

Underwater Archaeology Hawaiian Style

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September 1998**

**Published in: *International Handbook of Underwater Archaeology*
Carol V. Ruppe and Janet F. Barstad editors
Kluwer Academic/Plenum Publishers: New York, 2002**

1. Background

It would be hard to imagine a spot on the globe more intimately involved with maritime history and associated technologies than the islands of Hawaii. From their original discovery and settlement by voyaging Polynesians, to their importance in the sandalwood and whaling trades, to the more recent remains left behind by World War II in the Pacific, the Hawaiian Island chain has accumulated the material record of at least 1,500 years of maritime activity. Much has of course decayed, turned into reef through biological processes, floated away, or otherwise smashed against solid rock cliffs and broken into unrecognizable pieces. The remaining submerged material record, however, testifies to Hawaii's uniquely diverse maritime traditions. The investigation of this record is relatively new, but most assuredly there's more than just surfing in the Islands of Hawaii.

The Hawaiian Islands are located approximately 2,400 miles from the North American west coast, 3,800 miles from Japan, and 4,300 miles from Papua New Guinea. They are surrounded by the Pacific ocean which occupies 1/3 of the total surface area of the planet. There are eight main islands most familiar to visitors, all volcanic in nature: Niihau, Kauai, Oahu, Maui, Lanai, Molokai, Kahoolawe, and Hawaii. These occupy a stretch of ocean some 300 miles long. The extended Hawaiian Archipelago, however, stretches some 1,200 miles further to the northwest, including the lower atolls and islands of Kaula, Nihoa, Necker, French Frigate shoals, Gardner Pinnacles, Laysan, Lisianski, Pearl and Hermes reef, Midway, and Kure (Ocean Island). Prevailing trade winds from the northeast can raise large ocean swells, and as the Hawaiian islands have no continental shelf, the coastlines are often high energy environments bordered by volcanic rocks and cliffs. Waves generated from distant disturbances impact all shores of the islands, breaking apart many shallow wreck sites. While coral substratum does not present much interference to magnetometer surveys, iron content in basaltic lava flows

does introduce additional signals. Clear warm water adds to the attraction of working (and playing) in the ocean, but large swells and strong currents in the channels between the islands can present challenges. Hawaiian island shores are a high energy environment, with few natural consistently sheltered coves or anchorages.

As is common with many locations, most of the historical and archaeological work in the past has focused on terrestrial material, and only in more recent years has underwater investigation come to earn more general attention. This is somewhat surprising given the diversity of submerged cultural resources and the numerous and popular diving sites to be found throughout the islands. The University of Hawaii's Marine Option Program became the first local institution to pioneer the scientific investigation of coastal and underwater cultural remains beginning in 1989. The Marine Option Program is still the only institution dedicated to nautical archaeology in the Islands today. A relatively small program within the School of Ocean and Earth Science and Technology, the Program is currently training a pool of local maritime talent, chiefly through a graduate certificate course in maritime archaeology and history. This chapter consists of an informal summary of maritime archaeology in Hawaii's past followed by an outline of the Marine Option Program's development at the University of Hawaii to the present day. Detailed information of the two most well known projects, work at Pearl Harbor and at Hanalei Bay in Kauai, has been published in other sources and will be presented here only in outline form.¹

2. History, Projects, and Potentials

¹The most available are: Daniel J. Lenihan (ed.), *Submerged Cultural Resources Study: USS Arizona Memorial and Pearl Harbor National Historic Landmark* (Santa Fe: National Park Service, 1989); and Paul F. Johnston, "1997 Excavations of the Royal Hawaiian Yacht *Ha`aheo o Hawaii* in Hanalei Bay, Kauai: Preliminary Report" *Underwater Archaeology 1988*, edited by Lawrence F. Babits, Catherine Fach, and Ryan Harris (Pennsylvania: Society for Historical Archaeology, 1998) 96-103.

Sometime between 0-500 AD the first of many seagoing canoes from the South Pacific encountered the uninhabited Islands of Hawaii.² What followed was a long period of intentional two-way communication between Hawaii in the North Pacific and the original point of departure in either (or both) the Marquesas and the Society Island area (Tahiti) in the South Pacific, trips of more than 2,250 nautical miles. Marquesan style stone adzes, recovered from underwater locations in the Hawaiian islands, have played a large part in formulating the voyaging chronology. For Westerners such navigational accomplishment was initially hard to accept. This led to a debate of intentional voyaging versus accidental voyaging in the mid 1960's. Subsequent archaeological discoveries however reveal more about the complex process of colonization and the importation of changing cultural practices as well as tools, hunting and fishing implements, dogs, pigs, chickens, coconuts, taro, and the rest of the basic elements of survival which made settlement possible. Current theories are now more in accord with what the oral traditions of the Hawaiians have always held as fact, that the Polynesian ancestors were extremely skilled navigators quite capable of building suitable vessels and making long distance voyages. These most likely occurred from Southeast Asia eastward into the Pacific, against the equatorial easterly winds, which do seasonally shift to the northwest. Virtually all of the inhabitable islands of the Pacific had been discovered and settled long before Europeans made their way across the relatively narrow Atlantic Ocean, let alone into the Pacific.

