



ARCHAEOLOGY  
ON THE  
NORTHERN  
PLATEAU OF  
GUAM

## Acknowledgements

Author: Judith R. Amesbury of Micronesian Archaeological Research Services

Cardno: Artifact photographs, layout, and design

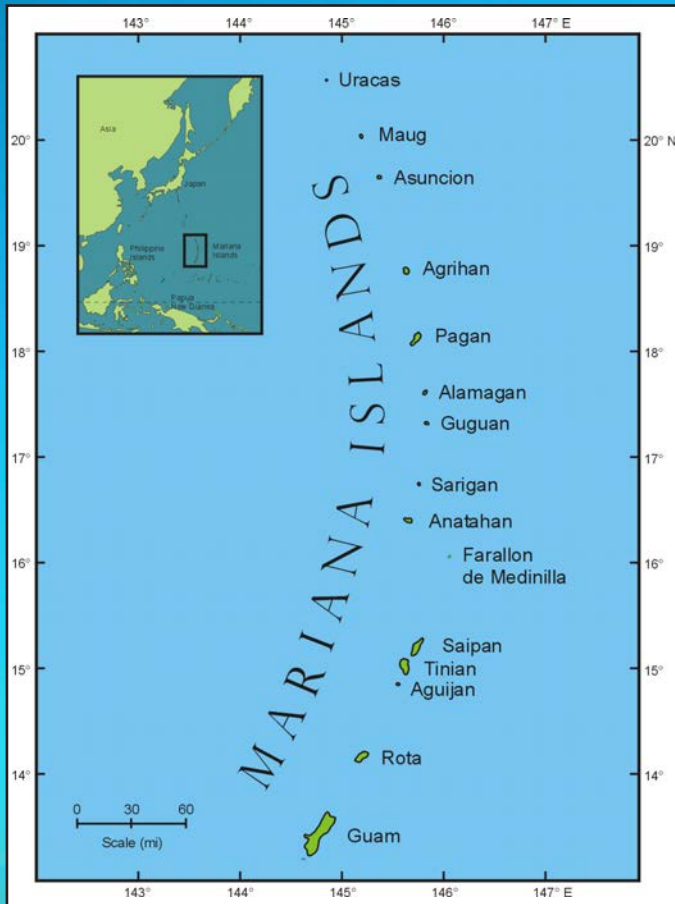
Cover and title page photo: Northern Plateau of Guam seen from the northwest coast.  
Photo courtesy of Southeastern Archaeological Research, Inc.

# ARCHAEOLOGY ON THE NORTHERN PLATEAU OF GUAM



In 2016, the U.S. Navy conducted archaeological research on Andersen Air Force Base on the Northern Plateau of Guam before military construction in the area. A total of 15 archaeological sites will be affected by military construction. However, only 14 of these sites were subject to data recovery excavations; archival research was conducted at one site, Northwest Field.

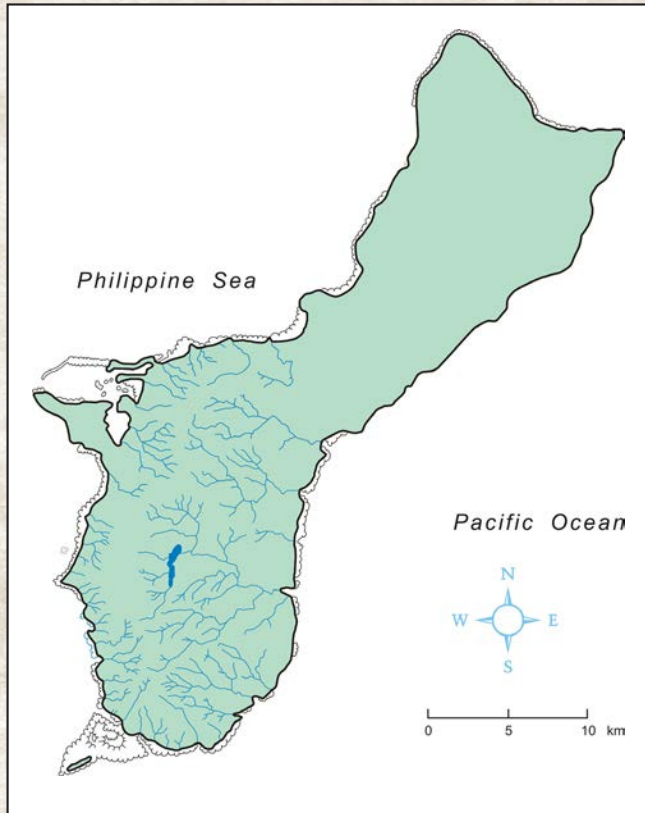
This booklet explains how the archaeological work was done and what was learned as a result.



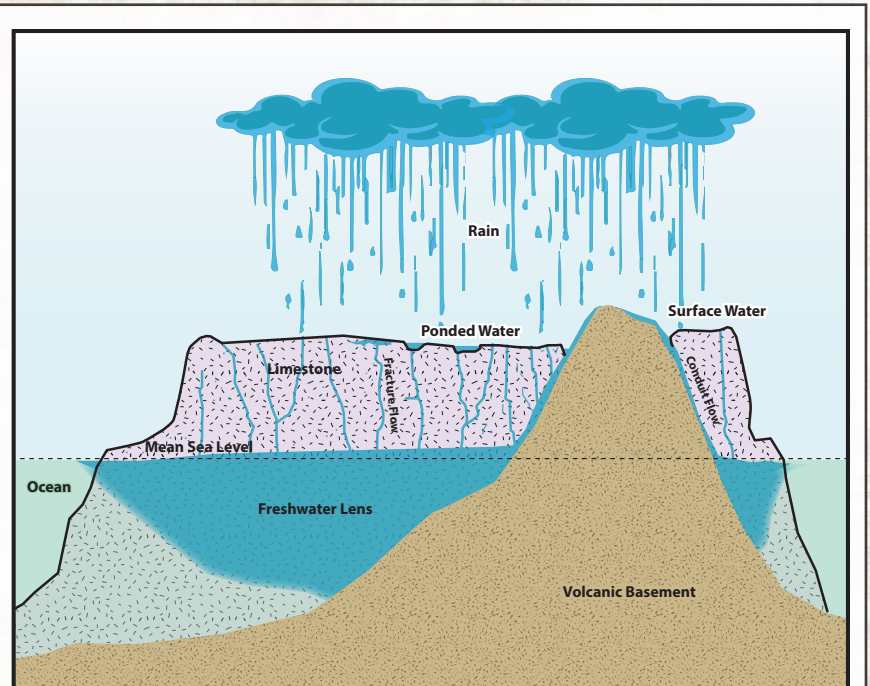
Above: The Mariana Islands. Figure by Barry Smith.

Right: Guam, showing the lack of streams on the Northern Plateau. Figure by Barry Smith.

Photo: One of the Northern Mariana Islands, Anatahan, erupting in 2003. Photo by Allan Sauter.



Guam is the largest island in the Mariana Islands. The island was formed millions of years ago by volcanic activity. In the volcanic southern part of Guam, there are numerous rivers, but the northern half of the island is a raised limestone plateau with no streams.



Rainwater seeps through the porous limestone and creates a lens of fresh water below ground surface. Today the water in the Northern Lens Aquifer is pumped for use by the people of Guam.

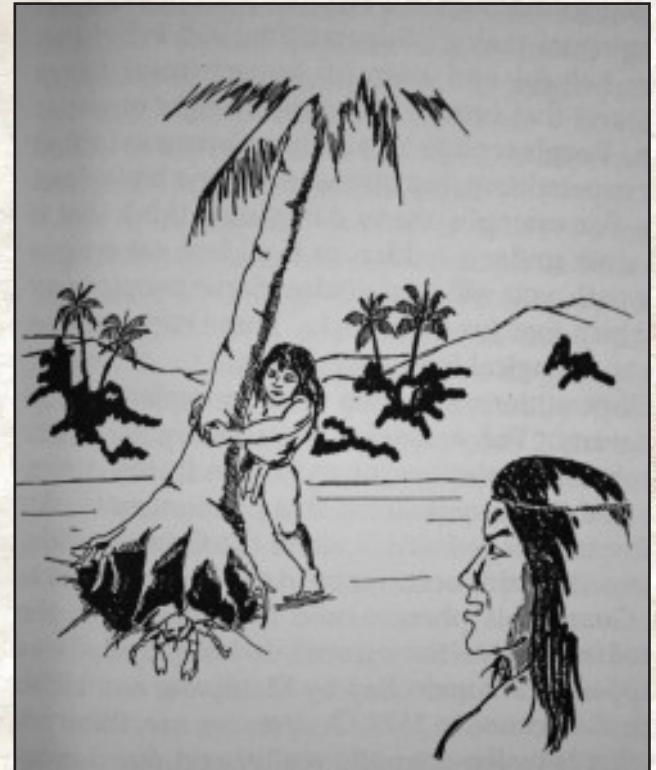
Of course, access to fresh water was important to the early inhabitants of Guam also. Many archaeological sites are found close to the rivers in southern Guam or close to the coasts where fresh water seeps out of the lens, but the archaeologists found sites on the Northern Plateau as well.

# What were People doing on the Northern Plateau 1,000 years ago?



There are a number of folktales about people in the past. One story involves a powerful man named Masala. His wife gave birth to a boy, and Masala was very proud of his son. However, as the child increased in stature and strength, the father became jealous, fearing that the boy would become stronger than he was.

