPENDIX

Ceramic Data

Sherd#	Site#	Sherd Type	Temper Type	Temper Fineness	Surface Prep	WT: VC	Wall Thickness
13205	10AA15	Body	Quartz	Heterogeneous	No		0.752
13205-2	10AA15	Body	Quartz	Heterogeneous	No		0.954
13193-4	10AA15	Body	Quartz	Heterogeneous	No		0.483
FS45	10AA15	Body	Quartz	Very Heterogeneous	No	.557: 32.65	0.829
13192	10AA15	Body	Quartz	Heterogeneous	Yes		0.55
13193-5	10AA15	Rim	Quartz	Heterogeneous	Yes		0.479
FS46	10AA15	Rim	Quartz	Homogeneous	Yes		0.557
FS10	10AA15	Body	Core/ basalt outside/ sand	Homogeneous	Yes		0.583
13193	10AA15	Body	Core/ basalt outside/ quartz	Homogeneous	Yes		0.508
13193-6	10AA15	Body	Quartz	Homogeneous	Yes		0.593
FS11	10AA15	Body	Mica/quar tz	Very Heterogeneous	Yes		0.981
13193-2	10AA15	Body	Quartz	Very Heterogeneous	Yes		0.537
13193-3	10AA15	Body	Quartz	Very Heterogeneous	Yes		0.574
	10AA762	Body	Basalt/ quartz	Heterogeneous	No		0.626
	10AA762	Body	Basalt/ quartz	Homogeneous	No		0.775
	10AA762	Body	Basalt	Homogeneous	No		0.826
	10AA762	Body	Sand	Homogeneous	No		0.751
	10AA762	Body	Sand	Very Heterogeneous	No		0.773
	10AA762	Body	Basalt/ quartz	Heterogeneous	Yes		0.902
	10AA762	Body	Sand	Homogeneous	Yes		0.67
A13	10CN1	Body	Quartz	Heterogeneous	No		0.833
A141	10CN1	Body	Quartz	Heterogeneous	No		0.733
A12	10CN1	Body	Quartz	Heterogeneous	No		0.767
A73	10CN1	Body	Sand	Homogeneous	No		0.761
A63	10CN1	Body	Sand	Homogeneous	No		0.762
Sherd#	Site#	Sherd Type	Temper Type	Temper Fineness	Surface Prep	WT: VC	Wall Thickness

A67	10CN1	Body	Quartz	Homogeneous	No		0.851
A107	10CN1	Body	Quartz/ sand	Homogeneous	No		0.778
A102	10CN1	Base	Sand	Homogeneous	No		0.857
A129	10CN1	Body	Basalt	Homogeneous	No		0.687
A61	10CN1	Body	Sand	Homogeneous	No		0.876
A134	10CN1	Body	Quartz	Heterogeneous	Yes		0.768
A66	10CN1	Body	Quartz	Heterogeneous	Yes		0.777
A57	10CN1	Body	Quartz	Homogeneous	Yes		0.818
A103	10CN1	Body	Basalt	Homogeneous	Yes		0.837
A11	10CN1	Body	Quartz	Very Heterogeneous	Yes		0.883
A2	10CN5	Body	Sand	Homogeneous	No		0.781
A20	10CN5	Body	Quartz	Very Heterogeneous	No		0.687
A13	10CN5	Body	Quartz	Very Heterogeneous	No		0.751
A77	10CN5	Rim	Quartz	Very Heterogeneous	No	.685: 53.38	0.685
A62	10CN5	Body	Mica	Homogeneous	Yes		0.932
A6	10CN6	Body	Sand	Heterogeneous	No		0.646
A23	10CN6	Body	Sand	Heterogeneous	No		0.743
A10	10CN6	Body	Sand	Heterogeneous	No		0.64
A3	10CN6	Body	Mica	Heterogeneous	No		1.02
A20	10CN6	Body	Quartz	Heterogeneous	No		0.685
A9	10CN6	Body	Basalt	Heterogeneous	No		0.634
A32	10CN6	Body	Quartz	Heterogeneous	No		0.631
A19	10CN6	Body	Sand	Heterogeneous	No		0.639
A14	10CN6	Body	Quartz	Heterogeneous	No		0.651
A27	10CN6	Body	Quartz	Heterogeneous	No		0.715
A5	10CN6	Rim	Basalt	Heterogeneous	No	.767:35 .953	0.767
A17	10CN6	Rim	Quartz	Heterogeneous	No	Too small	0.773
A30	10CN6	Rim	Quartz	Heterogeneous	No	Too small	0.782
A2	10CN6	Body	Basalt	Homogeneous	No		0.654
A16	10CN6	Body	Sand	Homogeneous	No		0.701
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**