Physical remains of such voyaging canoes are extremely rare. To date there are no known elements of ocean-going voyaging canoes from any underwater site. Outrigger or double-hulled canoes with no need for ballast simply don't seem to sink very often. The most likely areas for such finds, therefore, include swamps and ancient occupation sites on land, long since filled with mud. The best known terrestrial site was discovered

²This rough date remains a subject of continuing debate. See Ben Finney, "The Other One-Third of the Globe," *Journal of World History*, vol.5 no.2(1994), 273-297.

by Yoshihiko Sinoto, chairman of the anthropology department of Hawaii's Bernice P. Bishop Museum. In the early 1970's Sinoto uncovered a canoe production site in French Polynesia. Excavations were initiated by the construction of Hotel Bali Hai on the small island of Huahine, 110 miles northwest of Tahiti.³ The partially waterlogged site contained a number of shell, bone, and wooden artifacts as well as stone tools. Inundated by a tsunami, everything had been quickly covered by a thick layer of sand and silt, and then preserved in wet site conditions for hundreds of years. The most critical finds relevant to Hawaii occurred in 1977 with the discovery of a large wooden steering paddle, an outrigger boom, and two wooden canoe planks measuring 23 feet in length. Such boards would have been upper splash boards for the bow section of a canoe under construction. These were apparently meant for the construction of a large double-hulled sailing canoe. Though found in French Polynesia, these remains were to help shape the direction of experimental archaeology and the revival of voyaging culture in Hawaii.

Such evidence for the truly large size of ancient vessels, as well as contemporary examples and academic investigation into the sailing qualities of Pacific vessels, led to the first traditional voyaging canoe replica, the *Hokulea*, launched in Hawaii in 1974.⁴ (Though it is not underwater archaeology in a strict sense, voyaging is so significant in Hawaii that it deserves special mention here.) Dr. Ben Finney of the University of Hawaii, along with Herb Kane and Tommy Holmes, led the movement to create a performance accurate (non-traditional materials) replica for the investigation of sailing characteristics, and thus further the study of the oceanic migration of the ancestors of the Polynesians. Since then the experimental archaeology of voyaging canoe construction has blossomed throughout the island Pacific, tied closely to a transpacific cultural revival surrounding not just the physical form of the *vaka* or sailing canoe, but around the social

³Yoshihiko Sinoto, "The Huahine Excavation: Discovery of an Ancient Polynesian Voyaging Canoe," *Archaeology* 36:2 (1983): 11.

⁴Some of the contemporary evidence is summed up in Te Rangi Hiroa (Peter Buck), *Arts and Crafts of Hawaii section VI: Canoes*, (Honolulu: Bishop Museum press, 1964).

organization of a voyaging society and the continuing transmission of traditional navigating techniques. The Polynesian Voyaging Society, formed in 1973, successfully makes the connection between experimental archaeology, cultural revival, and popular education. In 1994 the *Hokulea* was followed by another replica of a traditional voyaging canoe, the *Hawaiiloa*, a vessel this time carved from the solid trunks of enormous trees. Both are now two of about 20 or so other ocean-going voyaging canoes throughout the Pacific Islands, still making traditional long distance round-trip journeys relying on the ancient skills of their navigators, i.e. without charts, modern directional aids, satellite navigation etc.⁵ The Festival of the Pacific Arts, sponsored by the South Pacific Forum, has focused on voyaging themes in the past, and continues to provide an opportunity for various traditional canoes and cultures of Hawaiians, Maoris, Tahitians, Cook Islanders, Marshallese, etc. to assemble. Experimental maritime archaeology has thus been transformed in Hawaii and other Pacific islands, becoming again long distance ocean voyaging truly in the traditional style. This has led to an increased awareness about maritime cultural resources of all types. The significance of these journeys goes beyond the academic discipline, for the vessels, the voyages, and the sailors are a proud revival of an ancient Pacific lifestyle. The canoes themselves are symbols of this reawakening.⁶

Actual remains of original voyaging canoes are scarce, but for hundreds of years the Hawaiians lived in close relation to the sea, and the cultural resources associated with this lifestyle are still very much in evidence throughout the main islands. Structures such as seawalls for fish ponds, tools, and fishing implements, speak of an advanced maritime culture and a sustainable form of food production. Today, of course, most of the necessities of life are shipped to Hawaii from any number of distant locations.

⁵Ben Finney, *Voyage of Rediscovery* (Berkeley: University of California Press, 1994).

⁶For more information please see Jon Jonassen, "The Politics of Culture: the Case of the Voyaging Canoes," in Werner vom Busch et al (ed.), *New Politics in the South Pacific*, (Suva: University of the South Pacific, 1994), 305-318.