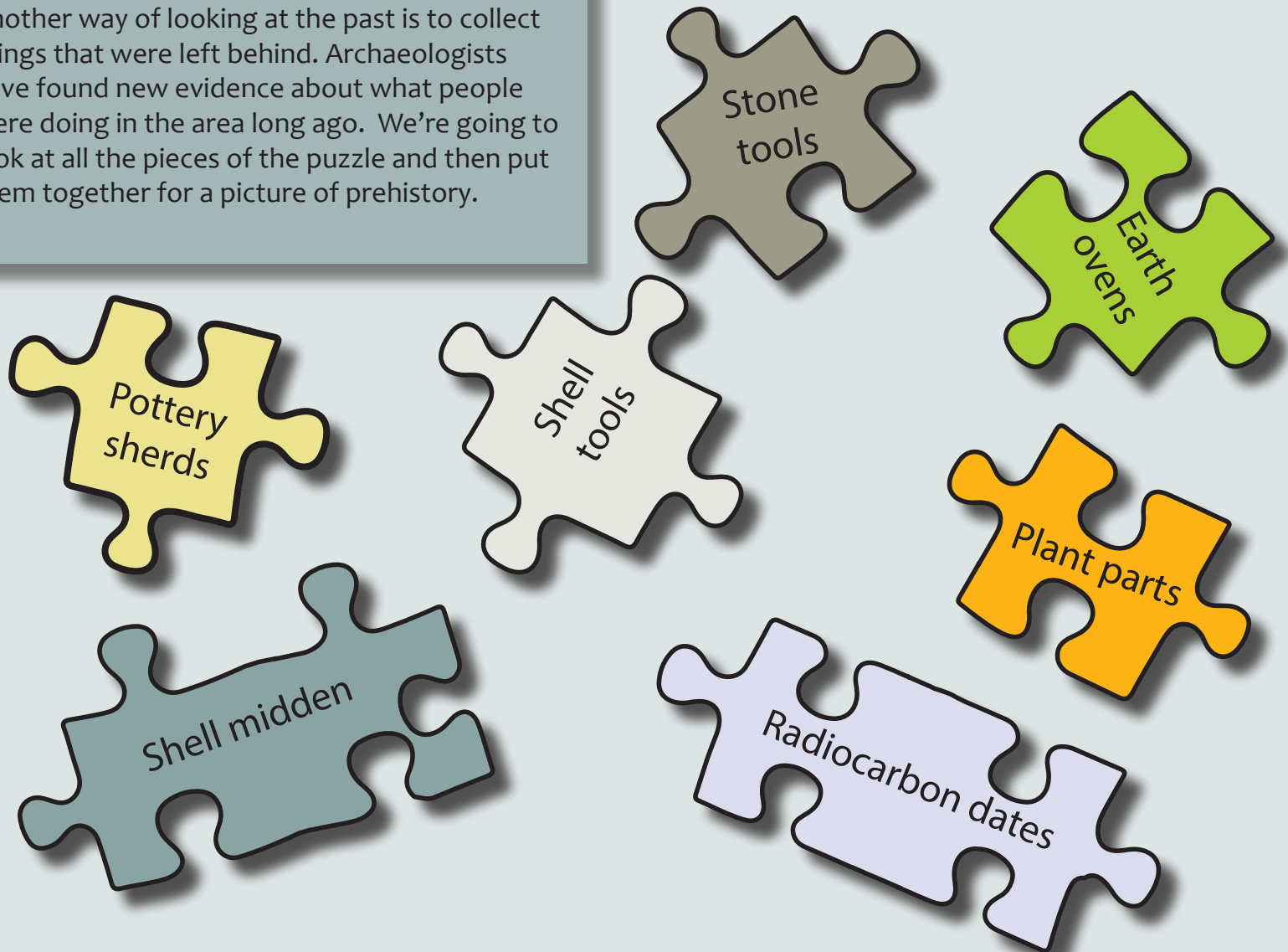
One day the child was playing with a crab, and the crab ran down a hole at the base of a coconut tree. Trying to reach the crab, the boy pulled the whole tree out of the ground. When the father saw the child's immense strength, his jealousy got the better of him, and he chased his son to the northern end of Guam. From there the frightened boy leaped across the ocean to the island of Rota, 40 miles to the north. It is said that one footprint can be seen on Puntan Pátgon (Child's Point), Guam, and the other footprint on Rota. Some people think the child became the legendary Chamorro chief or *maga'láhi*, named Taga.



The boy leaping from northern Guam to Rota.  
Courtesy of Bess Press, Honolulu.

Masala's son pulling the coconut tree out of the ground.  
Courtesy of Bess Press, Honolulu.

Another way of looking at the past is to collect things that were left behind. Archaeologists have found new evidence about what people were doing in the area long ago. We're going to look at all the pieces of the puzzle and then put them together for a picture of prehistory.



The different kinds of information are pieces in the puzzle.

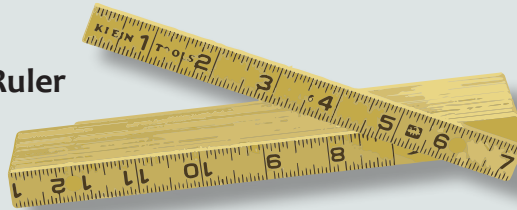
# What is Archaeology?

**Archaeology** is the study of the people and cultures of the past using the material remains they left behind. Archaeologists look for sites, which are places where people lived or worked and left evidence of what they were doing there, including artifacts and ecofacts.

Tools Used in Archaeology:



Folding Ruler



Trowel



Bucket



Screen





# What are Artifacts and Ecofacts?

**Artifacts** are man-made objects. Pieces of pottery, slingstones, shell adzes, and fishhooks are examples of ancient artifacts frequently found on Guam.



a. Slingstone, b. Fish Hook, c. Pottery Sherd, d. Shell Adzes, e. Shell Fragments

Hafted Adze

**Ecofacts** are not man-made. They are natural objects, which come from plants or animals, but which also provide evidence of what the people were doing. Examples of ecofacts are charcoal from fires, pollen from plants that were cultivated or collected, and fish bones and seashells left over from meals enjoyed long ago.

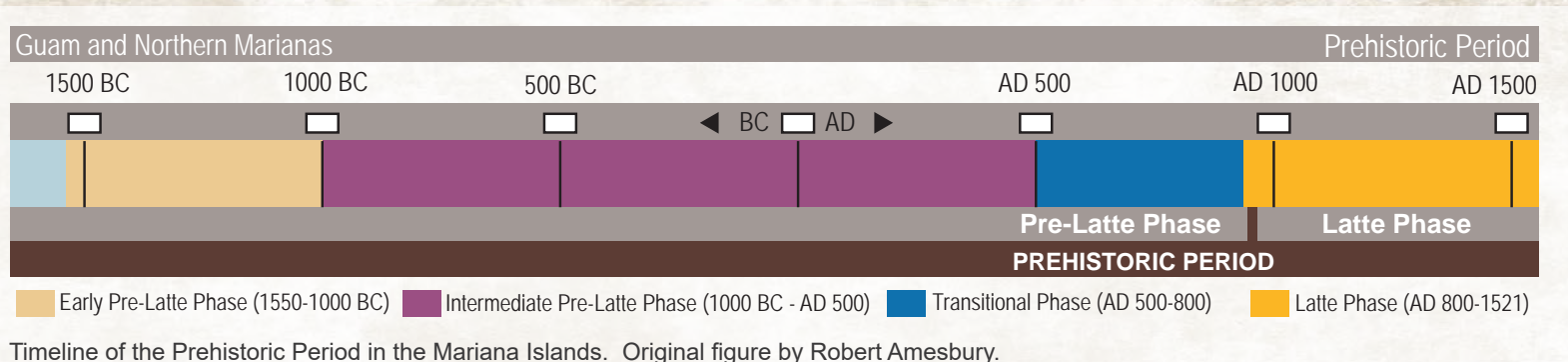
# What is Archaeological Data Recovery?

**Archaeological data recovery** is the process of collecting and analyzing archaeological materials in order to learn as much as possible about the past. During this archaeological data recovery project on the Northern Plateau of Guam, the archaeologists studied sites dating to both the Prehistoric Period and the Historic Period.

## What is Meant by the Prehistoric Period or Pre-Contact Period?

**Prehistory** is the period of time when there was no written history. There was no writing in the Mariana Islands before European Contact. The Prehistoric Period is the same as the Pre-Contact Period in the Marianas. It began with the arrival of the first people by at least 1500 BC and ended with the arrival of Magellan in AD 1521. So the Prehistoric Period lasted at least 3,000 years.

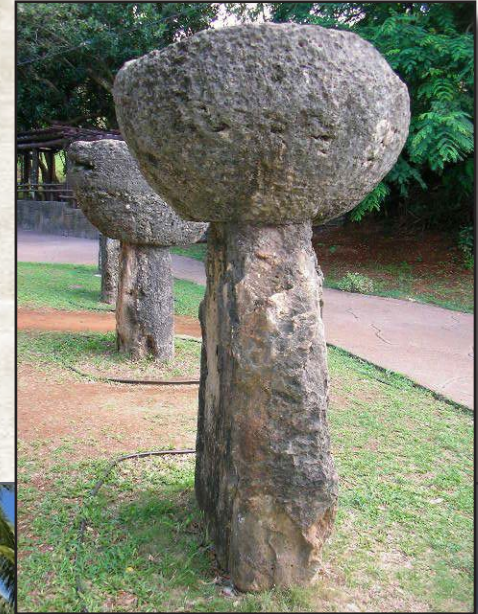
More than 50 years ago, an archaeologist named Alexander Spoehr described parts of the Prehistoric Period based on the presence or absence of *latte* stones. The Latte Phase (when the *latte* were built) began around 800 and continued until European Contact in 1521. The earlier Pre-Latte Phase (before there were *latte* in the Marianas) dates from about 1500 BC to AD 800.



## What are *Latte*?

A **latte** is a two-piece stone pillar consisting of an upright shaft (*haligi* in Chamorro) topped by a capstone (*tåsa*). *Latte* occur in sets of two parallel rows, usually with a total of eight, ten or twelve shafts and capstones. Based on the cultural materials and features associated with *latte* sets, archaeologists believe they functioned as foundations for houses. *Latte* sites are widely distributed along the coast as well as in the interior of the Mariana Islands. No *latte* were found during this project, but there have been *latte* found on other parts of the Northern Plateau.

This *latte* set, which originally had ten shafts and ten capstones, is located at South Finegayan on the southwestern part of the Northern Plateau. The capstones are no longer on top of the shafts.



