Tools but not Toolkits: Traces of the Arctic Small Tool Tradition in the Kodiak Archipelago

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Abstract: Archaeological data indicate that the prehistoric foragers of the Kodiak Archipelago had deep and enduring connections with societies of the Alaskan mainland. From trade to intermarriage, islanders maintained ties with their neighbors that reflect patterns of economic and social organization. This paper explores interregional interaction during Kodiak's Early Kachemak phase (4000 to 2700 BP), a period that coincides with Arctic Small Tool tradition (ASTt) occupations on the adjacent Alaska and Kenai peninsulas. Although this far southern corner of the Esk–Aleut world was not colonized by bearers of the ASTt, exotic raw materials and ASTt-type tools in Kodiak's Early Kachemak assemblages provide evidence of interaction across the Shelikof Strait.

Key Words: Early Kachemak phase, economic intensification, raw material sourcing, Kodiak Archipelago, Alutiiq people

INTRODUCTION

The spread of foraging societies across the North American Arctic roughly 4200 years ago is one of the most intriguing events in arctic prehistory. The ability of human societies to rapidly colonize this vast, ecologically varied landscape implies an enormously flexible cultural system, capable of remarkable economic adaptation. Bearers of the Arctic Small Tool tradition (ASTt) were the first to colonize the far north, inhabiting all areas of the North American and Greenlandic Arctic that would ever be peopled (Damas 1984:2; Dumond 1984:74).

While the dramatic eastward migration of ASTt foragers is well documented, the southern terminus of their movement, in southwest Alaska, is less understood. Although archaeologists have identified evidence of ASTt occupations on the central Alaska Peninsula (Dumond 1981; Harritt 1988; Henn 1978) and the southern Kenai Peninsula (Workman and Zollars 2002), researchers continue to debate the extent of ASTt occupations along the North Pacific Coast (Dumond 2001:292–298). ASTt-like tools occur repeatedly in adjacent areas, forcing researchers to consider broader connections with this pervasive culture. Did the remarkably versatile foragers of the ASTt spread into gulf coast environments to occupy places like Kodiak and the Aleutian Islands, or are signs of the ASTt among the populous, maritime societies of south-central Alaska an indication of interaction between highly mobile cultures (Dumond 2001:298; Hausler 1993:17, Workman and Zollars 2002)?

Part of the difficulty in discerning the spatial extent of ASTt occupations is the limited quantity of archaeological data from the fourth millennium BP. This pattern is changing, however, as researchers become more adept at locating sites and new data fill gaps in local chronologies. Recent excavations in the eastern Aleutian Islands (Knecht, Davis, and Carver 2001), the southern Alaska Peninsula (Maschner and Jordan 2001), and the Kodiak region (Steffian, Pontti, and Saltonstall 1998; Steffian, Eufemio, and Saltonstall 2002) have unearthed substantial archaeological samples from the middle Holocene. These finds have renewed interest in the relationships between North Pacific foragers and bearers of the ASTt and their implications for the evolution of later societies (Hausler 1993:17; Workman and Zollars 2002).

This paper summarizes new data from the very late Ocean Bay II and Early Kachemak phases in the Kodiak Archipelago—a period that extends from about 4400 to 2700 years BP and overlaps the ASTt elsewhere in Alaska. To investigate the links between the ASTt and Kodiak's societies, we first consider evidence for the structure of Kodiak societies three to four thousand years ago based on recent excavations in the Chiniak Bay region (Saltonstall, Kopperl, and Steffian 2001; Steffian, Pontti, and Saltonstall 1998; Steffian and Saltonstall 2003). How were these societies organized and what connections might they have had to the Alaskan mainland? This discussion is followed by a review of patterns in the fre-

quency, distribution, and use of non-local materials and possible ASTt artifacts in Kodiak assemblages.

These data indicate strong cultural continuity in the Kodiak region. Early Kachemak societies appear to grow seamlessly from the preceding Ocean Bay tradition, and to reflect an intensification of fishing and storage practices. Within this economy, exchange with the Alaskan mainland was a consistent activity, as it was throughout Kodiak's human history. Non-local materials and tools of distant manufacture occur repeatedly in small quantities throughout Kodiak's Early Kachemak assemblages. Thus, although it is tempting to interpret ASTt-type tools on Kodiak as a sign of occupation, a broader view of the archaeological data indicates that this southern corner of the Esk–Aleut world lay beyond significant ASTt influence. While ASTt materials may have made their way to Kodiak via long-distance trade, ASTt foragers do not appear to have colonized the region or substantially altered the course of local cultural development (Clark 1997:83; Dumond 1998:195).

ESKIMO SOCIETIES IN THE GULF OF ALASKA

The Kodiak Archipelago lies in the central Gulf of Alaska, south of the Kenai Peninsula and east of the Alaska Peninsula (Fig. 1). Formed by the collision of tectonic plates, sculpted by glacial ice, and inundated with ocean water, the archipelago is a mountainous island chain with deeply incised coastal fjords. No inland area is more than twenty-nine kilometers (18 miles) from the ocean (Capps 1937:120).

The region's complex coastline provides habitat for an abundance of marine life and opportunities for maritime foraging. This land has been home to the Alutiiq people for millennia. From a cultural perspective, the Kodiak region lies at the heart of the Alutiiq world, an area that includes Prince William Sound, the lower Kenai Peninsula, and the Alaska Peninsula. Anthropologists consider the Alutiiq people to be Eskimo. Sug'stun, their language, is a member of the Esk–Aleut language family. Moreover, Alutiiq people share many cultural and biological ties with their Yup'ik neighbors to the west, from the use of sod houses, skin boats, oil lamps, and waterproof gutskin clothing, to a bilateral kinship system and origin stories common to Inuit peoples (Crowell and Lührmann 2001:25; Lantis 1938:163; Mishler 2003:102; Scott 1991:48). Thus, the Alutiiq homeland in the relatively warm, rainy environments of the North Pacific represents the southern limit of the world's Eskimo societies.

Despite the apparent Eskimo roots of Alutiiq culture, the origins of Alutiiq societies and their ties to other coastal peoples remain a topic of great debate. Anthropologists also note many connections between Alutiiq and neighboring North Pacific societies. From wood-working tools to weaving techniques, and from ranked social systems to the importance of bird iconography and raven stories (Black 1994; Crowell and Lührmann 2001:29; Lantis 1938:128; Lee 1981; Townsend 1980), the Alutiiq people share many practices with the Aleut and Tlingit. To many, these similarities indicate ancestral ties beyond the Eskimo world. It is not surprising, therefore, that anthropologists have long searched for northern connections in their attempts to explain Alutiiq ethnogenesis (Clark 1992; Dumond 1988).

As archaeological data from the central gulf accumulate, however, they provide a picture of cultural continuity. Despite notable environmental variation across the Alutiiq homeland, and attendant diversity in economic practices and technologies, each major prehistoric cultural tradition is represented in each area—beginning with the early mobile foragers of the Ocean Bay tradition, and moving through the seasonally sedentary village communities of the Kachemak phase to the ranked societies of the Koniag phase. From earliest occupation, the distribution of prehistoric cultures mimics the historic distribution of Alutiiq people (cf. Clark 1997:84; Hausler 1993:10) illustrating a broadly unified evolutionary trajectory. This pattern not only indicates enduring cultural ties across the major bodies of water that dissect the central Gulf of Alaska, but suggests a persistent population. Although not every area was continuously or heavily occupied (Clark 1997:69; Workman and Zollars 2003:46; Yarborough and Yarborough 1998:138), the region's prehistoric population was substantial enough to generate a continuous sequence of cultural development for over 7500 years.

A major exception to this pattern of continuity is the Arctic Small Tool tradition (ASTt). Between 4440 and 3805 cal BP, people bearing a distinctive chipped stone toolkit camped on the shores of Kachemak Bay (Workman and Zollars 2002:40–42). Evidence of their activities is preserved in small bipointed and stemmed projectile points, gravers, unifaces, one polished burin, and an array of debitage, manufactured largely from non-local materials and distributed around three small hearths at SEL-033 (Workman 1996:44). These materials bear striking resemblance to ASTt assemblages from northern Alaska and Canada, whose makers are widely believed to have contributed to the development of modern Inuit populations (Dumond 1984:74–75; 1998:194), and they have "little in common with late Ocean Bay a few centuries earlier

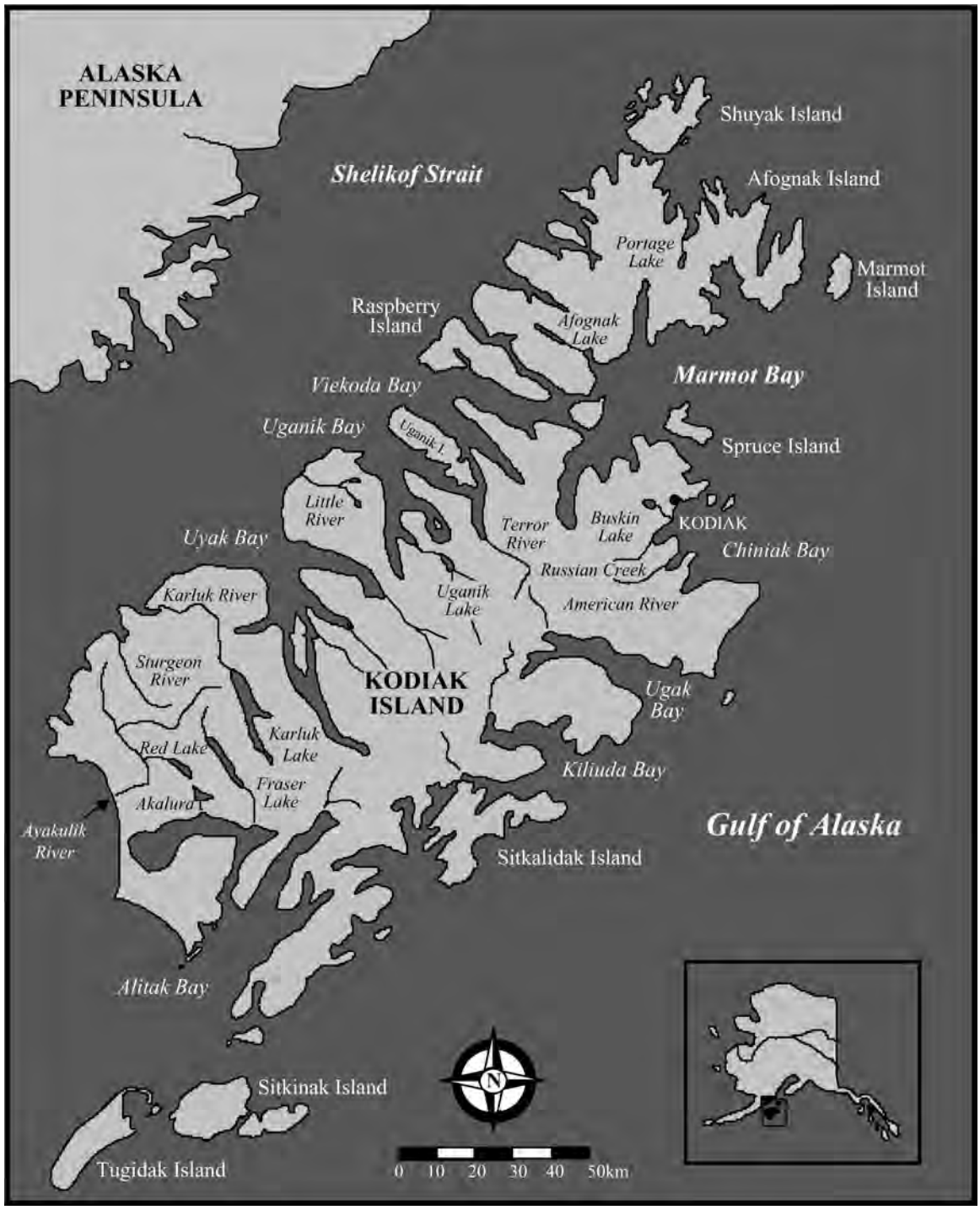


Figure 1. The Kodiak Archipelago.

or the early Kachemak tradition a millennium later" (Workman 1998:151). In Kachemak Bay, ASTt materials appear in a millennium-wide gap in the cultural sequence (Workman and Zollars 2002:46).

After about 3800 years ago, pervasive evidence of the ASTt appeared on the western Alaska Peninsula, on the periphery of the Alutiiq world (see Workman and Zollars 2002:40 for calibrated radiocarbon dates). On the banks of both the Ugashik and Brooks rivers, people of this tradition built small semi-subterranean sod houses and subsisted on salmon and caribou using tool assemblages characterized by bipointed endblades, sideblades, stemmed and shouldered projectile points, well-made scrapers, microblades, burins, and adzes. Here, this culture persisted for about 900 years before disappearing and precipitating a hiatus in occupation of the western Alaska Peninsula (Dumond 1998:194–195).

This southward expansion of the ASTt coincides with a time period when settlement of the central gulf coast appears spotty (Clark 1997:68–69). Despite strong conti-

nuities between Ocean Bay and succeeding Kachemak assemblages, sites spanning the transition between the two phases (ca. 3000 to 4000 cal BP) have been hard to locate. Almost thirteen centuries separate the known Ocean Bay and Early Kachemak occupations in Kachemak Bay (Workman 1998:151). Settlement of the Pacific coast of the Alaska Peninsula is represented by just a handful of sites affiliated with the Takli Birch phase (Dumond 1998:193–194), which is followed by a five-hundred-year period with no evidence of settlement. Similarly, sites dating between about 3800 and 2700 cal. BP have been consistently rare finds in the Kodiak and Prince William Sound regions (Fitzhugh 2003:173–174; Jordan and Knecht 1988:230; Yarborough and Yarborough 1998:138).

