

INTERIM REPORT TO THE NATIONAL ENDOWMENT FOR THE HUMANITIES

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“An Integrative Historical and Archaeological Study of the Rise to Leadership
of Kamehameha the Great, Hawai‘i”

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Narrative

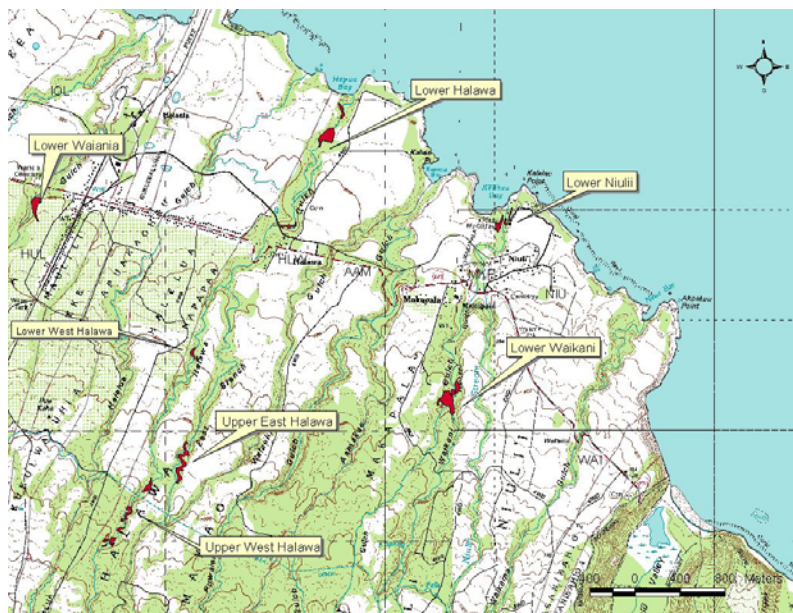
This report covers the period September 2006 through August 2007 for the Integrative History of Kamehameha NEH-sponsored Project. The goals of this project are to:

1. integrate information from historical documents and archaeological materials
2. study the political dynamics of late prehistoric and early historic periods in Hawaii, with particularly attention on the district of Kohala, on the Island of Hawaii;
3. understand the personal and institutional underpinning of Kamehameha's rise to power that resulted, eventually, in his integration of rule across all of the major Hawaiian islands;
4. investigate several components of his rise to power, including, agricultural development, organizational efforts, and the innovative use of new or borrowed technology and tactics;
5. conduct archaeological field work and archival research to directly document the period from about AD 1700 to AD 1850; and
6. develop a Geographic Information System (GIS) database that will spatially and temporally link archaeological and historical data to environmental and cultural variables.

Several components of this research were completed during this past year that add to the previous year's results to build the framework for completion of this project. Generally, these can be divided into: archaeological fieldwork, archival research, and specialized analyses.

Archaeological Fieldwork

Fieldwork was conducted in North Kohala from June through August 2007 for the



purpose of surveying locations associated with the Hawaiian chief Kamehameha, his predecessors, and contemporaries. This work was done in conjunction with an eight week field training program in ethnohistory and archaeology that was sponsored by the University of Hawai'i. We added new areas to the survey completed during the Summer of

Fig 1. Eastern North Kohala showing survey locations.

2006. For 2007, these surveys included the drainages of Halawa (both east and west branches), Waikani and Nuili'i in eastern north Kohala (see Figure 1). These drainages correspond to three different communities or (*ahupua'a* as they are termed in Hawaiian): from west to east, Halawa, Makapala and Nuili'i. Each of these communities included coastal areas, the gulches from which they take their names, and upland zones. Typically the boundaries of these communities were placed on the ridgelines above the gulches. Halawa is an especially important area as it is mentioned as the location of one of Kamehameha's household, there is a religious feature (*heiau*) known as Hale o Kahili on the top of the coastal cliffline just to the east of Halawa, and Kamehameha was said to have had agricultural plots in this area. Makapala and Nuili'i are notable for the relatively large number of land awards made to *maka'ainana* in the mid 19th century.

Areas surveyed included coastal portions and inland areas of these three drainages building on archaeological work in 2006. Again, the main focus was on former agricultural wetland terraces.