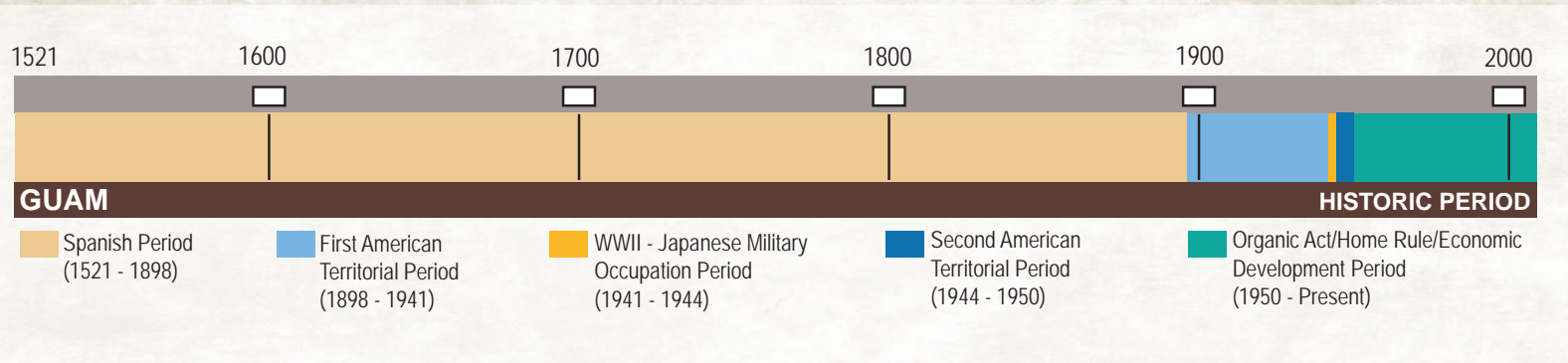
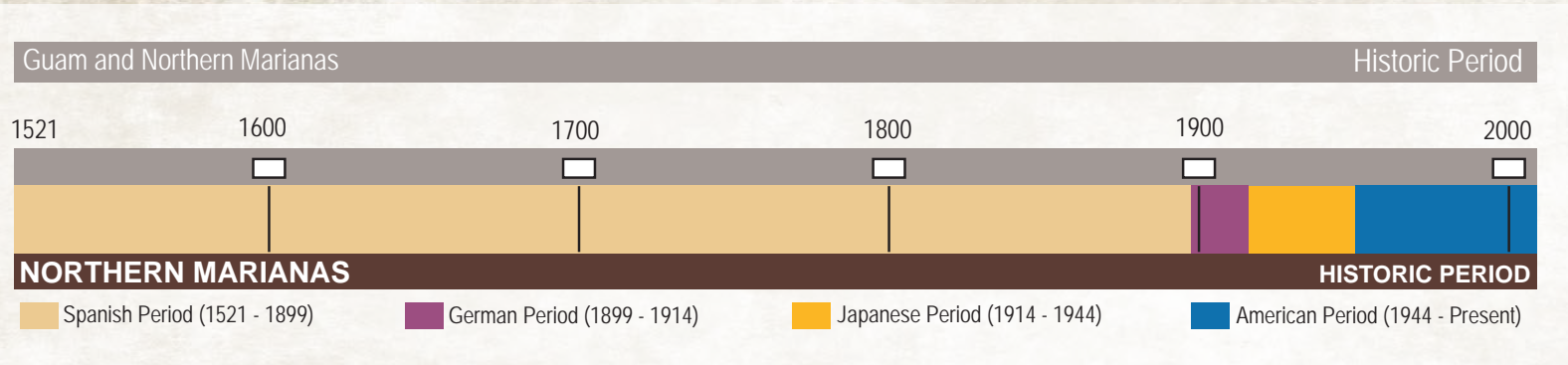
Top: *Latte* stones in *Latte* Stone Park, Hagåtña, Guam.  
Photo by Hajime NAKANO from Tokyo, Japan.

<https://commons.wikimedia.org/w/index.php?curid=4052621>

Bottom: South Finegayan *Latte* Stone Park.

# What about the Historic Period?

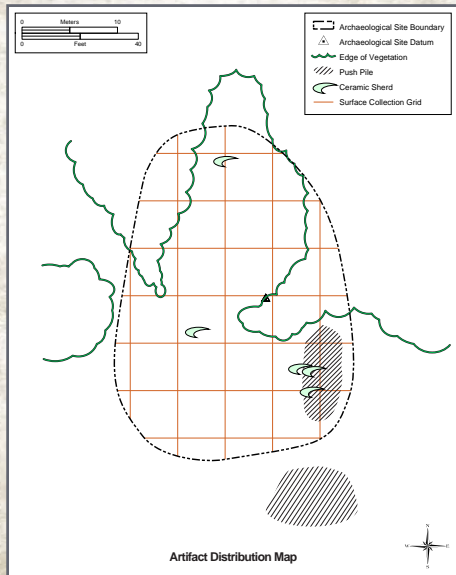
**The Historic Period** began with the arrival of Magellan in 1521. The Mariana Islands were claimed by Spain in 1565, and in 1668 the Spanish colonized Guam. Spain controlled Guam until the Spanish American War in 1898, when the United States took over Guam. The U.S. has governed Guam since 1898, except for a period of 32 months during World War II when Japan occupied Guam.



Timeline of the Historic Period in the Mariana Islands. Original figures by Robert Amesbury.

# What were the Steps in the Data Recovery Process?

Over the last decade, 29 archaeological sites have been found within the project area. However, 14 sites were found to be so disturbed that further study was not needed. Additional investigations were done at 15 sites because they have information that will benefit our understanding of the past.



Archaeological site map showing surface collection grid.

**1) Documentary research.** Before the archaeologists went into the field, documentary research was conducted. That means the archaeologists read what had been written about the area. This helped them to predict what kind of materials they would find at the sites. Additional documentary research in historic archives was conducted for one of the historic sites, Northwest Field, because construction would only occur on a small portion of the site. Fieldwork was conducted for the other 14 sites.

**2) Gridding, mapping, and surface collection.** The surface of each of the 14 sites was divided into a grid of squares, which measured 5.0 by 5.0 meters (or 16.4 by 16.4 feet). Then the site was mapped. At the same time, surface collection was conducted. The archaeologists collected informative artifacts and ecofacts in bags. Artifacts collected included broken pieces of pottery that were the rims of prehistoric pots and pieces of stone tools, such as pounders. Ecofacts collected included seashells, which had been carried to the Northern Plateau by the prehistoric people as food. The gridding, mapping and surface collection enabled the archaeologists to determine which parts of the site had the most artifacts.

**3) Subsurface testing.** Once the gridding, mapping, and surface collection were completed, the subsurface testing began. Shovel Test Pits (STPs) were dug about every 5 to 10 meters (16.4 to 32.8 feet) in order to determine how large the sites were. STPs were considered “positive” if they yielded cultural materials and “negative” if no cultural materials were found. As the archaeologists dug toward the outer edges of the site, the STPs were more frequently negative, and the archaeologists knew they had reached the limits of the site.

The STPs enabled the archaeologists to examine the stratigraphy of the site. Stratigraphy refers to the different layers of soil in the ground. The archaeologists inspected the layers to determine which layers contained cultural materials. Most of the STPs measured 0.50 by 0.50 meters (approximately 20 by 20 inches), and they were dug until the limestone bedrock below the soil was reached. A total of 172 STPs were dug at 14 sites

Excavation Units (EUs), which usually measured 1.0 by 1.0 meter (about 39.4 by 39.4 inches), were dug in the areas with the densest cultural materials. EUs were also dug at features. Features are areas with concentrated evidence of human activity, such as an earth oven (*chãhan* in Chamorro) or shell midden. The EUs were dug down to the limestone bedrock. All of the soil excavated was sifted through a screen with 1/8” openings, and what remained in the screen was collected for analysis. A total of 44 EUs were excavated.



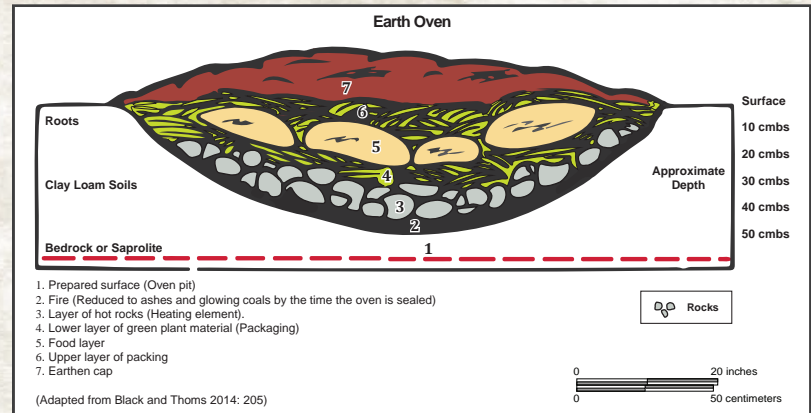
Shovel Test Pit



Excavation Unit

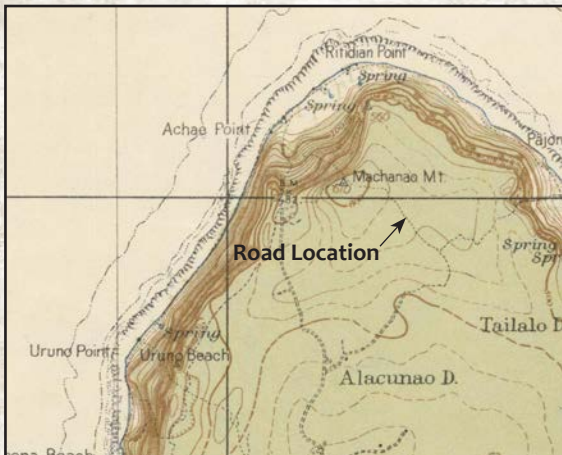
# So what Kind of Sites and Features were Examined?

One site is a rockshelter, similar to a shallow cave that people lived in or used as a shelter, with marine shell and an earth oven. In addition to the rockshelter, there are three open sites that are also relatively rich with evidence of use at least off and on over long periods of time. One of these three sites has four earth oven cooking basins, and another has four separate earth oven areas with multiple cooking basins. These four sites include the two sites with the greatest numbers of pottery sherds and three of the sites that had shell middens.



Earth Oven

Nine of the sites are mainly surface scatters of artifacts, especially Latte Period pottery sherds. These sites have limited cultural materials indicating that they were used less frequently or for shorter periods of time and by smaller groups of people.



Historical 1922 Topographic Map of Ritidian Point

Finally two sites are historic. One is a rock line that runs parallel to the unimproved road to Ritidian Point. The line was probably made as a result of machine clearing to construct the road prior to World War II. The road can be seen on a 1922 American topographic map and also on 1944 U.S. military aerial photos. The second historic site is Northwest Field, a World War II airfield built in 1944-45 and closed in 1949.

