

ARTICLE

CUPULES AND CUT LINES: AN EXPANDED VIEW OF KODIAK ALUTIIQ PETROGLYPHS

Amy F. Steffian

Alutiiq Museum & Archaeological Repository, 215 Mission Road, Suite 101, Kodiak, Alaska 99615; amy@alutiiqmuseum.org

Molly E. Odell

Alutiiq Museum & Archaeological Repository, 215 Mission Road, Suite 101, Kodiak, Alaska 99615; molly@alutiiqmuseum.org

Patrick G. Saltonstall

Alutiiq Museum & Archaeological Repository, 215 Mission Road, Suite 101, Kodiak, Alaska 99615; patrick@alutiiqmuseum.org

ABSTRACT

Alaska's Kodiak Archipelago is known for its Alutiiq/Sugpiaq petroglyphs. Rock carvings showing people, faces, animals, objects, and geometric designs are well documented around Cape Alitak and on the shores of Afognak Bay. Recent archaeological research illustrates that a second, more abstract style of petroglyph is also present across the region. Sites with pecked cupules and cut lines occur in at least 10 locations, carved into immovable boulders and bedrock outcrops beside salmon streams and bay mouths. An association between cupule sites and settlements suggests that this rock art dates to the Koniag tradition. The circular shape of the cupules, placement at the water's edge, affiliation with anadromous streams, occurrence beside barrier fishing structures, and manufacture during repeated site visits suggest that these carvings helped harvesters maintain relationships with animals to ensure future supplies of fish and game.

INTRODUCTION

Along the rocky shores of the Kodiak Archipelago, Alaska, Alutiiq/Sugpiaq ancestors carved thousands of images into stone. The islands' boulders and outcrops were their canvases, places where artists transformed the natural landscape into a cultural world rich with symbolism. Although petroglyph sites represent a very small portion of Kodiak's expansive archaeological record, they are widely documented, diverse, and durable. Petroglyphs are found from the protected, forested shore of northern Afognak Island to the exposed, windy tip of southern Kodiak Island, in both coastal and riverine settings. They include images of animals and people and geometric designs. They were made by pecking and cutting indentations into immovable slabs

of slate, granite, and greywacke, often in locations adjacent to settlements. As such, petroglyphs are a valuable record of the Alutiiq world, and their study complements other investigations of Alutiiq history. They mark places significant to Alutiiq people with lasting messages.

Kodiak's petroglyphs are among about 377 currently known rock art sites in Alaska, locations that include both carvings and paintings (AOHA 2022; Perrot-Minnot 2020). Most of these rock art sites, about 83%, occur in southeast Alaska. Rock art is rare elsewhere in the state. There are just a handful of pictographs and petroglyphs recorded in the Aleutian Islands (West et al. 2011), the interior (de Laguna 1956:105; Giddings 1941), western

Alaska (Jenness 1928:78, Pratt and Shaw 1992:4,11), and northern Alaska (Carlson et al. 2016; Davis et al. 1981; Irving 1962; Solecki 1952).

Beyond the coastal rainforest of southeast Alaska, the largest concentration of rock art sites lies in the Alutiiq homeland. The portion of southcentral Alaska that includes Prince William Sound, the Alaska Peninsula, the lower Kenai Peninsula, and the Kodiak Archipelago holds about 9% of Alaska's documented pictograph and petroglyph sites (Baird 2006; Baird et al. 2022; de Laguna 1956, 1975; Fagan 2008). The greatest density occurs in the Kodiak region. Here, archaeologists have recorded 27 petroglyph sites (Tables 1 and 2).¹ This includes the Cape Alitak Petroglyph District (XTI-18), a cluster of 13 closely spaced sites on southern Kodiak Island with more than 1300 images (Haakanson et al. 2012; Steffian and Lipka 2012). This is the largest rock art locus in Alaska. Thus, while rock art is best known from the Northwest Coast culture area, this artform is also an Alutiiq tradition, and its expression in the Alutiiq homeland reflects the unique history and worldview of the Alutiiq people.

Kodiak's best-known petroglyphs are representational images—carvings showing people, faces, and animals and objects like boats, drums, and harpoons—and geometric designs like spirals. These carvings are often large, varied in their designs, and prominently located. They include motifs found in other types of ancestral Alutiiq artwork (Clark 1964; Steffian 2018:20), and until recently they were the primary form of rock carving described (Alaska Packers Association 1917; Clark 1970; Griffin 1987 in AOHA 2022; Heizer 1947; Hrdlička 1944; Steffian and Haakanson 2018). However, archaeological research illustrates there is another abstract style of Alutiiq petroglyphs—cupules (pecked holes) that are commonly accompanied by cut lines.

In 1950, Donald Clark explored the Portage River lagoon. A young man with an interest in Alutiiq history and a talent for taking detailed notes, Clark recorded ancestral settlements with structure depressions, a possible stone fish weir, and cupule and cut line petroglyphs (Clark 1956, 1965). Although he mentioned these petroglyphs in later publications (Clark 1970:14, 1979:289), without photographs or scaled drawings, they remained unknown for years. Returning to Afognak Island in 1971 as a professional archaeologist, Clark documented a similar set of petroglyphs on slate slabs in the lower, intertidal portion of the Afognak River (AFG-218; Clark 1979:286–289) (Fig. 1). Here, an area of about two square meters contains at least 60 cupules and over 800 cut lines.

For many years, these two examples of cupules and cut lines were considered unique among Kodiak's petroglyph sites. Even Clark (1979:289) found them unusual, noting there were “no close parallels in Koniag phase incised slate or figurine art, in decorated ethnographic specimens, or in the earlier Kachemak tradition designs on slate point, stone lamps, and bone points.” However, recent research by Alutiiq Museum archaeologists has identified nine additional sites with this style of rock carving (Odell et al. 2021a, 2021b; Saltonstall and Steffian 2018; Steffian and Saltonstall 2019a, 2019b) (Table 2). It now appears that cupules and cut lines are a separate style of Alutiiq petroglyph widely present in the archipelago.

Importantly, the cupules and cut lines are not the prominently located representational petroglyphs found at Cape Alitak (Haakanson et al. 2012) or around Afognak Bay (Clark 1970; Steffian and Haakanson 2018). These diverse, varied images seem to tell stories or suggest family ties to harvesting areas. In contrast, cupules and cut lines are small, redundant, abstract carvings placed at the water's edge and often inundated by the tides. They occur beside lake-headed salmon streams and at bay entrances, important harvesting locales with substantial evidence of ancestral settlement. Moreover, some locales have many of these carvings. During repeated site visits, people added similar pecked circular holes to rock faces and boulders. They filled select places on the landscape with a simple, recurring design.

This article examines the distribution, character, and age of Kodiak's cupule petroglyphs. It begins with a review of Kodiak petroglyph studies illustrating the work completed and its influence on the identification of cupules. A summary of cupule and cut line petroglyph sites and their contents shares recently collected data and provides information on the manufacture, character, and distribution of these petroglyphs. When considered with ethnographic information, cupules appear to be material evidence of Alutiiq beliefs about the relationships between people and animals. We suggest that Alutiiq harvesters used cupules to attract fish and game and assist animals in passing to the next realm to ensure their reincarnation. This form of rock art helped Alutiiq harvesters maintain respectful relationships with the sentient, sensitive animals essential to human life (see Hill 2011; Losey 2011). As Clark wrote of the Afognak River petroglyphs (1979:289), “One may suspect that from their location that the petroglyphs relate in some way to the return of salmon.”

Table 1. Sites with representational petroglyphs in the Kodiak Archipelago.

Region	Site	Setting	Panels	Glyphs	Clear	Unclear	Material	Contents
Marka Bay, Afognak Island	AFG-19	Coastal	Unknown	ca. 30	8	ca. 22	Granite	Faces, dancer, fish, whale, geometric form
Afognak Bay, Afognak Island	AFG-269	Coastal	1	>4	4	>1	Granite	Faces, dancer, geometric form
Afognak Bay, Afognak Island	AFG-270	Coastal	1	8	8	0	Greywacke	Cluster of stacked faces
Kizhuyak Bay, Kodiak Island	KOD-118	Coastal	1	2	2	0	Granite	Fish and a geometric form
Cape Alitak, Kodiak Island	XTI-18	Coastal	14	432	263	169	Granite	People, faces, geometric forms, animals
Cape Alitak, Kodiak Island	XTI-124	Coastal	1	1	1	0	Granite	Face
Cape Alitak, Kodiak Island	XTI-125	Coastal	1	2	1	1	Granite	Geometric form
Cape Alitak, Kodiak Island	XTI-126	Coastal	6	129	60	69	Granite	Faces, whales, geometric forms
Cape Alitak, Kodiak Island	XTI-127	Coastal	1	3	1	2	Granite	Face
Cape Alitak, Kodiak Island	XTI-128	Coastal	10	245	152	88	Granite	Faces
Cape Alitak, Kodiak Island	XTI-129	Coastal	11	205	160	45	Granite	Faces
Cape Alitak, Kodiak Island	XTI-130	Coastal	1	6	5	1	Granite	Face
Cape Alitak, Kodiak Island	XTI-131	Coastal	3	80	49	31	Granite	Faces, geometric forms, animals
Cape Alitak, Kodiak Island	XTI-132	Coastal	4	65	41	24	Granite	Faces, drum, geometric forms
Cape Alitak, Kodiak Island	XTI-133	Coastal	5	134	97	37	Granite	Faces, geometric forms
Cape Alitak, Kodiak Island	XTI-134	Coastal	1	3	1	1	Granite	Face
Cape Alitak, Kodiak Island	XTI-135	Coastal	1	2	1	1	Granite	Face

This table only contains petroglyph sites confirmed by professional archaeologists. There are additional reports of representational petroglyphs in the Kodiak Archipelago that have yet to be confirmed.

Table 2. Sites with cupule and cut line petroglyphs in the Kodiak Archipelago.