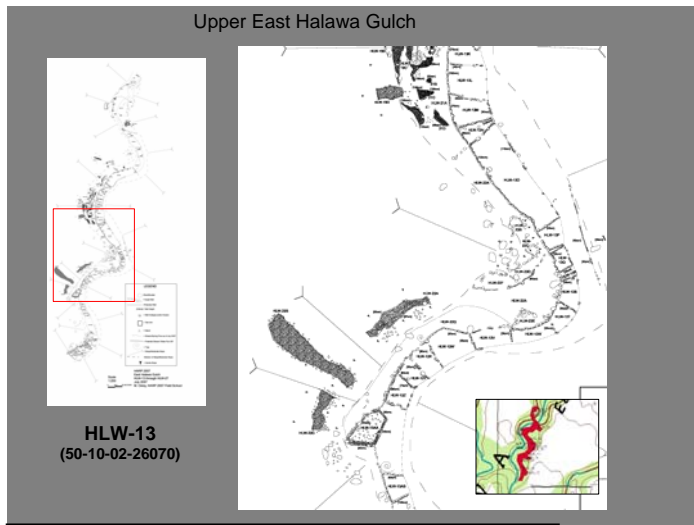


Fig 2. East Halawa Gulch agricultural terraces.

Several terrace complexes were located that take advantage of various edaphic and geomorphological features of these drainages. One of the complexes (see Figure 2) is situated in the valley bottom of the east branch of Halawa gulch. There is no permanent running water in this section of the drainage but numerous seeps occur along the bottom, creating a series of small marshes. These have all been converted to

terraces for farming and extend more than 300 meters along this section of the gulch. Several other features, house sites and potential religious sites (*heiau*) were also located, as well as a number of possible boundary walls. European and Asian materials occur at several habitation sites in this complex and while much of it probably dates to the late 19th or early 20th centuries, some historic material occurs in features that are otherwise indistinguishable from traditional Hawaiian residential sites. This suggests continued occupation in the upper portion of Halawa Gulch through the early part of the 19th century. As such, this agricultural complex is likely associated with the time of Kamehameha's life, from the mid 18th through the early 19th centuries. Subsequent use of the gulch occurred during the conversion of the ridge top lands to plantation sugar agriculture in the late 19th and early 20 centuries.

A second series of agricultural complexes were investigated in the west branch of Halawa where there is perennial stream flow and about the same elevation as the east branch complex. These occur as discontinuous sets of terraces. At least six different complexes are located along the bottom and lower slopes of the valley where alluvial land has accumulated near meanders of the stream. The complexes vary in extent and size,

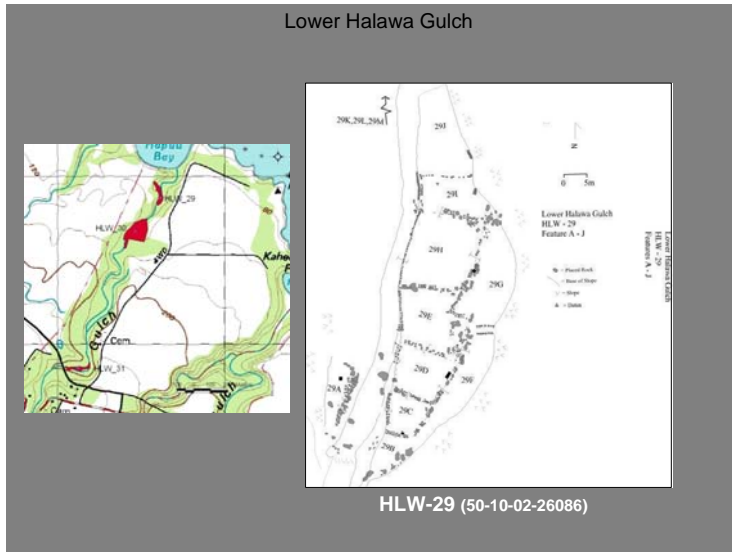


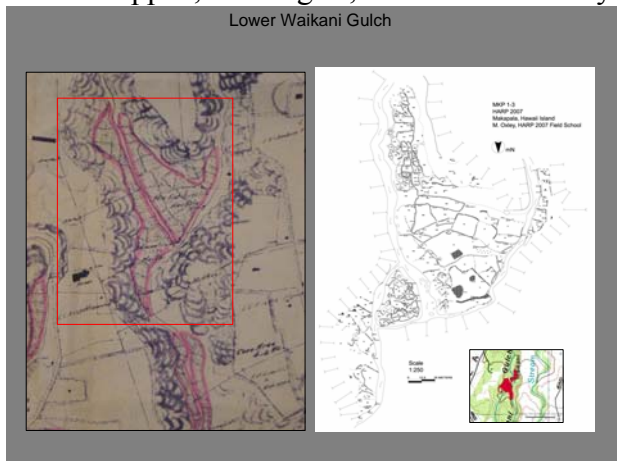
Fig 3. Lower Halawa Gulch terraces and habitation feature.