A26	10CN6	Body	Sand	Homogeneous	No		0.737
A31	10CN6	Rim	Sand	Homogeneous	No	.752:31.71	0.752
A13	10CN6	Rim	Sand	Homogeneous	No	.729:22.76	0.729
A46	10CN6	Rim	Mica/sand	Homogeneous	No	.822:33.177	0.822
A18	10CN6	Rim	Quartz	Very Heterogeneous	No	.733:34.91	0.733
A25	10CN6	Body	quartz	Very Heterogeneous	No		0.733
A84	10CN6	Body	Mica	Very Heterogeneous	No		0.71
A84(2)	10CN6	Body	Mica	Very Heterogeneous	No		0.628
A22	10CN6	Body	Quartz	Very Heterogeneous	No		0.705
A1	10CN6	Body	Mica	Very Heterogeneous	No		0.599
A36	10CN6	Base	Quartz	Very Heterogeneous	No		0.609
A151	10CN6	Body	Sand	Heterogeneous	Yes		0.621
A15	10CN6	Rim	Sand	Heterogeneous	Yes	.702: 29.39	0.702
A29	10CN6	Body	Basalt	Heterogeneous	Yes		0.619
A24	10CN6	Body	Sand	Heterogeneous	Yes		0.669
A21	10CN6	Rim	Basalt	Homogeneous	Yes	.747: 40.82	0.747
A28	10CN6	Body	Sand	Homogeneous	Yes		0.846
A53	10CN6	Body	Mica	Homogeneous	Yes		0.597
A8	10CN6	Body	Sand	Homogeneous	Yes		0.567
A11	10CN6	Body	Quartz	Very Heterogeneous	Yes		0.684
118	10EL01	Body	Mica/ quartz	Heterogeneous	No		0.796
171	10EL01	Body	Quartz	Heterogeneous	No		0.666
177	10EL01	Body	Orpiment/ quartz	Heterogeneous	No		0.923
139	10EL01	Body	Quartz	Heterogeneous	No		0.672
207	10EL01	Rim	Quartz	Heterogeneous	No		0.906
432	10EL01	Body	Quartz	Heterogeneous	No		0.585
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
1233	10EL01	Body	Cerussite	Homogeneous	No		0.599

397	10EL01	Body	Cerussite	Homogeneous	No		0.689
473	10EL01	Body	Mica	Homogeneous	No		0.527
1232	10EL01	Body	Cerussite/ quartz	Homogeneous	No		0.841
143	10EL01	Body	Orpiment/ quartz	Very heterogeneous	No		0.64
115	10EL01	Body	Quartz	Very Heterogeneous	No		0.868
176	10EL01	Body	Sand	Very homogeneous	No		0.428
175	10EL01	Body	Sand	Very Homogeneous	No		0.41
102	10EL01	Body	Quartz	Heterogeneous	Yes		0.616
93	10EL01	Body	Quartz	Heterogeneous	Yes		0.628
133	10EL01	Body	quartz	Heterogeneous	Yes		0.675
24	10EL01	Body	Basalt	Heterogeneous	Yes		0.754
92	10El01	Body	Mica/ quartz	Heterogeneous	Yes		0.719
552	10EL01	Body	Quartz	Heterogeneous	Yes		0.707
163	10EL01	Body	Quartz	Heterogeneous	Yes		0.634
84	10EL01	Body	Quartz	Heterogeneous	Yes		0.852
103	10EL01	Base	Quartz	Heterogeneous	Yes		0.932
43	10EL01	Body	Quartz	Heterogeneous	Yes		0.797
88	10EL01	Body	Quartz	Heterogeneous	Yes		0.527
1234	10EL01	Body	Sand	Heterogeneous	Yes		0.525
1230	10EL01	Body	Quartz	Heterogeneous	Yes		0.683
1208	10EL01	Body	Quartz	Heterogeneous	Yes		0.753
634	10EL01	Body	Quartz	Heterogeneous	Yes		0.547
587	10EL01	Body	Quartz	Heterogeneous	Yes		0.644
109	10EL01	Body	Quartz	Homogeneous	Yes		0.542
169	10EL01	Body	Sand	Homogeneous	Yes	.906: 57.2	0.703
36	10EL01	Body	Quartz	Homogeneous	Yes		0.795
392	10EL01	Body	Sand/ mica/ quartz	Homogeneous	Yes		0.745
1221	10EL01	Body	Cerussite	Homogeneous	Yes		0.729
1201	10EL01	Body	Cerussite/ sand	Homogeneous	Yes		0.801
595	10EL01	Body	Cerussite/ quartz	Homogeneous	Yes		0.438
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
117	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.536

