

# JPS

The Journal  
of the  
Polynesian Society

VOLUME 125 No.3 SEPTEMBER 2016

*Special Issue*

CEREMONIAL ARCHITECTURE IN  
EAST POLYNESIA: DEVELOPMENT  
AND VARIABILITY

THE POLYNESIAN SOCIETY  
THE UNIVERSITY OF AUCKLAND  
NEW ZEALAND



# CEREMONIAL ARCHITECTURE AND THE SPATIAL PROSCRIPTION OF COMMUNITY: LOCATION VERSUS FORM AND FUNCTION IN KAUPŌ, MAUI, HAWAIIAN ISLANDS

ALEXANDER BAER  
*Pacific Legacy, Inc.*

In the early 20th century, archaeologist and ethnographer Winslow Walker travelled throughout the island of Maui recording the names, histories and architectural features of prominent sites (Sterling 1998, Walker 1930). In conjunction with the early ethnohistories of Kamakau (1992) and Fornander (1996), these studies revealed that by the time of European contact in 1778, the arid, southeastern district (*moku*) of Kaupō had become central to the island's political rule. Home to the Maui kings, Kaupō featured a large population, numerous ritual sites and repeatedly served as a battleground in the wars between polities of Maui and Hawai'i Islands (Baer 2015, Fornander 1996, Kamakau 1992). Archaeologically, we see evidence for massive socio-political infrastructure in the form of an intensified field system, extensive residential sites and ritual architecture distributed throughout the district. However, through the integration of recent surveys with the information collected by Walker, we are presented with a striking pattern of monumental constructions bounding the edges of the district. This paper explores how the network of large ceremonial structures was consciously built to proscribe a uniquely productive agricultural region, effectively creating the community of Kaupō within a series of monumental sites. In contrast, smaller ritual sites in the region's interior indicate that for many structures, their location on the landscape was the primary factor in determining both form and function.

## KAUPŌ AND THE RISE TO POWER

In the leeward southeast of Maui, Kaupō was one of 12 semi-autonomous political districts. Prior to unification of the island by Kiha-a-Pi'ilani in the 16th century, each district featured its own internal socio-political organisation. Recent work has demonstrated that Kaupō, beginning early in its settlement sequence, was administered from the small area of Mokulau on the southeastern edge of the district (Baer 2015). By the arrival of Captain James Cook in 1778, paramount rulers had come to control entire islands, installing their own supporters as the heads of various districts. At this time, Kaupō served as one of the main administrative centres on the island, and was a highly productive agricultural region of political and economic

significance. This prominent role belies its relatively late development, however, as ethnohistoric sources make virtually no mention of the *moku* until the early 18th century, when Maui's King Kekaulike moved his entire royal court from the traditional seat in Nawaieha to Kaupō (Kamakau 1992). With this move, however, the district became central to the power struggle between the polities of Maui and Hawai'i, resulting in numerous battles on the broad, gentle slopes of the district.

While Kaupō's role in the ongoing wars between Maui and Hawai'i is demonstrated through numerous battles described in oral traditions (Fornander 1996, Kamakau 1992), increasing references to the district's developing agronomic and socio-political control systems are also evident (Maunupau 1998). Recent excavation and dating of monumental structures throughout Kaupō indicate a phase of *heiau* 'temple' construction from the mid-16th to 17th centuries (Baer 2015). By the arrival of King Kekaulike in the early 1700s, the region was home to dozens of ritual sites, generally located along the outer edges of a zone of intensified dryland agriculture. In oral traditions, Kekaulike is credited with expanding this emergent ritual network through both the creation of massive new structures and the enlargement of previously built temples. Among these are the war temples (*luakini*) of Pu'u-maka'a and Lo'alo'a, and the complex at Pōpōiwi (Kamakau 1992)—the latter two measuring amongst the largest structures in the archipelago. With this surge in construction, Kekaulike completed the ritual network surrounding Kaupō's agriculturally rich core, effectively using ceremonial architecture to proscribe an area of socio-political importance.

#### *Environmental Setting and Agricultural Production*

Kaupō straddles the boundary between the lush, wet districts of Kīpahulu and Hāna to the east, and arid Kahikinui to the west (Fig. 1). Bounded geographically by the gulches of Kālepa and Wai'ōpai, Kaupō stretches approximately 13 km east-west at its widest extent, while rising 5 km inland up the slope of the volcano Haleakalā. A broadly incised, erosional valley known as the Kaupō Gap dominates the district's higher elevations. Breaching the southern face of Haleakalā Crater, this rift in the crater wall is the result of erosion during a rejuvenation phase of volcanism c. 120 kya (Stearns and MacDonald 1942). Flowing outward from the gap, a combination of lava and mud was deposited from the crater rim down to the sea, creating a vast accretionary fan of nutrient-rich lavas and sediments. Unlike the mosaic of predominantly leached sediments in Kahikinui bordering to the west (Coil and Kirch 2005, Dixon *et al.* 1999), and the overly wet, incised valleys of Kīpahulu to the east, Kaupō's situation on this Hāna Volcanic Series (Sherrod

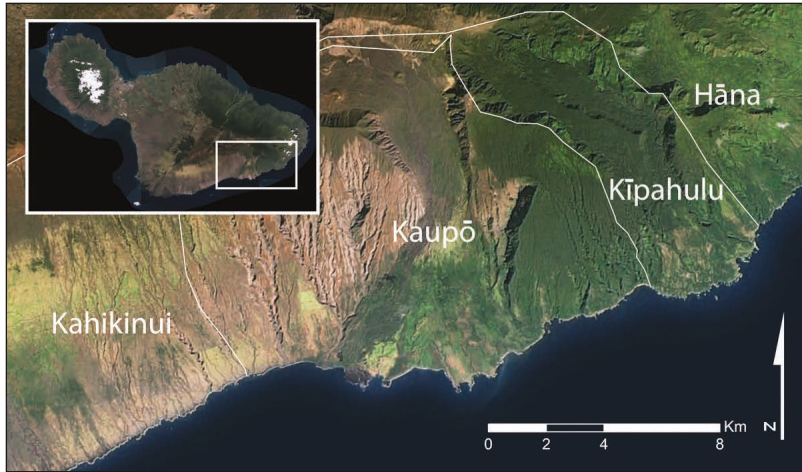


Figure 1. Location of Kaupō and adjacent districts in the southeastern portion of Maui Island.