although at least two of them use extremely large boulders in the terrace wall construction. A third complex, the largest in the group, extends upslope nearly 25 m from the stream bed, and includes both agricultural and habitation features. These complexes are located at about 700-900' elevation and are among the highest of the agricultural features found in these stream locations.

We remapped an archaeological complex in Lower Halawa that was first documented in 2006. This

complex includes a set of agricultural terraces on the east bank of Halawa and a traditional residential site on the west bank (see Figure to left).

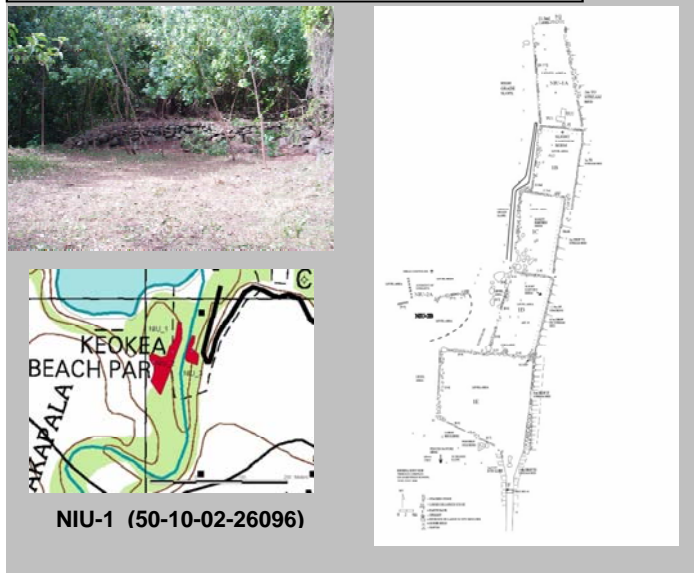
The largest set of agricultural complexes in these smaller gulches of North Kohala was discovered midway in Makapala and Nuili'i, where these two drainages converge to form a single gulch, known as Waikani (see Figure 4). Three sets of agricultural terraces were mapped, the largest, of which is fed by two irrigation ditches that transport water from both drainages to the complex.



Smaller complexes were found on a raised 'island' within the stream and along either side of the stream. The side complexes were each fed by a single irrigation ditch. More than 100 separate terraces comprise the three complexes of Lower Waikani Gulch, along with what appear to be residential features.

Fig 4. Waikani Agricultural Complex

Fig 5. Lower Nuili'i (Keokea) Agricultural Complex

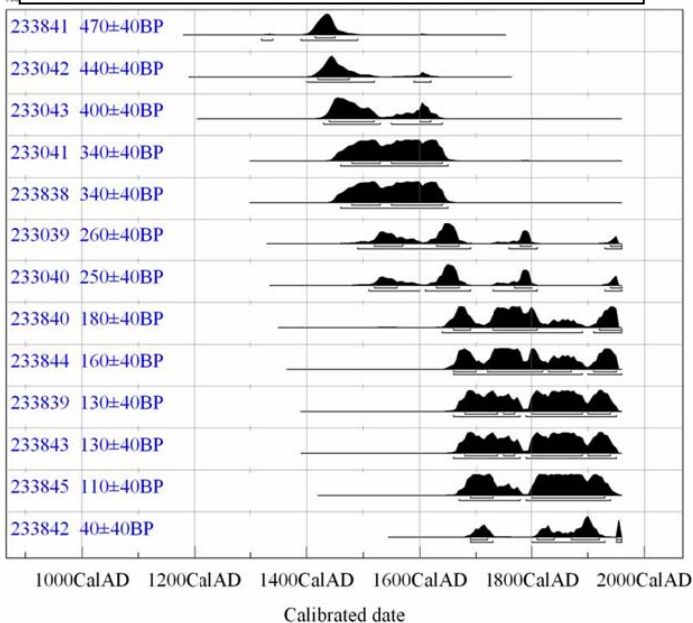


Lower Nuili'i (Keokea) Gulch was mapped in 2006 (see Figure 5). This site consists of two agricultural complexes on either side of the gulch. The largest, on the west wide consists of five terraces, watered by means of a ditch that extends from another agricultural complex farther up the valley and which extends along the slope, just below an outcropping of bedrock. This complex is adjacent to a *heiau* that is located on the ridge line to the west. The physical association of the *heiau* and the irrigated agricultural terraces suggests

that these features comprise a conjoined set of production and ritual, and very likely built in late prehistory.