136	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.839
119	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.816
75	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.753
51	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.706
174	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.716
168	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.681
161	10EL01	Body	Quartz	Very Heterogeneous	Yes		0.77
40	10EL01	Body	Sand	Very Homogeneous	Yes		0.732
402	10EL01	Body	Sand	Very Homogeneous	Yes		0.76
1	10EL1032	Body	Quartz	Very Heterogeneous	No	Too small	0.661
A154	10EL110	Body	Quartz	Heterogeneous	No		1.086
A115	10EL110	Body	Basalt	Heterogeneous	No		0.85
A120	10EL110	Body	Sand	Homogeneous	No		0.594
A151	10EL110	Body	Sand	Homogeneous	No		0.64
A155	10EL110	Body	Quartz	Homogeneous	No	.565: 81.23	0.565
A156	10EL110	Body	Quartz	Very Heterogeneous	No		0.642
A119	10EL110	Body	Quartz	Heterogeneous	Yes		0.542
A140	10EL110	Body	Sand	Heterogeneous	Yes		0.655
A124	10EL110	Body	Quartz	Heterogeneous	Yes		0.618
A165	10EL110	Body	Quartz	Heterogeneous	Yes		0.594
A129	10EL110	Body	Quartz	Heterogeneous	Yes		0.623
A113	10EL110	Body	Quartz	Heterogeneous	Yes		0.473
A6	10EL110	Body	Quartz	Heterogeneous	Yes		0.52
A8	10EL110	Body	Quartz	Heterogeneous	Yes		0.55
A137	10EL110	Body	Quartz	Heterogeneous	Yes		0.549
A84	10EL110	Body	Quartz	Heterogeneous	Yes		0.542
A169	10EL110	Body	Quartz	Heterogeneous	Yes		0.503
A132	10EL110	Body	Quartz	Homogeneous	Yes		0.641
A48	10EL110	Body	Sand	Homogeneous	Yes		0.617
A59	10EL110	Body	Sand	Homogeneous	Yes		0.669
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
A163	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.554

A123	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.672
A170	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.49
A111	10EL110	Rim	Quartz	Very Heterogeneous	Yes	.765: 35.2	0.765
A143	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.604
A55	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.77
A114	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.661
A149	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.607
A153	10EL110	Body	Quartz	Very Heterogeneous	Yes		0.58
A139	10EL110	Body	Sand	Very Homogeneous	Yes		0.602
FS229-1b	10EL1199	Rim	Quartz	Heterogeneous	No	Too small	0.874
FS232-3c	10EL1199	Body	Quartz	Heterogeneous	No		0.866
FS279-3	10EL1199	Body	Quartz	Heterogeneous	No		1.06
FS232-5	10EL1199	Body	Quartz	Heterogeneous	No		1.035
FS278	10EL1199	Body	Sand	Homogeneous	No		0.501
FS237	10EL1199	Rim	Quartz	Homogeneous	No	.924: 107.1	0.924
FS232-4b	10EL1199	Body	Quartz	Homogeneous	No		0.926
FS239-1	10EL1199	Rim	Sand	Homogeneous	No	.695: 19.32	0.695
FS229-1A	10EL1199	Body	Quartz	Very Heterogeneous	No		1.01
FS229-1C	10EL1199	Rim	Quartz	Very Heterogeneous	No	.968: 59.72	0.968
FS229-1d	10EL1199	Body	Quartz	Very Heterogeneous	No		0.997
FS229-1e	10EL1199	Body	Quartz	Very Heterogeneous	No		0.892
FS229-1f	10EL1199	Body	Quartz	Very Heterogeneous	No		0.873
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
FS229-1h	10EL1199	Rim	Quartz	Very Heterogeneous	No	.82: 56.83	0.82