*et al.* 2007, Stearns and MacDonald 1942) placed it within a set of sediments ideally aged for intensive dryland agriculture (Ladefoged *et al.* 2009).

Through analyses of soils and sediments across Kaupō, Baer *et al.* (2015) have demonstrated that Kaupō's productive potential was at least as great as that of the Leeward Kohala Field System on Hawai'i Island (Kirch (ed.) 2010, Ladefoged and Graves 2008, Ladefoged *et al.* 1996, 2003). Kaupō's combination of *in situ* weathered basalt parent materials and the aeolian deposition of fine-grained sediments, in fact resulted in nutrient levels rivalling some permanently irrigated wetland systems (Palmer *et al.* 2009), long held as the most productive and nutrient-rich form of Hawaiian agriculture.

This understanding of the region's agricultural capacity is supported by ethnohistoric traditions attesting to Kaupō's sweet potato production. Even into the 20th century, despite massive population loss both locally and across the archipelago, Kaupō was remembered as a *moku* of great productivity. Ethnologist E.S.C. Handy (1940: 161) noted, "Kaupō has been famous for its sweet potatoes, both in ancient times and in recent years . . . and the greatest continuous dry planting area in the Hawaiian Islands." This capacity for dryland production, along with its proximity to Hawai'i Island, is presumably what attracted the attention of King Kekaulike, whose adoption of the district transformed it from hinterland to the centre of Maui's political power.

## RITUAL STRUCTURES OF KAUPŌ

Perhaps more than all other types of sites, Hawaiian ritual architecture has garnered some of the strongest archaeological attention. Kaupō itself is home to a diversity of structures defined early in the 20th century as ritual locations (Maunupau 1998, Thrum 1909, Walker 1930), and again reassessed and codified in the work of Michael Kolb (1991, 1992), the surveys of Patrick Kirch (pers. comm.) and my own work (Baer 2015, 2016). In re-examining the district's ritual sites, I began by attempting to relocate all of the 24 locations numbered by Walker (1930). Working from his maps and descriptions, along with information provided by local informants, I found 21 of his previously recorded sites, and potentially identified two more that he mentioned, but offers little in the way of concrete information.

Having relocated 21 of the 24 Walker sites (and with knowledge of the specific areas for the missing three), we are provided an almost complete coverage, linking the early 20th century archaeology of Walker to current surveys. While not all of Walker's recorded sites correspond with modern understandings of *heiau* (Baer 2015), the information he collected on structure form and ethnohistoric data allow for a deeper exploration of site function and importance. These sites are not, however, the only ritual structures identified throughout the district. By combining Walker's data with recent work, we now have a better understanding of the distribution of important sites across the landscape, and the ways in which their placement may have determined construction styles and purpose.

*Identification of Ritual Sites*

The definition of ritual sites, in contrast to residences or other kinds of structures, has long been of interest to Hawaiian archaeologists. One of the first chroniclers of Hawaiian history, Abraham Fornander, posited that different styles of temples were a reflection of multiple phases of colonisation and major shifts in cultural practices (Fornander 1996, although his original works were written from 1878–1885). Stokes (1991) tested this hypothesis in the early 20th century, hoping that formal classifications of ritual structures would correspond to different time periods dating from the earliest settlement, to the era of the Tahitian priest Pa'ao, and then into the rest of Hawaiian history. Stokes was disappointed to find, however, that very little connection could be made between the architectural traits of individual temples and their time of construction. In particular, the distinction between high-walled structures (where rituals in the interior would have been hidden from outsiders) and open, unwallled platform styles had served as hypothetical temporal markers but, as with other formal traits, these offered little support for the notions espoused by Fornander and Stokes (Dye 1991).

Where Stokes failed to equate form with temporality, he was similarly confounded in efforts to associate specific forms with certain functions. Even these demonstrated no concrete rules linking form to function, leaving archaeologists with little solid information surrounding what a temple *ought* to look like (Dye 1991). These difficulties did nothing to dissuade subsequent researchers from attempting to identify architectural trends, beginning with Bennett (1931), whose typology was referenced through the 1990s (Graves and Cachola-Abad 1996). Following a lull in temple typology research (coinciding with a rise in broad settlement studies), the creation of ritual typologies returned strongly with the island-wide studies of Kolb (1991, 1992, 1994). This work spurred further classificatory schemes based on traits such as wall-enclosed versus open platforms, exterior steps, notches, interior platforms and more (Graves and Cachola-Abad 1996, Kolb 1994, Kolb and Radewagen 1997, Mulrooney and Ladefoged 2005). While these studies have all purported to identify various connections between time, form and function (with differing degrees of success), I am more inclined to agree with Valeri (1985) who argued that across the islands, form and function were largely independent in the construction of *heiau*, such that similar looking sites could have been built and used for entirely different purposes. That said, Valeri does put forth his own basic classification scheme, differentiating between war versus growth-centred temples and based largely on each structure's associated "owner" (most notably the king). He acknowledges the numerous limitations of this system, but contends that some strides may be made in identifying temples within such a scheme.