Specialized Analyses

Fig 6. ¹⁴C Dates from Halawa, Makapala, and Nuili'i.



We have now processed 13 conventional and AMS ¹⁴C dates from excavations within the agricultural terraces and at one of the habitation sites (see Figure 6). We have sampled these materials from the base of, and underneath retaining walls. Most of these dates, then, provide estimates on the latest interval in time before the retaining walls would have been built. Because we believe the charcoal emanating from beneath these walls was part of vegetation clearance prior to construction, the interval between clearing and building should be relatively brief. All charcoal was identified prior to dating and most of it comes from short-lived native or

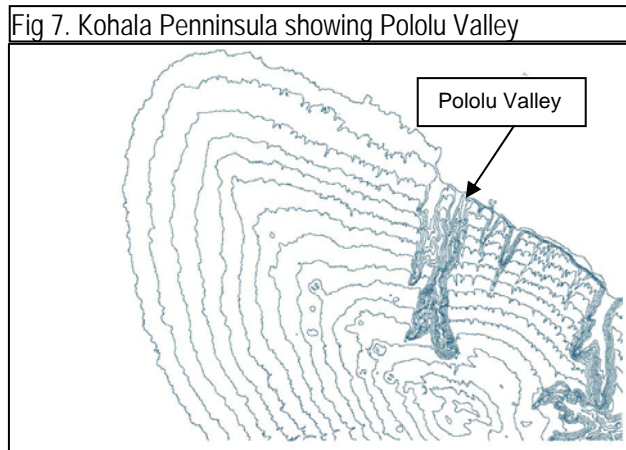
Polynesian-introduced taxa. These provide our best means for estimating the target date when lands were cleared of vegetation and converted to agricultural use.

All of the samples were dated to within the last 500 years (calibrated to ca. AD 1400-1900), and appear to sort into two, possibly three clusters. There is an earlier set,

dating to prior to AD 1600-1650 at a few of the complexes. These five earliest dates occur in both coastal and mid-valley agricultural contexts and likely document the initial conversion of valley bottom lands to wetland farming. Six dates, however, span a later period from about AD 1700-1850 (or later) and may include two other dates with extremely long and multiple-intercept calibrated intervals. This appears to have been the interval during which additional areas were put into agricultural development in these small gulches of Kohala. Note that this interval includes the span of Kamehameha's lifetime in the last half of the 18th century and into the two decades of the 19th century. It appears, then, that agricultural expansion throughout the gulches began well before A.D. 1600 but continued into late prehistory or the early post-contract interval, when Kamehameha came to power.

We have completed fewer excavations within habitation features in this area of Kohala. But we do have ¹⁴C dates on at least two different areas where such features occur. These dates, for the most part, are late prehistoric, again dating to the time after AD 1650. Most of the habitation features, especially those near the coast, contain historic materials that would date after 1778, when Captain James Cook entered the islands for the first time.

Pololu Valley Archival Research



As part of this research project we have been conducting archival research on the valley of Pololu (see Figure 7), located just to the east of the series of gulches where we have been doing fieldwork. Pololu Valley and its neighbor to the east, Honokane, were the subject of archaeological research in the 1970s by a former University of Hawai'i faculty member, David Tuggle. Tuggle surveyed both valleys, along the ridgelines above them, extending

2-5 km inland. Tuggle mapped all of the surface archaeological features; these included sites he identified as either historic (post 19th century) or prehistoric. Much of the archaeology in both valleys represents the former remains of agricultural features, both dryland and wetland. Tuggle also conducted excavations along the coastal dune in Pololu and at a major agricultural and habitation site in Honokane close the coast. In Pololu, Tuggle also excavated a series of habitation, agricultural, and lithic workshop/quarry features farther back in the valley.