FS229-1g	10EL1199	Body	Quartz	Very Heterogeneous	No		0.98
FS232-3d	10EL1199	Body	Quartz	Very Heterogeneous	No		0.789
FS232-3b	10EL1199	Body	Quartz	Very Heterogeneous	No		1.01
FS232-3a	10EL1199	Body	Quartz	Very Heterogeneous	No		0.928
FS226-1	10EL1199	Rim	Quartz	Very Heterogeneous	No	.883: 38.30	0.883
FS228-2	10EL1199	Body	Quartz	Very Heterogeneous	No		1
FS233	10EL1199	Rim	Quartz	Very Heterogeneous	No	.786: 22.60	0.786
FS267	10EL1199	Body	Quartz	Heterogeneous	Yes		0.85
FS232-4a	10EL1199	Body	Sand	Homogeneous	Yes		1.133
FS224-3	10EL1199	Rim	Quartz	Very Heterogeneous	Yes	.838: 23.23	0.838
1	10EL2169	Body	Quartz	Heterogeneous	No		0.735
1	10EL2169	Body	Sand	Heterogeneous	No		0.666
1	10EL2169	Rim	Quartz	Homogeneous	No		0.6
1	10EL2169	Base	Sand	Heterogeneous	Yes		0.99
1	10EL2169	Base	Sand	Homogeneous	Yes		1.1
FS55	10EL217	Body	Quartz	Heterogeneous	No		0.534
FS61	10EL217	Body	Quartz	Heterogeneous	No		0.493
FS65	10EL217	Body	Basalt	Heterogeneous	No		0.58
FS71.2	10EL217	Body	Quartz	Heterogeneous	No		0.766
FS91.1	10EL217	Body	Quartz	Heterogeneous	No		0.575
FS91.2	10EL217	Body	Basalt	Heterogeneous	No		0.676
FS99	10EL217	Body	Quartz	Heterogeneous	No		0.944
FS147	10EL217	Body	Basalt	Heterogeneous	No		0.618
FS88	10EL217	Body	Quartz	Homogeneous	No		0.602
FS95	10EL217	Body	Quartz	Homogeneous	Yes		0.767
FS71.1	10EL217	Body	Quartz	Very Heterogeneous	Yes		0.715
19	10EL22	Body	Quartz	Heterogeneous	No		0.606
1038	10EL22	Body	Sand	Heterogeneous	No		0.492
1883	10EL22	Body	Quartz	Heterogeneous	No		0.852
581	10EL22	Body	Quartz	Heterogeneous	No		0.456
325	10EL22	Body	Quartz	Heterogeneous	No		0.601
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
995	10EL22	Body	Quartz	Homogeneous	No		0.517
994	10EL22	Body	Quartz	Homogeneous	No		0.49

20	10EL22	Body	Basalt/ quartz	Very Heterogeneous	No		0.555
1551	10EL22	Body	Quartz	Very Heterogeneous	No		0.433
21	10EL22	Rim	Quartz	Very Heterogeneous	No	.924: 40.82	0.924
1743	10EL22	Rim	Quartz	Very Heterogeneous	No		0.591
1689	10EL22	Body	Quartz	Very Heterogeneous	No		0.685
205	10EL22	Body	Quartz	Very Heterogeneous	No		0.528
293	10EL22	Body	Quartz	Very Heterogeneous	No		0.657
1510	10EL22	Body	Basalt/ quartz	Very Heterogeneous	No		0.559
8	10EL22	Body	Quartz	Heterogeneous	Yes		0.631
1598	10EL22	Body	Quartz	Heterogeneous	Yes		0.556
1599	10EL22	Body	Quartz/ sand	Heterogeneous	Yes		0.46
1652	10EL22	Body	Quartz	Heterogeneous	Yes		0.556
526	10EL22	Body	Quartz/ sand	Heterogeneous	Yes		0.586
18	10EL22	Body	Sand	Homogeneous	Yes		0.648
16	10EL22	Body	Quartz	Homogeneous	Yes		0.504
1674	10EL22	Body	Quartz	Homogeneous	Yes		0.648
671	10EL22	Body	Quartz	Homogeneous	Yes		0.628
3	10EL22	Body	Quartz	Very Heterogeneous	Yes		0.834
1	10EL24	Body	Mica/ quartz	Heterogeneous	No		0.917
7.1	10EL24	Rim	Mica/ quartz	Heterogeneous	No	.734: 82.39	0.734
8.1	10EL24	Body	Mica/ quartz	Homogeneous	No		1.041
7.2	10EL24	Body	Quartz	Homogeneous	No		0.608
8.3	10EL24	Body	Quartz	Very Heterogeneous	No		0.863
8.2	10EL24	Body	Mica/ quartz	Very Heterogeneous	No		1.013
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
6	10EL24	Body	Quartz	Heterogeneous	Yes		0.547
2	10EL24	Body	Quartz/ basalt	Very Heterogeneous	No		0.85