Our understanding of *heiau* function comes largely from ethnohistoric and anthropological sources, in which a range of different ritual locations of varying sizes, meanings and associations were chronicled. From Kamakau (1976, 1992), Malo (1951), and others, we know of numerous categories, but through archaeological survey and even excavation, the certain association of a site with a specific sort of *heiau* remains unclear. Among the many types of *heiau* described for Hawai'i, the most prevalent (at least in reference to cultural memory and practice) were *pōhaku a Kāne* (sacred stones at which offerings were made), *hale mua* (the men's houses usually associated with a *kauhale* 'household' or larger 'ohana 'extended family'), *ko 'a* (generally small shrines associated with productivity, particularly in fishing), *hale o Lono* (medium-sized temples, often related to productivity and farming), and *luakini* (the largest class, and where human sacrifices were offered, particularly in regards to war). These categories, defined most concisely by Valeri (1985: 173-83), are by no means comprehensive, as not only are there numerous other types, but these may themselves be subdivided into smaller groups.

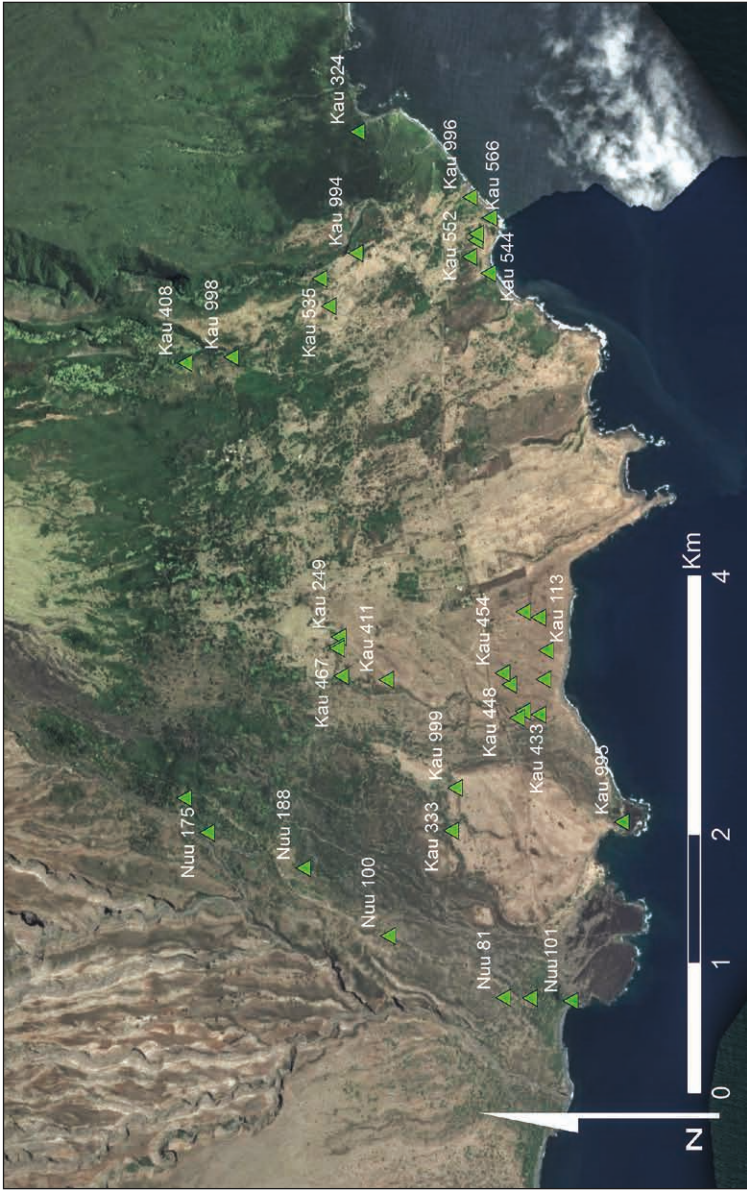


Figure 2. The distribution of ritual locations found throughout Kauaʻi, including Nuʻu.

While it remains tempting to associate the sites described throughout Kaupō with these different traditional categories, too much subjectivity is required for classification. For my own field survey, identification of supposed ritual sites employed formal categories in the definition of a structure's likely function although, as expanded below, location becomes increasingly important. In addition to formal traits, I also relied heavily on oral traditions surrounding specific *heiau* recorded by Walker (1930) in his island-wide examination of Maui's archaeological history. In addition to relocating many of Walker's previous sites, I identified 29 new ritual sites (out of 585 total sites) based on a combination of factors. Where previous studies attempted to isolate single or combined formal traits as indicative of era or specific ritual function, I defined structures as ritual if they contained three or more elements from a list of traits commonly associated with ceremonial structures. Critical elements in this identification were spatial footprint (>200 m<sup>2</sup>), wall thickness and height (either >1 m), wall construction (core filled or stacked), notching, upright stones, internal space divisions and internal platforms. While all types of sites could potentially feature one or more of these traits (such as a residential site with internal rooms), their combined presence, particularly in a relatively large site, led to the functional classification of ritual.

### *Survey Findings*

Across Kaupō, field surveys covering >5 km<sup>2</sup> identified 585 new sites. In conjunction with surveys by Patrick Kirch and John Holson in Kaupō's far western land division of Nu'u (a thin strip of land called an *ahupua'a*, running from the coast up the slope of the mountain), we now have more than 1000 discrete sites within the *moku*. With seven ritual sites in Nu'u, and 29 more identified in recent work, Kaupō is home to 36 examples of ceremonial architecture (of which 21 are relocated Walker sites). Figure 2 shows the overall distribution of ritual sites throughout the district. While this initially seems to indicate an even spread of *heiau* across the region, further analysis and the definition of two basic categories of ritual sites points to a highly uneven distribution of ceremonial forms, largely predicated on their location within the landscape.