Our AMS and conventional ¹⁴C dating of both habitation and agricultural contexts in Pololu, especially when combined with several ¹⁴C dates reported by Tuggle, now provides a more detailed (and confirmed) outline of the Valley's settlement and development (see Figure 8). The earliest dates, possibly extending back to AD 1200, come from the lowest occupation levels at one of the Dune sites excavated by Tuggle. There is a continuous sequence of occupation on the Dune and at least two other locations through the late prehistoric and into the historic period. The Dune location just

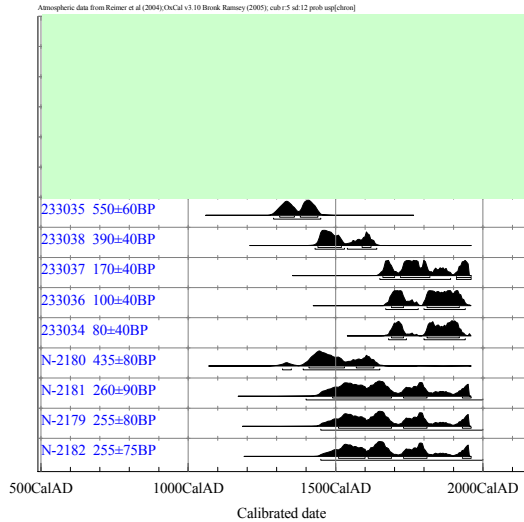


Fig 8. ¹⁴C Dates from Dune Site Pololu Valley, Kohala, see shaded area

inland from the coast and adjacent to a large marsh, which was likely converted to wetland taro cultivation, makes it the most suitable location for initial occupation.

In 2006 our archival research included analyses of traditional and historic artifacts from a series of sites in Pololu. One goal was to reconstruct lithic procurement and use in Pololu, since it contained a small quarry about 1.5 km inland. A second goal was to characterize the historic, i.e., 19th and 20th century, occupation of the Valley, since it was known that a marsh area in the front of the Valley had been converted to rice agriculture by the middle of the 19th century and was occupied into the early portion of the 20th century.

We have expanded this research in 2007 by including new geochemical analyses of the basalt lithic materials collected from Pololu Valley. This work was begun by an advanced undergraduate at the University of Hawai‘i, Mark Oxley, and it extended research that he had summarized in an Honor’s Thesis project in late 2006. The geochemical analyses were conducted at the new UH Hilo laboratory developed for this purpose. We have selected basalt from virtually every context in Pololu: different stratigraphic units within habitation features, agricultural terraces, and at the quarry site. This represents the first *ahupuaa* scale analysis of lithics from any location in Hawai‘i. Oxley has prepared an unpublished summary of this research and recently presented his findings at the 2007 Society for Hawaiian Archaeology meeting in late October. The

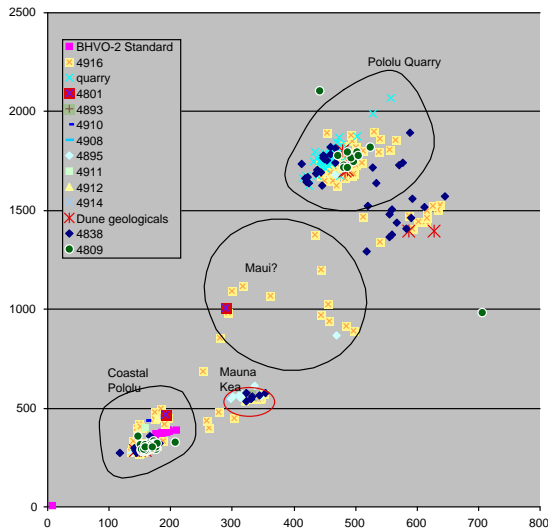


Fig 9. Basalt geochemistry, strontium and zirconium, for Pololu sites.

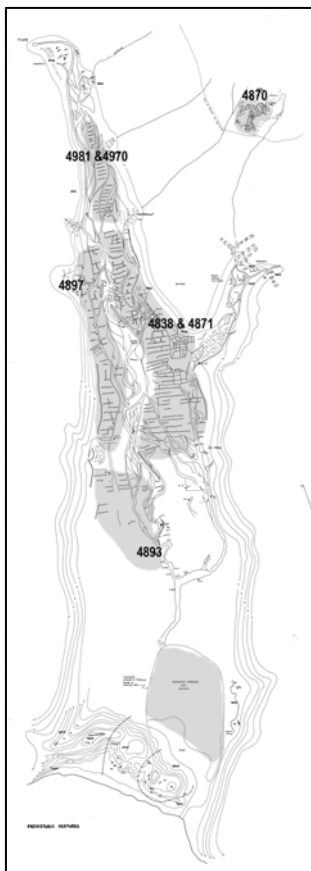
geochemistry suggests at least three, and possibly four sources for the basalt

materials collected from Pololu (see Figure 9).