Region	Site	Setting	Panels	Cupules	Lines	Stone	Setting
Paul's Bay, Afognak Island	AFG-383	Coastal	3	20	82	Greywacke	On beach near mouth of lake-headed salmon stream
Portage River lagoon, Afognak Island	AFG-327	Riverine	9	272	18	Slate	Clustered around the mouth of a lake-headed salmon stream and lagoon
Portage River, Afognak Island	AFG-328	Riverine	1	7	0	Slate	At the downstream end of a small waterfall beside a lake-headed salmon stream
Kitoy Bay, Afognak Island	AFG-316	Coastal	1	67	18	Slate	At entrance to lagoon near the entrance to Kitoy Bay.
Marka Bay, Afognak Island	AFG-381	Coastal	1	4 to 7	0	Greywacke	On beach near mouth of lake-headed salmon stream
Afognak River, Afognak Island	AFG-218	Riverine	2	60	869	Slate	Intertidal portion of a lake-headed salmon stream
Kizhuyak Bay, Kodiak Island	KOD-1242	Coastal	1	17	0	Slate	At the mouth of a lake-headed salmon stream beside an intertidal stone fish trap
Kizhuyak Bay, Kodiak Island	KOD-1302	Coastal	2	41	2	Slate	At the mouth of a lake-headed salmon stream beside an intertidal stone fish trap
Uyak Bay, Kodiak Island	KOD-1462	Coastal	1	Many	0	Granite	At bay mouth
Cape Hepburn, Kodiak Island	KAG-23	Coastal	2	68	0	Granite	At bay mouth

This table only contains petroglyph sites confirmed by professional archaeologists. There are other possible cupule sites in the Kodiak Archipelago that have yet to be confirmed or which are not clearly human made (e.g., AFG-00347, Odell et al. 2021a:58–62).



Figure 1. Cupules and cut lines from the lower Afognak River (AFG-218), covering a 2 m² area. AM725. Photograph by Patrick Saltonstall, 2006.

KODIAK ROCK ART RESEARCH

Petroglyphs were among the first archaeological resources described in the Kodiak region. In 1917, Captain C. A. Halvorsen, the superintendent of the Alaska Packers Association cannery in Olga Bay, published the first written description of Kodiak rock carvings (Table 3). In a short article for *American Anthropologist*, he reported several hundred images cut deeply into the coastal granite of Cape Alitak (Alaska Packers Association 1917:320). Although Halvorsen did not describe the images, four photographs showed stylized faces and silhouettes of whales and people.

Fifteen years later, Smithsonian Institution anthropologist Aleš Hrdlička visited Cape Alitak during a

broader survey of Kodiak archaeological sites. Traveling by boat, he investigated sites around Cape Alitak in 1932 (Hrdlička 1944:105, 109), where he photographed petroglyphs. Some of his images resemble those published by Halvorsen (Heizer 1947), suggesting that they viewed similar clusters of faces and animal forms. Hrdlička's only description was general. "The glyphs are very well made, deep, cover a number of huge and small rocks, some of which are underwater at high tide" (1944:105–107).

Hrdlička's photographs proved valuable to Robert Heizer, who used the images to write the first detailed summary of Cape Alitak rock art. Heizer's short paper provided key information. He noted the presence of silhouettes and outlined images of people, animals, and geometric designs (Heizer 1947:284). The images were carved into the

Table 3. Summary of Kodiak rock art field research.

Researcher	Year	Petroglyph Type	Work Completed	Reference
C.A. Halvorsen	1917	Representational	Photographed petroglyphs at Cape Alitak (XTI-18)	Alaska Packers Association 1917
Aleš Hrdlička	1932	Representational	Photographed petroglyphs at Cape Alitak (XTI-18)	Hrdlička 1944
Robert Heizer	1947	Representational	Summarized observations of the Cape Alitak petroglyphs (XTI-18)	Heizer 1947
Donald Clark	1950	Cupules & Cut Lines	Noted petroglyphs in Portage River lagoon	Clark 1956
Donald Clark	1951	Representational	Documented petroglyphs by Afognak Village (AFG-207)	Clark 1964
Donald Clark	1951	Representational	Documented petroglyphs at Lipsett Point (AFG-269)	Clark 1970
Donald Clark	1964	Representational	Documented petroglyphs in Marka Bay (AFG-19)	Clark 1970
Donald Clark	1971	Cupules & Cut Lines	Documented petroglyphs on the Afognak River (AFG-218)	Clark 1979
Dennis Griffin	1987	Representational	Documented a petroglyph near Port Lions, Kizhuyak Bay (KOD-118)	Griffin 1987 from AOHA 2022
Woody Kneble	1990s	Representational	Documented petroglyphs at Cape Alitak (XTI-18)	Knebel 2003
Sven Haakanson	2000–2022	Representational	Documented petroglyphs at Cape Alitak (XTI-18)	Haakanson et al. 2012, Steffian and Haakanson 2018
Patrick Saltonstall	2016	Cupules & Cut Lines	Documented petroglyphs in McDonald Lagoon, Kitoi Bay (AFG-316)	Saltonstall and Steffian 2018
Patrick Saltonstall	2016, 2018	Cupules & Cut Lines	Documented petroglyphs in Barabara Cove, Kizhuyak Bay (KOD-1242, KOD-1302)	Saltonstall and Steffian 2018a, Steffian and Saltonstall 2019a
Patrick Saltonstall	2018	Cupules & Cut Lines	Documented petroglyphs along the Portage River, Afognak Island (AFG-327, AFG-328)	Steffian and Saltonstall 2019b
Molly Odell & Patrick Saltonstall	2021	Cupules & Cut Lines	Documented petroglyphs at Cape Hepburn (KAG-23), Chief Cove (KOD-1462), Paul's Bay (AFG-383), Kitoi Bay (AFG-316), and Marka Bay (AFG-381)	Odell et al. 2021a, 2021b

surrounding bedrock up to 2 cm deep and ranged from about 5 to 61 cm across. Importantly, Heizer (1947:288) recognized spatial patterning in the petroglyphs. He noted the presence of two separate localities and that sea mammal images tended to co-occur. Heizer also noted the stylistic ties between the rendering of petroglyph faces and those depicted on incised pebbles—small pieces of slate and greywacke with stylized pictures of people cut into their surfaces.

In 1950, Clark noted cupules and cut lines at Portage River. He described the carvings as round-bottomed and typically 2.5 to 3.8 cm across. His hand-drawn map shows “rocks with pits” near the narrow channel leading between the lagoon and adjacent Discoverer Bay. He also noted cut lines 2.5 to 12.7 cm long on a boulder that formed the western, shoreward end of a rock alignment crossing the river channel (Clark 1979:289). He described these lines as up to about 0.6 cm deep and V-shaped in cross-section (Clark 1970:14). Although Clark did not map or photograph the carvings, his observations were the first record of cupule and cut line petroglyphs in the Kodiak Archipelago.

In 1951, a boy from Afognak Village showed Clark a set of stylized faces pecked into the ocean-facing side of a greywacke outcrop (AFG-270; Clark 1964:133; 1970:14). The motifs were representational like those from Cape Alitak, showing closely grouped people with Y-shaped noses and brows, eyes, and mouths. Further review of the area revealed additional representational petroglyphs at Lipsett Point (AFG-269)—also on a seaward-facing outcrop, though of granite (Clark 1970:14) (Fig. 2).

In the summer of 1964, Clark returned to Afognak Island. Massive subsidence and extensive coastal erosion caused by the Great Alaska Earthquake had exposed many archaeological sites and littered beaches with arti-

facts. Clark and his colleague Bill Workman spent time surveying the coast as part of the Konyag-Aleut Project (Laughlin and Reeder 1962). In Marka Bay, a small waterway on the southern coast of Afognak Island, they found a cluster of about 30 representational petroglyphs (AFG-19) (Clark 1970). Like the Afognak Village petroglyphs, they showed stylized animals, faces, and people (Clark 1970:15). In an article about the images, Clark (1970:14) wrote, “The Afognak petroglyphs are nearly identical to some of those at Cape Alitak.”

In 1971 Clark, Workman, and a team of archaeologists spent the summer studying ancestral Alutiiq sites on the Afognak River. Among other research, they documented the extensive cupule and cut line petroglyphs at Litnik (AFG-218, Clark 1979).

In 1987, Dennis Griffin, an archaeologist with Bureau of Indian Affairs, visited Port Lions on the shore of Kizhuyak Bay (Griffin 1987 in AOHA 2022). Here, he learned of a petroglyph on the beach adjacent to the village. Griffin located the rock art (KOD-118) and described it as a pair of heavily weathered designs on a granite boulder. The images include a spiral and perhaps stacked faces.

Public interest in Kodiak’s petroglyphs grew in the 1990s. Archaeologist Rick Knecht (1992) documented additional petroglyphs at Cape Alitak, and naturalist Woody Knebel (2003) conducted a personal study of the artwork. Their efforts expanded the number of documented images. Inspired by the growing record of ancestral images at Cape Alitak, Sven Haakanson Jr. began a long-term study. His work was part of a summer outreach program with the community of Akhiok. An artist and an archaeologist, Haakanson involved Akhiok students to photograph, sketch, and make rubbings of the artwork, work that continues today. Their studies revealed hundreds of additional representational petroglyphs, arranged in discrete clusters.