### MONUMENTALITY AND THE PROSCRIPTION OF SPACE

By identifying ritual locations through the presence of three or more discrete architectural features, I eliminated some of the subjectivity associated with previous identifications of *heiau* (or other ritual, though non-temple sites). This does, however, mask variability between these sites, treating them all equally when, in fact, each is unique, demonstrating significant differences. To



identify distinctions within the group of 36 sites, I emphasise two architectural elements of significance: overall size and the presence of internal architecture.

Of all the sites described, a few are certainly massive (Fig. 3), but as a whole they present a statistically smooth distribution. In first selecting a threshold for size, I argue that sites averaging above c. 20x20 m, or >400 m<sup>2</sup>, can reasonably be considered large. This figure, while admittedly somewhat arbitrary, builds on the distinction first identified by Bennett (1931) in his work on Kaua'i. There, he defined "small" and "large" *heiau* based on a combination of square footage and his general impression regarding the amount of labour required in construction. Smaller ritual sites averaged only 46 m<sup>2</sup>, while those classified as "large" fell into a number of categories (platform, walled, terraced and round, each with their own subdivisions) with a minimum average size ranging from just under 350 m<sup>2</sup> to 1800 m<sup>2</sup> (Bennett 1931: 30-33). In examining the *heiau* of Kaupō, I selected the 400 m<sup>2</sup> threshold as a relatively low cut-off toward the lower bounds of Bennett's definition for a "large" temple, as a structure of this size would have necessitated a significant investment in labour. This does not mean that all sites over this size are highly complex or have any traits such as large exterior walls, terraces, or internal divisions, nor that smaller sites cannot have any or all of these aspects, but simply that sites with a footprint greater than 400 m<sup>2</sup> tend to evince a higher level of investment.

Size alone, however, is inadequate for defining any categories of site types, including ritual. First, as shown by the white bars in Figure 3, some sites feature a disproportionate total area based on the simple multiplication of maximum length and width. While sites such as Kou (Kau-995) are indeed enormous, the area described in Figure 3 is not an accurate reflection of the space enclosed for ritual use within the large walls. The site is constructed in an L shape, with most of the area outside of the ritual interior space. Conversely, sites Kau-32 and -273 (also in white) do feature internal areas of 4000 and 1800 m<sup>2</sup> respectively, but these sites are both simply large enclosures that feature some substantial wall thickness, but nothing else like internal platforms or rooms to indicate that they were significant *heiau*. Of the sites, the five in white are least representative of true use area, limiting the viability of creating a ritual classification on size alone.

Additionally, as Gill *et al.* (2015) have demonstrated, sites of significant size (in their case, the O'ahu site of Pālehua, measuring >1500 m<sup>2</sup>) may be deemed "ritual" without also being a *heiau*. Despite the substantial footprint of the enclosure they describe, the lack of all traits associated with temples separates a site such as this from other sites featuring the traditional characteristics of a *heiau*. Similarly large sites are found in Kaupō (again, such as Kau-32 and -273), but once more, a lack of distinguishing traits identifies them as perhaps ceremonial, but by no means major temples.

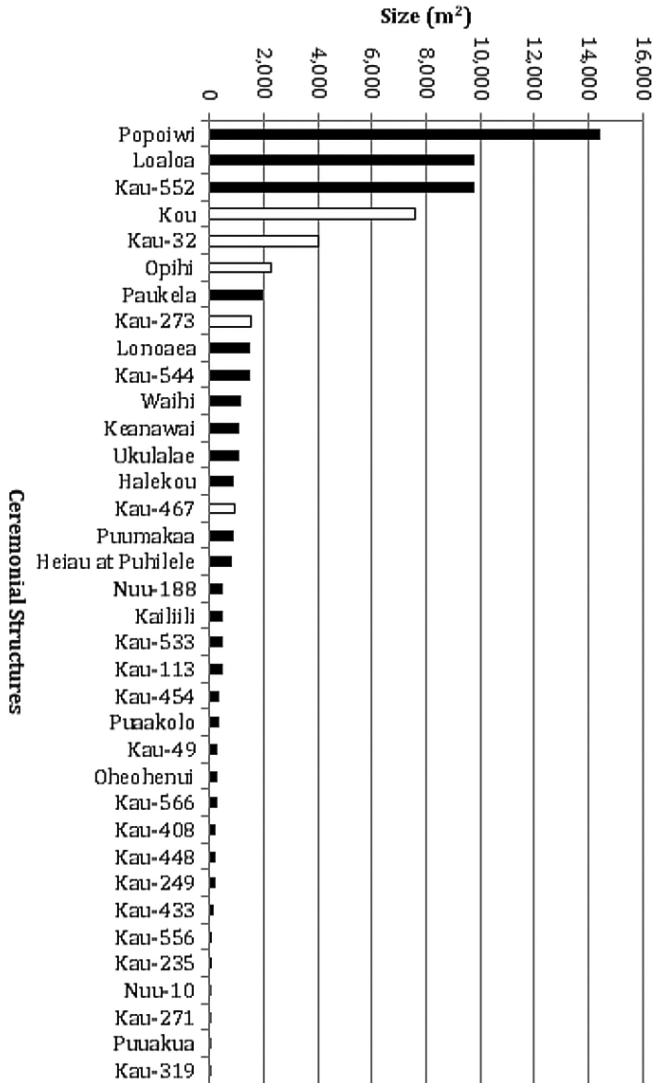


Figure 3. Rank scale plot of the ritual sites found throughout Kaupō (includes some of the sites identified by Walker that may not actually have been ritual locations). White bars indicate sites with reported sizes not truly reflective of the size of the constructed space (see text for details).