22	10EL392	Body	Quartz/ sand	Heterogeneous	No		0.769
38	10EL392	Body	Quartz	Heterogeneous	No		0.658
31	10EL392	Body	Quartz/ sand	Heterogeneous	No		0.791
30	10EL392	Body	Quartz	Heterogeneous	No		0.603
40	10EL392	Body	Quartz	Heterogeneous	No		0.758
51	10EL392	Rim	Quartz	Heterogeneous	No	.867: 40.03	0.867
59	10EL392	Rim	Sand/ quartz	Very Heterogeneous	No	.94: 29.07	0.94
49	10EL392	Body	Quartz	Very Heterogeneous	No		0.684
50	10EL392	Body	Quartz	Very Heterogeneous	No		0.755
53	10EL392	Rim	Quartz	Very Heterogeneous	No	.953: 48.48	0.953
35	10EL392	Body	Quartz	Very Heterogeneous	No		0.647
29	10EL392	Body	Quartz	Very Heterogeneous	No		0.429
19	10EL392	Body	Sand/ quartz	Very Heterogeneous	No		0.801
39	10EL392	Body	Quartz	Very Heterogeneous	No		0.779
38	10EL392	Rim	Quartz	Very Heterogeneous	No	.855: 19.78	0.855
52	10EL392	Body	Quartz	Very Heterogeneous	No		0.769
FS1	10EL43	Body	Quartz	Heterogeneous	No		0.632
FS5	10EL43	Body	Quartz	Very Heterogeneous	No		0.619
FS3	10EL43	Body	Quartz	Very Heterogeneous	No		0.602
FS8	10EL43	Body	Quartz	Very Heterogeneous	No		0.652
FS9	10EL43	Body	Quartz	Very Heterogeneous	No		0.742
FS11	10EL43	Body	Quartz	Very Heterogeneous	No		0.63
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
FS4	10EL43	Body	Basalt/ quartz	Heterogeneous	Yes		0.502
FS2	10EL43	Body	Quartz	Very Heterogeneous	No		0.589

FS7	10EL43	Body	Quartz	Heterogeneous	Yes		0.579
FS10	10EL43	Body	Quartz	Heterogeneous	Yes		0.606
FS6	10EL43	Body	Quartz	Homogeneous	Yes		0.498
82-44.58	10EL78	Body	Quartz/ basalt	Heterogeneous	No		0.612
82-44.59	10EL78	Body	Quartz/ basalt	Heterogeneous	No		0.77
82-44.57	10EL78	Body	Quartz	Heterogeneous	No		0.937
82-44.54	10EL78	Body	Quartz/ basalt	Heterogeneous	No		1.056
82-44.50	10EL78	Body	Quartz/ basalt	Heterogeneous	No		1.043
82-44.47	10EL78	Base	Sand	Heterogeneous	No		1.009
82-44.49	10EL78	Body	Quartz	Very heterogeneous	No		1.077
82-44.52	10EL78	Body	Quartz	Heterogeneous	Yes		1.255
82-44.51	10EL78	Base	Quartz	Heterogeneous	Yes		1.302
82-44.55	10EL78	Body	Quartz	Heterogeneous	Yes		1.132
82-44.56	10EL78	Body	Quartz	Heterogeneous	Yes		0.995
82-44.48	10EL78	Body	Quartz	Heterogeneous	Yes		0.554
82-44.53	10EL78	Body	Quartz/ basalt	Heterogeneous	Yes		1.18
3	10GG418	Rim	Sand	Homogeneous	Yes		0.721
8	10OE2072	Body	Sand	Heterogeneous	No		0.648
2	10OE2072	Body	Quartz	Heterogeneous	No		0.863
3	10OE2072	Body	Quartz	Heterogeneous	No		0.833
5	10OE2072	Body	Sand	Heterogeneous	No		0.791
4	10OE2072	Body	Sand/mica	Homogeneous	No		0.664
6	10OE2072	Body	Quartz	Very Heterogeneous	No		0.78
67.81.27	10OE222	Body	Quartz	Heterogeneous	No		0.724
67.81.26	10OE222	Body	Quartz	Heterogeneous	No		0.684
67.81.30	10OE222	Body	Sand	Heterogeneous	No		0.663
67.81.31	10OE222	Body	Sand	Heterogeneous	No		1.036
67.81.32	10OE222	Body	Sand	Homogeneous	No		0.618
67.81.29	10OE222	Body	Quartz	Very Heterogeneous	No		0.572
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
38	10OE2296	Body	Quartz	Very Heterogeneous	No		0.93
67.81.28	10OE222	Body	Quartz	Very Heterogeneous	Yes		0.746