# What Kind of Artifacts were Collected during the Data Recovery?

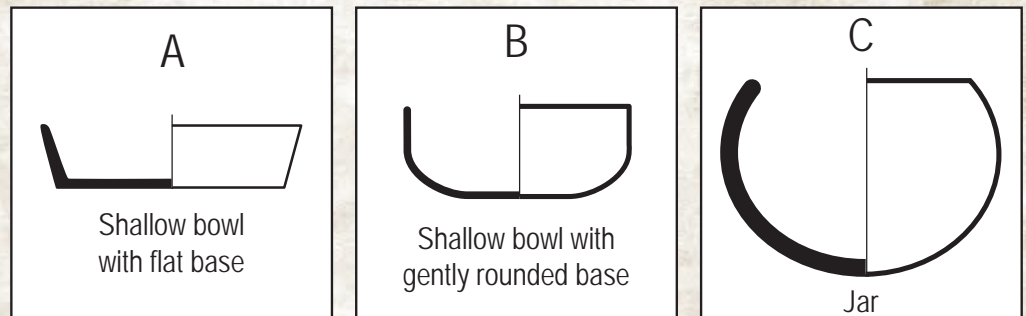
**1) Pottery sherds.** Broken pieces of prehistoric clay pots, called pottery sherds, were the most abundant artifacts, both by number and by weight. More than 1,300 sherds, weighing a little more than 28.5 pounds, were collected. About 24 pounds of sherds were analyzed. The remaining sherds were too small or too eroded to analyze.



Ceramic Rim Sherds

The sherds are evidence that people used ceramic pots at the sites on the Northern Plateau. When the pots broke, the pieces were left behind. The sherds came from 13 of the 14 excavated sites. Three of the sites yielded more sherds than the other ten sites put together.

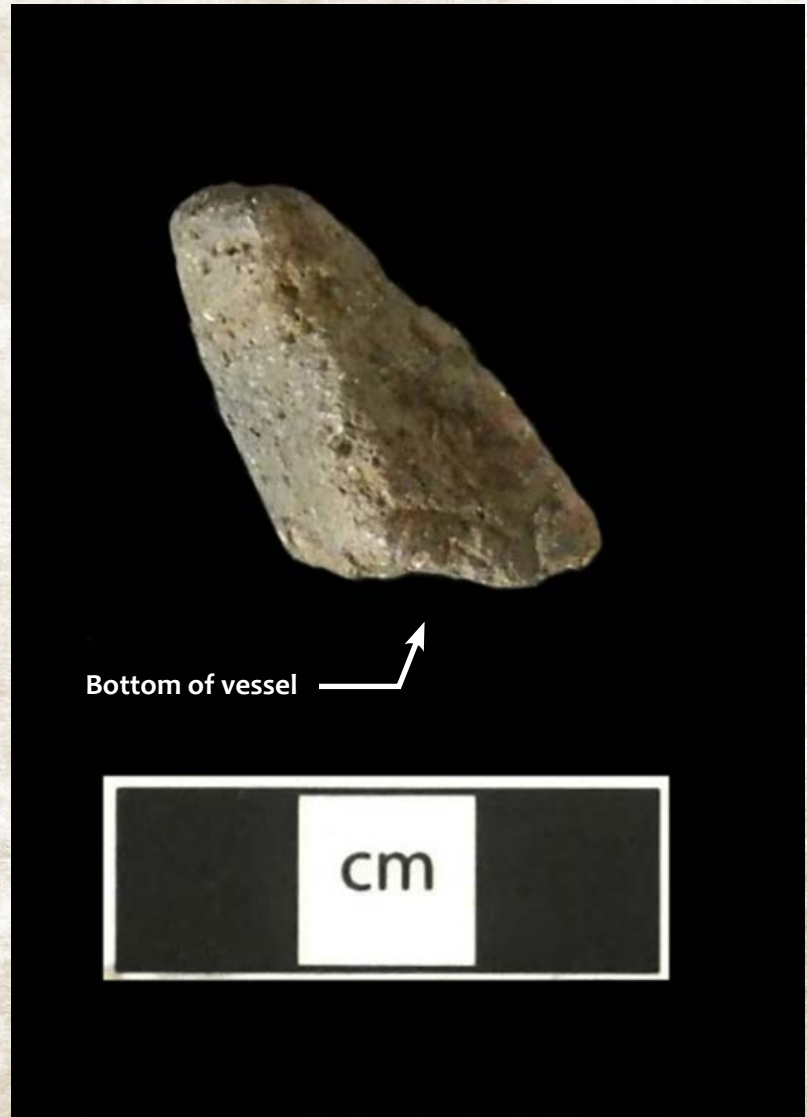
The pots that the sherds came from were mostly simple bowls or jars with gently rounded bases. The rims were somewhat thicker than the walls of the bowls, and the walls were nearly vertical or curved in slightly toward the rim, with a plain or rough finish on the outside. These vessel forms date to the Latte Period.



Ceramic Vessel Forms in the Mariana Islands



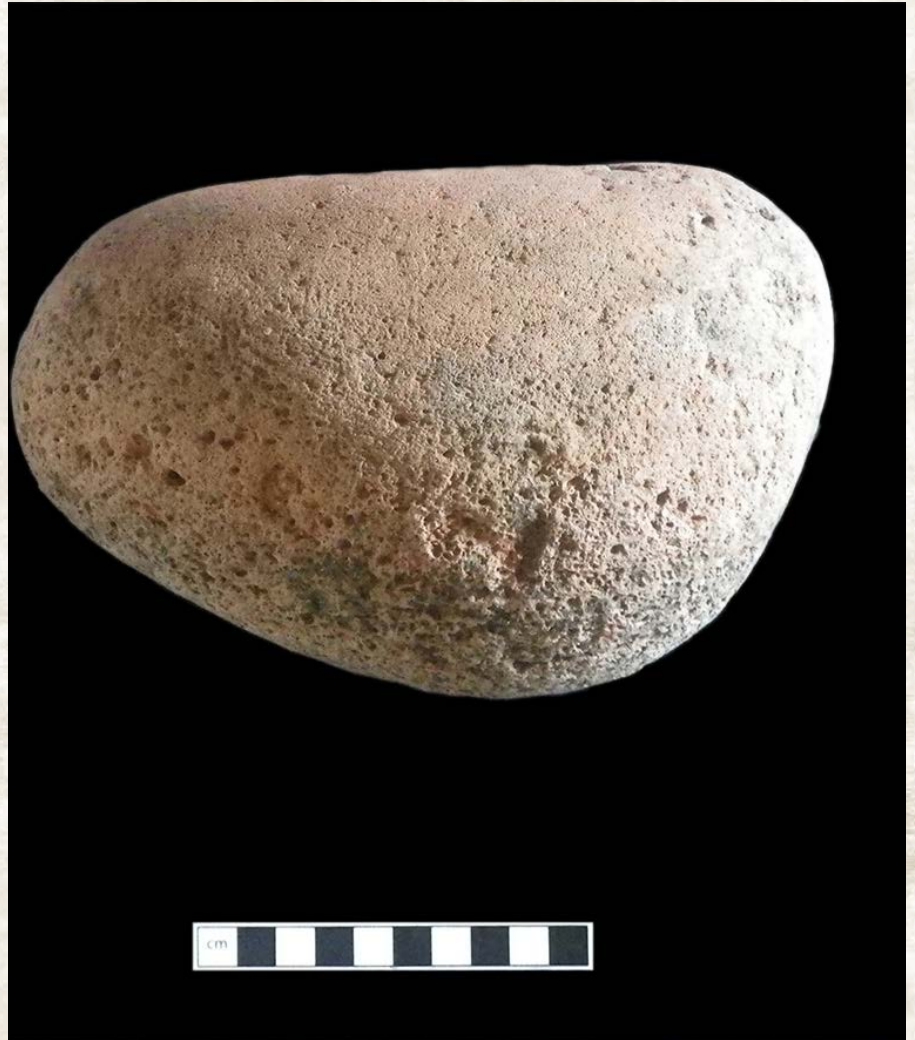
However the rockshelter had some sherds from flat-bottomed bowls that date to the Late Pre-Latte. These bowls were more likely to have a smoother surface. Although some very early prehistoric pottery from the Mariana Islands is decorated, none of the sherds from this project had decorations.



Sherd from Flat-bottomed Vessel

**2) Lithic artifacts.** Lithic artifacts, commonly referred to as lithics, are stone tools, tool fragments, and tool manufacturing debris. Nineteen lithics were collected from eight of the sites. Total weight of the lithics is about 12 pounds, but one tool alone weighs more than 6 pounds. Most of the lithics were made from volcanic rocks that were carried to the project area, probably from southern Guam. They didn't occur naturally on the limestone plateau.

The largest stone tool is a basalt netherstone; the bottom stone against which something else was worked. The circular top surface of this netherstone has been ground smooth by someone grinding or sharpening other stone or shell tools.



Basalt Netherstone

From the same site as the netherstone, there is a chunk of basalt that was not shaped into a formal tool, but it has been used as a handheld grinder or abradar. Marks on one surface indicate that it was used in a back and forth motion.

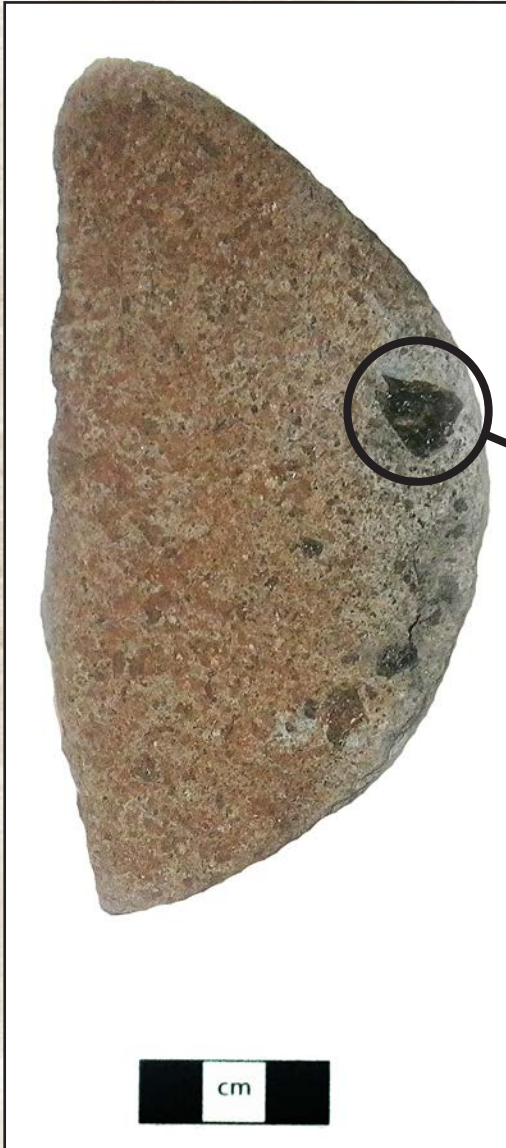


Handheld basalt grinder showing marks or grooves on the grinding surface.



Limestone Pounder

The rockshelter had a limestone pounder. This is one of the few lithic artifacts made from the stone available on the Northern Plateau. The pounder weighs about 2 pounds and one end is smoother than the other from use. It was probably used for pounding cycad nuts, breadfruit, or screwpine fruits or leaves.