While sampling issues have contributed to this picture of limited settlement (Clark 1997:69; Dumond 1998:194), the presence of ASTt occupations along the periphery of the culturally cohesive central Gulf of Alaska, a possible decline in the gulf coast population 3000 to 4000 years ago, and connections between the ASTt and the development of Inuit societies are intriguing. While ASTt foragers inhabited the shores of Cook Inlet and the western slopes of the Aleutian Range, were they also exploring and settling adjacent regions, such as Kodiak? Did limited population densities provide opportunities for settlement? If so, what effect did interaction between coastal foragers and bearers of the ASTt have on the development of Alutiiq societies and their Eskimo roots? One way to approach these questions is to examine the organization of Kodiak societies, in the center of the region, during this time period.

NEW DATA FROM THE FOURTH MILLENNIUM BP

Archaeologists have studied Kodiak prehistory for more than seventy years, documenting over 1300 sites, recovering hundreds of thousands of artifacts, and publishing extensively on the region's prehistory. Until recently, however, the period between about 4200 and 3000 years BP, assigned to the Early Kachemak phase, remained poorly known. Although Clark's 1963 excavation of Old Kiavak, an Early Kachemak settlement in Kiavak Bay, helped to define Kodiak's long-standing cultural chronology (Clark 1966), additional sites from the Early Kachemak proved elusive (Clark 1997:69).

Jordan's multi-year survey of the Uyak Bay and Karluk River region of southwestern Kodiak Island yielded just three sites affiliated with the twenty centuries spanning the Ocean Bay II and the Early Kachemak, or two percent of his sample of 145 settlements (Jordan and Knecht 1988:230). Knecht (1995:107) suggests that this limited evidence of occupation may reflect a period of abandonment due to regional volcanism. On the opposite shore of the archipelago, Fitzhugh identified just three Early Kachemak site components in his comprehensive survey of Sitkalidak Island (2003:173). Again, these sites represent about two percent of settlement components, with both older and younger deposits better represented in the Sitkalidak sample. Fitzhugh hypothesizes that this decrease in occupational intensity reflects differential preservation of sites due to fluctuations in sea level or, alternatively, a regional redistribution of Kodiak's population due to changes in foraging patterns during the colder, wetter Neoglacial (Fitzhugh 2003:230).

While survey projects have located few sites in the 3000 to 4000-year-old range, recent excavations in Chiniak Bay, a large bay complex on northern Kodiak Island, have been much more successful. Since 1997, archaeological investigations by the Alutiiq Museum & Archaeological Repository have unearthed Early Kachemak components at six sites. These include: the Blisky site, a small settlement in a protected bight on the coast of Near Island; Zaimka Mound, a coastal midden on Cliff Point overlooking the mouth of Womens Bay; Bruhn Point and Salonie Mound, inner bay settlements near the mouth of Salonie Creek; and the Outlet and Array sites, inland settlements flanking the banks of the Buskin River at the outlet of Buskin Lake.

A review of published information (Clark 1997:79) and the Alaska Heritage Resources Survey (AHRS)—the state-maintained file of archaeological site information—suggests that there are at least seven additional Early Kachemak sites in the Chiniak Bay region (Table 1; Steffian, Pontti, and Saltonstall 1998:95). Like the excavated sites, these settlements occur in a variety of settings ranging from open coast to protected inner bay environments (Fig. 2). They are only absent in exposed outer coastal locations—a settlement trend generally shared with Ocean Bay and Kachemak-era sites across the archipelago (Fitzhugh 2003:194; Steffian n.d.). The occurrence of at least thirteen sites containing Early Kachemak deposits (some with multiple components, Steffian, Pontti, and Saltonstall 1998:43–46), in an area covering roughly forty-five square kilometers, suggests that people were not only present, but that their use of the region was extensive and enduring.

This impression is confirmed by a review of temporal settlement data from Chiniak Bay. Although the region has not been as fully or systematically surveyed as

Table 1. Characteristics of Early Kachemak sites in Chiniak Bay.

Site	Setting	Size (sq m)	Average Depth	EK Components	Assemblage Size
KOD-010 Kalsin Cove	Mid Bay	>750	ca. 100 cm	Unknown	NA
KOD-013 Zaimka Mound	Mid Bay	3,600	ca. 40 cm	>3	>1,963
KOD-016 Gibson Cove	Mid Bay	Unknown	Unknown	Unknown	NA
KOD-017 unnamed	Mid Bay	Unknown	Unknown	Unknown	NA
KOD-018 Ice House Lake	Protected Outer Coast	Unknown	Unknown	Unknown	NA
KOD-026 Monashka Bay	Mid Bay	Unknown	Unknown	Unknown	NA
KOD-210 Blisky	Protected Outer Coast	>325	ca. 30 cm	2	3,185
KOD-363 Rice Ridge	Protected Outer Coast	3,000	ca. 40 cm	1	NA
KOD-451 Salonie Mound	Inner Bay	1,000	ca. 22 cm	1	450
KOD-561 Array Site	Inland Riverine	Unknown	ca. 12 cm	1	>33
KOD-562 Outlet	Inland Riverine	1,600	ca. 40 cm	>1	299
KOD-909 Bruhn Point	Inner Bay	>500	ca. 5 cm	1	228
KOD-1053 Amak	Inner Bay	Unknown	ca. 20 cm	Unknown	NA

Sitkalidak Island or the Uyak Bay–Karluk River region, localized surveys (Clark 1965; Hrdlička 1944; Knecht 1991), proximity to the City of Kodiak, and the presence of a modern road system have resulted in the identification of many sites. To investigate regional settlement trends, we coded information on the known prehistoric archaeological sites for geographic setting and relative age for the area between Termination Point on the northwest coast of Monashka Bay to Cape Chiniak, which marks the far eastern edge of the bay. Site components were assigned to one of five cultural phases (Ocean Bay I, Ocean Bay II, Early Kachemak, Late Kachemak, and Koniag) based on temporally sensitive characteristics of surface features, site strata, and associated artifacts (cf. Clark 1997:65; Fitzhugh 2003:146–147; Steffian, Pontti, and Saltonstall 1998:57), and to one of five general settings (inland riverine, inner bay, mid-bay, protected outer bay, exposed outer coast). Historic sites were not included in the analysis.

There are sixty-eight known prehistoric sites in greater Chiniak Bay with a minimum of ninety temporally distinct components (Appendix A). Of these ninety components, twenty could not be assigned to a specific cultural phase. Table 2 summarizes the temporal distribution of the remaining seventy components (77.8 percent of the total sample). The results of this review suggest that Chiniak Bay was inhabited continuously and with increasing frequency throughout the prehistoric period. Unlike the results of previous studies, there is no decrease in occupational frequency during the Early Kachemak phase. The number of settlements rises in each phase, from eight in the Ocean Bay I phase to twenty-two in the Koniag.

Settlement counts are deceptive, however, as the cultural phases they represent are of varying duration. The Ocean Bay I phase, for example, spans twenty centuries, whereas the Koniag lasts just six centuries. To control for this bias, we divided the number of settlements by the number of centuries in each phase to produce a weighted site frequency value (Table 2). The resulting values indicate a near doubling of settlement frequency until the Koniag phase. Habitation of Chiniak Bay increased gradually through the Late Kachemak and then intensified significantly in the Koniag, a pattern observed

elsewhere in the archipelago (Fitzhugh 2003:173; Saltonstall and Steffian 2003:51). While imperfect,[1] this data suggests the continued slow expansion of human groups through the Early Kachemak phase.

This broad picture of continuous prehistoric settlement is enhanced by a review of carbon dates from excavated sites in Chiniak Bay (Table 3). Deposits with Early Kachemak characteristics (strata, features, and artifacts; cf. Clark 1997) occur throughout the fourth millennium BP, from the terminus of the Ocean Bay II phase ca. 4300 before the present to the inception of the Late Kachemak after 2700 BP.[2] Although these dates come from just four sites, their two sigma calibrated ranges show no gap in the sequence (Fig. 3). At least in Chiniak Bay, Early Kachemak sites appear widely distributed across both time and space.

Other archaeological evidence also suggests the presence of a substantial and enduring Early Kachemak population. First, Chiniak Bay's Early Kachemak settlements have large accumulations of debris. These are not ephemeral deposits indicative of passing or infrequent use of the region, but substantial middens suggesting extended stays and revisitation. Early Kachemak occupations are up to a meter thick with a minimum average thickness of a least twenty centimeters (see Table 1). Moreover, at least three of the

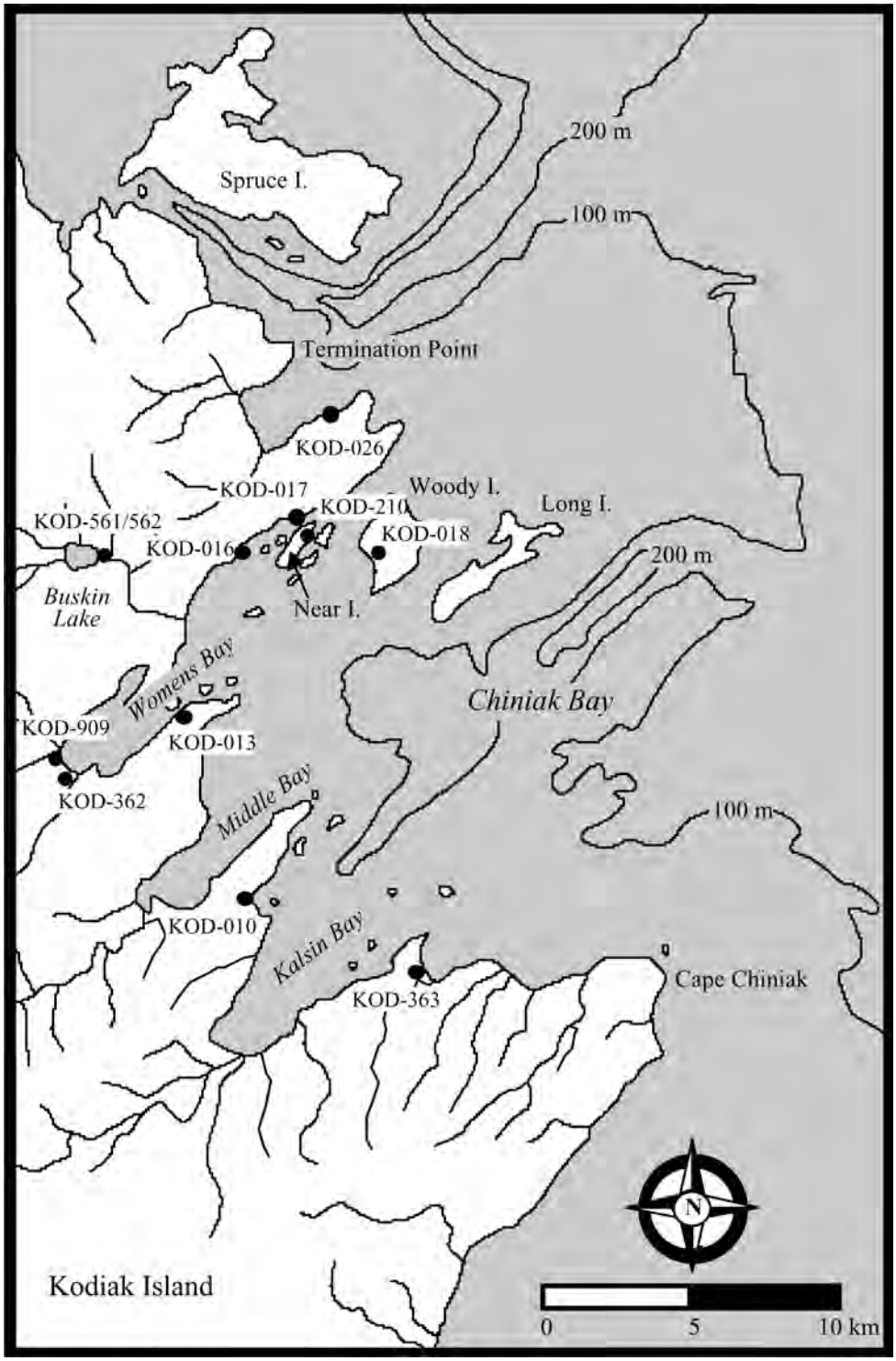


Figure 2. Early Kachemak settlements in Chiniak Bay.

[1]We suspect that many of the sites with only surface information contain additional buried components. Eight of the eleven known Ocean Bay I and II components in Chiniak Bay were identified through subsurface testing or excavation. A contingency test of cultural phase (Koniag, Kachemak, or Ocean Bay) versus the method of component identification (surface or subsurface investigation) indicates that this pattern is statistically significant at the .05 level chosen for this study. Ocean Bay deposits occur with greater than expected frequency in the sample of components identified through subsurface inquiry (see also Fitzhugh 1996:214). Thus, the frequency of older deposits is underestimated in this study. Moreover, we note that it is likely that coastal erosion and resettlement have differentially impacted older sites (see Fitzhugh 2003:139–140), causing greater site attrition with age.

[2]The terminal date of the Ocean Bay II phase is unclear. While Clark (1997:82) postulates that the transition to Early Kachemak occurred about 3900 cal BP, the presence of black, charcoal-rich, rubble-filled midden deposits, fired gravels and pit features at Rice Ridge and Zaimka Mound suggest that this transition may be as much as 400 or 500 years earlier (see Table 3). For the purposes of this paper, we interpret levels 1 and 2 (stratum A according to Kopperl 2003:99) at Rice Ridge as Early Kachemak (Hausler, pers. comm. 2004).

Table 2. Prehistoric site frequencies in Chiniak Bay.

Phase	Temporal Span BP	# Centuries	# Components	% Components	Comp. per century
Ocean Bay I	7500 – 5500	20	8	11.4	.40
Ocean Bay II	5500 – 4000	15	6	8.5	.40
Early Kachemak	4000 – 2700	13	13	18.6	1.00
Late Kachemak	2700 – 800	19	21	30.0	1.11
Koniag	800 – 200	6	22	31.4	3.66
TOTAL	7500 – 200	73	70	100.0	

Note: BP (before present) = before AD 1950.

Table 3. Radiocarbon dates from Early Kachemak deposits in Chiniak Bay.