For the purposes of identifying discrete classes of ritual location, I therefore combine size with the presence of internal structural or spatial divisions. More than any other single trait, the existence of interior boundaries and separated zones (particularly elevated areas, such as internal platforms) indicates that a structure was consciously divided to allow for differential access and use of space. By separating the 36 ritual structures of Kaupō into two basic categories, I define a class of “Major” sites, featuring a footprint >400 m<sup>2</sup> along with the existence of internal architecture, and “Minor” sites, lacking one or both of the aspects above. While these terms do imply a level of supposed pre-contact social importance, without extensive excavation and further research, they are more heuristic descriptors than realised classes. With that acknowledgement, however, these two groups are quantifiably different, mirroring impressions from field research that there are multiple classes of ritual structures, akin to the categories of *heiau* posited by Bennett (1931), Stokes (1991), Valeri (1985) and others.

#### *Spatial Distribution of Ritual Locations*

The distribution of Major and Minor sites on the landscape, demonstrated in Figure 4, reveals that while ritual locations are indeed spread throughout the district, the larger structures with internal architecture are almost entirely located along the exterior boundaries of the mud and lava outflow from the Kaupō Gap. Of the 19 Major sites, 15 are located along the edges of this accretionary fan. Geochemical analyses by Baer *et al.* (2015) have demonstrated that this portion of the flow features what Ladefoged *et al.* (2009) call a “sweet spot” for the production of dryland crops, primarily sweet potato (*Ipomoea batatas*) augmented by dryland taro (*Colocasia esculenta*), yams (*Dioscorea* spp.) and sugarcane (*Saccharum officinarum*). The placement of major structures around this core of productive land indicates the intentional construction of a broad network of sites designed to bound and control valuable territory.

The distribution seen in Figure 4 highlights the discrepancy between sites in the interior of the district and those located along the borders of the fan. In the central, coastal portion of the district, the cluster of ritual sites is exclusively categorised as Minor. Inland and upland, three Major sites are localised towards the upper bounds of the field system, but these three (also recorded by Walker) serve as the only large temples outside of the fan borders. Two of the three feature some of the earliest temple dates found for Kaupō, with initial construction at Opihi Heiau (Kau-333) beginning from AD 1441–1530, and an even earlier date of AD 1296–1476 for Keanawai Heiau (Kau-999; see Baer [2015] for further date ranges). Opihi and Keanawai (along with Kou, on the coast and just to the interior of the western line of

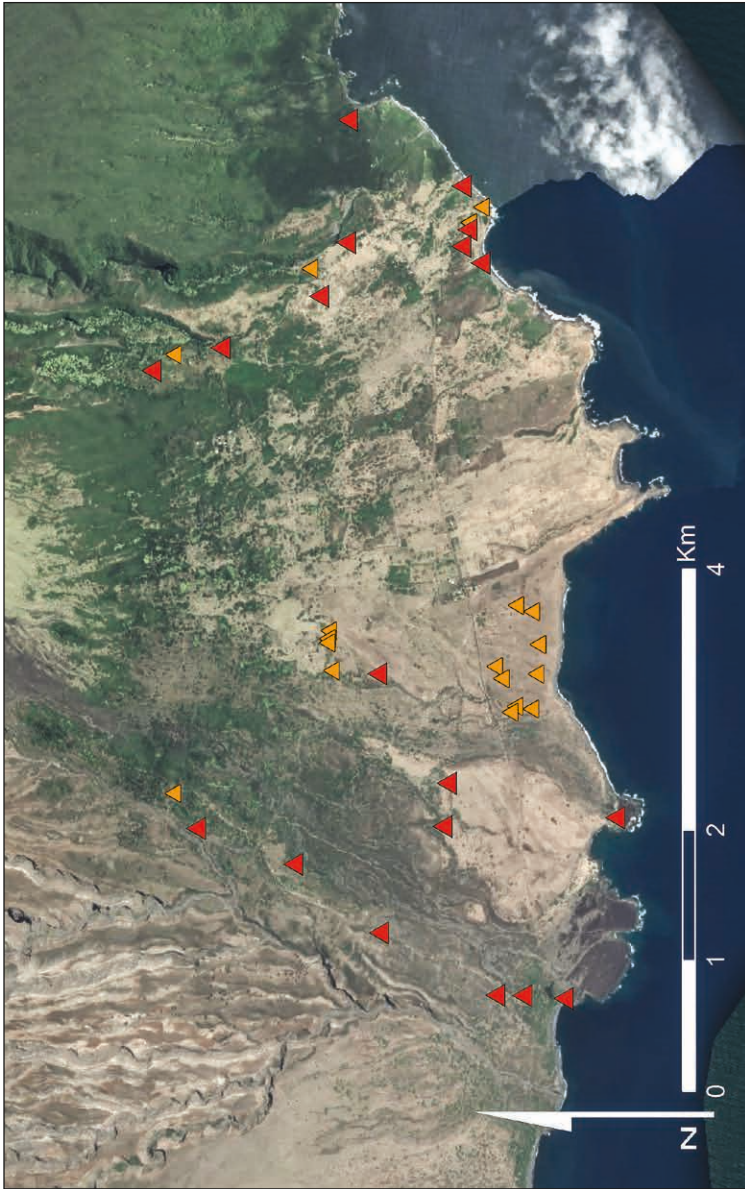


Figure 4. Differential distribution of “Major” (red) and “Minor” (orange) ritual sites.

temples) are also the only *heiau* in the interior whose traditional names were recalled into the 20th century. While the early dates recovered from these sites, along with the extremely early Uranium-Thorium date for Kou (Kirch *et al.* 2015), may be coincidental, they could also reflect the construction of ritual sites before a larger push to bound Kaupō's core in a system of Major *heiau*.