From the historic road site, there is a fragment of a large tool, probably a pounder, made from andesite tuff. A pounder is a heavy tool used to crush, grind, or pulverize. The artifact was broken both lengthwise and crosswise, so this is only about one-fourth of the tool. In the broken surface, you can see a large particle of volcanic glass. The tuff and volcanic glass formed as a result of a volcanic eruption of magma (hot fluid below the earth's surface) followed by rapid cooling in the air. Tuff is formed by the compression of ash from a volcanic eruption. This tool probably dates to the Prehistoric Period although it was found at an historic site.



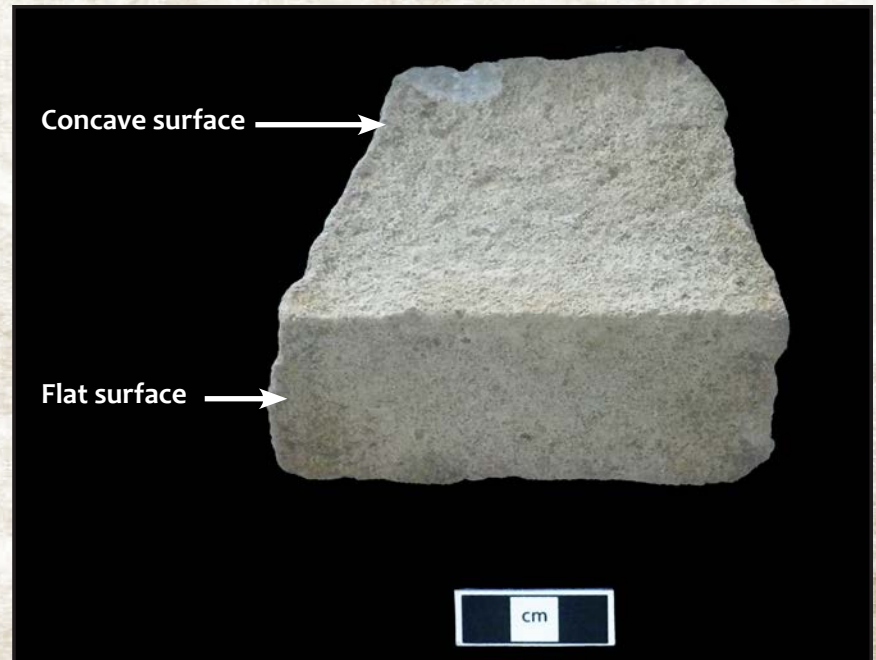
Left: Fragment of large groundstone tool, probably a pounder, broken both lengthwise and crosswise.

Above: A large particle of volcanic glass can be seen in the broken surface of the groundstone tool fragment.



Blade End of Stone Adze

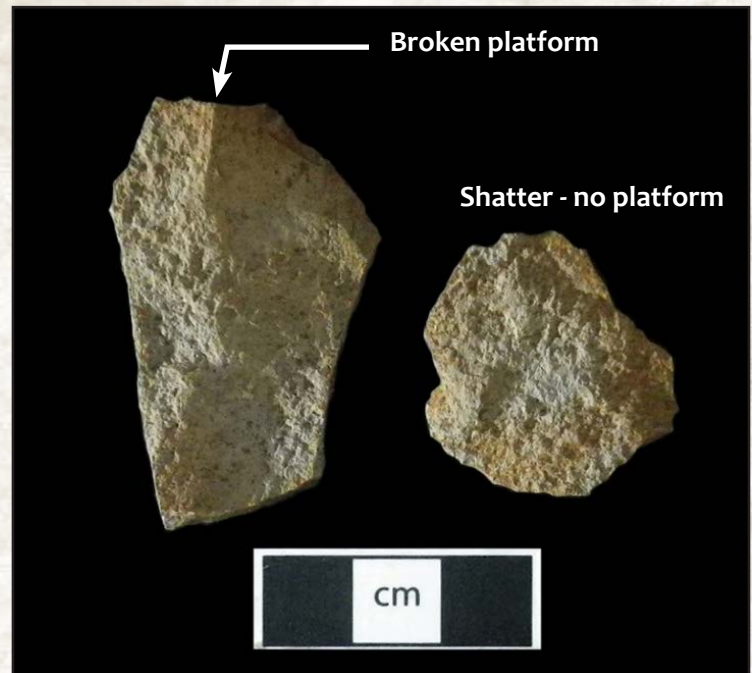
From the site with the greatest weight of analyzed pottery sherds, there is a piece of a stone adze. An adze is a woodworking tool similar to an axe, but with the cutting edge formed from a bevel on only one side. This stone adze would have been hafted or tied to a wooden handle. The blade end of the adze was found, but the poll end is missing. It was broken long ago. This adze was probably used for cutting trees, felling trees, or working wood.



Sanding Tool  
(Convex surface is not visible in the photograph)

A versatile tool made of andesite was found at one of the short-term use sites. It is a multi-purpose sanding tool with three different surfaces. One surface is flat, another is concave and another is convex. All three surfaces could have been used in finishing wooden objects.

The six stone tools or lithics previously shown are the largest of the 19 lithics collected. The remaining 13 lithics all together weigh only about five ounces. They are either small tools, small fragments of tools, or fragments of stone left over from making tools. Flakes are thin, sharp-edged pieces of stone removed from a larger stone by percussion or pressure. Five percussion flakes were found at four sites.





*Tridacna* shell adze with the blade (cutting) end missing.

3) **Shell adzes.** Fragments of two shell adzes were found during the project. Both were made from the giant clam shell, *Tridacna* or *hima* in Chamorro. The first fragment is from a relatively large, thick, well-crafted adze with the blade end missing. The adze is triangular in plan view and has a slightly squared poll end. The characteristic *Tridacna* sculpture is present on the front or top of the adze.

The second is a very weathered blade end of an adze with the *Tridacna* pattern barely visible. The curious thing about this fragment is that it has a hole near the center of the width of the adze and close to the broken edge opposite the blade end. The hole was drilled from the underside. There are mollusks that drill holes in shells, but they would drill from the outside of the shell. Since this hole was drilled from the inside of the shell, it appears to be manmade. It's possible the hole was somehow used in hafting the adze or in attempting to mend it once it cracked. It's also possible this old, worn adze blade was strung for wearing, the way some people nowadays wear shell adzes.



Weathered blade end of a *Tridacna* shell adze.

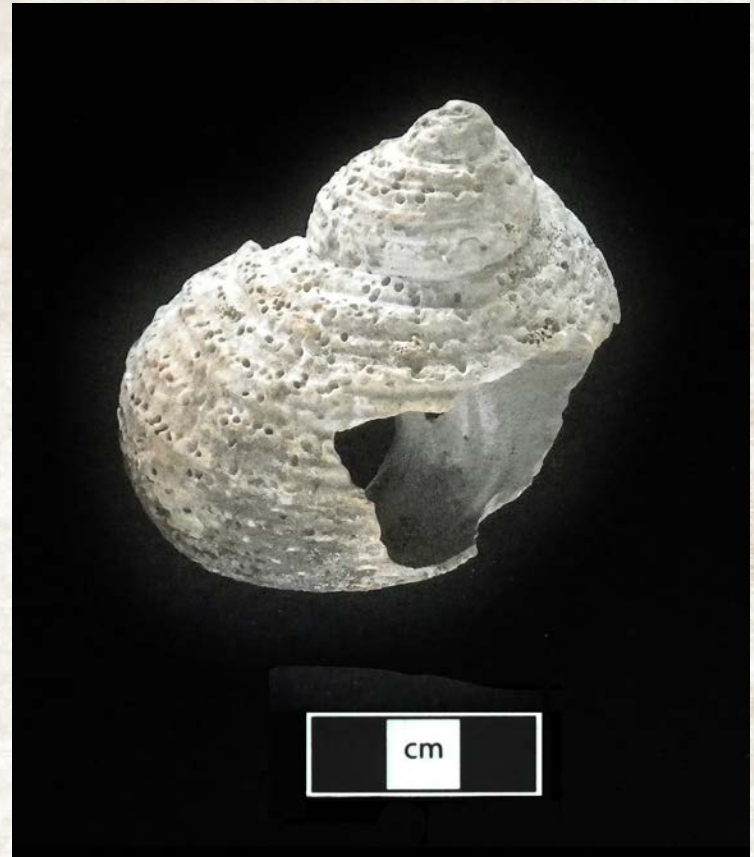
## What Kind of Ecofacts were Collected?

**1) Faunal remains.** Faunal remains, which are the remnants of animals, such as bones, teeth, and shells, were collected from nine sites. Three of the richest prehistoric sites had shell middens, which were food refuse dumps. People of the past ate the mollusks, then discarded the shells. At all three sites, gastropods (single-shell mollusks, like snails) out-weighed bivalves (double-shell mollusks, like clams). This is what would be expected of shells collected in northern Guam. Bivalves are more abundant in the silty bay and beach areas of southern Guam.

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The most abundant families of mollusks represented in the shell middens were the turban snails and top snails, known in Chamorro as *alileng*. These relatively large gastropods would have been handy containers of protein to carry up to the Northern Plateau, the way we might carry a can of Spam or Vienna sausages.

In fact, someone carried *alileng* to the Northern Plateau in the 20th century, because one of the shells collected is *Tectus niloticus*, the commercial top shell, which was introduced to Guam after World War II. Apart from that shell, the marine shells collected from the prehistoric sites probably date to the Prehistoric Period.



*Turbo Shell (alileng in Chamorro)*



Three more sites had very small quantities of a shell with the scientific name *Pythia scarabaeus*. This is a land snail, known in Chamorro as *akaleha'*. This species is not usually considered a food snail, and these few shells probably occurred in the sites naturally. They were not carried there by people like the marine shells were.

*Pythia scarabaeus* Shells (*akaleha'* in Chamorro)



A few shells of two other land snails, also known as *akaleha'*, were collected during the project, but they are both 20th century introductions to Guam. *Achatina fulica* is the African land snail, which was introduced to Guam during the 1940s, and *Euglandina rosea* is the cannibal snail, which was introduced to Guam in 1957 in an attempt to kill off the African land snails. *Achatina* and *Euglandina* have no archaeological significance except as indicators of recent or disturbed deposits.