Site	Beta #	Provenience	RCYBP	Cal BP
Outlet	160046	Locus C: Pit	2650 ± 50	2849 (2755) 2743
Blisky	113164	HF1	2880 ± 120	3357 (2988, 2979, 2972) 2753
Blisky	113163	Level 1	3050 ± 60	3437 (3318, 3309, 3296, 3293, 3265) 3003
Outlet	145865	Locus B: Feature	3070 ± 70	3445 (3323, 3287, 3268) 3077
Outlet	145864	Locus A: L5 HF	3140 ± 60	3471 (3361) 3212
Zaimka	172028	Level 1, Pit D	3340 ± 70	3811 (3626, 3622, 3571) 3399
Zaimka	172027	HF1	3500 ± 80	3981 (3825, 3791, 3761, 3748, 3727) 3571
Rice Ridge	43135	Level 2	3850 ± 80	4508 (4244) 3989
Rice Ridge	43134	Level 2	3860 ± 90	4522 (4254) 3985
Zaimka	130190	Level 1	3890 ± 70	4519 (4350, 4327, 4299) 4092
Rice Ridge	171559	Level 2	3900 ± 70	4523 (4404, 4400, 4380, 4371, 4353, 4311, 4302) 4094

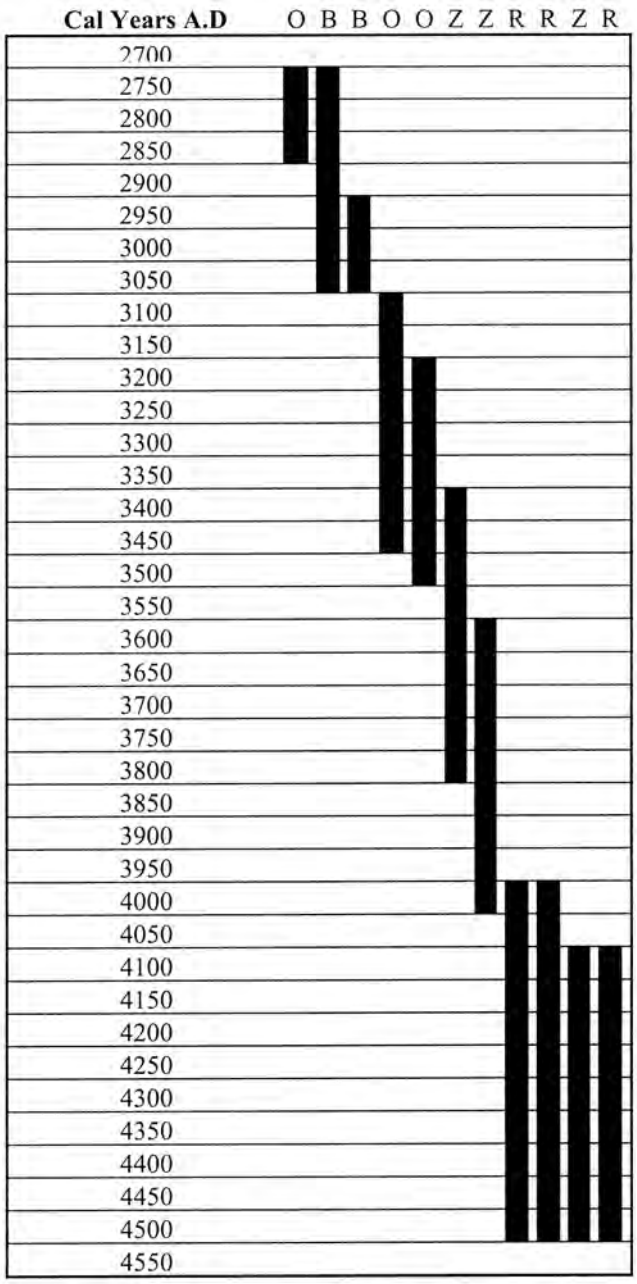
Notes: All dates were run on wood charcoal and calibrated by the authors using Calib 4.3 (see Stuiver and Reimer 1993). The resulting dates are presented as the two-sigma range of their calibrated intercepts.
Dates for the Rice Ridge site are from Kopperl 2003:117. Two of Kopperl's dates from Stratum A (Beta-171564) are not included here as Hausler, the site's excavator, suspects they are too old (pers. comm. 2004). The remaining dates were compiled from the Alutiiq Museum's files.

five excavated sites have more than one component. The Blisky site has two distinct Early Kachemak strata, one thirty centimeters thick, the other ranging from twelve to forty centimeters. The broad horizontal extent of deposits at the Outlet site and Zaimka Mound also suggests repeated use. At Outlet, Early Kachemak deposits follow the bank of the Buskin River for at least eighty meters, and at Zaimka Mound, they cover a horizontal area of roughly 3600 square meters. Both these sites have substantial, semi-subterranean features within their middens. At Zaimka Mound, these features appear at the top of the deposits, buried within the deposits, and excavated into underlying Ocean Bay II strata. Carbon dating indicates that this complex of structures formed as the result of revisitation rather than a single occupation, as their ages span a seven hundred year period from about 4300 to 3600 cal BP. Similarly, three Early Kachemak features spread along the Buskin River bank date to the six hundred year period between roughly 2750 and 3360 cal BP (Table 3, Figure 3).

Another indication of sustained settlement is the widespread construction of large permanent features, which are present at Blisky, Outlet, and Zaimka Mound and probably at Rice Ridge (Hausler, pers. comm. 2004).[3] Only the Array site, where excavators examined just six-

[3]At both Zaimka Mound and Rice Ridge, residents also used depressions created by older, underlying semi-subterranean features as pits.

Figure 3. Plot of radiocarbon dates from Early Kachemak deposits in Chiniak Bay.



Key: O = Outlet, B = Blisky, Z = Zaimka Mound, R= Rice Ridge

Notes: Dates are represented by their calibrated two-sigma range rounded to the nearest 50 years.

teen square meters of the site, failed to produce Early Kachemak features.[4] The remaining settlements contain at least three types of structures: dwellings, processing structures, and pits (Figs. 4, 5, and 6). Although their size and construction vary, all of these features are excavated into underlying deposits and most are substantial. A partially excavated house from the Blisky site is roughly 5.5 meters in diameter with a sod roof and up to thirty centimeters of floor deposit (Steffian, Pontti, and Saltonstall 1998:46–49). Similarly, a complete house from Zaimka Mound is 5 meters long by 3.5 meters wide with a sod roof, twenty centimeters of floor deposit and a slate slab hearth near the rear of the structure (Fig. 4).

The Outlet site also produced large (5 meters in diameter), oval, sod-roofed structures, but unlike the dwellings described above, these appear to be processing facilities. These structures were filled with charcoal and burned rock rubble and had large sub-floor pits and numerous postholes (Fig. 5). They lacked the centralized hearths characteristic of the dwellings identified at Blisky and Zaimka. We believe that the residents of this interior, riverside site were capturing salmon and drying or smoking them for later use in specialized structures. In essence, these structures functioned as smokehouses. Although over 150 cubic meters of excavation revealed only one formal processing structure at Zaimka Mound, the site's Early Kachemak layers are riddled with pits that range from sixty centimeters to 3.6 meters across, and from twenty-three to forty-three centimeters deep. These features are typically lined with large gravel and then filled with burned rock rubble and black soil (Fig. 6). Whatever their function, the construction of permanent facilities required a substantial investment of labor and materials. This suggests that site residents were not casual visitors, but people who devoted a portion of their annual round to inhabiting these locations and who intended to return.

Support for the idea that Early Kachemak foragers were processing quantities of food for storage also comes from the character of site deposits. Like the structure floors at the Outlet site, middens of this phase look like the contents of a heavily used firepit. Although carbonized wood is difficult to recover, the soil is charcoal-black and full of burned slate and gravel (Clark 1997:70), suggesting that the deposits accumulated as the result of extensive burning and dumping. Again, we believe that this reflects the use of fire (heat and/or smoke) to dehydrate animal flesh for storage.

Although meaningful quantities of faunal data are lacking to test this hypothesis, there is growing evidence that fish remains are significantly associated with Early Kachemak pits and middens. Profiles from the 1988 excavation of Rice Ridge (Hausler 1988) show lenses of compressed fishbone and thin shell bands within the loose black rubbles in the site's uppermost levels (see also Kopperl 2003:119). Similarly, a pit feature, exposed in an

[4]Features at the Blisky, Outlet, and Zaimka Mound sites were all revealed through larger excavations that uncovered broad horizontal areas of each settlement. Moreover, the Early Kachemak stratum at the Array site has been truncated in places by massive disturbance in the historic period.