With the other interior ritual locations, we see a distinct emphasis on Minor sites. This area, featuring a dense, highly formalised dryland agricultural system (Kirch *et al.* 2010), and an abundance of small residential sites (Baer 2015), clearly served as the district's productive centre. The aggregated population of farmers, along with the collection of small temples with virtually no interior features, suggests that the ritual locations found in the central coast area were less corporate, and functioned as smaller scale settings for ceremonial practice. While we cannot say definitively, some likely served as *hale mua* (men's houses generally associated with household clusters), while others located in the fields themselves demonstrate the characteristics described by Valeri (1985) and Bennett (1931) as *ho 'oūluūlu 'ai*, or temples designed to increase agricultural productivity.

In contrast, the Major sites along the borders of the fan demonstrate much larger sizes and the presence of features such as interior courts, multiple interior elevations, rooms and generally larger investments in labour cost. Of the 15 structures surrounding the productive core, 11 retained their traditional names, and at least five (Lo'alo'a [Kau-324], Hale o Kane [not relocated], Pu'u Maka'a [Kau-535], and Halileo [not relocated] in the east, and Pili-o-Kane [Nuu-79], and potentially Halekou [Nuu-100], in the west) are recorded as sites at which human sacrifices were offered (Kamakau 1992, Walker 1930). The presence of massive temples surrounding Kaupō's interior, along with historical accounts of Maui kings ruling from the district, indicates that the ritual network was constructed to centralise and control the highly productive area. Within the core, as many as 15,000 residents (Kirch *et al.* 2010) farmed one of the richest agricultural zones in the archipelago, ever surrounded by monumental representations of power.

While oral traditions offer clues as to the specific functions of individual sites across Kaupō, the definitive purpose of each ritual structure remains unclear. Beyond the clear pattern of larger, more complex *heiau* distributed around the boundary of the agriculturally intensified centre, little can yet be said about how each location was used. Ethnohistoric analyses by Valeri (1985), along with early research featuring temporally-closer oral accounts (Bennett 1931, Stokes 1991, Thrum 1909, Walker 1930), have defined broad categories of ceremonial architecture, yet the variability in structural features means the link between form and function is somewhat tenuous. Making this link even more complicated is the fact that in designing new *heiau*, priests intentionally borrowed architectural aspects from a range of other, pre-existing

temples (Valeri 1985). In utilising one or more traits found in other *heiau*, priests hoped to maximise the spiritual power and efficacy of new structures. In this process, however, they also created constantly changing forms with little clarity for the etic interpretations of modern researchers.

Evidence from Kaupō, along with analyses of *heiau* within a similarly intensified agricultural system from Kohala (Ladefoged and Graves 2008, McCoy 2014, McCoy *et al.* 2011, Mulrooney and Ladefoged 2005, Phillips *et al.* 2015), now indicate that while form and function remain critical for interpreting individual sites, location on the landscape may be equally important. In 1931, Bennett's classification of *heiau* on Kaua'i largely created groups based on architectural traits, but he did include one small subdivision of temples defined by their hilltop locations. Archaeologists have long known that structures throughout Hawai'i can serve as the markers between territories or other boundaries (Kirch 1985), yet in the interpretation of discrete temples, location has largely remained a secondary concern behind how a structure was designed and/or the activities practiced within. This in no way minimises the many crucial settlement pattern studies that have informed our understanding of pre-contact Hawai'i (Kirch 1992, Rosendahl 1972, Weisler and Kirch 1985, among others); instead, it highlights the potential for location to be an interpretive tool *on par* with form and function, rather than an afterthought.

With the distinct placement of Major *heiau* along the boundary of Kaupō's highly productive, nutrient-rich core (Baer 2016, Baer *et al.* 2015), and Minor structures in the interior (likely associated with small-scale, rather than corporate practices), we have evidence that location on the landscape was the primary factor informing construction practices and use. Elites prior to Kekaulike, followed by the king himself, built a network of large *heiau* in very specific places, as these examples of monumental architecture would serve to proscribe a socio-politically valuable area. Similarly, in Kohala, the placement of temples on *ahupua'a* boundaries *allowed* them to act as markers of socially significant space, with both form and function dependent on their location.

\* \* \*

Early settlement throughout the Hawaiian Archipelago emphasised small groups practicing irrigated agriculture in windward valleys. By the 1500s, however, demographic pressures and an increasingly powerful class of elites pushed people towards the drier parts of the islands and into the more labour-intensive practice of dryland cropping (Kirch 2010, Kirch (ed.) 2010). The lava and mudflows of Kaupō were quickly recognised as highly conducive to sweet potato and dryland taro cropping, and the region's production was amplified through *landesque capital* investments (permanent modifications of the landscape) in an intensive dryland field system (Baer 2016, Brookfield

1972). Bounding this zone, the formalised set of monumental structures offer a clear demonstration that Kaupō's agricultural capacity was highly valued, and that despite being well away from early centres of Maui power, large-scale labour was being organised to maximise production. Whether this organisation was run by some independent local authority or under the aegis of a leader elsewhere on the island remains unclear, but in either case, massive amounts of labour were being mobilised in the development of the region.

Overall, the Kaupō District features a uniquely elaborated display of monumentality. Through the creation of a simple classification system based on formal architectural features we can explore how the landscape and community of Kaupō were structured, and the expressions of power that served to centralise and contain the district's population. The discrepancy between Major *heiau* along the edges of the productive centre, and Minor ritual sites within the interior, indicates a highly formal network of corporate temples in stark contrast to the less formal sites of the commoner class. While *heiau* are known to have delineated boundaries and marked land ownership (McCoy 2014, McCoy *et al.* 2011, Mulrooney and Ladefoged 2005), the network of structures along the edges of Kaupō's accretionary fan represent the cultural construction of space on a scale previously unseen in Hawai'i, and serve as evidence that the location of a site may be a critical factor in the determination of both form and function.