Trace element analysis using ratios of strontium to zirconium (in parts per million) separates what appear to be distinct geochemical signatures for basalt artifacts from Pololu. One of the sources is very clearly associated with the quarry and basalt outcrops on the summit of Mauna Kea on Hawai‘i Island. This is some of the best quality basalt in the islands and its location at the top of a 12,000’ mountain in the middle of the islands increased the cost of its procurement. Its occurrence in Pololu confirms the transport and introduction of Mauna Kea basalt adzes to other locations in North Kohala. While relatively few basalt artifacts can be sourced to Mauna Kea out of the entire assemblage of over 200 artifacts, their presence in later deposits suggests that transport of

basalt from this source likely post-dates AD 1650. More recent geochemical analyses have suggested that a few pieces of basalt from Pololu may be sourced to the Island of Maui, perhaps in the vicinity of Haleakala where high quality basalt is known to occur.

The bulk of the basalt from Pololu included in the geochemical analysis can be associated with one or two sources. The first of these sources is clearly the quarry site located within Pololu. This cluster includes materials from the quarry as well as a number of other features located elsewhere in the Valley. The second source has not yet been confirmed but is likely from the coastline of Pololu where basalt rocks comprise a major component of the beach materials. Very likely basalt has entered the waters off of the coast of Pololu through stream transport and then has been deposited on the beach through wave action. We suspect these materials would have been initially exploited as the Valley was settled, given their proximity to the Dune site where substantial habitation deposits have been documented.

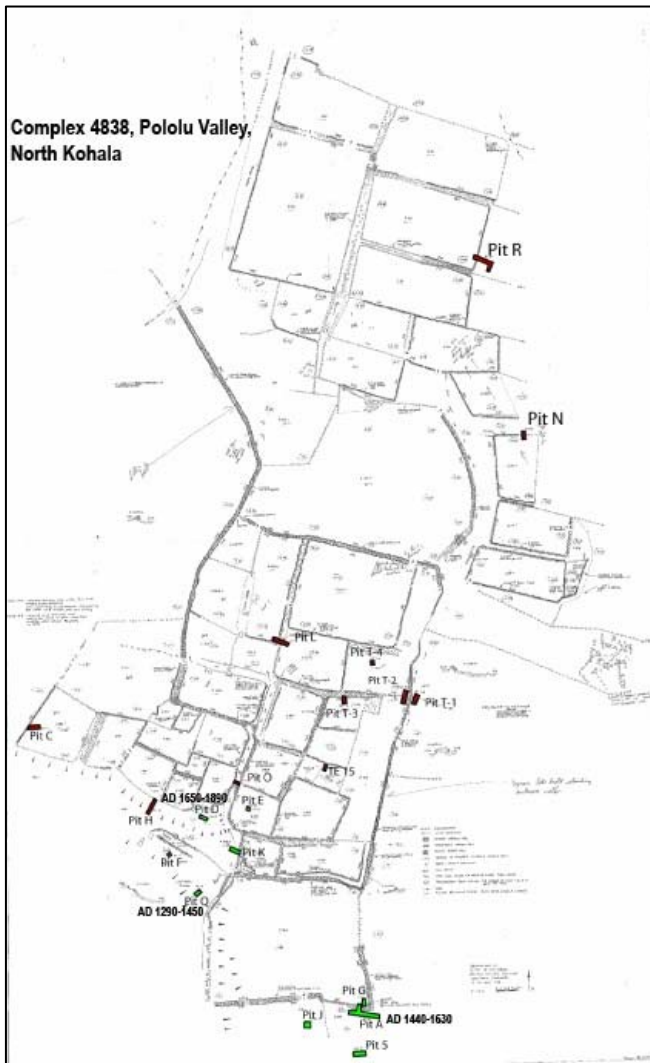


The second major project employing Pololu archival materials has been to re-study agricultural development in the Valley. This was one of the major topics of Tuggle's work and was reported in summary fashion in the early 1980s. However, Tuggle had done only limited ^{14}C dating, given the ubiquitous nature of volcanic glass hydration dating at that time. We now know hydration dates for Hawai'i cannot be independently confirmed and thus they cannot be used to tie either stratigraphic deposits or site materials into an absolute chronology.