Figure 4. Complete house from Zaimka Mound

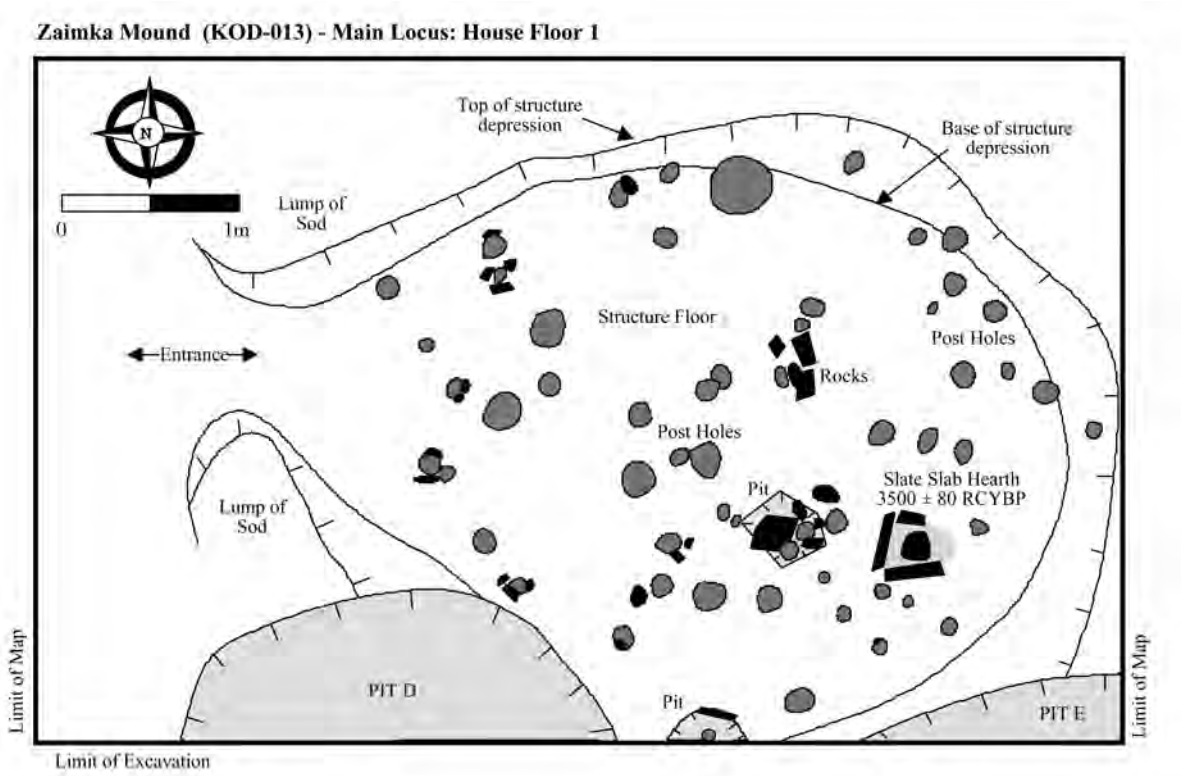


Figure 5. Processing structure from the Outlet site

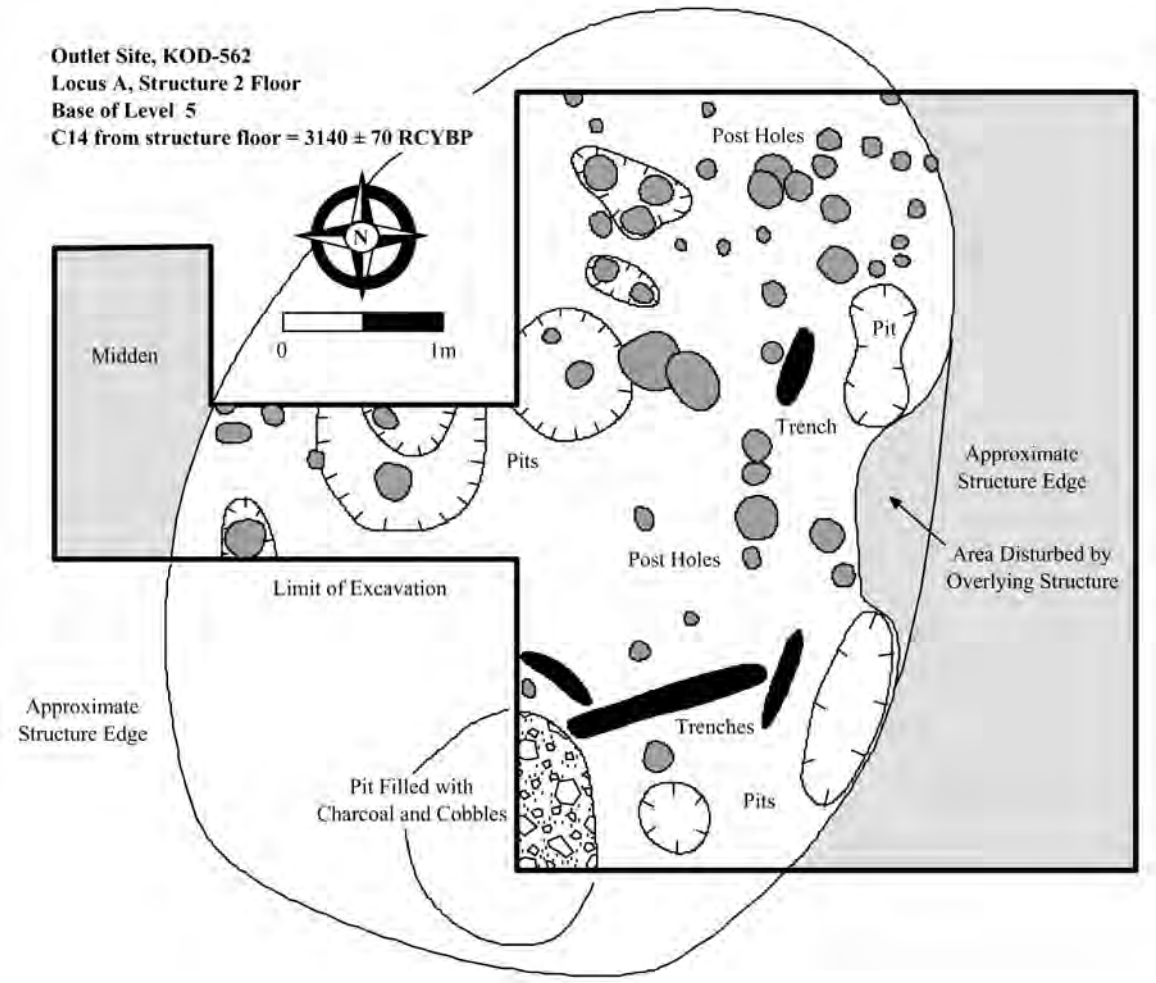
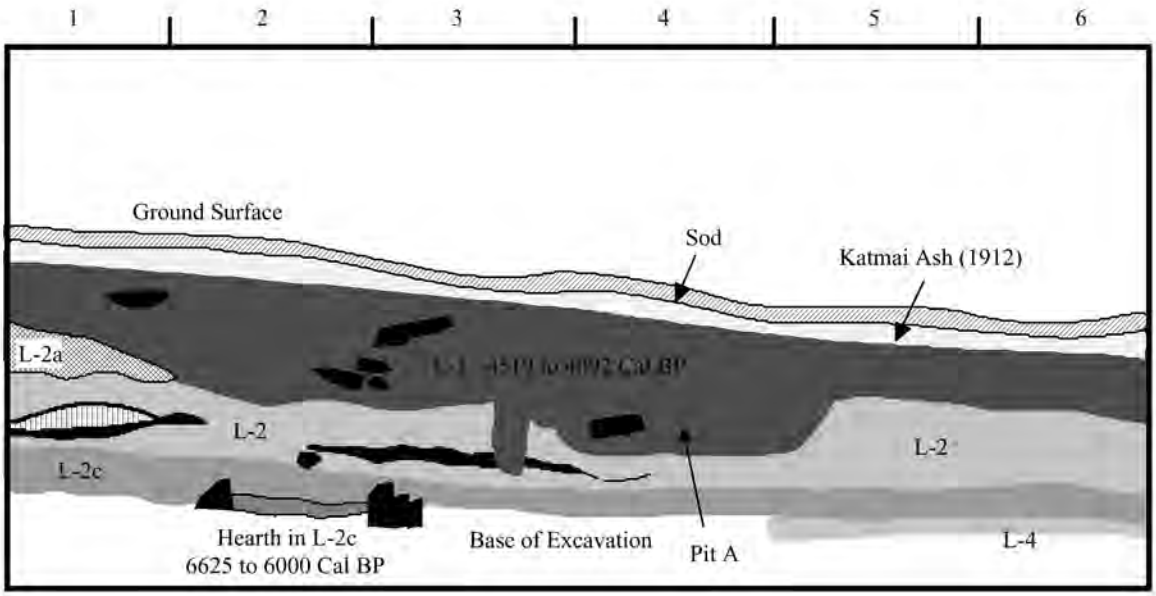


Figure 6. Early Kachemak pit feature in profile at Zaimka Mound (south wall of main excavation, 1998).



Notes: Squares marked on the horizontal axis are one-meter units. To better portray stratigraphic details, the vertical scale is twice the horizontal.

erosion profile at the Horseshoe Cove site on Uganik Island (KOD-415) and dated between 3467 and 3077 cal BP (Hedman 2003), holds well-preserved fish remains beneath a thick deposit of black soil and rubble. Moreover, Kopperl (2003:167) shows relatively greater abundance of fish in the uppermost stratum at Rice Ridge, suggesting that fish were gaining economic importance relative to other resources, a pattern that continues through the prehistoric era (see also Saltonstall, Kopperl, and Steffian 2001).

Artifact assemblages also enrich the picture of focused exploitation provided by site features and strata. Patterns in Early Kachemak toolkits are particularly evident in comparisons with assemblages from the preceding Ocean Bay II. Table 4 combines tools by phase from the Blisky, Outlet, and Zaimka Mound sites to provide a broad, integrated picture of technology in each phase.[5] Although the Early Kachemak and Ocean Bay II assemblages share a preponderance tool types, there are two notable differences. First, Early Kachemak stone tool assemblages expand to include several new fishing and processing tools. The most prominent of these is the plummet, a greywacke cobble grooved on one end to create a line weight for deepwater fishing (Clark 1997:39) that is a strong temporal diagnostic of this phase.[6] Other additions are mauls made from large greywacke cobbles, which may have been used to build weirs (Clark 1997:76–77), and ulu-shaped scrapers (Clark 1997:46) made from roughly flaked greywacke or coarse slate.

Second, fishing and processing tools that occur infrequently in Ocean Bay II contexts become common in the Early Kachemak phase. These include notched pebbles, which were presumably used as weights for the bottoms of fishing nets (cf. Knecht 1995). Although notched pebbles are not present in the enormous quantities associated with some younger sites (Jordan and Knecht 1988; Steffian and Saltonstall 2000), they are relatively common finds that suggest the development of net fishing (Clark 1997:77; Workman and Clark 1979:263). Our sample of Early Kachemak includes eleven notched pebbles from the Outlet site, one from the Array site, twenty-nine from Zaimka Mound, and four from the Blisky site. These sinkers occur adjacent to open water (e.g., Zaimka and Blisky [Steffian, Pontti, and Saltonstall 1998:64]), at river mouths (Old Kiavak [Clark 1997:39]; AFG-088 [Workman and Clark 1979:260]), and in inland settings (Outlet and Array [Saltonstall, Kopperl, and Steffian 2001]), suggesting that they were used for both riverine and marine fishing.

[5]The assemblage statistics present in this paper do not include a small number of Early Kachemak tools from the 2004 excavation of Zaimka Mound, as the authors collected these materials while this paper was in preparation for publication.

[6]We believe the presence of plummets in the Ocean Bay II deposits at Zaimka Mound reflects stratigraphic mixing at this large, complex site. Extensive construction, including the digging of pits, house foundations, and numerous postholes into older underlying strata have moved some material out of stratigraphic position. This mixing is also evidenced by the presence of a small amount of microblade technology, characteristic of the Ocean Bay I phase (Steffian, Eufemio, and Saltonstall 2002), in every level of the site.

Table 4. Comparison of Early Kachemak & Ocean Bay II assemblages from Chiniak Bay.

INDUSTRY	ALL EK	%EK	ALL OB	%OB
CHIPPED STONE				
bifaces	76	4.0	19	4.3
projectile points	16	0.8	14	3.2
scrapers	25	1.3	1	0.2
retouched and used flakes	146	7.7	74	16.9
burins	1	0.1	0	0.0
piecès esquillées	1	0.1	2	0.5
GROUNDSTONE				
adzes	10	0.5	3	0.7
bayonets	32	1.7	57	13.0
double-edged knives	3	0.2	5	1.1
projectile points	67	3.5	21	4.8
ulus	208	10.9	27	6.2
COBBLE TOOLS				
abraders	41	2.2	15	3.4
ball	18	0.9	0	0.0
burnishing stone	1	0.1	0	0.0
cobble spalls	942	49.4	131	30.0
grinding stones	6	0.3	7	1.6
grooved cobbles	2	0.1	1	0.2
hammerstones	133	7.0	36	8.2
hones	4	0.2	0	0.0
lamps	6	0.3	2	0.5
mauls	2	0.1	0	0.0
notched cobbles	44	2.3	2	0.5
plummets	25	1.3	2	0.5
U-shaped abraders	70	3.7	4	0.9
ulu-shaped scrapers	5	0.3	1	0.2
whetstones	21	1.1	13	3.0
TOTALS	1905	100.0	437	100.0

Note: Tool classes include preforms and miniatures.

Ulus also become more common in Early Kachemak assemblages. Although present in modest numbers (Clark 1997:76), they are accompanied by a variety of ulu-like tools—trimmed slate and greywacke pieces that resemble ulus (cf. Clark 1997:47–48; Workman and Clark 1979:261-262). As such, Early Kachemak assemblages contain larger relative quantities of processing tools (Clark 1997:46–47), particularly cobble spalls. These thick cortical flakes struck from Kodiak's ubiquitous greywacke beach cobbles were presumably used as expedient cutting and scraping tools.

A close look at Table 4 illustrates this trend. While processing tools (scrapers, retouched and utilized flakes, double-edged knives, ulus, cobble spalls, and ulu-shaped scrapers) make up 54.7% of the combined Ocean Bay assemblage from the Blisky, Outlet, and Zaimka Mound sites, these same tools account for two-thirds (69.8 percent) of the combined Early Kachemak sample. Similarly, the frequency of fishing weights (plummets, grooved cobbles, and notched cobbles) increases from just 1.1 percent in the Ocean Bay sample to 3.7 percent in the Early Kachemak sample.

The use of new fishing and processing tools is also evident in the Rice Ridge assemblage, with different but functionally equivalent artifacts. Although plummets and ulus are not found in this upper stratum, Hausler reports (pers. comm. 2004) that Level 2 produced large, flat, longitudinally grooved cobbles and a variety of large, handled, double-edged, ground slate knives not characteristic of older strata. As Rice Ridge Level 2 appears to be the oldest Early Kachemak deposit identified to date, these tools may be precursors of the plummets and ulus that become common a few centuries later. Additional samples from the period between 4500 and 4000 BP are needed to clarifier such technological changes.

In sum, although there are just a handful of truly new harvesting and processing tools, these new implements combined with the increased frequency of existing tools, the creation of processing facilities, evidence of extensive burning, and faunal data hinting at the increased importance of fish, suggest a qualitative change in economic activity.

Archaeological data from Chiniak Bay reveal a new picture of the Early Kachemak phase. They suggest that the archipelago was not minimally occupied. At least in Chiniak Bay, deposits spanning the fourth millennium BP are not rare, but widely distributed across the landscape. It now appears that the Early Kachemak enigma represents a sampling problem rather than a true absence of occupation. Part of the problem may be in identifying Early Kachemak sites. As these deposits are often poorly preserved, partially eroded, and contain artifacts common to later phases (e.g., ulus, net sinkers, cobble spalls, and red chert debitage), it is easy to misclassify Early Kachemak deposits as examples of Late Kachemak or even Koniag settlement. Still other sites with Early Kachemak dates and characteristics have been assigned to the Ocean Bay II (Nowak 1979:27). This confusion simply underscores the continuities in the region's prehistoric record and the inherent difficulties in splitting a continuous evolutionary sequence into discrete cultural units.

This perspective is further confirmed by continuities in land-use patterns, settlement locale, and long-distance exchange across the Ocean Bay II / Early Kachemak transition (Steffian and Saltonstall 2003). The Early Kachemak deposits at Blisky, Zaimkas and Outlet are all underlain by Ocean Bay II deposits, and although there are clear changes in the archaeological record across the late centuries of the fourth millennium BP, evidence of continuity is pervasive. An analysis of the Ocean Bay to Kachemak transition is beyond the scope of this paper. However, we agree fully with Clark (1997:84) that the Kachemak tradition developed out of Ocean Bay and add that the major changes across this transition appear locally derived and economic (Steffian and Saltonstall 2003).

Specifically, data from Chiniak Bay indicate that Early Kachemak foragers were processing animal flesh in quantity. The construction of specialized processing structures on the banks of the salmon-rich Buskin River, the adoption of new types of heavy line weights (Clark 1997:64), and an increase in the production of sinkers (Clark 1997:77), suggest that fish were their target. Thus, rather than a period of decreased settlement, the Early Kachemak now appears to have been a phase of increasing localization and of focused and intensified harvesting of fish for storage that emerged from the preceding Ocean Bay II phase. As such, Fitzhugh's (2003:230) hypothesis that the prehistoric population reorganized in relationship to the spatial distribution of subsistence resources seems likely. Unlike the Kenai Peninsula in the early fourth millennium BP, it appears that there was no settlement hiatus on Kodiak, or even a period of markedly reduced population.

CONNECTIONS WITH THE MAINLAND

While Kodiak's Early Kachemak foragers were focusing increasingly on the localized exploitation of fish, they were also maintaining ties with the mainland. This interaction is indicated by the presence of raw materials from sources beyond Kodiak (Clark 1997: 38, 48, 50; Workman and Clark 1979:274) as well as stylistically distinct, ASTt-like tools (Clark 1997:83; Hausler 1993:16–17; Knecht, Davis, and Carver 2001:58; Nowak 1979:figure 11). To characterize this interaction and evaluate the relationship between the southern Alaskan ASTt and Kodiak's cultural history, we examine patterns in the frequency, use, and distribution of both non-local materials and tools of potential ASTt manufacture. Throughout this study, we accept other researchers' assignment of assemblages from beyond Kodiak to the ASTt. Although a careful evaluation of the southern ASTt, its genesis, organization, and relationships to northern cultures is needed, these issues are beyond the scope of this paper. This paper aims to characterize economic organization and social interaction in the Kodiak Archipelago three to four thousand years ago independently of the issues surrounding the fuller definition of the southern ASTt.