In 2010, the Alutiiq Museum received National Park Service funding to complete a systematic archaeological survey of Cape Alitak. At the outset, it was clear that Cape Alitak held a large set of rock art images and that there were settlements adjacent to these sites that needed documentation. A museum crew set out to create a comprehensive account of area sites under Haakanson’s direction. This team documented 13 discrete petroglyph locations with over 1300 individual images and mapped 13 nearby ancestral Alutiiq settlements and middens (Haakanson et al. 2012). The petroglyphs occurred in clusters of one to over 430 images. Individual images ranged in size from 2.7 by 6.5

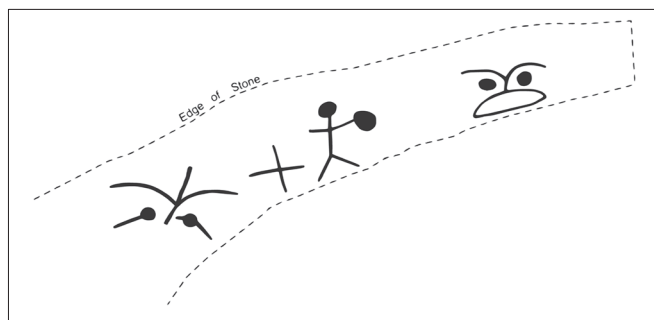


Figure 2. Lipsett Point representational petroglyphs (AFG-269), facing south and covering a ca. 1 m long ledge. The images are up to 20 cm tall. Illustration by Eric Carlson from photographs by Patrick Saltonstall.

cm to as much as 117 by 90 cm. Importantly, the settlements nearest many of the petroglyph clusters dated to the end of the Kachemak tradition (ca. AD 1000 to AD 700), the centuries immediately preceding the development of large, multiroomed, sod house villages of the Koniag tradition (ca. AD 700 to AD 1763). In contrast, petroglyphs were nearly absent beside Koniag tradition sites. The archaeologists also recognized differences between the types of glyphs and their locations and placement. Silhouettes of dancers, people, boats, and whales occurred nearest the tip of the cape on low-lying boulders. Clusters of faces rested on more prominent rock outcrops below settlements inside the bay. This patterning was a key find. It illustrated the likelihood that Alutiiq ancestors chose the location and content of rock art to share distinct messages. The presence of whale imagery on low-lying boulders at the very tip of Cape Alitak, and whalebone and slate lances in nearby settlements, suggested a connection between the rock art and whaling ritual. In contrast, clusters of faces on more visible outcrops in front of settlements suggested the use of rock art to mark family harvesting areas, perhaps over generations.

Together, these rock art studies illustrated the presence of petroglyph clusters in multiple regions of the Kodiak Archipelago with the potential for meaningful spatial patterning and an antiquity of perhaps 1000 years. They also indicated that representational petroglyphs were the common type of image. The well-documented cupules and cut lines from the Afognak and Portage Rivers remained an anomaly, in part because details of the Portage River cupules had not been published.

Kodiak petroglyph studies also revealed sampling issues. Archaeologists recorded just 18 petroglyph sites between 1917 and 2010, most of them at Cape Alitak. Over the same period, researchers documented hundreds of ancestral settlements (AOHA 2022). Why were so few rock art sites found?

First, purposeful searches for petroglyphs were limited. Apart from Haakanson's detailed study of the Cape Alitak petroglyphs (Haakanson et al. 2012), there had been no research solely dedicated to locating and documenting Alutiiq rock art. Most of Kodiak's petroglyphs were found incidentally (e.g., Clark 1965) or by people who encountered rock art and reported their discoveries to a researcher (Clark 1970:14).

Second, the limited number of petroglyph sites and the lack of formal rock art studies reflect the difficulty of locating Kodiak petroglyphs. This ancestral graphic art

has faded from living memory (Hrdlička 1944:67), leaving limited ethnographic information on their placement, manufacture, and meaning.

Third, most of the known petroglyphs occur in shoreline areas, where daily tides inundate the carvings and scouring by wind and waves soften the images, making them difficult to see (Alaska Packers Association 1917; Clark 1965). Even the well-known Cape Alitak petroglyphs, hammered into granite bedrock, have weathered notably in recent decades (Haakanson et al. 2012:91–92). Rock art visibility is also hampered by the barnacles, shellfish, and marine algae that grow abundantly on Kodiak's rocky shores. At Marka Bay, where Clark (1970) observed about 30 petroglyphs in 1964, rockweed, barnacles, and mussels have now enveloped intertidal boulders, shrouding and disintegrating the artwork. When Clark returned to the site in 1995, he was only able to relocate one image.

The dense cover of organisms disguising coastal petroglyphs is complicated by the archipelago's tectonic history. Geological data illustrate that a great earthquake strikes Kodiak about every 500 years (Saltonstall and Carver 2002). During these major seismic events, the land submerges rapidly. Petroglyphs once above the reach of the tides sink into the intertidal zone or even the ocean, where they are colonized by marine organisms (Steffian and Haakanson 2018:65). Over centuries, as the shoreline rebounds, rising above the reach of the daily tides, the organisms covering the petroglyphs die, making the carvings visible again. For all these reasons, even well-documented petroglyphs can be difficult to locate. Finding previously undocumented carvings is exceptionally challenging.

Finally, the search for Alutiiq rock art has been hampered by expectations. Most of the previously documented petroglyph locales contain images of people, faces, animals, and objects carved into relatively vertical outcrops facing the ocean. As such, archaeologists have looked for similar images in similar locations.

This approach changed in 2016, when Alutiiq Museum archaeologists discovered two sets of cupules on nearly horizontal, low-lying intertidal boulders. Since then, researchers have investigated local reports of cupules, finding most of them credible. This includes carvings in Kizhuyak Bay, Kitoi Bay, Afognak Bay, Paul's Bay, Uyak Bay, two locations along the Portage River, and at Cape Hepburn (Table 3). These finds increased the number of known Kodiak petroglyph sites from 18 to 27 and provided new information on the location and character of Alutiiq rock art.

SITES WITH CUPULES AND CUT LINES

There are now 10 petroglyph sites with confirmed examples of cupules, some with cut lines, in the Kodiak Archipelago (Fig. 3). They include AFG-218, the site in Litnik described by Clark (1970), and nine sites recently documented by Alutiiq Museum archaeologists. Each is described below.²

Throughout this discussion, we refer to *images*, *panels*, and *sites*. An image is an individual rock carving—e.g., a single cupule or cut line. A pair of crossed lines is considered two images. A panel is a group of images that occur together—e.g., seven cupules on a single boulder. A petroglyph site is one or more panels found in a discrete location—e.g., nine petroglyph panels clustered around the mouth of a stream. Thus, a rock art site might include one image on a single panel, or it might hold a complex array of images on multiple neighboring panels.

In recording cupules and cut lines, researchers were careful to differentiate between natural and cultural fea-

tures. The distribution and character of images provided clues. Where there are natural holes in coastal outcrops, they tend to occur on many boulders, reflecting a widespread geological process. In contrast, where petroglyphs are present, multiple images tend to occur on a small number of adjacent rocks. Moreover, human carvings have distinctive features (Fig. 4). Cupules are often dish-shaped, with a rounded bottom. Sometimes, it is possible to see peck marks in these depressions. The surface of the cupule is dimpled from manufacture. In places, there are also natural holes enhanced by pecking. However, the hardness of the underlying bedrock influences the preservation of these marks. Pecking is seldom visible in slate. Similarly, human-made cut lines have a distinctive V-shaped cross section. They are wider at the top of the cut than at the bottom. This distinguishes human carvings from glacial striations that tend to be U-shaped in cross section. Researchers were also careful to note natural holes, as the clustering of holes and cupules may be purposeful. In other words, natural holes may be part of a cultural presentation.

In describing cupules and cut lines, we include the number of carvings observed and summarize data on petroglyph size. These data are estimates. In many cases, the cupules and cut lines were heavily weathered and blended into the surrounding rock. This made it difficult to accurately count and measure the images. Researchers mapped clear carvings and made notes where others might exist. The data presented here are for clear carvings. It is likely that cut lines are particularly underrepresented in our sample as they weather faster than cupules. Similarly, measurements were rounded to the nearest 0.5 cm or even

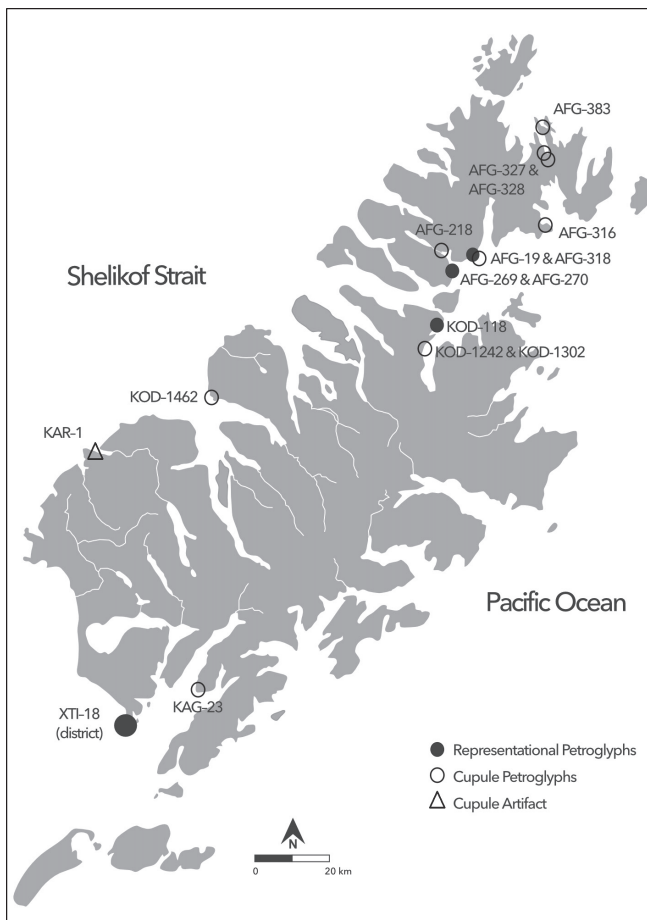


Figure 3. Location of petroglyph sites in the Kodiak Archipelago. Illustration by Amy Steffian.

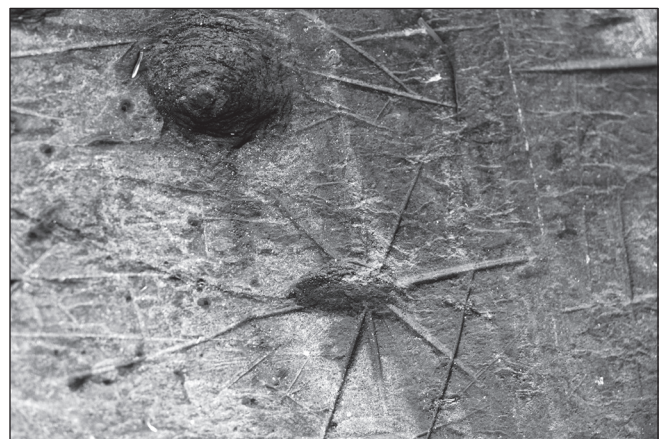


Figure 4. Detail of cupules and cut lines at AFG-218. AM996:432. Photograph by Patrick Saltonstall, 2021. Cupule in upper left is about 2 cm in diameter.