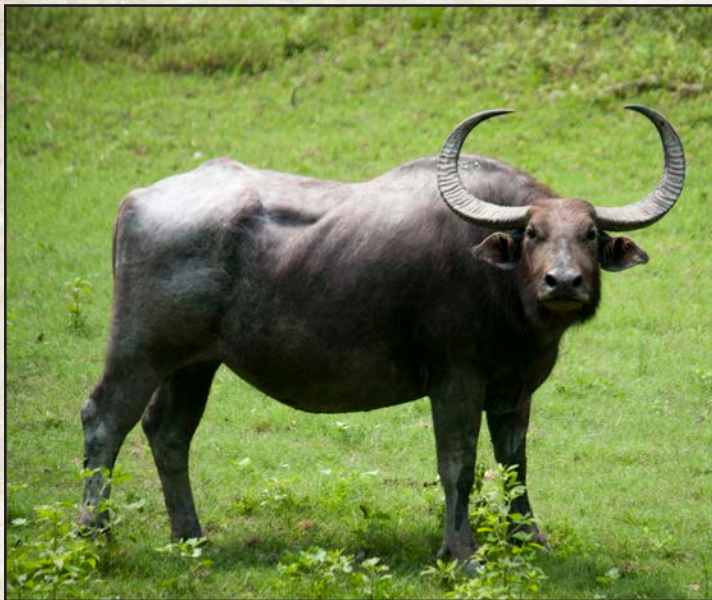
*Euglandina rosea* Shell (*akaleha'* in Chamorro)

A few bones of the cane toad, *Rhinella marina*, were found at three sites. This species was introduced to the Mariana Islands in the 1930s. Like the African land snail and the cannibal snail, these remains have no significance with regard to the prehistoric sites where they were found.

Finally, one bone and two teeth of the Philippine deer, *Rusa marianna*, were found at two sites, and three teeth of the Asiatic water buffalo, *Bubalus bubalis*, were found at one of those sites. The Philippine deer, *binâdu* in Chamorro, was introduced to Guam by Governor Mariano Tobias in the 1770s, and the water buffalo, *karabao* in Chamorro, was also introduced from the Philippines by Jesuit priests in the 1600s.



Philippine Deer, *Rusa marianna*



Teeth of the Asiatic water buffalo, *Bubalus bubalis* (*karabao* in Chamorro).

**2) Pollen and other microscopic plant parts.** In order to understand the vegetation on the Northern Plateau at the time the sites were used and also to discover which plants were being collected or eaten at the sites, eight samples were collected from the soil and the shell middens. These samples from the prehistoric sites were submitted to a company that does analysis of microscopic plant parts, such as pollen and starch grains.

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*Cycad, fadang in Chamorro, (Cycas micronesica):* Photo by L. Gutierrez:  
Available at <https://www.flickr.com/photos/guam-flora-fauna/albums/>

The pollen of two kinds of plants was very abundant in the samples. The plants are cycad (*Cycas micronesica* or *fadang* in Chamorro) and screwpine (*Pandanus tectorius* or *kafu* in Chamorro). Both are local plants that produce edible fruits. Screwpine leaves are also very useful for weaving.



*Screwpine, kafu in Chamorro, (Pandanus tectorius):*  
Photo by L. Gutierrez:  
Available at <https://www.flickr.com/photos/guam-flora-fauna/albums/>

At one site there was a large quantity of pollen from a flowering plant that could not be specifically identified, but belongs to a family of plants (Scrophulariaceae) that are used medicinally in other parts of the world. Some of the plants in that family are native to Guam and were probably used medicinally here as well.

Small amounts of pollen were found from other food or medicine plants: banana (the genus *Musa* or *chotda* in Chamorro), coconut (*Cocos nucifera* or *niyok*), ti plant (*Cordyline fruticosa*), Indian mulberry or noni (*Morinda citrifolia* or *lada*), and the Moraceae family, which includes banyan (*nunu*) and breadfruit (*dokdok* and *lemmai*) trees.



Coconut, *niyok* in Chamorro (*Cocos nucifera*): Photo by Tu7uh (Own work) [CC BY 3.0 (<http://creativecommons.org/licenses/by/3.0/>)], via Wikimedia Commons



Breadfruit, *dokdok* or *lemmai* in Chamorro (*Artocarpus* spp.): Photo by Mkwk (Own work) [CC BY-SA 3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons



Banana, *chotda* in Chamorro (*Musa* spp.): (Uploaded by JoJan) [GFDL (<http://www.gnu.org/copyleft/fdl.html>) or CC-BY-SA-3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons



Indian mulberry, *lada* in Chamorro (*Morinda citrifolia*): Photo by L. Gutierrez Available at <https://www.flickr.com/photos/guam-flora-fauna/albums/>



Ti plant (*Cordyline fruticosa*): Photo by Mokkie (Own work) [CC BY-SA 3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons



Banyan, *nunu* in Chamorro: Photo by Diego Delso [CC BY-SA 3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons

Large quantities of microscopic fragments of charcoal were also found in the pollen samples, which indicates that there were fires at the sites. There were no doubt cooking fires and probably also burning of vegetation.



Three kinds of starch were found in the samples. Tiny starch grains of taro (*Colocasia esculenta* or *sunen agaga'* in Chamorro) or other closely related plants were found in six samples. One sample contained evidence of the lesser yam (*Dioscorea esculenta*, *nika* or *gado'* in Chamorro). The third kind of starch came from plants closely related to taro or from cycad or arrowroot (*Tacca leontopetaloides* or *gâpgap* in Chamorro).

*Taro, sunen agaga' in Chamorro (Colocasia esculenta): Photo by Thierry Caro Assumed (based on copyright claims). - Own work assumed (based on copyright claims)., CC BY-SA 2.5, <https://commons.wikimedia.org/w/index.php?curid=353479>*



*Lesser yam, nika or gado' in Chamorro (Dioscorea esculenta): Photo by Ahmad Fuad Morad [http://tropical.theferns.info/plantimages/sized/d/9/d9bd0087999edd93686070db889d7d2b91fca077\\_960px.jpg](http://tropical.theferns.info/plantimages/sized/d/9/d9bd0087999edd93686070db889d7d2b91fca077_960px.jpg)*



*Arrowroot, gâpgap in Chamorro (Tacca leontopetaloides): Photo By Craig Franklin (Own work) [CC BY-SA 3.0 au (<http://creativecommons.org/licenses/by-sa/3.0/au/deed.en>)], via Wikimedia Commons*

**3) Charcoal for radiocarbon dating.** Samples of charcoal and organic-rich soils were collected from six prehistoric sites for radiocarbon dating. They were submitted to a company that specializes in finding when charcoal from fires was created, and 13 ancient dates were obtained. The dates are not reported as a single year, for example AD 1521. Instead they are reported as a range, which in all likelihood includes the actual dates.

The earliest site found to be occupied was the rockshelter. People were using that site during the Late Pre-Latte and also during the Latte Period. Three radiocarbon dates from the midden range from about AD 550 to 900, the end of the Pre-Latte Period. Two dates from different levels of an earth oven at the rockshelter range from the late 1400s to the mid-1600s. That means the earth oven was used some time between the Late Latte Period and early Historic Period. The site was not continuously occupied, but it was occupied off and on for about 1,000 years.



Excavation unit in front of a rockshelter.

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Of the other three sites that contained many artifacts, one was dated to the Early Latte and Mid-Latte Periods (from about AD 1000-1300), and the other two were dated to the Mid-Latte and Late Latte Periods or even into the Historic Period. One of those sites yielded dates ranging from the mid-1200s to the mid-1600s, and the other yielded dates ranging from about AD 1250 to 1500.

One additional site dated to the Early Latte Period.

# What Happens when we Put all These Puzzle Pieces Together?

Now that the archaeologists have completed the field work and obtained reports from specialists about the artifacts and ecofacts, they are able to put together the puzzle pieces and see a much fuller picture of what people were doing on the Northern Plateau during the Prehistoric Period.

We know that these Northern Plateau sites were close to large villages on the north coasts of Guam. The villages, like Ritidian and Tarague, were occupied throughout the Prehistoric Period. They contain abundant evidence of large populations, including *latte* sets, caves and rockshelter sites, numerous mortars (*lusong* in Chamorro), large quantities of pottery sherds and shells, and human burials.



When the puzzle pieces are put together, we can see a much fuller picture of the prehistory of the Northern Plateau.

Just think about feeding all those people! Almost everyone would have been engaged in fishing, mollusk collecting, and harvesting edible plants. They would not have restricted themselves to the coastal environment only. They would have made use of all the island environments, even those like the Northern Plateau that were not hospitable for long-term habitation due to a lack of surface water. People from the coastal villages no doubt made trips to the Northern Plateau to obtain resources not readily available on the coast.

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The large quantities of cycad and screwpine pollen are an important piece of the puzzle. Both cycads and screwpine have separate male and female plants. Since the pollen would be found on the male flowers, perhaps the people were using the male flowers in food preparation or they may have been using pollen-laden leaves in the earth ovens, either as fuel or as food wraps. Cycad pollen was found in Late Pre-Latte midden and in Early Latte, Mid-Latte and Late Latte oven samples. Screwpine pollen was found in Mid-Latte and Late Latte ovens samples.



Left: Screwpine, *kafu* in Chamorro (*Pandanus tectorius*) (male flower): Photo by Forest Starr & Kim Starr Biologists / Environmental Consultants <http://www.starrenvironmental.com/>

Center: Male cycad cone, *fadang* in Chamorro: Photo by Salvatore Ingrassia (Taken at Binghamton University Greenhouse.) [Public domain], via Wikimedia Commons

Right: Female cycad cone, *fadang* in Chamorro: Photo by Yercaud-elango (Own work) CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=36916618>



During the Spanish Period and 20th century on Guam, cycad seeds were processed to remove toxins and ground into flour to make tortillas (*titiyas* in Chamorro). Chamorro people also used the raw seeds to make a poultice for wounds. It's possible that the prehistoric people were also aware of how to use the cycad seeds for food and medicine.

The screwpine is an exceptionally useful plant. Screwpine fruits can be eaten, cooked or raw, and the leaves are used for making grass skirts and weaving baskets, mats, thatch roofs and sails for canoes. The leaves can also be used in cooking and in making medicines.

It's interesting to note that one site had large quantities of pollen from a family of plants that are medicinal. In fact, the rockshelter still has medicinal plants growing on the rock. The four species in this photo, which was taken in 2010, all have medicinal uses.



Four species of medicinal plants growing on the face of the rockshelter. Photo by Sam Walker.

The archaeologists have concluded that the prehistoric Northern Plateau sites were places where people were collecting and processing native forest plants, mainly cycad and screwpine. In addition they may have been cultivating or maintaining their favorite fruits and tubers, like coconut, banana, and taro. The taro may have been grown closer to the coast and carried to the plateau to feed the people working there, as were the marine mollusks.