Use of Non-local Materials

Kodiak's distinct biological and geological setting, the availability of alternative resources on the Alaskan main-

land,[7] and the use of boats by foragers of all phases (Clark 1966:369; Steffian, Eufemio, and Saltonstall 2002:6) both facilitated and encouraged exchange. Archaeological and ethnographic data illustrate that Kodiak Islanders have long sought high-quality chippable stone (Fitzhugh 2001:150–151; Holmberg 1985:51; Merck 1980:106), land mammal products (Davydov 1977:4, 22, 27–28; Black 1977:92, 98; Holmberg 1985:39; Lisianskii 1968:207; Merck 1980:205; Kopperl 2003:133, 135; Shelikhov 1981:54, 77; Steffian 1992:126), plant materials (Davydov 1977:4; Lisianskii 1968:181; Merck 1980:102; Shelikhov 1981:54), and exotic materials such as ivory, coal and dentalium shell (Holmberg 1985:37; 45; Steffian 1992; Steffian and Saltonstall 2000) from neighboring mainland societies.

Importantly, as Kodiak's geological and biological histories differ markedly from those of the surrounding mainland, archaeologists can determine the general origin of most of the materials used to manufacture artifacts. Due to Kodiak's position on the subducting edge of the Pacific tectonic plate, its sedimentary and metamorphic rocks are distinct from the volcanic and sedimentary rocks found on the adjacent, volcanically active margin of the North American plate, part of which forms the Alaska Peninsula (Connelly 1978; Jacob 1986:150; Plafker, Moore, and Winkler 1994; Silberling 1994). Moreover, the fact that the archipelago has only five indigenous land mammals (Rausch 1969),[8] makes it possible to identify organic material from off-island sources (cf. Steffian 1992).

Despite the unique distribution of materials on Kodiak and adjacent areas of the Alaskan mainland, raw material studies must focus on the broad regional origins of materials and not on their precise source. For most inorganic materials, scientists have yet to locate quarry sites or to match the petrographic signatures of artifacts with specific outcrops.[9] As such, the patterns presented below provide only a general view of the movement of raw materials during the Early Kachemak phase. Further studies will undoubtedly refine these observations (see also Fitzhugh 2004).

As none of the four Early Kachemak assemblages included in this study contains organic artifacts, raw material analysis focused on stone objects. To investigate patterns of interregional interaction, we identified the material used to manufacture each artifact based on a comprehensive raw material inventory (Appendix B) developed from published sources and the Alutiiq Museum's prehistoric collections, and refined these identifications using thin sections (Steffian, Pontti, and Saltonstall 1998:80). Objects were then coded as being made of a local or non-local material. Throughout this study, we assumed that each raw material came from its closest source and that non-local materials (with the exception of pumice; see below) were transported to sites by people rather than by natural forces. Pumice, which originates on the Alaska Peninsula, floats. This material is commonly transported to Kodiak by wind and waves, and as such, we considered it locally available. Additionally, although there are a variety of brightly colored cherts in the assemblages (see Steffian, Pontti, and Saltonstall 1998:150–151), the color of chert can vary widely across a single outcrop and, as little is known about the chert sources on the Alaska and Kenai peninsulas, we combined all of these materials into one exotic chert type. Thus, this analysis tends to under represent the number and variety of non-local materials. Despite this bias, broad patterns in the use of raw materials are evident.

There are twenty-six raw material types in the Early Kachemak assemblages from Chiniak Bay: nineteen local, six non-local, and one from an unknown source (Table 5). Table 6 outlines the distribution of these materials in each assemblage and illustrates five patterns. First, although the variety of material types in each assemblage correlates with the size of the assemblage (large assemblages have more material types), multiple non-local material types are present in all but the very small assemblage from the Array site (Table 6). These materials account for a relatively consistent percentage of the total number of material types (from 22.7 to 27.3 percent). Thus, non-local materials do not simply represent the reduction of a single piece of exotic stone, but reflect use of a variety of materials from different distant sources.

Second, although tool assemblages are dominated by objects made of local stone, tools made of non-local materials are consistently present. They occur repeatedly in small quantities (from 1.4 to 6.7 percent of all raw materials). They are an infrequent but consistent part of Early Kachemak assemblages.

[7]48 km separate Kodiak from the Alaska Peninsula to the west.

[8]Our raw material-source model assumes that Kodiak's terrestrial fauna in the Early Kachemak phase mirrored the fauna documented at the time of Russian contact, but see Fitzhugh (1996:177–178) for a discussion of the possibility that caribou were once indigenous to Kodiak.

[9]There are indications that the quarry concept may not be broadly applicable to Kodiak, where intensive glaciation redeposited chippable stone. For example, a recent analysis of early Ocean Bay microblade technology illustrates a preference for cobble blanks and suggests that foragers were opportunistically collecting raw material eroding from area streams and beaches (Steffian, Eufemio, and Saltonstall 2002:18–19). Moreover, as Clark notes (pers. comm. 2004) materials collected from beaches and streams may actually be better suited for tool production as high-energy contexts may break weak or flawed material.

Table 5. Inorganic raw materials from Early Kachemak assemblages.

LOCAL	NON-LOCAL	UNKNOWN
granite 2	basalt 1	granite 1
granite 3	basalt 2	
greywacke	chalcedony	
grey chert	exotic chert	
meta tuff 1	rhyolite	
meta tuff 2	scoria	
meta tuff 3		
meta tuff 4		
meta tuff 5		
ochre		
pumice		
quartz		
red chert		
sandstone		
schist		
siltstone		
slate		
tuff 1		
tuff 2		

Note: Ochre is not included in the raw material analyses presented here as it typically occurs as staining in the soil and not in quantifiable pieces. Ochre is present in the Early Kachemak assemblages from the Blisky, Outlet, and Zaimka Mound sites, but not in the very small sample from the Array site.

Table 6. Frequency of non-local materials in Early Kachemak assemblages.

Site / Component	Stone Artifacts	Material Types	Non-Local Materials	Artifact of Non-Local Material	% Artifacts of Non-local Materials
Array/ C1	31	4	1	1	3.2
Outlet/ C3	298	11	3	4	1.3
Blisky/ C1 & C2	3185	22	5	87	2.7
Zaimka/ C1	3330	20	5	66	2.0
All/Early Kachemak	6813	25	6	154	2.2

Note: Ochre samples are not included in the statistics presented above.

Third, non-local materials occur not just as finished tools, but as pieces of debitage and unmodified raw material.[10] Tables 7 and 8 summarize the artifacts of non-local material in the four assemblages. These tables illustrate that debitage, including cores, flakes and shatter, dominates, constituting from 50.0 to 87.3 percent of the non-local artifacts from each site, again with the exception of the small assemblage from the Array site. These data indicate that the non-local materials were not simply imported as finished tools, but were employed in the fabrication of some implements on Kodiak.

Fourth, among the three major artifact industries represented in Early Kachemak assemblages—chipped stone, ground stone and worked cobble—non-local materials occur with greater than expected frequency among

[10]Unworked pieces of scoria were coded as non-local raw material. No other type of non-local material occurs as an unworked piece.

Table 7. Artifacts of non-local materials in Early Kachemak assemblages.

Object	Array	Outlet	Blisky	Zaimka
DEBITAGE				
cores			7	3
flakes		2	48	43
shatter			18	
raw material			3	3
TOOLS				
projectile point			1	
biface			2	2
scraper			5	
flake tool	1			3
utilized flake		1	3	4
burin				1
abrader		1		7
TOTALS	1	4	87	66

Table 8. Distribution of non-local materials by artifact class.

Site / Component	Total Tools	Total Debitage	Tools of Non-local Material	Debitage of Non-local Material
Array/ C1	15	15	1 (6.7%)	0 (0.0%)
Outlet/ C3	131	167	2 (1.5%)	2 (1.2%)
Blisky/ C1 & C2	473	2673	11 (2.3%)	73 (2.7%)
Zaimka/ C1	1302	2010	18 (1.4%)	50 (2.5%)

Notes: Percentages are of artifact classes (tools or debitage), not the entire assemblage. Artifacts interpreted as pieces of raw material are not included in this table.

chipped stone artifacts and with less than expected frequency in artifacts reflecting stone grinding and cobble working. This is not surprising. Kodiak's hard black slate is the primary material used to produce groundstone tools. This material is both abundant and widely available in the archipelago and absent on the Alaska Peninsula. Historic sources hint that slate and projectiles made of this slate were commodities that Kodiak Islanders traded with their neighbors (Merck 1980:207). Although Kodiak foragers may have exported slate and slate tools (see Holland 2001:179), they had neither a reason nor an opportunity to import material for stone grinding. Similarly, cobbles suitable for a variety of heavy stone tools (e.g., hammerstones, grooved cobbles) are also ubiquitous, and there is no reason to import such materials.[11] The cobbles available on the mainland are no better suited to tool production than those available on Kodiak beaches.

In contrast with slate and cobbles, the cherts available on Kodiak are of poor to moderate quality (e.g., flawed, fractured, and thus harder to work, Fitzhugh 2001:150, 2004). Kodiak's prehistoric craftsmen typically chipped a variety of local cherts, siltstones, tuffs, and meta tuffs (Appendix B), particularly a widely available red radiolarian chert (Connelly and Moore 1979). Glassy cherts and volcanic stones such as basalt and obsidian were potentially valuable commodities worth obtaining and transporting (see also Fitzhugh 2004). This idea is sup-

[11]Abraders made of scoria cobbles from the Alaska Peninsula are the one exception.

ported by the distribution of non-local materials among artifact classes.

Fifth, despite the dominance of chipped stone debitage among artifacts made from non-local materials, non-local materials are statistically more likely to occur as formal tools than are local materials. This pattern is not evident in each assemblage individually. The Array and Outlet sites' chipped stone artifact assemblages are too small for a statistically meaningful chi-square analysis, and such analyses on the Blisky and Zaimka Mound assemblages produced statistically borderline results ($p = .0793$ and .0698 respectively) at the .05 level of significance chosen for this study. However, when data from the four chipped stone assemblages are combined into one large sample, non-local materials appear with greater than expected frequency as chipped stone tools and with less than expected frequency as chipped stone debitage. In other words, where they appear, non-local materials occur disproportionately as tools in comparison to local materials. Where available, these materials were worked into formal tools.

Together, the small variety of non-local material types, the small but consistent quantities of artifacts made from these materials, the presence of non-local debitage, and the association between non-local materials and chipped stone tools suggest that long distance travel and exchange occurred with some regularity throughout the Early Kachemak and that these activities provided access to high quality chippable stone. We do not mean to imply that the procurement of high-quality stone was the central purpose of long distance travel and exchange, only that it was one result of such interaction. Non-local stone was not a necessary commodity. Early Kachemak phase foragers made the great majority of their stone tools from lesser quality, locally available stone, but basalt, chalcedony, rhyolite, and exotic cherts were desirable materials whose value derived from their greater workability and utility and perhaps from their ability to symbolize social affiliation with off-island groups (J. B. Fitzhugh pers. comm. 2004).

Artifacts of Non-local Manufacture

Patterns of raw material use suggest that Early Kachemak foragers interacted with mainland societies on a limited but repeated basis. Did this interaction bring them into contact with ASTt foragers from the Alaska or Kenai peninsulas? The presence of a few ASTt-like artifacts in Kodiak assemblages suggests that it did.

Archaeologists have long noted the presence of ASTt-like artifact types in assemblages from Kodiak's very late Ocean Bay II and Early Kachemak phases (Clark 1997:83; Hausler 1993:16–17; Knecht, Davis, and Carver 2001:58). To characterize these tools and their frequency, use, and distribution in Kodiak assemblages, we used published accounts of ASTt assemblages from the Alaska and Kenai peninsulas (Dumond 1981:120; Harritt 1988:193; Henn 1978:43; Zollars 1982:20–25) to develop a comprehensive list of the tool types characteristic of this phase (see Table 9). Then, we culled all of the similar objects from roughly contemporary Kodiak assemblages and coded them for object type, raw material type, condition, and degree of use (preform, new, used, or expended) (Appendix C). Items ubiquitous in both ASTt assemblages and Ocean Bay and or Early Kachemak assemblages were not included in this study (e.g., bifaces, edge-modified flakes, whetstones, etc.).

This analysis focused on assemblages from the Blisky, Array, Outlet, and Zaimka Mound sites, but included materials from the Rice Ridge and Refuge Rock (KOD-450) sites, as researchers have identified these assemblages as containing ASTt-like materials (Clark 1997:83; Hausler 1993:16–17). We also included one object—a ground burin—from the Malina Creek site (AFG-005). This artifact is identified as one of six found in "a thin ASTt occupation" (Knecht, Davis, and Carver 2001:58) (Table 9).[12] The remaining five objects—a stemmed point, a utilized blade, and three bilaterally barbed darts—were not included (Figure 7). The stemmed point is an Ocean Bay type (Hausler pers. comm. 2004), macroblade technology is not diagnostic of ASTt assemblages from southcentral Alaska but is found in Kodiak's earliest assemblages (ca. 7300 years old, Fitzhugh 2003:155),[13] and the darts are stylistically similar to those from the lower levels of the Uyak site (Heizer 1956:59[j,k], 170[a,k,l,m and o]). Clark believes these darts to be Early Kachemak forms (Pers. comm. 2004).

Our review of the seven assemblages, with an estimated combined total of at least 10,000 artifacts from the very late Ocean Bay II and Early Kachemak phases, produced just thirty-two objects that would be at home in

[12]A review of the provenience data associated with these six artifacts (Knecht 1993) illustrates that they were recovered from three different strata, at depths ranging from 318 centimeters to 458 centimeters below datum, on different days. Although we recognize the complexity of the site's stratigraphy, these artifacts do not appear to have been recovered from a discrete level or feature indicative of an occupation.

[13]Dumond (1981:120–121) and Harritt (1988:193) report a combined total of three possible blade cores, two tools made on blades, and two blades / microblades from assemblages of the Brooks River Gravels phase out of roughly 1000 stone tools. No blades were found in Ugashik Hilltop-phase assemblages or in the ASTt assemblage from Chugachik Island.

Table 9. Distribution of ASTt tool types in Kodiak assemblages.