#### ACKNOWLEDGEMENTS

Funding for this project was provided by the National Science Foundation and the University of California, Berkeley. I would like to thank Dr. Patrick Kirch and John Holson for introducing me to Kaupō and helping me establish this field research, along with Andy and Bernie Graham whose hospitality made it possible. Jimmy Haynes and the people of Kaupō Ranch have also been very generous with their time and access to ranch land. Finally, thanks to Dr. Guillaume Molle for organising this collection of interesting research.

#### REFERENCES

- Baer, Alexander, 2015. On the Cloak of Kings: Power, Agriculture, and Community in Kaupō, Maui. Unpublished PhD dissertation, University of California, Berkeley.
- 2016. Soil geochemistry and the role of nutrient values in understanding archaic state formation: A case study from Kaupō, Maui, Hawaiian Islands. In D. Contreras (ed.), *Advances in Environmental Archaeology*. New York: Routledge, pp. 229-56.
- Baer, Alexander, Oliver Chadwick and Patrick V. Kirch, 2015. Soil nutrients and intensive dryland agricultural production in Kaupō, Maui, Hawaiian Islands. *Journal of Archaeological Science: Reports* 3: 429-36.

- Bennett, Wendell C., 1931. *Archaeology of Kauai*. Vol. 80. Honolulu: Bishop Museum Press.
- Brookfield, H.C., 1972. Intensification and disintensification in Pacific agriculture: A theoretical approach. *Pacific Viewpoint* 13: 30-48.
- Coil, James H. and Patrick V. Kirch, 2005. An Ipomoean landscape: Archaeology and the sweet potato in Kahikinui, Maui, Hawaiian Islands. In C. Ballard, P. Brown, R.M. Bourke and T. Harwood (eds), *The Sweet Potato in the Pacific: A Reappraisal*. Oceania Monograph 56, Ethnology Monograph 19. Sydney: Oceania Publications, pp. 71-84.
- Dixon, B., P.J. Conte, V. Nagahara and W.K. Hodgins, 1999. Risk minimization and the traditional *ahupua'a* in Kahikinui, Island of Maui, Hawai'i. *Asian Perspectives* 38: 229-55.
- Dye, Thomas S., 1991. A reputation unmade: J.F.G. Stokes's career in Hawaiian archaeology. In T. S. Dye (ed.), *Heiau of the Island of Hawai'i. A Historic Survey of Native Hawaiian Temple Sites*. Honolulu: Bernice P. Bishop Museum Press, pp. 3-20.
- Fornander, Abraham, 1996. *Ancient History of the Hawaiian People to the Times of Kamehameha I*. Honolulu: Mutual Publishing. Reprint of Vol. II of *An Account of the Polynesian Race*, first published in 1878-1885.
- Gill, Timothy M., Patrick V. Kirch, Clive Ruggles and Alexander Baer, 2015. Ideology, ceremony, and calendar in pre-contact Hawai'i: Astronomical alignment of a stone enclosure on O'ahu suggests ceremonial use during Makahiki season. *Journal of the Polynesian Society* 124 (3): 243-68.
- Graves, Michael and Carolyn Kehaunani Cachola-Abad, 1996. Seriation as a method of chronologically ordering architectural design traits: An example from Hawai'i. *Archaeology in Oceania* 31: 19-32.
- Handy, E.S.C., 1940. *The Hawaiian Planter. Volume I: His Plants, Methods and Areas of Cultivation*. Vol. 161. Honolulu: Bernice P. Bishop Museum.
- Kamakau, Samuel Manaiakalani, 1976. *The Works of the People of Old. Na Hana a ka Po'e Kahiko*. Bernice P. Bishop Museum Special Publication no. 51. Honolulu: Bishop Museum Press.
- 1992. *Ruling Chiefs of Hawaii*. Revised edition. Honolulu: Kamehameha Schools Press.
- Kirch, Patrick V., 1985. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory*. Honolulu: University of Hawaii Press.
- 1992. *Anahulu: Anthropology of History in the Kingdom of Hawaii Vol. 2: Archaeology of History*. Chicago: University of Chicago Press.
- 2010. *How Chiefs Became Kings: Divine Kingship and the Rise of Archaic States in Ancient Hawai'i*. Berkeley: University of California Press.
- Kirch, Patrick V. (ed.), 2010. *Roots of Conflict: Soils, Agriculture, and Sociopolitical Complexity in Ancient Hawai'i*. Santa Fe: School for Advanced Research Press.
- Kirch, Patrick V., John Holson and Alexander Baer, 2010. Intensive dryland agriculture in Kaupō, Maui, Hawaiian Islands. *Asian Perspectives* 48 (2): 265-90.
- Kirch, Patrick V., Regina Mertz-Kraus and Warren D. Sharp, 2015. Precise chronology of Polynesian temple construction and use for southeastern Maui, Hawaiian Islands determined by 230Th dating of corals. *Journal of Archaeological Science* 53: 166-77.