Tuggle mapped and identified a number of complexes that include substantial agricultural terraces (see Figure 10); most of these are along the valley bottom inland from the Dune site (Sites 4893, 4838, 4871, 4897, 4970, 4981). A large marsh, adjacent to the Dune site (and un-numbered here) was utilized historically for irrigated rice and Tuggle suggests it was earlier the location of a large taro-growing complex. Finally, Tuggle located an agricultural complex (Site 4870) on the ridge line situated above Pololu Valley to the west.

Fig 10. Pololu Valley Agricultural Complexes

Fig 11. Agricultural Complex 4838, Pololu Valley



We have re-examined in greater detail the mapped terraces and features of one of the largest agricultural complexes, Site 4838 (see Figure below). An honors undergraduate student at the University of Chicago, Jason Espiritu, undertook to develop a GIS model of the Site 4838 complex. His three-dimensional modeling of the surrounding landscape and the complex itself confirms that irrigation was employed in the uppermost portion of the complex. Water could have drained from upper fields to lower fields within this portion of 4838 but it was less likely that sustained irrigation was used in the lowermost portion of the complex. Here it appears that water was occasionally diverted to these fields when flooding occurred from the nearby Pololu stream. We have also identified several features in this Complex that likely were not used for agricultural purposes. Near the southern edge of the Complex, archaeological remains were found on the surface and in excavations that suggest this was the habitation area associated with the site. Substantial numbers of flaked basalt were also recovered here,

suggesting it may have functioned in tool manufacture or maintenance.

We have also re-dated a number of features from Complex 4838 and in conjunction with several ^{14}C dates published by Tuggle, and can reconstruct the broad outlines of agricultural development in the Valley (see Figure 12).

We have five new ^{14}C dates from Complex 4838, ranging from 550 ± 60 bp to 80 ± 60 bp. The earliest dates come from habitation related deposits at the southern end of the Complex. While they do not directly date agricultural features, but rather come from habitation feature deposits, by the 14th century AD there was human occupation in the inland portion of Pololu Valley. This likely included an agricultural component, although thus far we do not have equally early dates on the agricultural features from Site 4838. Dating thus far of agricultural contexts at Site 4838 has produced relatively late estimates, ca. AD 1650/1700 and perhaps extending into the late 18th and early 19th centuries.

Figure 12. ¹⁴C Dates from Complex 4838, shaded area.

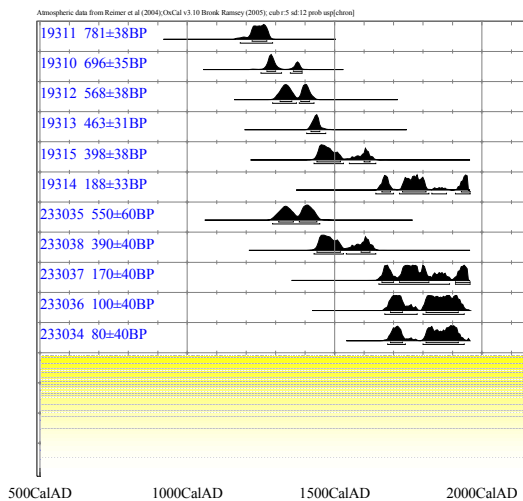
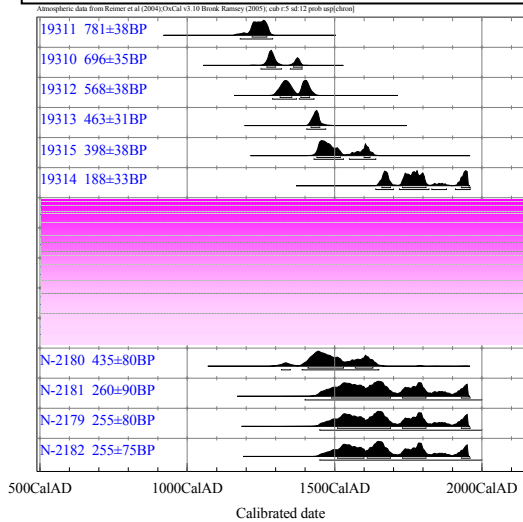


Fig 13. ¹⁴C Dates from Other Agricultural Complexes, Pololu Valley, see shaded area.