ASTt Tool Type	Blisky	Outlet	Zaimka	Malina	Refuge Rock	Rice Ridge	TOTAL
lanceolate point					4	4	8
bipoint						1	1
sideblade			1				1
shouldered knife							0
flaked scrapers	5	2	5		4		16
drill bit							0
graver							0
burin							0
ground burin	1		1	1		1	4
ellipsoidal flake cores							0
microblade core		1	1				2
TOTAL	6	3	8	1	8	2	32

an ASTt assemblage (Table 9). This accounts for roughly 0.3 percent of all the artifacts from the study assemblages and represents a much smaller proportion than that represented by artifacts made of distant raw materials. Artifacts made of non-local raw materials are minimally four times more common than artifacts of potential ASTt manufacture.

Despite the extremely small number of potential ASTt tools, several tool types considered diagnostic of this phase (cf. Dumond 1981:120; Henn 1978:43) are present in the Kodiak sample. Moreover, all of the evaluated site assemblages, except for the very small assemblage from the Array site, have one or more potential ASTt artifacts (Table 9). These include carefully flaked, lanceolate points (Figure 8), a bipoint, a sideblade, a variety of flaked scrapers (particularly endscrapers and one angle-nosed scraper [Figure 9]), ground burins, and microblade cores. Thus, of the eleven artifact types considered diagnostic of the southern Alaska ASTt, six are tentatively present.

We say "tentatively" for three reasons. First, all of these sites have complex stratification and, with the exception of the Refuge Rock, all have older, underlying strata. Thus, objects such as bipoints, sideblades, burins, blades, and artifacts of microblade technology (Figure 10), characteristic of older Ocean Bay occupations (Clark 1979; Fitzhugh 2003:147; Hausler 1993), may be intrusive. They may have been introduced to Early Kachemak deposits by site formation processes (e.g., digging house foundations, pits, and postholes into underlying strata). Moreover, throughout the prehistoric era, Kodiak foragers collected artifacts from previous phases, some of which are waterworn, suggesting they were obtained from area beaches. For example, two waterworn ASTt-style endscrapers of exotic chert were found in historic period deposits at the Igvak site (AFG-016). Thus, artifacts diagnostic of different time periods are occasionally mixed into temporally distant assemblages.

Second, some possible ASTt artifacts, such as flaked scrapers (Figure 11), appear to be part of a spectrum of tools that may be indicative of both the Early Kachemak and the ASTt. Although flaked scrapers are rare on Kodiak (Clark 1997:48) and appear to be restricted to the Early Kachemak phase, sites of this age contain a variety of flaked scraping tools. The Blisky site produced twenty-six flaked scrapers of four different styles (based on the location and degree of edge flaking [Steffian, Pontti, and Saltonstall 1998:142–143]). The Blisky endscrapers, some of which closely resemble ASTt forms, may actu-

Figure 7. Purported ASTt artifacts from Malina Creek. From left to right: utilized blade of exotic chert (AM24.93.5160); stemmed point of chalcedony (uncataloged); ground burin of basalt (AM24.93.5199); bilaterally barbed dart of sea mammal bone (AM24.93.5154); bilaterally barbed dart of sea mammal bone (AFO-5.93.833); bilaterally barbed dart of sea mammal bone (AM24.93.5089).

ally be locally produced as part of the Early Kachemak typological system. Perhaps the increasing economic focus on fish, a small-bodied prey, fostered the production of smaller, more delicate scraping tools to process fish skins.[14] While this is not the only possible explanation, it highlights the potential for some ASTt-like tools to have locally derived origins.

Third, while some tools are reminiscent of the ASTt, they are not duplicates of those from the mainland. A red chert sideblade from Zaimka Mound illustrates this pattern (Figure 12). Although the size and style of an ASTt object, this tool is not finely flaked, but more crudely chipped, like other Early Kachemak tools. This sideblade is ASTt-like in form but not in execution and, therefore, its attribution is equivocal.[15] The choice of a lower quality raw material may have influenced the manufacturing process, or it may be an aberrant Early Kachemak artifact.

Similarly, archaeologists have found microblades but not microblade cores in association with the ASTt in south-central Alaska (Dumond 1981:131, Harritt 1988:193). The characteristics of such cores are unknown and the microblade cores in the Kodiak sample must be considered equivocal evidence of ASTt technology (Figure 10). Although both examples have the parallel flake scars characteristic of microblade cores, both have been reworked and subsequently used as tools. A red chert example from the Outlet site (AM327:6673) is a core tab-

[14]Alutiiq people once used this strong, supple material for clothing.
[15]Knecht, Davis, and Carver (2001:58) note a similar pattern in the assemblage from Level 2 of the Margaret Bay site on Amaknak Island. Here, "some of the small points and endscrapers . . . are less gracile than those at some ASTt sites such as those of the Brooks River Gravels Phase."

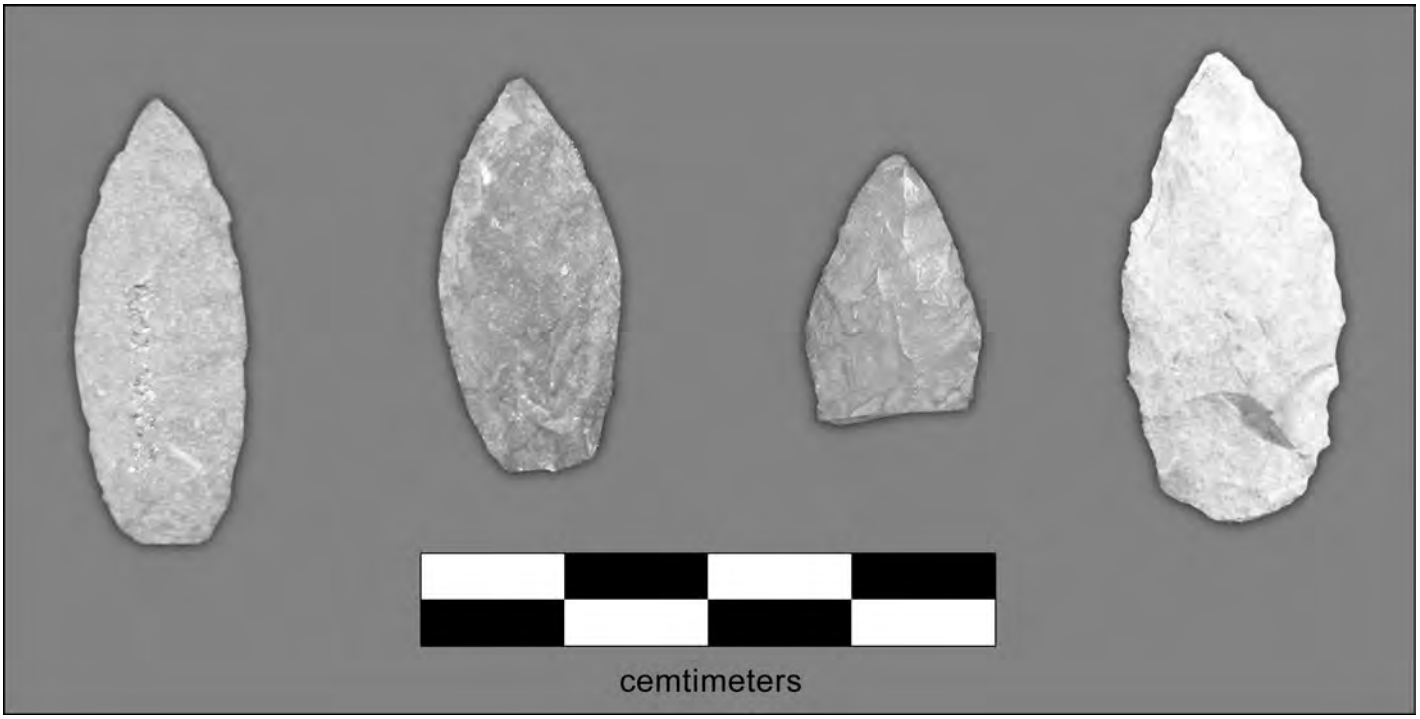


Figure 8. Projectile points from Refuge Rock. From left to right: basalt (KOD450:21); basalt (KOD450:854); red chert (KOD405:668); meta tuff (KOD450:639).

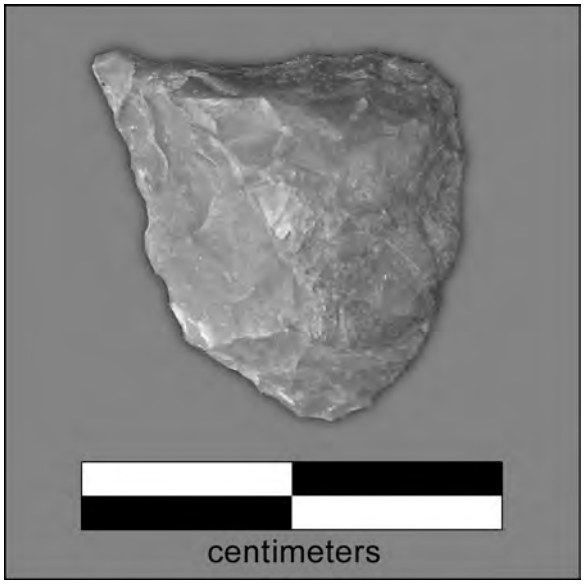


Figure 9. Red chert angle-nosed scraper from the Refuge Rock site (AM411:248).

let, struck from the face of the core platform. This piece was transversely burinated or snapped, and the resulting edge utilized. A chalcedony example from Zaimka Mound (AM411:13638) is a pièce esquillée, a spent core used as a wedge.

Despite these caveats, a few tools strongly resemble ASTt objects. The most notable is a chalcedony bipoint from Rice Ridge (Figure 13). This piece has delicate denticulate edges. Four ground burins are also strong ASTt candidates (Figure 14).[16] Carefully made burins are very rare on Kodiak, occurring primarily in the Ocean Bay I phase (Steffian, Eufemio, and Saltonstall 2002:26). Ground burins are even more rare, with just a few examples from the Early Kachemak phase. The ground burins in our sample are similar to those of the Ugashik Hilltop (Henn 1978:112) and Brooks River Gravel phases (implement classes 79 and 82; Dumond 1981: plates V:I[f] and VI:B [b,c]), as they were made on either bifacially or unifacially worked flakes. The Kodiak specimens, however exhibit a much greater degree of polishing. Two of these tools do not even exhibit burin blows, but are formed only by ground faceting. On two examples (Rice Ridge 363-90-GEN-1 and Malina AM24.93.5199[17]) the burin was created with four ground facets, and a third, incomplete specimen from the Blisky site (AM199:2149) has at least three facets. The only Kodiak example without extensive polishing is from Zaimka Mound (AM411:13024). This piece resembles a mitten burin. It is a burinated flake lightly polished on both its dorsal and ventral surfaces.

[16]Ground burins and other ASTt-type artifacts also occur in Norton; thus. there may be ancestral Norton on the Alaska Peninsula (Clark, pers. comm. 2004).

[17]This tool has two burin-like facets: one created by four ground facets and the other by two ground facets and a burin blow.

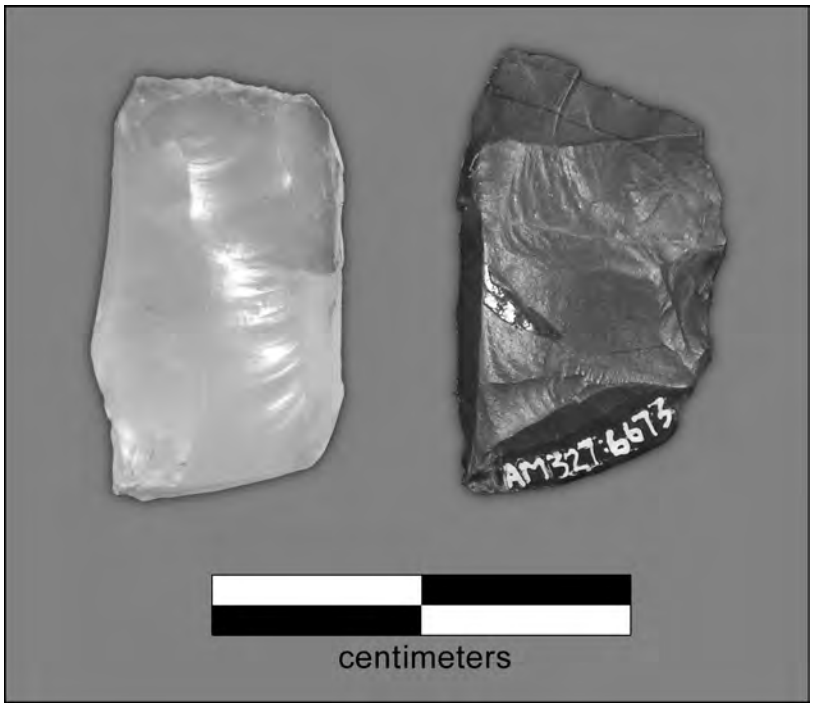


Figure 10. Microblade core fragments. From left to right; Outlet Site: chalcedony (AM327:6673); Zaimka Mound: red chert (AM411:13638).

Additional clues to the origins of potential ASTt tools lie in the raw materials used in their manufacture. Presumably, objects obtained from the Alaska Peninsula would have been made of mainland materials, distinct from those available on Kodiak. Zollars (1982:20) reports such a pattern from his analysis of the ASTt assemblage from Chugachik Island. Here, non-local materials dominate the artifact sample, constituting roughly 75 percent of all objects, suggesting that the site's occupants imported both tools and raw materials to Kachemak Bay.

The distribution of raw materials in the possible ASTt sample from Kodiak shows a somewhat similar pattern. The same set of chippable, non-local materials found throughout Early Kachemak assemblages occurs in the sample of potential ASTt tools (i.e., basalt, chalcedony, exotic chert, and rhyolite). However, these materials are present in much greater quantities among the suspected ASTt tools. They make up 28 percent of these artifacts as compared to just a few percent of Early Kachemak tools (see Table 8 above). Chi-square analysis indicates that this pattern is statistically significant. Though extremely rare, tools of possible ASTt manufacture are made with greater than expected frequency from non-local materials. It is not surprising, therefore, that all but one of the best candidates for ASTt tools (see above) are made from non-local material. This pattern of raw material use suggests that at least some of the tools we identified are of ASTt manufacture.