1.0 cm based on the condition of petroglyphs. As such, our data provides a relative view of petroglyph size.

YAAMAT CETRIT (ROCK'S MARKS/LINES/ SCRATCHES/CRACKS), AFG-383

This site contains a set of three petroglyph panels on greywacke boulders (Table 2). The boulders sit in the intertidal area of rocky beach just west of the stream that drains Paul's Lake on the eastern shore of Afognak Island's Perenos Bay. Along the adjacent shore, there is a small settlement likely dating to the Koniag tradition (AFG-32) (Odell et al. 2021a; Saltonstall and Steffian 2018).

The three petroglyph panels range in size from 0.32 m² to 0.7 m² and cluster in an area of 9 m². Panel 1 contains at least 13 cupules (2 to 4.5 cm in diameter) pecked into the face of a relatively flat boulder measuring 75 by 55 cm. Panel 2 includes a single cupule (4 cm in diameter) and at least 80 cut lines on the gently sloped multifaceted face of a boulder (Fig. 5). Some of the lines extend over the edge of the top surface of the rock onto its vertical sides. They vary in depth from a few millimeters to as much as a centimeter. Some of the lines are only a few centimeters long, while others are approximately 20 cm long. Panel 3 contains six cupules (2 to 3 cm in diameter) and two cut lines on the shoreward slanting face of a boulder that measures 40 by 80 cm.

PORTAGE RIVER LAGOON PETROGLYPHS, AFG-327

Portage River lagoon is the place where Clark observed cupule and cut line petroglyphs in 1951 (Clark 1956, 1970,

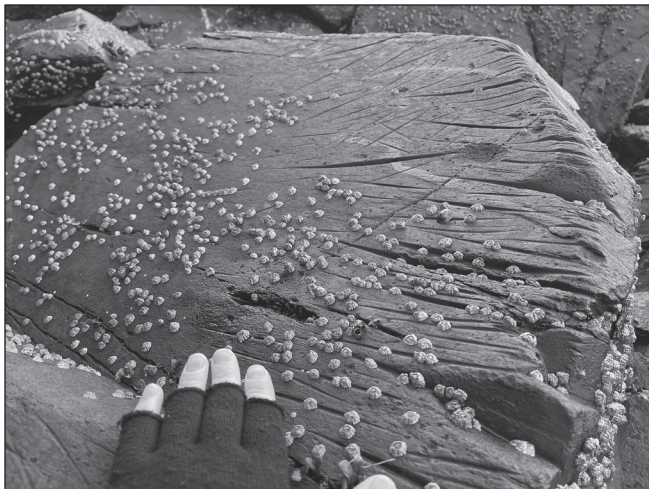


Figure 5. Cupule and cut lines on panel 2, AFG-00383. AM996:662. Boulder is 70 cm across. Photo by Molly Odell.

1979). Here, the anadromous Portage River empties into a shallow lagoon at the head of Discoverer Bay on north-eastern Afognak Island. Along the banks of the lagoon, there is an extensive Koniag tradition settlement. There are older components from the Kachemak and Ocean Bay traditions as well (Steffian and Saltonstall 2019b). In addition to the petroglyphs, Clark (1956:2) noted a string of boulders just above the mouth of the stream. He hypothesized that Alutiiq ancestors placed the stones as part of a fish weir. At the west end of the weir, he described cut marks on one of the boulders (Fig. 6).

Alutiiq Museum archaeologists visited the Portage River lagoon and identified nine panels (Steffian and Saltonstall 2019b) (Table 4). This is the largest cluster of cupule petroglyphs documented to date in the Kodiak Archipelago. They were also able to locate the line of boulders described by Clark (1956). Today these rocks are completely covered in marine algae, and it was not possible to find the cut marks Clark described.

The petroglyphs in the Portage River lagoon are all carved into slate bedrock and boulders. Seven of the panels lie around a small tidal island at the mouth of the lagoon, and two others lie across the lagoon mouth on the opposite shore from the island.

The number of cupules per panel at the Portage River lagoon ranges from five holes to 104, and from just 1 to 17 cm in diameter (Table 4). Only four of the nine panels (excluding those described by Clark) have cut lines, with

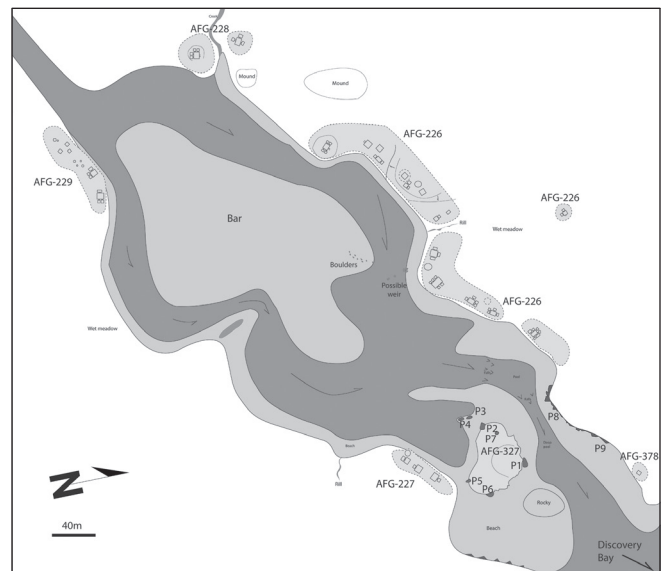


Figure 6. Cultural features surrounding the mouth of Portage River. Illustration by Alexandra Painter. Petroglyph panels are labeled P1 through P9.

Table 4. Summary of petroglyphs panels at AFG-327.

Locus	Rock Size (cm)	Aspect	Slope	Cut Lines	Cupules	Comments
P1	360 x 250	273°N	15°	0	60	Two discrete clusters of cupules on one rock. Eight of the cupules are much larger than others.
P2	615 x 320	280°W	13°	4	26	On a jumble of boulders. Here there are six discrete clusters of cupules, and two discrete pairs of lines.
P3	276 x 167	9°N	8°	2	40	At least three clusters of cupules, perhaps more.
P4	330 x 210	14°N	21°	7	104	Five clusters of cupules. One cluster includes cut lines.
P5	365 x 180	263°W	6°	5	10	Two clusters of cupules.
P6	200 x 200	277°W	19°	0	9	A single cluster of cupules.
P7	320 x 310	284°W	9°	0	13	Fairly flat surface. There are three areas of exposed rock each with a set of cupules.
P8	125 x 75	273°W	16°	0	5	A single cluster of cupules.
P9	75 x 88	288°W	11°	0	5	A single cluster of cupules, including one very large example.

Rock dimensions are maximum length and width of the boulder on which the petroglyphs lie.

the number of lines per panel ranging from two to seven. Some of the cut lines appear parallel, while a set of four lines on one panel cross each other at roughly 90-degree angles, creating two Xs.

The placement of petroglyphs on multiple boulders around the stream mouth, below a settlement, and adjacent to a likely weir, strongly suggests they were part of the cultural landscape of a Koniag fishing village.

PORTAGE WATERFALL PETROGLYPHS, AFG-328

Approximately 1.6 km upstream from the Portage River lagoon there is a small waterfall. A single panel with seven cupule petroglyphs rests on the west bank of the river (Fig. 7), about 25 m from the waterfall. The circular images are carved into slate bedrock and face away from the river. The carvings are relatively large, ranging from 4 to 8.3 cm in diameter, but cover an area of just 95 by 40 cm. A shallow, square depression that may represent a historic structure lies in the woods immediately west. This feature is not likely associated with the petroglyphs (Steffian and Saltonstall 2019b).

YAAMATNI IGARUAT (WRITINGS ON THE ROCKS), AFG-316

AFG-316 is a set of petroglyphs pecked and carved into the slate bedrock of a small islet on the north shore of McDonald Lagoon, near the entrance to Kitoi Bay, on the western coast of Afognak Island's Izhut Bay. Connected to the mainland at low tide, the islet sits near an early Koniag



Figure 7. Cupules on a slate boulder beside the Portage River waterfall (AFG-328), view east-northeast. Boulder is 120 cm across. AM881:263. Photograph by Patrick Saltonstall.

tradition settlement (Odell et al. 2021a). The petroglyphs are well above the reach of daily tides.