- Kolb, Michael J., 1991. Social Power, Chiefly Authority, and Ceremonial Architecture, in an Island Polity, Maui, Hawaii. Unpublished PhD dissertation, University of California, Los Angeles.
- 1992. Diachronic design changes in *heiau* temple architecture on the island of Maui, Hawai‘i. *Asian Perspectives* 31: 9-38.
- 1994. Monumentality and the rise of religious authority in precontact Hawai‘i. *Current Anthropology* 35 (5): 521-47.
- Kolb, Michael J. and Erica Radewagen, 1997. *Na heiau o Kahikinui*: The temples of Kahikinui. In P.V. Kirch (ed.), *Na Mea o Kahikinui*. Berkeley: Archaeological Research Facility, pp. 61-77.
- Ladefoged, Thegn N. and Michael W. Graves, 2008. Variable development of dryland agriculture in Hawai‘i. *Current Anthropology* 49 (5): 771-802.
- Ladefoged, Thegn N., Michael W. Graves and Richard P. Jennings, 1996. Dryland agricultural expansion and intensification in Kohala, Hawai‘i Island. *Antiquity* 70 (270): 861-80.
- Ladefoged, Thegn N., Michael W. Graves and Mark D. McCoy, 2003. Archaeological evidence for agricultural development in Kohala, Island of Hawai‘i. *Journal of Archaeological Science* 30 (7): 923-40.
- Ladefoged, Thegn N., Patrick V. Kirch, Samuel M. Gon, Oliver A. Chadwick, Anthony S. Hartshorn and Peter M. Vitousek, 2009. Opportunities and constraints for intensive agriculture in the Hawaiian archipelago prior to European contact. *Journal of Archaeological Science* 36 (10): 2374-83.
- Malo, David, 1951. *Hawaiian Antiquities: Mo‘olelo Hawai‘i*. Translated by N.B. Emerson. Honolulu: Bernice P. Bishop Museum.
- Maunupau, Thomas K., 1998. *Huakai Makaikai a Kaupo, Maui*. Honolulu: Bishop Museum Press.
- McCoy, Mark D., 2014. The significance of religious ritual in ancient Hawai‘i. *Journal of Pacific Archaeology* 5 (2): 72-80.
- McCoy, Mark D., Thegn N. Ladefoged, Michael W. Graves and Jesse W. Stephen, 2011. Strategies for constructing religious authority in ancient Hawai‘i. *Antiquity* 85 (329): 927-41.
- Mulrooney, Mara A. and Thegn N. Ladefoged, 2005. Hawaiian *heiau* and agricultural production in the Kohala dryland field system. *Journal of the Polynesian Society* 114 (1): 45-67.
- Palmer, Molly A., Michael Graves, Thegn N. Ladefoged, Oliver A. Chadwick, T. Ka‘eo Duarte, Stephen Porder and Peter M. Vitousek, 2009. Sources of nutrients to windward agricultural systems in pre-contact Hawai‘i. *Ecological Applications* 19 (6): 1444-53.
- Phillips, Natasha, Thegn N. Ladefoged, Blair W. McPhee and Gregory P. Asner, 2015. Location, location, location: A viewshed analysis of *heiau* spatial and temporal relationships in leeward Kohala, Hawai‘i. *Journal of Pacific Archaeology* 6 (2): 21-40.
- Rosendahl, Paul, 1972. Aboriginal Agriculture and Residential Patterns in Upland Lapakahi, Hawaii. Unpublished PhD dissertation, University of Hawai‘i, Manoa.

- Sherrod, D.R., J.M. Sinton, S.E. Watkins and K.M. Brunt, 2007. Geologic map of the state of Hawai'i. Open File Report 2007-1089. Renton, Virginia: U.S. Geological Survey.
- Stearns, H.T. and G.A. Macdonald, 1942. *Geology and Ground-Water Resources of the Island of Maui, Hawai'i*. Vol. 7. Honolulu: State of Hawai'i.
- Sterling, Elspeth P., 1998. *Sites of Maui*. Honolulu: Bishop Museum Press.
- Stokes, John F.G., 1991. *Heiau of the Island of Hawai'i: A Historic Survey of Native Hawaiian Temple Sites*. Edited by T.S. Dye. Honolulu: Bishop Museum Press.
- Thrum, Thomas G., 1909. *Hawaiian Almanac and Annual for 1910*. Honolulu: Thos. G. Thrum.
- Valeri, Valerio, 1985. *Kingship and Sacrifice: Ritual and Society in Ancient Hawai'i*. Chicago: University of Chicago Press.
- Walker, Winslow M., 1930. Archaeology of Maui. Unpublished manuscript. Bernice P. Bishop Museum Library, Honolulu.
- Weisler, Marshall I. and Patrick V. Kirch, 1985. The structure of settlement space in a Polynesian chiefdom: Kawela, Moloka'i, Hawaiian Islands. *New Zealand Journal of Archaeology* 7: 129-58.

#### ABSTRACT

Recent work in the district of Kaupō, Maui, has demonstrated the presence of a highly intensified dryland agricultural system, extensive residential sites and a range of ceremonial structures that include some of the largest temples (*heiau*) in the Hawaiian Islands. In this paper I discuss the ritual sites of Kaupō and how their placement on the landscape demonstrates a unique expression of elite power. Using formal architectural features to define two basic classes of ritual sites, I show that the nutrient-rich core of the district is bounded on either side by a network of monumental temples, effectively proscribing the highly productive interior. In contrast to these major *heiau* around the exterior, the interior of the district is dominated almost exclusively by small, relatively simple ceremonial spaces. Understanding the differential distribution of the ritual structures in Kaupō offers insights into how pre-contact Hawaiian rulers sought to centralise and control highly productive regions.

*Keywords:* Hawaiian Islands, landscape archaeology, ceremonial architecture, agricultural intensification, social complexity, remote sensing

#### CITATION AND AUTHOR CONTACT DETAILS

Baer,<sup>1</sup> Alexander, 2016. Ceremonial architecture and the spatial proscription of community: location versus form and function in Kaupō, Maui, Hawaiian Islands. *Journal of the Polynesian Society* 125 (3): 289-305; DOI: <http://dx.doi.org/10.15286/jps.125.3.289-305>

<sup>1</sup> Correspondence: Pacific Legacy, Inc., 900 Modoc St., Berkeley, CA 94707, USA. Email: [alexbaer@mail.com](mailto:alexbaer@mail.com)