Despite the notably higher percentage of non-local materials in the suspected ASTt assemblage, 72 percent of the possible ASTt tools are made from Kodiak materials—particularly the ubiquitous red chert. While it is possible that some of these tools were manufactured and traded to Kodiak from Kachemak Bay (where red chert is also available and was used by ASTt residents; Zollars 1982:20), or produced by ASTt visitors to Kodiak, it is unlikely that sustained trade, visitation, or occupation would produce so few typologically ASTt tools. Even the small tool assemblage from the briefly occupied Chugachik Island site is larger than the total number of possible ASTt tools identified in the much larger sample from Kodiak. Many of the artifacts made from Kodiak red chert may be ASTt-like rather than actual imports.

In sum, the evidence from non-local materials and artifacts suggests that while long distance exchange was a repeated but infrequent activity during the Early Kachemak phase, it was rare for Kodiak foragers to obtain or manufacture ASTt tools. There are very few un-

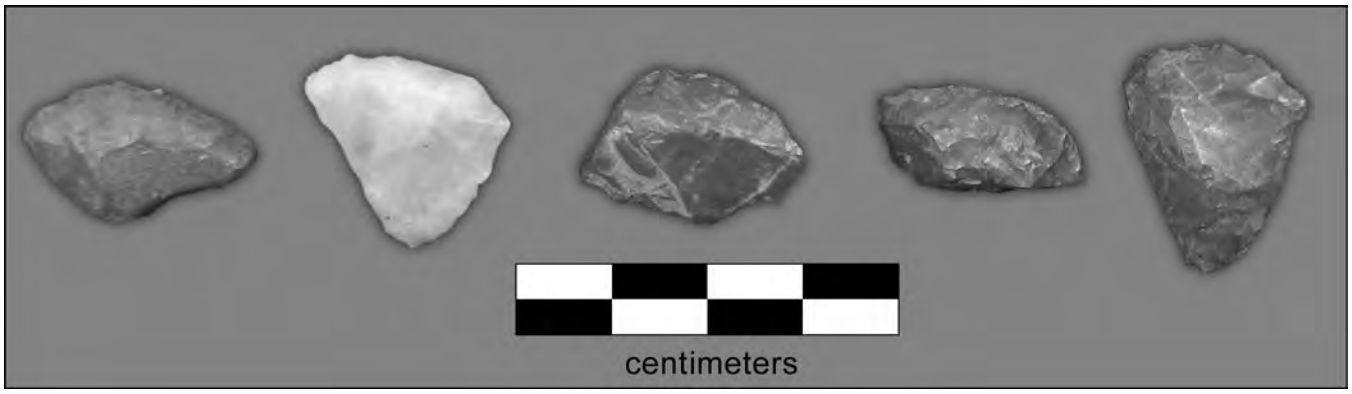


Figure 11. Flaked scrapers from the Blisky site. From left to right: red chert (AM199:2356); red chert (AM199:2135); red chert (AM199:3166); exotic chert (AM199:1639); exotic chert (AM199:1375).

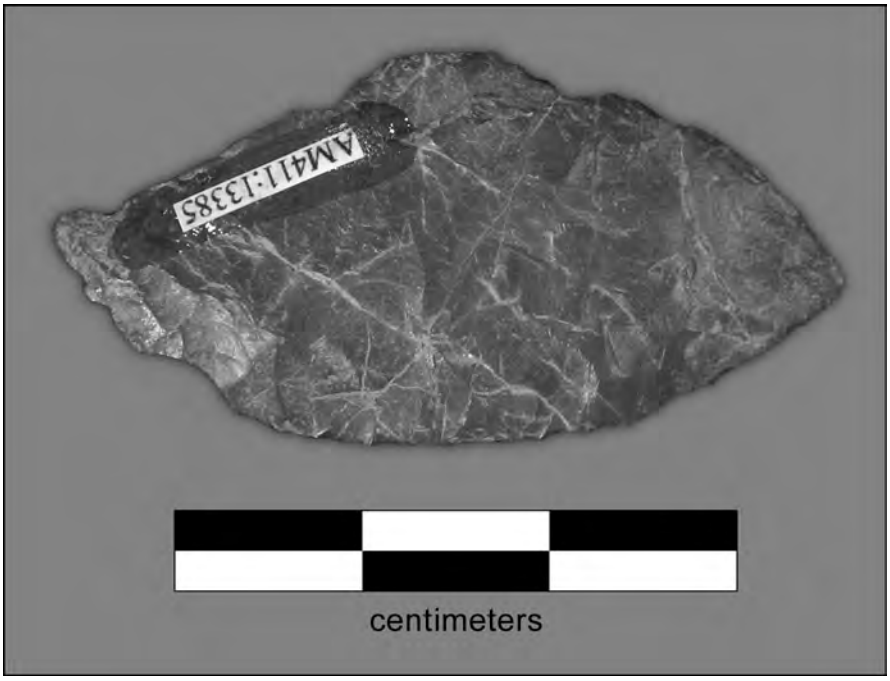


Figure 12. Red chert sideblade from Zaimka Mound (AM411:13385).

While these societies developed and flourished on Kodiak, they vanished from Kachemak Bay. Here, more than a millennium separates samples from the Ocean Bay II and Early Kachemak phases. During this settlement hiatus, bearers of the ASTt visited the Gulf of Alaska. Data from Chugachik Island site provide a unique view of their activities and offer an example of what an ASTt occupation of Kodiak might look like. On Chugachik Island, foragers inhabited an ephemeral structure and worked large quantities of non-local stone into toolkits characteristic of the ASTt while harvesting birds and small mammals (Workman and Zollars 2002:41–42). The remains of their brief visit were preserved in a thin stratum of just 4 to 7 centimeters of soil (Zollars 1982:13).

equivocal ASTt artifacts in Kodiak assemblages, and no ASTt assemblages. While it is possible that such an occupation will eventually be found,[18] the evidence at hand suggests that foragers of this widespread tradition did not colonize Kodiak. Kodiak foragers used non-local materials that were also widely used by bearers of the ASTt (Dumond 1981:120; Henn 1978:68; Zollars 1982:appendix H), but it is unclear whether they collected these materials or obtained them in trade. Whatever the answer, interaction with mainland societies seems to have contributed little to Early Kachemak technology.

IMPLICATIONS

New data from the Kodiak Archipelago enhance the regional picture of settlement and interaction during the fourth millennium BP. Rather than a decline in habitation, it now appears that the archipelago's population continued to increase gradually as new ways of using resources evolved. The Ocean Bay phase developed seamlessly into the Early Kachemak after 4300 years ago, as the islands' residents began harvesting and processing food for storage. Many categories of archaeological data—from settlement patterns to midden characteristics, features, and technologies—indicate an intensified economic focus on fish (Steffian, Saltonstall, and Kopperl in press).

The currently available data from Kodiak provide a very different picture. Kodiak's Early Kachemak sites have large, thick accumulations of debris, permanent semi-subterranean structures and features, assemblages demonstrating a focus on fishing and food processing, a strong preference for local materials, and toolkits that are clearly related to the preceding Ocean Bay phase. These differences, and the overwhelming continuity in Kodiak's prehistoric record, suggest that the archipelago was not extensively visited or colonized by ASTt foragers. Kodiak archaeologists have not identified any occupations similar to the ASTt component at Chugachik Island.

Why is the ASTt absent from Kodiak? One likely reason is that Kodiak was too densely inhabited. Elsewhere in south-central Alaska, the ASTt occurs during periods of minimal or no settlement by other cultures. From the data presently available, it appears to be an intrusive culture. The ASTt does not evolve out of the previous Ocean Bay, Ugashik Knoll, Brooks River Beach Ridge, or Brooks River Strand phases, but seems to reflect the southward movement of northern foragers into landscapes that were not extensively occupied (Dumond 1998:192, 194; Workman and Zollars 2002:42). Another factor may be the maritime character of the archipelago's resource base. Bearers of the ASTt are thought to have been terrestrial foragers, heavily dependent upon caribou and salmon (Dumond 1998:194). While Kodiak has ex-

[18]Our Early Kachemak sample comes exclusively from the northeastern side of the Kodiak archipelago. Samples from the western coast of the archipelago may yield more evidence of interaction with the Alaska Peninsula, as the peninsula is visible from this coast of Kodiak.

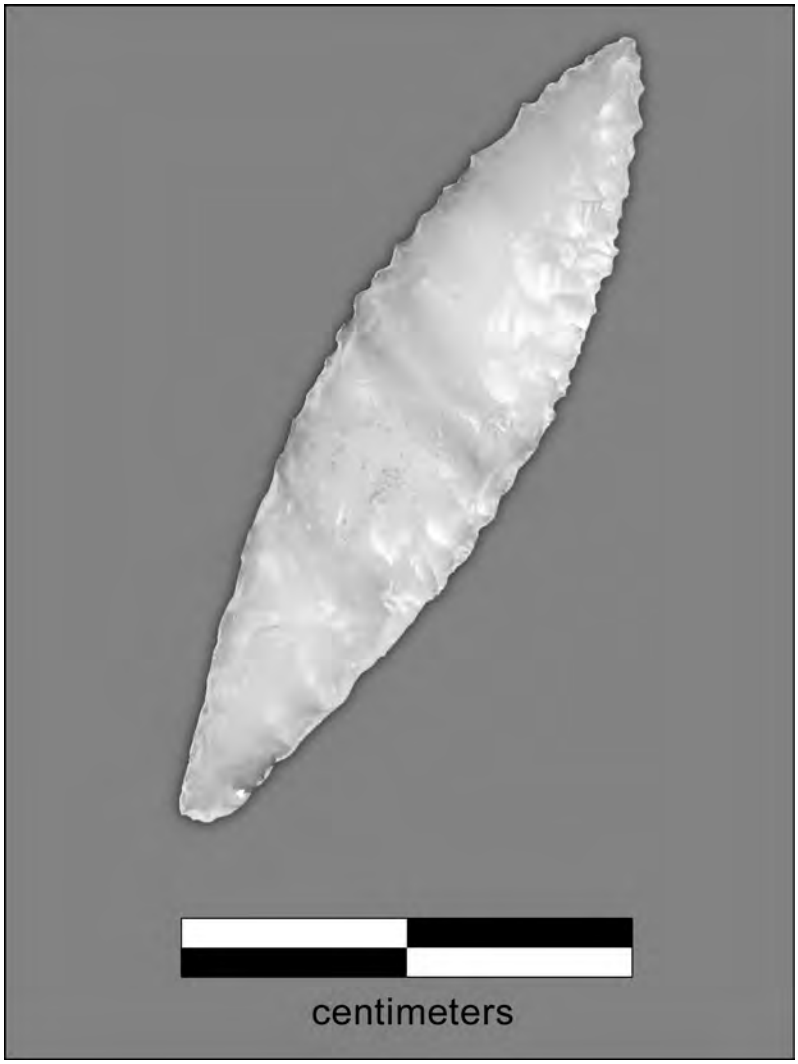


Figure 13. Chalcedony bipoint from Rice Ridge (363-90-10b-34-129).

tensive anadromous fish runs, it has a limited terrestrial fauna with no native cervids. The archipelago is outside the tundra-boreal forest ecotone where ASTt settlements are typically found (Workman and Zollars 2002:39).

Although colonization appears unlikely, a few ASTt-type tools do occur in Kodiak assemblages. However, these tools are so rare, and so seldom unequivocally ASTt, that we believe they reflect extremely limited contact. It is possible that Kodiak Islanders obtained these items in trade with culturally related foragers of the Pacific coast of the Alaska Peninsula. Dumond notes the presence of an extremely small number of ASTt-like tools in Takli Birch assemblage from this region (13 out of 2700 artifacts; Dumond 1998:195). The continual importation of non-local stone throughout the Early Kachemak phase indicates that Kodiak foragers maintained contact with the mainland. It is possible that some ASTt tools traded to the Pacific coast were passed on to Kodiak islanders. We note that the frequency of potential ASTt tools in Kodiak assemblages (0.3 percent) is even lower than that reported for the Takli Birch phase (0.5 percent; Dumond 1998:195). This pattern resembles that of hand-to-hand exchange (cf. Renfrew 1969), where materials become less common with distance from their source.

However non-local tools and raw materials arrived on Kodiak in the fourth millennium BP, they are best viewed in the greater context of prehistoric exchange. Interaction with mainland societies has always been a feature of Kodiak economies. From first colonization through the historic period, island residents obtained mainland resources unavailable locally. As a result, non-local materials occur in Kodiak sites of all ages and their frequency increases with time. As Kodiak's societies grew and intensified their use of the environment, exchange became a more common and economically important activity. This activity can be measured both in the frequency of non-local materials and in the distance from their sources. Ongoing studies of raw material use in Kodiak prehistory (Steffian n.d.) indicate that greater quantities of materials came from greater distances with time. The limited long distance exchange of the Early Kachemak phase brought small quantities of non-local materials to Kodiak and even smaller quantities of items from truly distant sources including those made by ASTt foragers.

From the data summarized here, the ASTt appears to have had little influence on the development of Kodiak societies. The ASTt does not appear to be the elusive Eskimo ancestor of Alutiiq societies. As Hausler (1993:17) and Clark (1997:84) have both argued, Kodiak's archaeological record indicates that Native societies evolved in place with plenty of external interaction but no interruption. The prehistory of the archipelago illustrates the steady adaptation of maritime foragers to a complex set of environmental, demographic, and social factors that promoted continual economic intensification. The Early Kachemak phase simply represents a step in this process.