The images include cupules, circles, and cut lines spread across a gently sloping outcrop over an area of 120 by 110 cm (Fig. 8). In total there are 66 cupules at the site (2 to 5 cm in diameter), 18 of which sit at the center of a pecked circle. One cupule has two concentric circles around it. This is the only known cluster of cupule petroglyphs in the Kodiak region with circle images, although similar concentric circle designs are recorded on artifacts from both the Kachemak and Koniag traditions (Steffian 2018:58, 111, 115) and on a cupule recorded in Prince William Sound (AOHA 2022). In addition, there are 19

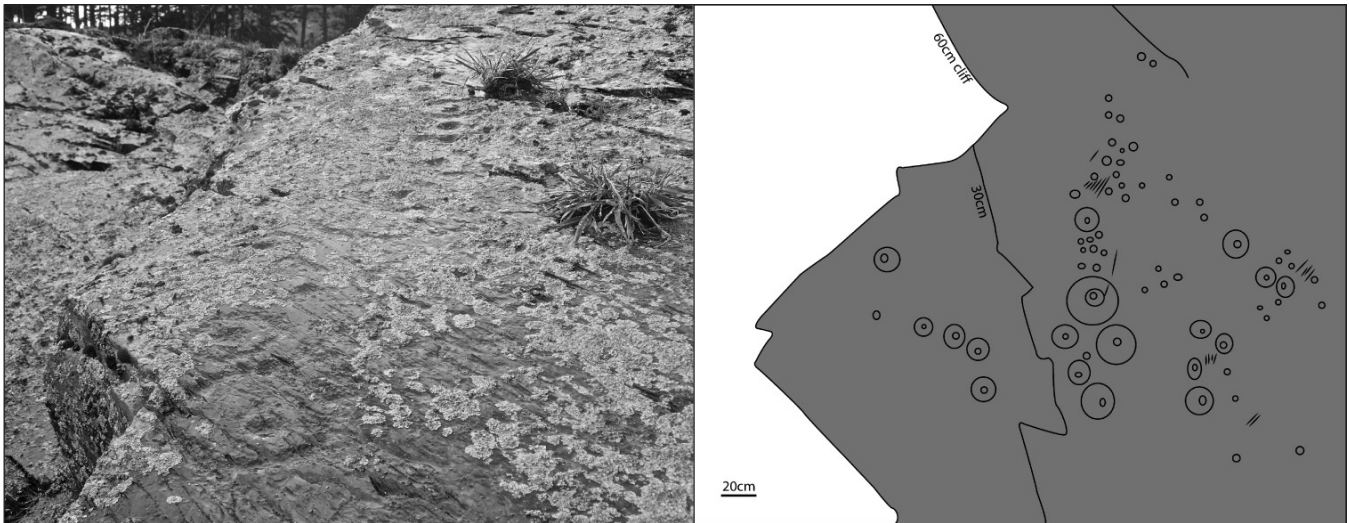


Figure 8. Petroglyphs at AFG-316, AM824. Photograph by Patrick Saltonstall. Illustration by Alexandra Painter.

cut lines at AFG-316. These include three single lines and four groups of two to seven subparallel lines.

KEN'ARTULIM UKINRAT (MARKA BAY'S HOLES), AFG-381

Marka Bay, on Afognak Island's southeast side, holds two distinct sets of petroglyphs. Clark (1970) described a cluster of representational images (AFG-19) on the southwestern shore of the bay. In 2019, the Alutiiq Museum documented one cupule panel (AFG-381) 165 m southeast of the representational glyphs (Odell et al. 2021a). This narrow bay, which largely empties at low tide, is headed by a stream that supports at least three species of salmon as well as Dolly Varden. On the shore near the cupule petroglyphs is an early Koniag tradition settlement. These petroglyphs sit on the top of a slab of greywacke bedrock in the upper intertidal zone. The face of this slate slopes gently toward the land and contains four distinct cupules (3 to 3.5 cm in diameter) and three faint images distributed over an area of roughly 140 by 110 cm.

CUKITAT YAAMASINAMI (HOLES ON THE ROCK), KOD-1242, AND UKINERET (HOLES), KOD-1302

Located in Kizuyak Bay on Kodiak Island's north side, Barabara Cove is a small waterway with a productive anadromous stream at its head. The inner cove is a lagoon-like environment that largely empties at low tide, although water continues to flow through a wide channel in the center of the cove. On both shores of the cove, there are

ancestral Alutiiq settlements dating to the Koniag tradition. Stretching across the channel is a stacked stone fish trap—a feature built by Alutiiq ancestors to trap fish on falling tides (Fig. 9). On the northern end of the trap is a rectangular stacked stone pen, two corners of which are formed by large, immovable boulders (Steffian and Saltonstall 2019a). These features are only visible from above at extreme low tide.

Along the beach on either end of the stone trap are two sets of petroglyphs (KOD-1242 and KOD-1302). On the eastern shore lies one cupule panel (KOD-1242). This slab of low-lying slate bedrock in the intertidal zone contains 17 cupules ranging from 3 to 8 cm in diameter (Fig. 10). The cupules cover much of the slab's face, filling an area of roughly 80 by 150 cm.

On the other side of the channel, the western shore, are two petroglyph panels 50 m apart (KOD-1302). The easternmost of these two panels is a low-lying slate boulder in the upper intertidal. This panel contains 30 cupules, 2 to 15 cm across, and two parallel cut lines. Like KOD-1242, the cupules cover much of the boulder's face, filling an area of about 70 by 100 cm. The other panel occurs on slate bedrock immediately above the mean high tide line. It contains 11 cupules, 2 to 6 cm in diameter. There are two clusters of images spread across the sloping rock face in an area of about 160 by 160 cm. The placement of petroglyphs on either side of a stone fish trap fronting a salmon stream, and below a settlement, strongly suggests they were part of the cultural landscape of a Koniag fishing village.

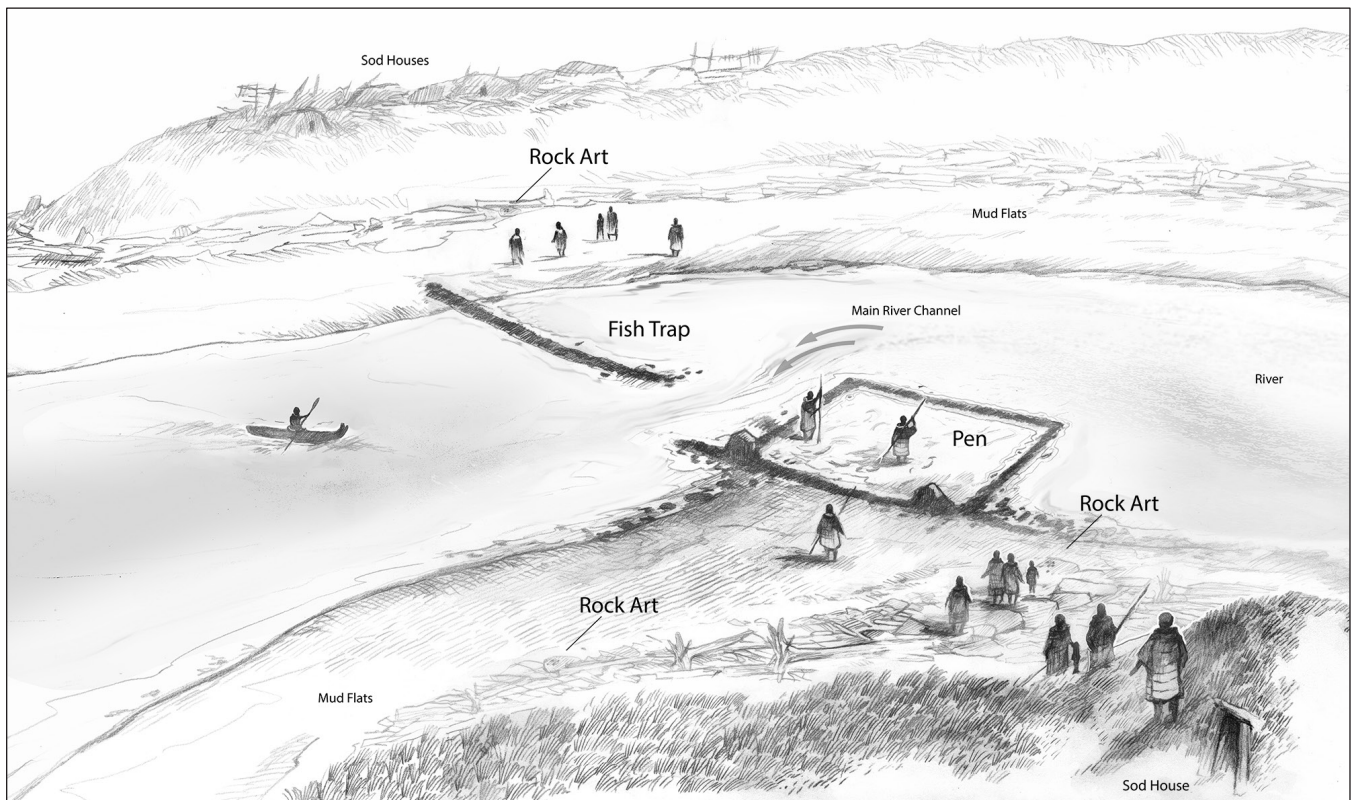


Figure 9. Koniag tradition settlement in Barabara Cove with sod houses, fish trap, and petroglyphs, view south. Illustration by Eric Carlson.



Figure 10. Cupule petroglyphs at AFG-1242, Barbara Cove, Kizhuyak Bay. Boulder is about 2 m long. AM824. Photograph by Patrick Saltonstall.

NUNALLEM YAAMAA (OLD VILLAGE'S ROCK), KOD-I462

KOD-1462 is a granite boulder with numerous cupules that lies in Chief Cove on the north shore of Uyak Bay on Kodiak's Island's western coast. The boulder, which measures approximately 2 m by 3 m and stands about 1.5 m tall, sits in the intertidal zone on a small pocket beach directly in front of a very large multicomponent village site (KOD-171) with both Kachemak and Koniag tradition deposits. All the exposed surfaces of the rock have cupules. Many of them appear to have been pecked, although at least one looks like a natural indentation. While briefly visited, this cupule site remains to be fully documented (Odell et al. 2021b).

WAAYAM YAAMAA (CAPE HEPBURN VILLAGE'S ROCK), KAG-23

KAG-23 is a large granite boulder with numerous cupules located in the upper intertidal zone on the beach just below the remains of a Koniag tradition village site (KAG-26) at Cape Hepburn on southern Kodiak Island (Odell et al. 2021b) (Fig. 11). The bedrock in this area

is a mix of greywacke and slate, but numerous granite boulders are scattered across the sand and gravel beach. In 2019, only one boulder was found to have cupules, although a picture provided to the Alutiiq Museum suggests there may be a second, smaller granite boulder with 5 to 8 cupules.

The cupule-covered boulder documented at Cape Hepburn is partially buried in the sand and stands 1.5 m tall with at least 63 cupules on its top, relatively flat surface. The carvings fall on the southern half of the rock, on the top side. The cover and area of about 200 by 240 cm and range from 2 to 7 cm in diameter. Unlike some of the cupules found in slate and greywacke, these holes do not have sharp, distinct edges. This difference in appearance reflects the character and weathering of the rock.