14	10OE2296	Body	Basalt/ quartz	Heterogeneous	No		0.984
13	10OE2296	Body	Quartz	Heterogeneous	Yes		0.609
10	10OE2296	Body	Quartz	Heterogeneous	Yes		0.574
11	10OE2296	Body	Quartz	Very Heterogeneous	Yes		0.514
12	10OE2296	Body	Plant/ quartz	Very Heterogeneous	Yes		0.652
9	10OE2296	Body	Quartz	Very Heterogeneous	Yes		0.527
5	10OE3272	Body	Quartz	Heterogeneous	No		0.618
3	10OE3272	Body	Quartz	Heterogeneous	No		0.648
1	10OE3272	Rim	Quartz	Homogeneous	No	.776: 43.77	0.776
9	10OE3272	Body	Sand/ basalt	Homogeneous	No		0.746
4	10OE3272	Body	Sand/ quartz	Homogeneous	No		0.578
6	10OE3272	Body	Sand	Very Homogeneous	No		0.661
26	10OE3314	Body	Quartz	Heterogeneous	No		0.595
4	10OE3314	Body	Quartz	Heterogeneous	No		0.557
12	10OE3314	Body	Quartz	Very heterogeneous	No		0.753
9	10OE3314	Body	Sand	Homogeneous	Yes		0.724
12	10OE3314	Body	Quartz	Homogeneous	Yes		0.622
13	10OE3315	Body	Quartz	Heterogeneous	No		0.589
27B	10OE3315	Body	Quartz	Heterogeneous	No		0.63
7	10OE3315	Body	Quartz	Heterogeneous	No		0.627
10	10OE3315	Body	Quartz	Heterogeneous	No		0.528
12	10OE3315	Body	Basalt	Homogeneous	No		0.657
8	10OE3315	Body	Quartz	Homogeneous	No		0.665
11	10OE3315	Body	Sand	Homogeneous	No		0.878
6	10OE3316	Body	Sand/ quartz	Heterogeneous	No		0.752
6	10OE3316	Body	Sand/ quartz	Heterogeneous	No		0.857
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
29	10OE3316	Body	Quartz	Heterogeneous	No		0.649
6	10OE3316	rim	Quartz	Heterogeneous	No	.838: 27.61	0.838
29	10OE3316	Body	Quartz	Heterogeneous	No		0.724
29	10OE3316	Body	Quartz	heterogeneous	No		0.643