Elsewhere in the valley, Tuggle has reported four ¹⁴C dates from agricultural contexts at three sites. The earliest of these is ca AD 1500-1650 from Site 4891, located farther up the valley floor from site 4838 (and also associated with the basalt quarry). The remaining three dates have long calibrated intervals but may span AD 1600-1750. Two of these samples come from Site 4893, located nearer to the coast from 4838. The third date was derived from Site 4870, the agricultural complex located on the top of the ridge line above the valley floor. The ridgeline complex is likely an irrigated set; the two valley bottom complexes are more likely dryland.

Thus, we have a mosaic of agricultural development in Pololu with both early and late development and in different portions of the Valley (including its ridgeline). While the habitation site dates follow a progression in time from earlier coastal to later inland, this not yet documented and may not be the case for agricultural contexts. We have the earliest evidence for agriculture from two complexes that are inland and somewhat difficult to access but which appear to have had reliable sources of water or sufficient rainfall for dryland farming. The irrigated features of 4838 are currently dated later in time, during the last period of prehistory just prior to European discovery. However, we still do not have ¹⁴C dates on the earliest phase of agricultural development at 4838—either the dryland or irrigated components.

The link between arable land, water, and the dating of human occupation in Kohala seems clear. To examine the later portion of this linkage, we have begun to study land awards made in the mid 19th century as fee simple land titles were first introduced into the Hawaiian Islands. We have developed a GIS database for the more than 200 such awards listed for Kohala; these include land commission, royal patent, and land grant awards. The largest awards were made to the monarchy (Kamehameha’s descendants) and to other chiefs and prominent individuals. Fewer, but still some substantial awards were made to individuals who claimed residence on the land or who had previously worked the land. These documentary materials were inventoried by two students: Cy Calugay, a graduate student at the University of Hawai‘i, and Lillian Richards, an undergraduate at the University of New Mexico. Preliminary analyses of the awards demonstrate the uneven distribution of lands across the different classes of applicants with chiefs receiving many more and much larger area awards. Still, there are locations

where commoner awards were abundant. These tend to be concentrated in the eastern gulches, such as at Halawa and Makapala-Nuili'i where considerable investment in wetland agriculture had been made and which we documented through archaeological field work during the summers of 2006 and 2007.

One goal of this project has been to develop an integrated GIS database that would link archaeological and historical materials and which could be displayed spatially, via maps. All of the archaeological features discovered in the study area have also been entered into a GIS database. Some of these features were found as part of a previous research program along the leeward (western) portion of the Kohala mountains where a large dryland field system was developed. However, the new agricultural complexes in the smaller gulches of eastern Kohala are now part of the GIS, along with the previously mapped archaeological features of Pololu and Honokane valleys. Work began this past summer along the leeward coast of North Kohala to document settlement and the history of occupation in this region that would have been part of a system of coastal and inland land use. Previous research places its timing from about the 14th through the end of the 19th centuries. We have continued mapping of all of the religious features (*heiau*) in the region. This began in the uplands of leeward Kohala where more than 30 agriculturally related religious sites have been found. We are now adding the features previously documented (sometimes, unfortunately, already destroyed) and newly discovered during our surveys along the windward, eastern coast of Kohala. Some of these sites are identified traditionally and have accompanying Hawaiian names. We are also documenting other place names, associated with historical events and named individuals, as they are encountered on maps or through our ethnohistorical research. Fred Cachola, a Native Hawaiian, continues to assist with this portion of the research. Cachola has historical ties to the area and he is sharing his knowledge of oral traditions with our research team. He has particularly good oral histories for locations and events associated with Kamehameha, the Great. These, too, will be entered into the GIS database.

Summary

Substantial headway has been made towards the goals of this research project. We have developed information from both archaeological and historical sources on Kamehameha, his contemporaries, and his ancestors. The archaeological documentation, however, also provide information on untold and unnamed numbers of Hawaiians who lived in Kohala. While we do not have their names in many cases, their record of accomplishments is evident in the agricultural, ritual, resource procurement remains that they have left and which have survived until today.

This project was originally designed to end in August of 2008. However, the senior Principal Investigator, Michael Graves has moved from the University of Hawai'i to the University of New Mexico in early 2007. This has delayed work on some portions of the project, most notably the development of the database of oral traditions associated with Kamehameha. This will require more time to complete and we will be seeking a no-cost extension of the project through December 31, 2009, along with the transfer of the grant from UH to UNM.