KAR-I ARTIFACT

During salvage excavation at Karluk One, a Koniag tradition village at the mouth of the Karluk River, the crew found a small boulder with cupules (Steffian et al. 2015:313). Lying on the beach by the site, this water-rounded piece of greywacke has 13 depressions pecked into one surface, ranging from 2.2 to 7.0 cm in diameter (Fig. 12). In addition, it has one natural hole encircled by a pecked depression. It is not clear whether this rock was an outdoor object left on the beach or if it eroded from the site. The piece is heavy but portable. It is 43 cm long,

23 cm wide, and 19 cm high. Whatever its intended function, the pits in the surface of the stone are small, pecked, roughly circular, and round-bottomed, very similar to the cupules observed in petroglyph sites.

There is no other artifact like this in the Alutiiq Museum's large archaeological collections. However, during excavations at the Uyak Site (KOD-145), a large multicomponent settlement in Uyak Bay, Hrdlička encountered sizable stones with holes. While uncovering a very large, centrally located structure interpreted as a *qasgiq* (community house) (Heizer 1956:17), Hrdlička's crew unearthed at least two of these stones. He interpreted these objects as crude carvings of faces and dubbed them granduncles. He wrote, "A couple of 'granduncles'—natural stones, modified somewhat, resembling faces, found near kazim . . . used doubtless in some plays or ceremonies" (Hrdlička 1944:177). A photo of these pieces shows two rocks with oval to circular holes, but it is not clear how they were modified. However, they are additional examples of rocks with multiple, roughly round indentations found in a Koniag tradition context.

DISCUSSION

Together, the data on cupules and cut lines illustrate patterns in their manufacture, character, and distribution and hint at the age of this style of petroglyphs.

MANUFACTURE

The techniques used to make cupules and cut lines reflect Alutiiq manufacturing industries with ancient roots (Saltonstall et al. 2021). Craftspeople created both cupules

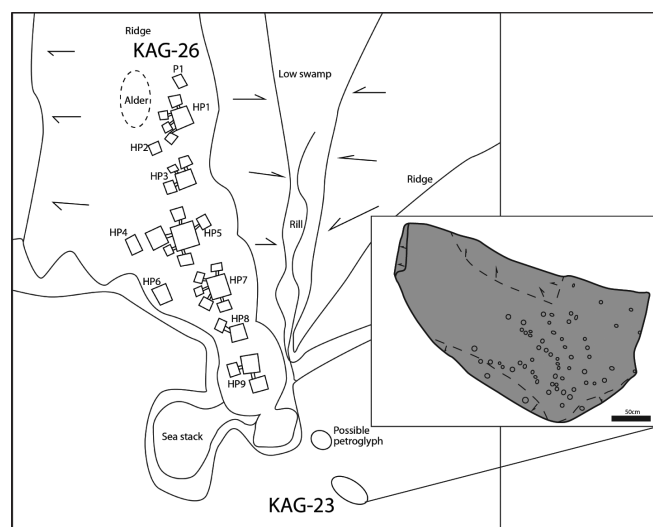


Figure 11. Map of KAG-26 settlement and drawings of cupule-covered boulder at Cape Hepburn (KAG-23). Illustrations by Alexandra Painter.



Figure 12. Pecked boulder, 43 cm long, from KAR-1. Koniag, Inc. Collection, AM193.94.1984. Photograph by Pam Foreman.

and representational petroglyphs by pecking. There is no evidence of surface preparation, only that people hammered designs into relatively smooth, waterworn stone to create impressions. This process removed flecks of material and left tiny pits. Although many of Kodiak's cupules are worn by exposure to water, waves, and wind, some still display pecking marks. Experiments by Haakanson (2018) suggest that petroglyph makers used two stones: a hammerstone to drive a pecking stone. They also indicate that pecking is time-consuming. It is physically difficult to create a design or shape an object by hammering. Each cupule took time to make, especially those pecked into hard stone like granite.

As a manufacturing technique, pecking dates back thousands of years to the Ocean Bay tradition (Saltonstall et al. 2021). Early artifact assemblages from the Kodiak region include sinkers for marine fishing made by pecking a groove into a water-rounded cobble. More recent assemblages hold an array of pecked tools ranging from stone adzes and mauls with pecked hafting grooves to pecked stone lamps and even three-dimensional stone sculptures. In the Late Kachemak tradition (700 BC to AD 1300), pecked stone artistry flourished. At this time, craftspeople produced a variety of intricately decorated pecked stone lamps. Some examples have sunken motifs, including circular cupule-like depressions, resembling Kodiak petroglyphs (Heizer 1956:32; Hrdlička 1944:303). Others have sculptural elements that appear in relief. Most pecked objects were made on hard, waterworn cobbles of greywacke, granite, and schist, although craftspeople also shaped sandstone by pecking. In short, this shaping technique is widely represented in ancestral Alutiiq tool assemblages. It is typically associated with heavy stone pieces made from hard materials, and it was used to shape both common implements and unique pieces of artwork. The proliferation of stone pecking after about 2700 years ago, and its use in creating artwork, suggests petroglyphs are aligned with the later millennia of Alutiiq history.

Like cupules, cut lines were likely made with common cutting tools, especially cobble spalls. Found in assemblages throughout Alutiiq history, these large, sharp-edged flakes were knocked off greywacke beach cobbles to create utilitarian knives. Archaeologists believe that craftspeople used these knives to work slate. By scoring deep grooves into a leaf of slate, a toolmaker could break the material along the cut to create long, narrow lengths of stone for shaping and sharpening. Like cut-line petroglyphs, artifacts documenting slate working have cut lines

with V-shaped cross sections. Cobble spalls and perhaps flakes of chipped stone were also used to incise lines into the surface of slate lances to create makers' marks. Cut lines are also present on pecked stone objects. For example, lamps from the Uyak site have cut lines on their bowls and rims (Heizer 1956:131–132, 141). Like pecking, cutting and incising stone are widespread, long-used techniques, and they were sometimes paired (Steffian and Saltonstall 2018:65).

CHARACTERISTICS

Comparisons of the cupules documented in Kodiak rock art sites highlight some shared characteristics. The great majority are round or roughly round. Only a few cupules are distinctly oval. The images are highly redundant. Craftspeople carved the same design repeatedly. The carvings typically occur in groups of 13 or fewer, but there are examples with 60 or more depressions on a single panel.

The cupules are small and designed to be viewed up close. The 507 measured cupules in our sample range from 1 to 17 cm across with a mean diameter of 4.13 cm. Similarly, a review of cupule sizes for individual panels illustrates that individual site groupings have mean diameter values ranging between 2.5 and 8.5 cm and clustering around 4.5 cm (Table 5). In short, the distribution of cupule sizes is heavily skewed. It is dominated by small and medium-sized depressions. Large depressions, those over 10 cm, are just 1% of the sample. Individual representational petroglyphs tend to be much larger and visible from a distance.

This observation is reinforced by the placement of many cupules on nearly horizontal surfaces that face upward or slope gently, often away from the water. Some are low-lying and in areas inundated by daily tides. This is distinct from many of the representational petroglyphs. At places like Cape Alitak, carvings of faces, animals, and people face the water and are relatively easy to see from a distance. When they were first pecked, they likely stood out from the parent rock distinctly. In contrast, cupules feel private, perhaps even intended to be underwater at times. Despite this difference, the cupules are similar in size and shape to the circular carvings used to represent eyes and labrets in representational petroglyphs. Both types of petroglyphs have small, round carvings.

Cupule depressions are typically shallow. They range from a tenth of a centimeter to as much as 6 cm deep. The 402 cupules measured have a mean depth of 1.1 cm.

Table 5. Cupule size data.

Site	Location	Cupules	Mean Diameter (cm)	Diameter Range (cm)	Mean Depth (cm)	Depth Range (cm)	Rock Type
AFG-383 Panel 1	Paul's Bay near stream mouth	13	3.23	2.0–5.5	1.4	1.0–2.0	Greywacke
AFG-383 Panel 2	Paul's Bay near stream mouth	1	4.0	4.0	2.0	2.0	Greywacke
AFG-383 Panel 3	Paul's Bay near stream mouth	6	2.50	2.0–3.0	1.3	0.5–2.0	Greywacke
AFG-327 Panel 1	Portage River lagoon	60	4.90	1.5–12.5	1.8	0.5–6.0	Slate
AFG-327 Panel 2	Portage River lagoon	26	4.60	2.0–8.0	1.0	0.2–3.0	Slate
AFG-327 Panel 3	Portage River lagoon	40	3.90	2.0–6.0	0.6	0.2–1.7	Slate
AFG-327 Panel 4	Portage River lagoon	104	3.56	1.0–9.0	0.9	0.1–3.0	Slate
AFG-327 Panel 5	Portage River lagoon	10	4.60	3.0–6.0	0.7	0.2–1.1	Slate
AFG-327 Panel 6	Portage River lagoon	9	4.30	2.0–6.0	1.6	0.5–4.0	Slate
AFG-327 Panel 7	Portage River lagoon	13	4.03	2.0–6.0	0.6	0.1–1.0	Slate
AFG-327 Panel 8	Portage River lagoon	5	5.40	3.5–6.5	1.4	0.2–3.0	Slate
AFG-327 Panel 9	Portage River lagoon	5	8.50	5.0–17.0	2.7	1.5–5.1	Slate
AFG-328	Portage River waterfall	7	5.90	4.0–8.3	2.4	1.0–5.0	Slate
AFG-316	Kitoy Bay	67	2.84	2.0–5.0	–	–	Slate
AFG-381	Marka Bay near stream mouth	7	3.29	3.0–3.5	–	–	Greywacke
KAR-1	Artifact from river mouth	12	4.50	2.2–7.0	0.8	0.2–2.0	Granite
KOD-1242	Barabara Cove near stream mouth	17	5.76	3.0–8.0	1.2	<1.0–3.0	Slate
KOD-1302 East Panel	Barabara Cove near stream mouth	11	4.36	3.0–6.0	0.91	<1.0–2.0	Slate
KOD-1302 West Panel	Barabara Cove near stream mouth	30	3.82	3.0–12.0	1.85	<1.0–5.0	Slate
KAG-23	Cape Hepburn, bay entrance	63	4.33	2.0–7.0	0.86	0.5–2.0	Granite

Most are not deep indentations but gentle surface depressions. However, in comparison with representational petroglyphs, cupules are deeply carved. At Cape Alitak the least weathered representational petroglyphs ranged from just 0.3 to 0.7 cm deep (Haakanson et al. 2012:67). Interestingly, a comparison of cupule dimensions and rock type produced no statistically meaningful relationship. The underlying material does not appear to influence cupule size in this sample.