29	10OE3316	Body	Quartz	Heterogeneous	No		0.765
28	10OE3316	Rim	Quartz	Heterogeneous	No	Too small	0.726
28	10OE3316	Body	Quartz	Heterogeneous	No		0.788
28	10OE3316	Body	Quartz	Heterogeneous	No		0.556
28	10OE3316	Rim	Quartz	Heterogeneous	No	Too small	0.714
28	10OE3316	Body	Quartz	Heterogeneous	No		0.726
28	10OE3316	Body	Quartz	Heterogeneous	No		0.689
28	10OE3316	Body	Quartz	Heterogeneous	No		0.712
28	10OE3316	Body	Quartz	Heterogeneous	No		0.616
28	10OE3316	Body	Quartz	Heterogeneous	No		0.576
28	10OE3316	Body	Quartz	Heterogeneous	No		0.768
28	10OE3316	Body	Quartz	Heterogeneous	No		0.735
28	10OE3316	Body	Quartz	Heterogeneous	No		0.659
28	10OE3316	Body	Quartz	Heterogeneous	No		0.591
28	10OE3316	Body	Quartz	Heterogeneous	No		0.742
6	10OE3316	rim	Sand	Homogeneous	No	.996: 17.77	0.996
29	10OE3316	Body	Sand	Homogeneous	No		0.763
29	10OE3316	Rim	Sand/ quartz	Homogeneous	No	.722: 48.87	0.722
29	10OE3316	Body	Quartz	Homogeneous	No		0.613
29	10OE3316	Body	Quartz	Homogeneous	No		0.714
29	10OE3316	Body	Quartz	Homogeneous	No		0.679
29	10OE3316	Body	Quartz	homogeneous	No		0.788
29	10OE3316	Body	Quartz	Homogeneous	No		0.522
29	10OE3316	Body	Quartz/ sand	Homogeneous	No		0.557
28	10OE3316	Body	Quartz	Homogeneous	No		0.623
3	10OE426	Body	Basalt	Homogeneous	No		0.467
4	10OE426	Body	Quartz/ basalt	Homogeneous	Yes		0.532
2	10OE426	Body	Quartz	Homogeneous	Yes		0.461
1	10OE426	Body	Ignimbrite	Homogeneous	Yes		0.731
1	10OE602	Body	Quartz	Very Heterogeneous	No		0.734
13-1	10OE602	Body	Quartz	Very Heterogeneous	No		0.685
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
1 - 3	10OE605	Rim	Quartz	Heterogeneous	Yes	.849: 32.53	0.849
M/4	10OE602	Body	Quartz/ basalt	Very Heterogeneous	Yes		0.724

L/6	10OE602	Body	Quartz	Very Heterogeneous	Yes		0.692
1	10OE678	Rim	Sand/ quartz	Heterogeneous	No	1.056: 46.88	1.056
7	10OE680	Body	Quartz	Heterogeneous	No		0.521
8	10OE680	Body	Quartz	Heterogeneous	No		0.542
1	10OE680	Body	Quartz	Very Heterogeneous	No		0.531
2	10OE680	Body	Quartz/ basalt	Very Heterogeneous	No		0.518
5	10OE680	Body	Quartz	Very Heterogeneous	No		0.511
3	10OE680	Body	Sand	Homogeneous	yes		0.58
6	10OE680	Body	Quartz	Homogeneous	Yes		0.54
4	10OE680	Body	Quartz	Very Heterogeneous	Yes		0.558
78.84.303	10OE688	Body	Quartz/ mica	Heterogeneous	No		0.667
78.84.275	10OE688	Rim	Quartz	Heterogeneous	No	.703: 61.70	0.957
78.84.281	10OE688	Body	Quartz	Heterogeneous	No		1.227
78.84.334	10OE688	Body	Mica (shell?)	Homogeneous	No		0.391
78.84.274	10OE688	Body	Mica (shell ?)	Homogeneous	No		0.345
78.84.347	10OE688	Body	Mica (shell?)	Homogeneous	No		0.387
78.84.333	10OE688	Body	Mica (shell ?)	Homogeneous	No		0.324
78.85.582	10OE688	Body	Sand	Homogeneous	No		0.702
78.84.356	10OE688	Body	Sand	Very Heterogeneous	No		0.822
78.85.580	10OE688	Body	Quartz	Heterogeneous	Yes		0.61
78.84.355	10OE688	Body	Quartz/ sand	Heterogeneous	Yes		0.703
78.85.581	10OE688	Body	Quartz	Heterogeneous	Yes		0.619
78.84.263	10OE688	Body	Sand	Heterogeneous	Yes		0.605
78.84.304	10OE688	Body	Quartz	Heterogeneous	Yes		0.503
78.84.262	10OE688	Body	Sand	Heterogeneous	Yes		0.582
78.84.344	10OE688	Body	Quartz	Heterogeneous	Yes		1.098
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
78.84.296	10OE688	Rim	Sand	Homogeneous	Yes	.883: 48.82	0.883
78.84.357	10OE688	Body	Quartz	Heterogeneous	Yes		0.715
78.84.324	10OE688	Body	Quartz	Heterogeneous	Yes		0.572