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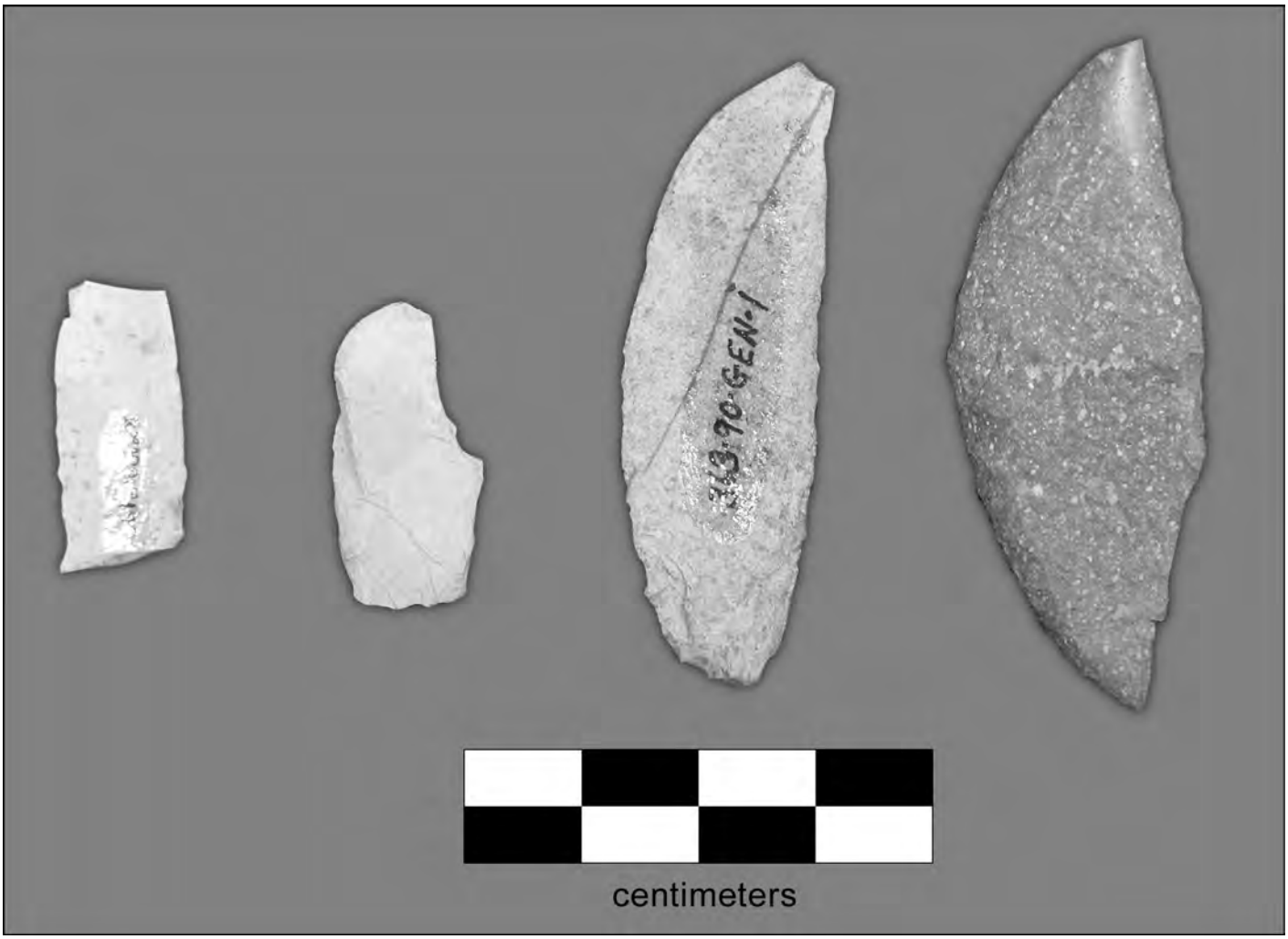

Figure 14. Ground burins. From left to right; Blisky: meta tuff (AM199:2149); Zaimka Mound: rhyolite (AM411:13024); Rice Ridge: meta tuff (363-90-GEN-1); Malina Creek: basalt (AM24.93.5199).

enhancing our knowledge of Alutiiq prehistory. We are very grateful for their assistance. We would also like to recognize the landowners who permitted archaeological research on their property and lent assemblages to the Alutiiq Museum. They include Leisnoi, Inc., the University of Alaska Fairbanks, the U.S. Coast Guard, the Rice Family, the Old Harbor Native Corporation, and Afognak Joint Venture. Drafts of this paper were reviewed by Philomena Hausler, Don Clark, Don Dumond, Bob Kopperl, Ben Fitzhugh, Dan Odess, Erica Hill, and Bill Sheppard, whose thoughtful comments helped to refine the ideas presented. Additional thanks go to Philomena Hausler for generously sharing information from her excavations of the Rice Ridge site, to Joan Dale at the Alaska Office of History and Archaeology for assistance using the AHRS, and to Dan Odess for inviting us to develop this paper for the symposium he organized at the 2004 ICASS-V meeting. Finally, we extend our appreciation to the Alutiiq Heritage Foundation and Sven Haakanson, Jr., Executive Director of the Alutiiq Museum, for providing time and space for this study. *Quyanaasinaq*—thank you very much. Patrick Saltonstall took all the photographs for this paper. Amy Steffian created the graphics.

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Appendix A: Chiniak Bay settlement data.

AHRS #	Era	Setting	Justification
005	ND	OCE	NA
006	ND	OCE	NA
007	ND	OCE	NA
008	ND	OCE	NA
009	ND	OCE	NA
010	EK	MB	Collection
012	LK	MB	Collection
013	EK	MB	Excavation
013	OBII	MB	Excavation
013	OBI	MB	Excavation
014	K	MB	Collection, Features
015	K	MB	Collection, Features
015	LK	MB	Collection, Features
016	EK	MB	Collection
017	EK	MB	Collection
018	EK	MB	Collection
019	ND	MB	NA
020	K	OCP	Historic Reference
021	K	MB	Collection
022	K	OCP	Collection
022	LK	OCP	Collection
023	LK	OCE	Collection
024	K	MB	Features
025	K	IB	Collection
026	K	MB	Excavation
026	LK	MB	Excavation
026	EK	MB	Collection
027	K	MB	Features
028	K	IB	Features
029	K	MB	Collection, Features
029	LK	MB	Collection, Features
056	ND	MB	NA
057	LK	MB	Collection, Features
059	ND	MB	NA
061	LK	MB	Features
129	ND	MB	Features
200	LK	MB	Tested, Collection, Features
201	LK	OCE	No Explanation
208	LK	OCE	Coll.
210	K	OCP	Excavation
210	LK	OCP	Excavation
210	EK	OCP	Excavation
210	OBII	OCP	Excavation
212	ND	MB	NA
303	ND	OCE	NA
350	K	OCE	Tested, Features
351	K	IB	Collection, Features
362	LK	MB	Features

Appendix A (continued): Chiniak Bay settlement data.

363	EK	OCP	Excavation
363	OBI	OCP	Excavation
363	OBII	OCP	Excavation
368	LK	MB	Features
376	K	IB	Coll., Features
376	OBII	IB	Coll., Features
411	K	MB	Collection, Features, Excavation
411	LK	MB	Collection, Features, Excavation
411	OBI	MB	Collection, Features, Excavation
431	LK	OCP	Features
443	K	OCE	No Explanation
444	ND	MB	NA
445	ND	MB	NA
448	OBI	OCP	Features
449	K	OCE	Features
451	EK	IB	Tested, Collection
451	OBI	IB	Tested, Collection
458	K	MB	Features
561	EK	INT	Excavation
561	OBII	INT	Excavation
562	K	INT	Excavation
562	LK	INT	Excavation
562	EK	INT	Excavation
562	OBII	INT	Excavation
563	ND	MB	NA
605	ND	MB	NA
610	K	MB	Features
611	ND	OCE	NA
612	K	IB	Features
627	LK	IB	Collection
849	ND	OCE	NA
856	ND	IB	NA
892	ND	OCE	NA
893	LK	OCE	Features
895	LK	OCP	Features
909	OB	IB	Collection, Features
909	EK	IB	Collection, Features
911	LK	IB	Collection
1045	OBI	IB	Tested
1053	EK	IB	Tested
1053	OBI	IB	Tested
1054	ND	IB	NA

Notes: Abbreviations for phase are: K = Koniag; LK = Late Kachemak; EK = Early Kachemak; OBII = Ocean Bay II; OBI = Ocean Bay I. Abbreviations for setting are: INT = Interior; IB = Inner Bay; MB = Mid-Bay; OCP = Outer Coast Protected; OCE = Outer Coast Exposed.

LOCALLY AVAILABLE MATERIALS

ORGANIC

- baleen
- bird bone
- fish bone (halibut)
- grass
- land mammal bone (brown bear, fox, land otter)
- sea mammal bone (harbor seal, porpoise, sea lion, sea otter, whale)
- shell (chiton, clam, mussel, whelk, etc.)
- spruce root
- tooth (bear, seal, sea lion, etc.)
- wood (alder, cottonwood, willow)

INORGANIC

KODIAK BATHOLITH

- bog iron
- calcite
- granites
  - G3 Granite (from batholith)
  - G2 Tonalite (dike rock)
- iron ore
- iron oxide (red ochre)
- quartz

CHUGACH TERRANE

Kodiak Formation

- black slate
- greywacke
- cherts from density slide conglomerates

Uyak Formation

- meta tuffs
  - MT1 greenstone
  - MT2 gray slate
- radiolarian chert (red, gray, green)
- schists (green & blue facies)
- silicified meta tuffs
  - MT3 silicified tuff w/ metallic inclusions
  - MT4 spotted chert – silicified meta tuff
  - MT5 silicified greenstones

PRINCE WILLIAM TERRANE

- coal - sub bituminous, high in vitrinite
- conglomerate cherts
  - TC Tanginak gray chert
- sedimentary
  - S1 sandstone
  - S2 siltstone
- tuffs
  - T1 straight tuff (grainy and soft)
  - T2 indurated tuff (spotted w/ feldspars, not silicified or distorted by metamorphism)

Locally available materials from an off island source

- glacially transported pebbles (e.g., banded chert)

driftwood (e.g., cedar, hemlock, pacific yew)
drift metal (from flotsam, shipwrecks)
pumice

Non-local materials

ORGANIC

antler
exotic shell (dentalium, abalone)
horn (goat, sheep)
fossilized ivory
ivory (walrus, fossilized, etc.)
land mammal bone (caribou, moose, etc.)
tooth (beaver, marmot or porcupine incisors)

INORGANIC

PENINSULAR TERRANE

volcanics

basalt (fine grained mafic)
- B1 with phenocrysts
- B2 without phenocrysts
- B3 olivine rich

obsidian
pumice (silicic, floats)
rhyolite (fine grained silicic)
scoria (mafic, does not float)

Other

canel coal (bituminous, high in liptonite)
chalcedony
chalk
copper oxide
exotic cherts – various colors
jadeite
limestone
metal (copper and iron)
red shale

UNKNOWN ORIGIN

aphinitic granite (G1)
coral
galena
graphite
quartz crystal

Appendix C. Possible ASTt tools from the Kodiak archipelago.

Site	Cat #	Object	Material	Condition	Use	Comments
Blisky	AM199:1375	End Scraper	Exotic Chert	W	Used	360 degree working edge
Blisky	AM199:1639	End Scraper	Exotic Chert	W	Used	360 degree working edge
Blisky	AM199:2135	End Scraper	Red Chert	W	Used	180 degree working edge
Blisky	AM199:2149	Ground Burin	Meta tuff	PF	Broken	unifacial retouch - 3 ground facets
Blisky	AM199:2356	End Scraper	Red Chert	W	Used	270 degree working edge
Blisky	AM199:3166	End Scraper	Red Chert	W	Used	360 degree working edge
Malina	AM24.93.5199	Ground Burin	Basalt	W	Used	ground & burinated at both ends
Outlet	AM327:6673	Microblade Core	Red Chert	F	Used	utilized
Outlet	AM327:6751	End Scraper	Red Chert	W	Used	180 degree working edge
Outlet	AM327:7121	End Scraper	Red Chert	W	Used	180 degree working edge
Refuge Rock	KOD450:123	End Scraper	Chalcedony	W	Spent	(some bifacial retouch) 270 degree working
Refuge Rock	KOD450:21	Lanceolate Point	Basalt	W	New	stem old bulb of percussion
Refuge Rock	KOD450:248	End Scraper/Graver	Red Chert	W	Used	360 degree working edge
Refuge Rock	KOD450:592	End Scraper	Red Chert	W	Used	360 degree working edge
Refuge Rock	KOD450:639	Lanceolate Point	Meta tuff	W	Preform	
Refuge Rock	KOD450:668	Stemmed Point	Red Chert	DF	Broken	contracting stem
Refuge Rock	KOD450:764	End Scraper	Red Chert	W	Used	180 degree working edge
Refuge Rock	KOD450:854	Lanceolate point	Basalt	W	New	stem old bulb of percussion
Rice Ridge	363-90-10-7-52	Lanceolate Point	Red Chert	W	New	boat shaped with flat base
Rice Ridge	363-90-10b-2-55	Lanceolate Point	Red Chert	PF	Broken	long parallel edges flat base
Rice Ridge	363-90-10b-34-129	Bipoint	Chalcedony	W	New	
Rice Ridge	363-90-10b-3-63	Lanceolate Point	Red Chert	PF	Broken	long parallel edges round base
Rice Ridge	363-90-10c-22-118	Lanceolate Point	Red Chert	W	Used	boat shaped with flat base
Rice Ridge	363-90-GEN-1	Ground Burin	Meta tuff	W	Spent	4 ground facets
Zaimka	AM411:10052	End Scraper	Red Chert	W	Used	360 degree working edge
Zaimka	AM411:13024	Ground Burin	Rhyolite	W	Used	mitten shape
Zaimka	AM411:13385	Sideblade	Red Chert	W	New	
Zaimka	AM411:13638	Microblade Core	Chalcedony	W	Spent	utilized & Burinated?
Zaimka	AM411:1934	Flaked Scraper	Meta tuff	W	Used	utilized blade? 180 degree UT edge
Zaimka	AM411:9148	Flaked Scraper	Red Chert	W	Used	270 degree working edge
Zaimka	AM411:9318	Flaked Scraper	Red Chert	W	Spent	270 degree working edge
Zaimka	AM411:9486	End Scraper	Red Chert	W	Used	360 degree working edge