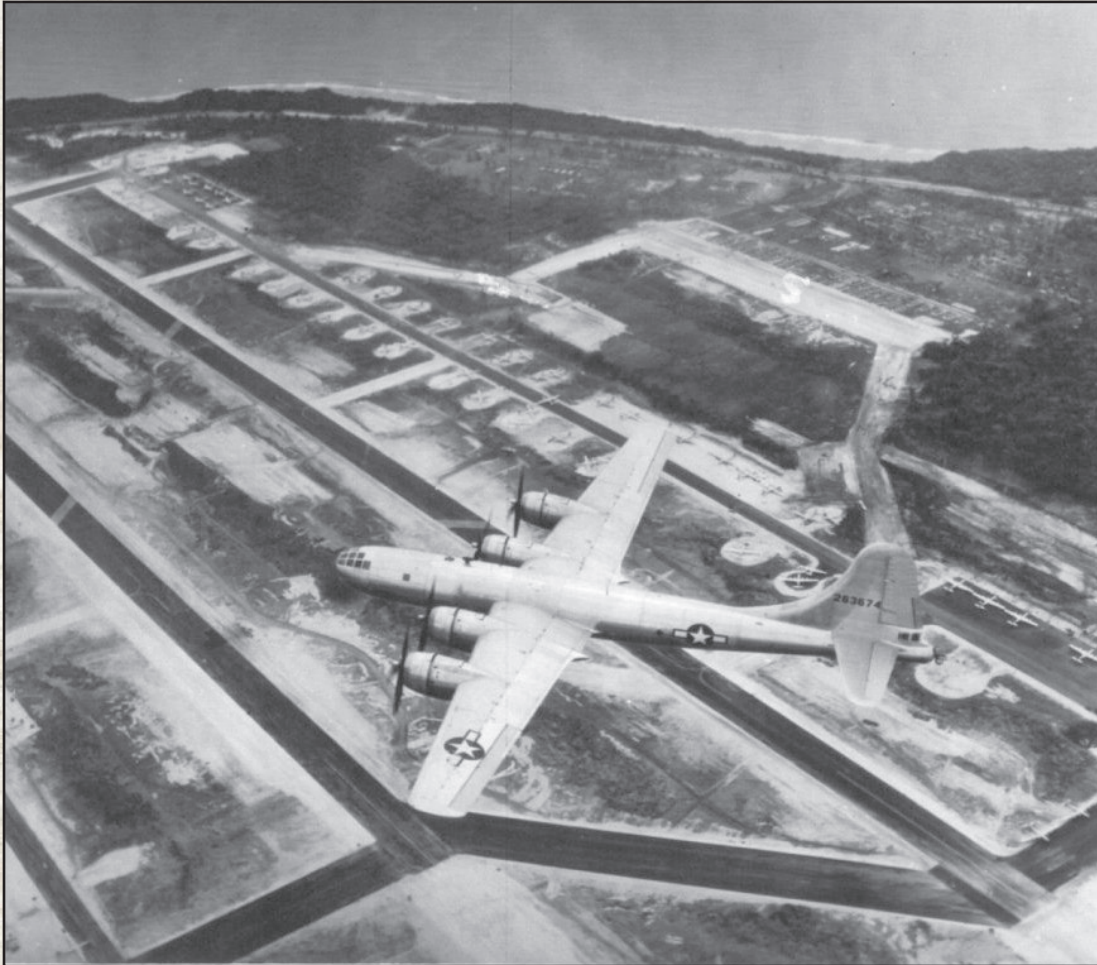
We don't know if the ceramic pots were made on the plateau or carried up and down with food in them. The shell adzes and the stone tools or the volcanic rocks they were made from were carried to the plateau.

The sites with limited cultural materials may have been left by people moving across the landscape collecting the plants, while the larger, more complex sites with the earth ovens are places where the plants were being processed. While none of these sites was continuously occupied, it is likely that some were occupied off and on at the same time, the way rural *lanchos* (ranches) are today.



Early- to Mid-Twentieth Century Chamorro Lanchon (Lotz 1973).

## The Northern Plateau had a New Use in the 20th Century.

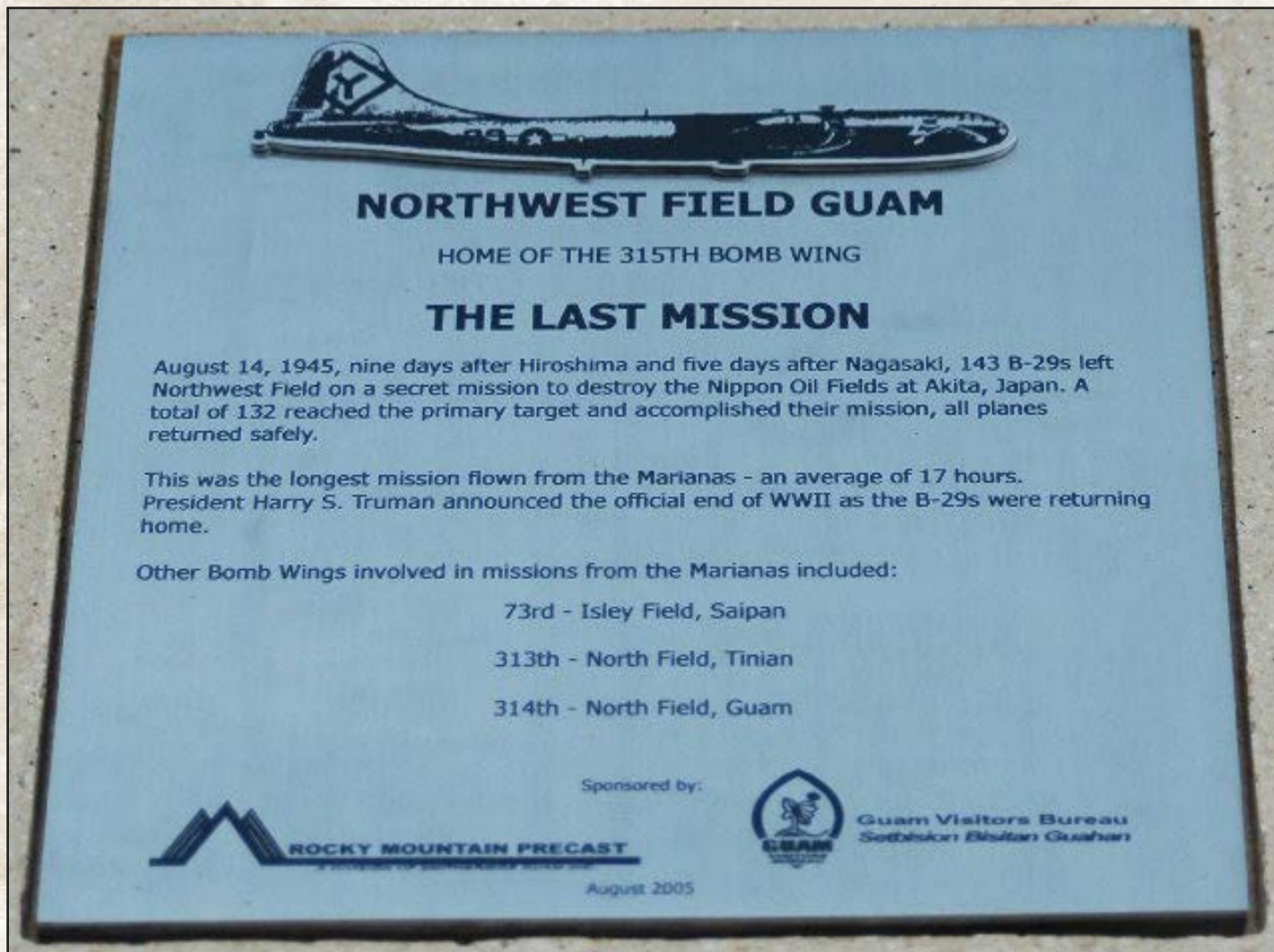


B-29 in flight over Northwest Field in 1945 (Wikipedia photo).

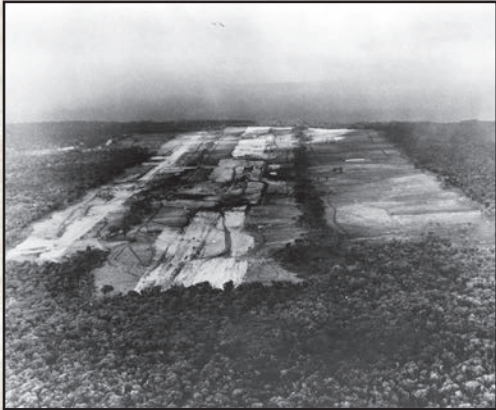
The Northern Plateau served a new purpose during the 20th century as a result of World War II. Soon after the Americans wrested control of Guam from the Japanese in August 1944, they began a massive military buildup for the remaining battles in the Pacific. Northwest Field was constructed in 1944-45 as a base for the B-29 Superfortresses.

On August 14, 1945, just days after the bombing of Hiroshima and Nagasaki, more than 100 B-29s took off from Northwest Field on a mission to destroy oil reserves at Akita, Japan. The 17-hour mission was the farthest-range and final combat mission of the war. On August 15, 1945, Emperor Hirohito announced the surrender of Japan.

Northwest Field was closed in 1949, but the nearby North Field became Andersen Air Force Base.



Monument on Guam to mark the last combat mission of World War II.



Northwest Field December 1944,  
View to the Northeast



Northwest Field January 1945,  
View to the Northeast



Northwest Field May 1945,  
View to the Northeast



Northwest Field August 1945,  
View to the Northeast



331st Bomb Group at Northwest Field

# Glossary

**Adze** — a cutting tool where the blade is set at a right angle to the handle.

**Archaeology** — the study of the people and cultures of the past based on the material remains they left behind.

**Archaeological data recovery** — the process of collecting and analyzing archaeological materials in order to learn as much as possible about the past.

**Archaeological site** — a place where people of the past lived or worked and left evidence of having been there.

**Artifact** — man-made object, such as a tool or a work of art.

**Bivalves** — a class of mollusks that have a two-part shell, like clams.

**Documentary research** — the study of written records.

**Ecofact** — a natural remnant of a plant or animal that reveals something about the past.

**Feature** — an area with concentrated evidence of human activity, such as an earth oven or shell midden.

**Faunal remains** — the remnants of animals, including things like bones and teeth and shells.

**Gastropods** — a class of mollusks that usually have a single coiled shell, like a snail.

**Ground stone** — stone tool formed by abrading one stone with another and may have been used to grind other materials including plants.