Cupules seldom overlap. Although a few of the depressions recorded at AFG-218 touch (see Fig. 1), most of the recently recorded cupules are separated by at least a centimeter of uncarved space. They are discrete holes. The depressions were not intended to outline an image but were made as individual carvings. They are meant to represent circular holes. However, on some panels, the carvings are clustered. At AFG-327 several panels have groupings of cupules and cut lines in spatially discrete areas. Groups of images, the large number of cupules on some panels, and the careful manufacture of these carvings suggest that they were made during repeated site visits.

Cupules are the central, defining feature of this type of rock art, and cut lines are a secondary feature. Only 60% of cupule sites contain cut lines, and no site found to date has only lines. Where present, the number of cut lines varies dramatically. Some sites, like AFG-383 and AFG-218, have many more cut lines than cupules. At one extreme, two panels on the Afognak River (AFG-218) have over 800 cut lines (see Table 2). At the other, a Barabara Cove panel has just a pair of cut lines (KOD-1302). Cut lines are present in slate and greywacke boulders, but they have not been observed in harder granite.

Like the cupules, the cut lines in our data set tend to be small. They are short and shallow, up to about 20 cm long, and no more than a centimeter deep (Table 6). These lines occur among the cupules and typically cluster with the depressions. Often, the lines on a panel trend in a general direction. Unlike the cupules, which tend to be spatially discrete, cut lines sometimes intersect other lines or cupules (see Fig. 4). In some instances, at AFG-218 and AFG-327, cut lines form an X or an asterisk (see Fig. 1).

Table 6. Cut line size data.

Site	Location	Lines	Mean Length (cm)	Length Range (cm)	Rock Type
AFG-383 Panels 2 & 3	Paul's Bay near stream mouth	82	–	2.0–20.0	Greywacke
AFG-327 Panels 2–5	Portage River lagoon	18	12.4	4.0–20.0	Slate
AFG-316	Kitot Bay, bay entrance	19	8.0	3.0–15.0	Slate
KOD-1302 West Panel	Barabara Cove near stream mouth	2	15.0	12.0–18.0	Slate

DISTRIBUTION

The time and labor needed to make cupules, and the presence of multiple carvings at individual sites, indicate that they were purposefully placed. They represent a cultural practice tied to ancestral uses of the landscape. Based on the presence of multiroomed structure depressions, incised pebbles, and dense concentrations of fire-cracked rock, 9 of the 10 cupule sites lie adjacent to Koniag tradition settlements (Table 7). The one exception is the single panel beside the Portage River waterfall, the only inland example of a petroglyph. Many of these settlements have older components, but their most recent occupation dates to the centuries preceding European conquest. While this is not definitive evidence of an association between cupules and the Koniag tradition, it is intriguing and broadly supported by other settlement data.

Cape Alitak's representational petroglyphs tend to occur beside Kachemak tradition settlements. Moreover, the three representational petroglyph sites in Afognak Bay and Marka Bay lie near settlements tied to the Late Kachemak tradition (Steffian and Haakanson 2018:65). If petroglyphs are cultural features of ancestral settlement, representational petroglyphs appear to be affiliated with the end of the Kachemak tradition and cupule sites with the Koniag tradition. This suggests that cupules are less than about 700 years old.

Additional survey work is needed to better understand the distribution of cupules. As noted above, the known sites reflect the few areas carefully studied. However, the cupules documented to date occur in two distinct geographic settings. Seventy percent of cupule sites lie beside or very near Pacific salmon streams. All these streams are lake-headed and support multiple species of anadromous

Table 7. Cupule site distribution.

Cupule Site	Location	Adjacent Koniag Tradition Settlement	Salmon Stream	Fish Species Present	Cut Lines Present
AFG-383	Paul's Lake stream, near stream mouth	Yes	Yes	Chum, Coho, Pink, Sockeye, Dolly Varden, Steelhead	Yes
AFG-327	Portage River lagoon, around river mouth	Yes	Yes	Chum, Coho, Pink, Sockeye, Dolly Varden, Steelhead	Yes
AFG-328	Portage River, beside inland waterfall	No	Yes	Coho, Pink, Sockeye	No
AFG-316	McDonald Lagoon, near Kitot Bay entrance	Yes	No	–	Yes
AFG-381	Marka River, near river mouth	Yes	Yes	Chum, Coho, Pink, Dolly Varden	No
AFG-218	Afognak River, intertidal area of river mouth	Yes	Yes	Chum, Coho, Pink, Sockeye, Dolly Varden, Steelhead	Yes
KOD-1242	Barbara Cove, near stream mouth	Yes	Yes	Chum, Coho, Pink, Sockeye, Dolly Varden, Steelhead	Yes
KOD-1302	Barbara Cove, near stream mouth	Yes	Yes	Chum, Coho, Pink, Sockeye, Dolly Varden, Steelhead	Yes
KOD-1462	Chief Cove, Uyak Bay entrance	Yes	No	–	No
KAG-23	Cape Hepburn, Deadman Bay entrance	Yes	No	–	No

fish that return from early summer into the fall (Table 7). These are not the largest, most productive streams in the archipelago, but they are regionally important salmon harvesting locales. They are places where salmon are dependably present in quantity and where the first fish of the season can be intercepted. The link between cupules and barrier fishing structures strengthens their association with salmon fishing. Cupule sites occur on both sides of the large, intertidal, stacked stone fish trap in Barabara Cove, near the mouth of the area's most productive anadromous stream. In Portage River lagoon, cupules occur just below, and possibly on (Clark 1956), the remains of a stone wall that was likely a weir. They are also present in areas where natural features encourage fish to pool. This includes the inner shore of the Afognak River estuary at Litnik and near the waterfall on the Portage River. In short, this group of cupule sites appears tied to productive salmon streams and prime, seasonally significant fishing locations.

In addition to stream mouths, cupule-covered boulders occur at bay entrances. In three locations cupules lie on prominent boulders or on bedrock between the ocean and a sizable settlement. These villages represent places of long-term, multiseason residence and bases from which people pursued a variety of resources. From these locations, people could have watched for sea mammals entering the bays and accessed marine fish and birds returning to coastal waters in the spring. The number of cupules at these locations is large, ranging from 63 to over 100. This quantity likely reflects the intensity of occupation, either in the number of people present or the duration of settlement. This issue requires further evaluation. However, it supports the idea that there were repeated episodes of rock art manufacture at specific locales.

Although Alutiiq cupules are best known from the Kodiak Archipelago, there is an example from Prince William Sound (COR-311). Near the entrance to Constantine Harbor on Hinchinbrook Island, archaeologists recorded a single cupule in the center of an "engraved" circle (AOHA 2022). This carving is remarkably like the Kodiak carvings in construction and placement. The cupule is small and shallow, 2.5 cm in diameter and 3.3 cm deep. The roughly circular line around the cupule is about 18 cm in diameter and maximally 1.4 cm deep, within the size range of the Kitoi Bay pecked circles (AFG-316). And like many Kodiak examples, the petroglyph lies near the entrance to a small bay, at the water's edge, and may have been submerged at high tide. With more research, cupule petroglyphs may prove to be more

widely present in the Alutiiq world and part of a regional rock art tradition.

INTERPRETATION

Cupule petroglyphs are found around the globe among many cultures. They are recorded on every continent except Antarctica, were made for hundreds of thousands of years, and reflect an enormous diversity of cultural beliefs and practices (Bednarik 2001, 2010a, 2010b; Hector 2009; Whitley 2011). Despite their widespread manufacture and use, ethnographic information on cupules is very limited and culturally specific (Bednarik 2010a:113). There is no overarching explanation for their creation. In a review of the available data, Bednarik (2010b:67–69) recognizes 11 general categories of cupule use that fall into two broad groups. One group reflects the use of cupules as tools—for holding items, playing games, grinding, keeping records, and making maps. Another group reflects ties between cupules and ritual practices—the use of the depressions to make offerings, generate luck, perform rites, and share symbols.

The strongest ethnographic evidence links cupules to the expression of Indigenous ontologies (Bednarik 2010b; Hector 2009). Such carvings were often made and used for activities that affirmed and reconstituted the structure of the world and the place of people within it. This includes carvings made by ritual specialists. For example, in California, Indigenous shamans created rock carvings to control the weather and perhaps encourage salmon runs. They made cupules to bring rain and wind and incised lines to generate snow during rituals that supported future resource abundance (Parkman 1986:249).

The expression of Indigenous ontologies also includes examples of more routine cupule manufacture by individuals expressing and reaffirming their connections to the universe. For example, Native Hawai'ian families repeatedly carved cupules, adding one for each newborn child and using the small indentation to hold the infant's *piko* (umbilical stump). This act created an enduring record of each family member, linked every child to their ancestral lands, and encouraged blessings for a long, prosperous life from their *mana* (guiding spirit energy) (National Park Service 2021). The cupules helped to affirm each baby's place in the Hawai'ian world. In this and other well-documented ethnographic examples (Bednarik 2010a), cupules represent material expressions of Indigenous perceptions. As Hector (2009:68) notes, "The spiritual aspects of

existence are inextricably connected to the mundane places of daily activity in traditional culture; this is reflected in the use and modification of the physical environment or landscape.” With the help of ethnographic data, Alutiiq cupules can be viewed through a similar lens.