78.84.308	10OE688	Body	Sand	Heterogeneous	Yes		0.701
78.84.261	10OE688	Body	Sand	Homogeneous	Yes		0.628
78.85.579	10OE688	Body	Quartz	Very Heterogeneous	Yes		0.644
78.84.469	10OE697	Body	Quartz	Heterogeneous	No		0.521
78.84.445	10OE697	Body	Plants/ quartz	Heterogeneous	No		0.98
78.84.487	10OE697	body	Quartz/ basalt	Heterogeneous	No		0.463
78.84.545	10OE697	Body	Quartz	Heterogeneous	No		0.661
78.84.467	10OE697	Body	Quartz	Very Heterogeneous	No		0.73
78.84.479	10OE697	Body	Quartz	Very Heterogeneous	No		0.489
78.84.403	10OE697	Body	Quartz	Very Heterogeneous	No		0.643
78.84.402	10OE697	Body	Quartz	Homogeneous	Yes		0.479
78.84.697	10OE697	Body	Quartz	Very Heterogeneous	Yes	.525: 34.06	0.525
78.84.697	10OE697	rim	Sand	Homogeneous	yes		0.894
158	10OE722	Body	Sand	Heterogeneous	No		0.953
309	10OE722	Body	Quartz	Heterogeneous	No		1.023
301	10OE722	Body	Quartz	Heterogeneous	No		0.876
119	10OE722	Rim	Quartz	Heterogeneous	No		0.934
63	10OE722	Body	Quartz	Heterogeneous	No		0.904
159	10OE722	Body	Quartz	Heterogeneous	No		1.093
56	10OE722	Body	Quartz	Heterogeneous	No		1.059
358	10OE722	Body	Quartz	Heterogeneous	No		1.155
234	10OE722	Body	Quartz	Heterogeneous	No		1.1
217	10OE722	Body	Quartz	Heterogeneous	No		1.143
311	10OE722	Body	Quartz/ basalt	Heterogeneous	No		0.921
59	10OE722	Body	Sand	Homogeneous	No		1.118
128	10OE722	Body	Sand	Homogeneous	No		1.011
187	10OE722	Rim	Basalt	Homogeneous	No	1.089: 50.93	1.089
41	10OE722	Body	Sand	Homogeneous	No		0.882
Sherd#	**Site#**	**Sherd Type**	**Temper Type**	**Temper Fineness**	**Surface Prep**	**WT: VC**	**Wall Thickness**
111	10OE722	Body	Sand	Homogeneous	No		1.042
124	10OE722	Body	Quartz	Homogeneous	No		0.951
44	10OE722	Body	Sand/ quartz	Homogeneous	No		0.911

121	10OE722	Body	Quartz	Homogeneous	No		0.95
284	10OE722	Body	Basalt	Homogeneous	No		1.036
122	10OE722	Body	Quartz	Homogeneous	No		0.997
218	10OE722	Body	Sand/ quartz	Homogeneous	No		1.117
234	10OE722	Body	Quartz	Homogeneous	No		0.859
233	10OE722	Body	Quartz	Homogeneous	No		1.036
310	10OE722	Body	Quartz	Homogeneous	No		1.16
351	10OE722	Body	Quartz	Very Heterogeneous	No		0.969
120	10OE722	Body	Quartz	Very Heterogeneous	No		0.885
118	10OE722	Body	Quartz	Heterogeneous	Yes		6.94
60	10OE722	Body	Quartz	Heterogeneous	Yes		1.138
170	10OE722	Body	Quartz	Homogeneous	Yes		1.031
47	10OE722	Body	Sand	Homogeneous	Yes		0.93
2	10TF1296	Rim	Quartz	Heterogeneous	No		1.07
3	10TF1296	Body	Sand	Homogeneous	No	.621: 37.68	0.621
1	10TF1297	Body	basalt	Heterogeneous	No		0.732
2	10TF1297	Body	Basalt	Heterogeneous	No		0.641
FS1	10TF1304	Body	Quartz	Heterogeneous	No		0.541
1	10TF15+ 16	body	Sand	Homogeneous	No		0.705
4	10TF354	Body	Quartz	Very Homogeneous	No		0.794
FS1	10TF392	Body	Quartz	Heterogeneous	No		1.11
1	10TF392	Body	Sand	Homogeneous	No		0.837
FS1	10TF392	Body	Sand	Homogeneous	No	Too small	0.633
FS1	10TF392	Rim	Quartz	Heterogeneous	Yes		0.74
FS1	10TF392	Body	Quartz	Very Heterogeneous	Yes		0.839