**Hafting** — the manner in which a stone tool is attached to a handle or shaft.

**Historic Period** — in the Mariana Islands, the period of time from European Contact in AD 1521 until the present.

**Indigenous** — occurring naturally in a place, native.

**Latte set** — an arrangement of two parallel rows of *latte*, usually with six, eight or ten shafts.

**Lithic Artifact** — a chipped or groundstone tool, tool fragment, or debris from stone tool manufacturing.

**Midden** — a trash deposit from the past containing food refuse such as seashells and bones.

**Netherstone** — the bottom stone against which something else was worked.

**Pottery sherd** — broken piece of a ceramic pot.

**Pounder** — a tool used to pound, crush, or beat an object.

**Pre-Contact Period** — in the Mariana Islands, the period of time between the arrival of the earliest inhabitants and the arrival of Magellan's ships (approximately 1500 BC until AD 1521).

**Prehistoric Period** — in the Mariana Islands, this is the same as the Pre-Contact Period (approximately 1500 BC until AD 1521).

**Prehistory** — the period of time before written records.

**Rockshelter** — a shallow cave sometimes found at the base of a cliff usually used as permanent or temporary habitation.

**Stratigraphy** — the study and interpretation that the lowest layer of soil is the oldest and the uppermost layer is the youngest.

**Subsurface testing** — archaeological excavation by machine or by hand to determine the presence or nature of a cultural deposit

# Chamorro Words in the Text

**Akaleha'** — land snails.

**Alileng** — marine snails of the family Turbinidae; turban snails (*alileng pulan*) and top snails (*alileng tulompo*).

**Binådu** — the Philippine deer, *Rusa marianna*.

**Chåhan** — earth oven; the method of cooking in an earth oven.

**Chotda** — the banana plant, genus *Musa*.

**Dokdok** — the indigenous seeded breadfruit tree, *Artocarpus mariannensis*.

**Fadang** — the indigenous cycad plant, *Cycas micronesica*.

**Gado'** — the spiny yam, *Dioscorea esculenta* var. *spinosa*.

**Gåpgap** — the arrowroot plant, *Tacca leontopetaloides*.

**Haligi** — the shaft of a *latte*.

**Hima** — the giant clam; clams of the genus *Tridacna*.

**Kafu** — pandanus or screwpine, *Pandanus tectorius*.

**Karabao** — the Asiatic water buffalo, *Bubalus bubalis*.



**Lada** — Indian mulberry or noni, *Morinda citrifolia*.

**Låncho** — a ranch or farming area with a simple shelter.

**Latte** — a stone pillar with an upright shaft and a capstone.

**Lemmai** — the prehistorically introduced unseeded breadfruit tree, *Artocarpus altilus*.

**Lusong** — a stone mortar.

**Maga'låhi** — a Chamorro chief.

**Nika** — the wild yam, *Dioscorea esculenta* var. *fasciculata*.

**Niyok** — coconut tree, *Cocos nucifera*.

**Nunu** — banyan tree, *Ficus prolixa*.

**Puntan Påtgon** — Child's Point, a place name in northern Guam.

**Sunen agaga'** — taro, *Colocasia esculenta*.

**Tåsa** — the capstone of a latte.

**Titiyas** — tortillas.

## Scientific Names in the Text

***Achatina fulica*** — the African land snail, introduced to Guam in the 1940s, *akaleha'* in Chamorro.

***Bubalus bubalis*** — the Asiatic water buffalo, *karabao* in Chamorro, introduced to Guam in the 1600s.

***Cocos nucifera*** — coconut, *niyok* in Chamorro, indigenous to Guam.

***Colocasia esculenta*** — taro, *sunen agaga'* in Chamorro, introduced to Guam in the Prehistoric Period.

***Cordyline fruticosa*** — ti plant, introduced to Guam during the Prehistoric Period.

***Cycas micronesica*** — an indigenous species of cycad, *fadang* in Chamorro.

***Dioscorea esculenta*** — the lesser yam, introduced to Guam during the Prehistoric Period. There are two varieties. The wild yam is *nika* and the spiny yam is *gado'* in Chamorro.

***Euglandina rosea*** — the cannibal land snail, introduced to Guam in 1957, *akaleha'* in Chamorro.

**Moraceae** (not italicized) — the family of trees that includes banyan (*nunu* in Chamorro) and breadfruit. The indigenous seeded breadfruit tree is *dokdok* and the unseeded breadfruit tree, a prehistoric introduction, is *lemmai* in Chamorro.

***Morinda citrifolia*** — Indian mulberry or noni, *lada* in Chamorro, introduced to Guam during the Prehistoric Period.

***Musa*** — the genus of the banana tree, *chotda* in Chamorro, introduced to Guam during the Prehistoric Period.

***Pandanus tectorius*** — an indigenous species of screwpine, *kafu* in Chamorro.

***Pythia scarabaeus*** — an indigenous land snail, *akaleha'* in Chamorro.

***Rhinella marina*** — the cane toad, formerly *Bufo marinus*, introduced to the Mariana Islands in the 1930s.

***Rusa mariana*** — the Philippine deer, formerly *Cervus mariannus*, *binådu* in Chamorro, introduced to Guam in the 1770s.

***Tacca leontopetaloides*** — arrowroot, *gåpgap* in Chamorro, either indigenous or introduced during the Prehistoric Period.

***Tectus niloticus*** — the commercial top shell, formerly *Trochus niloticus*, *alileng tulompo* in Chamorro, introduced to Guam after World War II.

***Tridacna*** — The genus of the giant clam, *hima* in Chamorro.

# Where can I get Further Information?

## Websites:

[www.Guampedia.com](http://www.Guampedia.com) contains articles about archaeology, history, and culture of Guam.

[www.nps.gov/state/GU/index.htm](http://www.nps.gov/state/GU/index.htm) lists the National Historic Park on Guam with links to photographs, audio clips, and videos regarding the history of Guam.

<https://www.nps.gov/efmo/learn/education/so-what-does-an-archeologist-do.htm> describes what archaeologists do.

<http://www.radiocarbon.com/about-carbon-dating.htm> describes the history of radiocarbon dating and how it works.

<http://www.pastperfect.org.uk/archaeology/pollen.html> describes what pollen analysis is and how it works.

[www.pbs.org/wqbh/nova/tech/radiocarbon-dating.html](http://www.pbs.org/wqbh/nova/tech/radiocarbon-dating.html)

<http://www.visitguam/chamorro-culture/heritage-sites/> gives short descriptions of history, legends, sites of Guam.

[www.wpcouncil.org/coralreef/documents/Mariana](http://www.wpcouncil.org/coralreef/documents/Mariana) Archaeological Review of Archaeological and historical data concerning reef fishing on Guam and the Northern Mariana Islands.

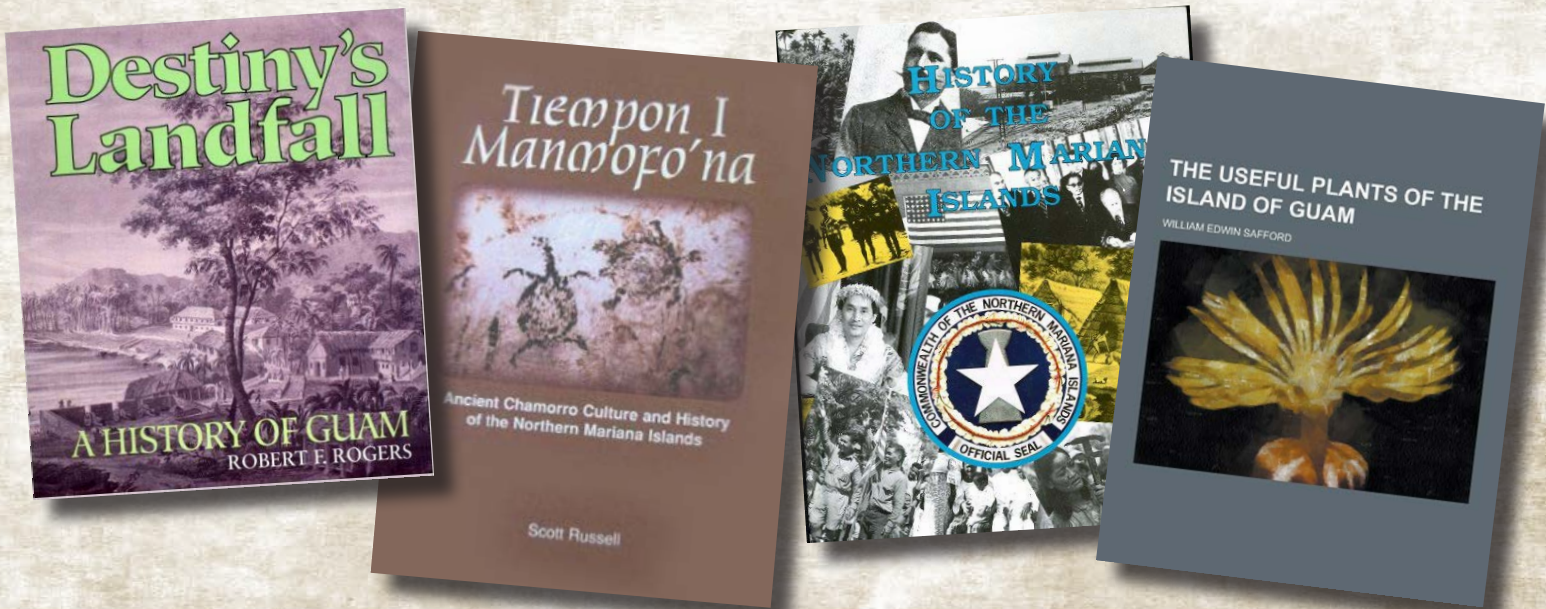
**Books:**

**Destiny's Landfall: A History of Guam** by Robert F. Rogers (1995)

**Tiempon I Manmofona: Ancient Chamorro Culture and History of the Northern Mariana Islands**  
by Scott Russell (1998)

**History of Mariana Islands to Partition** by Don Farrell (2011)

**Useful Plants of Guam** by William Edwin Safford (1905 with facsimile printing in 2009)







Planned construction at Northwest Field, Andersen Air Force Base, Guam, will affect 15 archaeological sites, which the Navy had previously determined to be eligible for listing on the National Register of Historic Places. In preparation for the construction and in order to mitigate adverse effects to the cultural resources, the Navy conducted an archaeological data recovery project in 2016. The project complies with the National Historic Preservation Act. This booklet has been prepared to inform the public about the work.