Discussions with Alutiiq people in the early twentieth century indicated that while the Cape Alitak images were known,³ petroglyph manufacture had faded from living memory (Alaska Packers Association 1917:320; Heizer 1947:288; Hrdlička 1944:67). However, in 1872, French anthropologist Alphonse Pinart recorded an immovable, whale-shaped rock on the shore of Spruce Island (Wallace 2007:114–115). According to Pinart, the rock was culturally significant and modified. It had bulging rock eyes and holes on either side of its head. Pinart reports that Alutiiq hunters removed the rock’s eyes to use as talismans. They altered the stationary boulder to harness its power for hunting. Decades later, Frederica de Laguna spoke to two Kodiak Alutiiq men while researching Prince William Sound pictographs. The men reported that hunters made rock paintings to represent the game they harvested and to bring hunting luck (de Laguna 1956:105). Similarly, a Chugach Alutiiq informant told Kaj Birket-Smith (1953:34) that whalers painted pictures of animals in secret places for luck.

Why might rock art be linked to harvesting success? In the Alutiiq world, animals are people (Golder 1907). They are sentient beings, nonhuman persons that are aware of and responsive to human action. This consciousness is described as their person, an internal being known in the Alutiiq language as a *suk* or *sua* (plural *sui*), or literally “its person” (Crowell and Leer 2001:194). Animals give themselves to humans who act correctly. Harvesters must treat animal bodies appropriately from the moment of harvest through the cycle of use. Animals don’t stop being aware of human actions at death, and they retain agency. When an animal dies, its *sui* survives. Proper treatment of an animal’s body pleases its *sui*, which then allows its soul to be reborn (Birket-Smith 1953:120, 123). Therefore, people can directly influence the availability of fish and game and the future prosperity of their communities. This relationship between human and nonhuman persons requires regular demonstrations of respect. Hunters painted their kayaks with talismans (Wallace 2007), dressed neatly, carried amulets, and sang animal songs to attract fish and game (Birket-Smith 1953:32–33, 118). Moreover, they followed rules for butchering and disposing of animal parts to ensure reincarnation (Birket-

Smith 1953:27). Newly killed whales and sea otters received a drink of fresh water (Birket-Smith 1953:34). Similar proscriptions extended to the behavior of hunters’ family members and the use of animal products. In short, Alutiiq people commonly performed small sacraments to maintain their relationships with animals. Robert Losey (2010) and Erica Hill (2011) demonstrate that such rituals can generate material evidence visible in the archaeological record—amulets, unique assemblages of animal remains, and even patterns in the treatment of fish traps. Alutiiq cupules may be another example.

The repeated creation of circular petroglyphs is intriguing. Circles appear widely in ancestral Alutiiq art, where they represent the Alutiiq universe, are symbols of vision, and act as passageways between the human and nonhuman worlds (Drabek 2018:182–183). Alutiiq ancestors conceptualized the universe as multilayered with sky worlds and undersea worlds. At the center of this universe lay *Llam Sua*, the supreme, all-seeing being. Graphically, artists represented the universe as a set of concentric circles known as *Llam Ingala*, the eye of the universe. In its most abstract form, *Llam Ingala* appears as a circle or a circle with a dot in the center. Circle designs were used on labrets, harpoons, baskets, painted designs, tattoos, rattles, masks, and even in the tiered construction of Alutiiq clothing (Steffian 2018). The repeated use of this motif affirmed the structure of the universe, enhanced vision (the ability to see deeply and beyond the obvious) and reminded people of the forces that shaped life. One of these forces was the recycling of souls.

Circles are holes through which the souls of animals can pass into the spirit world. Perhaps cupules provided a pathway for the souls of harvested fish, sea mammals, and birds to move between worlds so they could be reborn. Importantly, the places cupules appear, beside salmon streams and bay mouths, are the locations where animals were removed from their home in the water and butchered, the first step in recycling their souls. Riverbanks and beaches were places of significant transition for nonhuman persons. Here, cupules may have provided a pathway to the next realm, supported and affirmed by their repeated creation. At many locations, the rock art is underwater at high tide, visible to ocean creatures. This placement may have enticed animals to give themselves to people by demonstrating the presence of a pathway and the intent of harvesters to support souls in transition.

John William Norder (2018:73–75) argues that rock art is a form of communication, and he notes that redun-

dancy in rock art imagery increases the clarity of intended messages. The repeated use of circular cupules, at multiple sites and with large numbers of carvings, highlights the importance of the design. Alutiiq harvesters pecked permanent circular designs into the shoreline of important harvesting, butchering, and living locales. Over and over, they marked the landscape with the widely recognized cultural symbol of the cosmos, expressing and reconstituting the structure of their world.

This relationship between cupules and harvesting is especially evident in their association with anadromous streams. The presence of many cupules below ancestral settlements and adjacent to barrier fishing structures suggests the petroglyphs were part of the built environment of Koniag tradition fishing sites. Interestingly, small, portable, incised stones with cupule and cut-line-like designs have been found in Koniag tradition settlements beside the anadromous Buskin, Kizhuyak, and Karluk Rivers (Fig. 13; Righter and Jordan 1980:146; Steffian et al. 2015:298).

But what about the cut lines? In Alutiiq tradition, butchering releases an animal's soul. Cut-line petroglyphs could symbolize this process. According to Alutiiq tradition, the souls of fish and birds lived in their guts. Once captured, these animals' intestines were removed and returned to the water to help produce more fish and birds (Birket-Smith 1953:39, 42). Other animal souls were released from other body parts to support reincarnation. Harvesters buried bear skulls at kill sites, facing inland. They dropped otter skulls into the ocean or buried them on land, depending on the location of the kill (Birket-Smith 1953:27, 33, 38). Perhaps cut-line petroglyphs represented the release of animal souls and cupules provided a pathway to the next stage of life.

Cupules may also represent a family's ancestral ties to harvesting areas expressed through the reincarnation of human souls. In the Alutiiq world, human souls are reincarnated five times before their fifth and final death (Desson 1995:56). In addition to providing a pathway for animal reincarnation, cupules may have supported the transition of human souls. A possible connection between circular rock art and the veneration of ancestors appears in an early nineteenth-century ethnographic account.

A summary of a winter festival held in an Alutiiq *gasgiq*—a community house—describes the use of a painted rock in a ceremony honoring an ancestor. This object may resemble the pitted boulders from Karluk One and the Uyak site. “In this spot there was also a stone with red spots painted on it, representing the burial place of one

of their number considered to be famous, in whose honor the performance was taking place” (Davydov 1977:107–108). This performance also combines rock art, spots (circles?), and a place for the dead. It also suggests a link between circular artwork, the passage of people into the spirit world, and, by extension, the rebirth of human souls.

In sum, Alutiiq ethnographic data reveal some possible meanings of cupule petroglyphs. These small, frequently repeated carvings appear in key resource-harvesting locales, typically as part of the cultural landscapes of village sites. The use of a round motif, a well-recognized symbol of the circular cosmos and movement between its multiple layers (Crowell and Leer 2001:198; Steffian 2018:136) in places where animals were brought to shore and butchered suggests that the carving may represent passageways. We suggest that the creation of these small depressions was one of the many ways that harvesters continuously negotiated their relationships with the animals essential to human existence. It is not surprising that these carvings occur in places where generations of Alutiiq people lived and died. In the Alutiiq worldview, the differences between people and animals are indistinct. Cupules may have also supported human reincarnation and maintained important connections with ancestors. We suspect that this form of Kodiak rock art is more common than previously recognized and that it will continue to be found in the places where Alutiiq ancestors interacted regularly with animal persons and expressed their connections to ancestors and traditionally used harvesting areas.

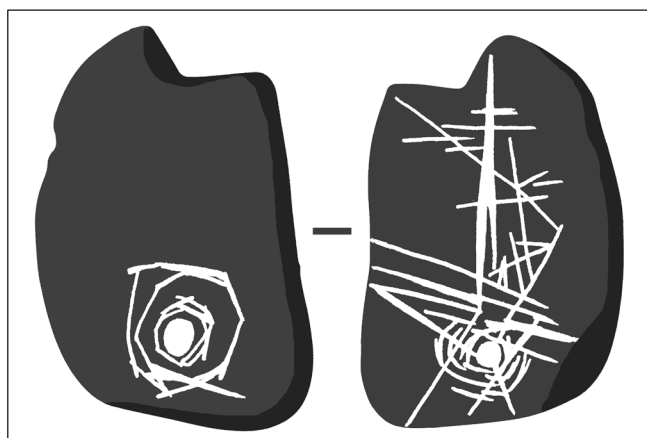


Figure 13. Stone with circles and slashes incised on both faces around a carved hole. Outlet site, KOD-561, Buskin River. U.S. Coast Guard Collection, AM327:8544. Stone is 7.5 cm long. Illustration by Eric Carlson from a drawing by April Laktonen Counciller.

NOTES

1. Although pictographs are the predominant form of rock art in the Cook Inlet and Prince William Sound regions of the Alutiiq world (Baird 2006; de Laguna 1956:102–109; de Laguna 1975; Fagan 2008; Klein 1996), they have yet to be found in the Kodiak region (Odell et al. 2021b). There are also additional unconfirmed reports of Kodiak petroglyphs that are not included in this summary.
2. Some of the sites discussed here have Alutiiq names. These names do not represent long-recognized place names. Rather, they are newly coined terms created by elder Alutiiq speakers for the museum's technical reports. They extend the privilege of naming ancestral properties to Native elders, promote the use of Alutiiq terms for Alutiiq cultural properties, express the connections people feel to these properties, and support the use of the Alutiiq language (Counciller 2015:347). This process connects the living language and culture of the Alutiiq people to ancestral settlements whose histories are beyond modern memory. For two sites, AFG-381 and KAG-23, traditional place names were used in developing a name for a petroglyph site in the same general location.
3. Just one Alutiiq place name explicitly describes a rock art site. Alutiiq speakers Julia Naughton and the late John Pestrikoff report that the representational petroglyphs at Afognak (AFG-270) are known as *mingullenguat*—small old smeared/rubbed things (Native Village of Afognak 2023). One additional Alutiiq place name refers to the area at Cape Alitak that holds Kodiak's largest cluster of representational rock art sites. The late Ephraim Agnot (1990) reported that this place is known as Aluwaqlit, “place where you go to frown.” At present, there are no recorded place names for cupule petroglyph sites or the locales where they occur.

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