Stone walls for fish ponds and fish traps were once prominent features in the Hawaiian landscape. Prior to Western contact, there may have been between 400 and 500 stone fish ponds in the Hawaiian islands, producing something around two million pounds of fish annually.⁷ Today only 12 ponds are in condition to produce some fish. Stone canoe houses and canoe launching ramps can also still be found in certain locations. Such lithic remains can sometimes endure hundreds of years in relatively good shape. Marine Option Program maritime archaeology students mapped a stone fish trap at Koloko Honokahau National Park on the Big Island during the field school in 1997. Compartments which seemed to be traps or holding areas were surrounded by a larger seawall. Information gathered can help determine the presence or absence of a traditional gate or *makaha*. Not only are such structures examples of an advanced and efficient food production system, but if restoration is to take place, accurate surveys should be completed before the sites are further altered.

While terrestrial *heiau* or temples have been investigated, submerged *heiau* and other structures represent an almost completely untouched cultural resource. One university researcher is currently studying the Hawaiian oral histories and chants in an effort to locate further underwater sites.⁸ It should be mentioned that understanding the cultural significance of such places can be quite challenging to the traditionally trained researcher. In Hawaiian culture, as with other Pacific peoples, the land itself possesses a special connection with the remembered history of the ancestors, sites being a direct link to historical genealogies and events. This cultural difference adds a layer of significance to, and demands a greater sensitivity from, what has often been in the past a strictly Western interpretation of artifacts.⁹

⁷Personal communication with Joseph Farber, 2-11-97. For a good example of a single study of one fishpond, see Marion Kelly, *Loko I'a O He'eia: Heeia Fishpond*, (Honolulu: Bernice Pauahi Bishop Museum, 1975).

⁸Personal communication with Tom Stone, 8-27-98.

⁹One of the best recent anthropological studies highlighting Pacific Islander connections to sites both on shore and at sea is Edvard Hviding's *Guardians of Marovo Lagoon: Practice, Place, and Politics in Maritime Melanesia* (Honolulu: University of Hawaii Press, 1996.)

Shell fishing hooks, as well as scattered basalt artifacts such as octopus lure weights, fish trap weights, and canoe anchors are abundant on specific near shore reefs, even in the developed areas near Honolulu on the Island of Oahu. In 1996 the Marine Option Program's field school focused on one such site, a scattered collection of lithic artifacts, sinkers and octopus lures, directly off the Waikiki shoreline. Michael Pfeffer, a PhD candidate in anthropology at the University of Washington, hypothesized that near shore raised reefs with their greater density of marine life would therefore identify a greater density of fishing artifacts, which indeed seems to be the case.¹⁰ Distribution patterns were recorded, though the artifacts themselves had been weathered by hundreds of years in the near surf zone. (Students had a first-hand experience in site formation processes as strong surge rocked the shallow site...16-foot waves eventually postponed field operations temporarily.) Care must be taken in this line of research, though, for other sources of basalt, such as dredging and beach enrichment, cannot be completely ruled out.

Other locations of artifacts may be more random in nature. Near Kualoa on the windward side of Oahu, such artifacts are being eroded out of the river bank and deposited onto the seabed. There are at least 14 other submerged locations where prehistoric artifacts have been recovered from the surface of the seabed around the islands, mainly on Oahu and Maui, reflecting the greater popularity and easier access for swimmers and divers there.¹¹ Shell and bone fish hooks have been recovered in various locations as well. Dr. Sinoto has spent years creating a Polynesian fish hook chronology, an important tool for dating sites given the scarcity of ceramic remains in the Pacific. Currently many traditional Hawaiian fishing sites, places where both lithic remains and bone and shell artifacts can be found, are threatened by modern shoreline development.

¹⁰Michael T. Pfeffer, "Distribution and Design of Pacific Octopus Lures: the Hawaiian Octopus Lure in Regional Context," *Hawaiian Archaeology*, vol. 4(1995), 47-56.

¹¹Personal communication with Yosihiko Sinoto, August 1998.

Many traditional fish ponds, an extremely efficient method of nurturing and gathering protein, have been lost to siltation or landfill, though there has been some effort to restore such marine systems to their original operating state both on Oahu and Molokai islands.¹² As is often the case, nautical archaeology remains an important tool for locating, investigating, and protecting these culturally significant coastal and underwater sites.

By the late 18th century, the time of Captain Cook's third voyage into the Pacific and first substantiated European contact with the islands, Hawaiian voyaging canoes had long since ceased making regular passages to the South Pacific. Cook encountered an advanced maritime society existing in isolation. Whether he was actually the first European to make contact with the Hawaiians, or whether a stray Spanish galleon making one of the many annual Pacific crossings between New Spain and Manila had first sighted and perhaps even shipwrecked on the Hawaiian islands, remains a matter of some contention. Areas of Kealahou Bay which some feel may contain traces of a Spanish shipwreck were surveyed in 1997 during remote sensing training by Marine Option Program students. This information is currently being data processed and interpreted. It's not completely unfeasible that Japanese or Chinese ships, perhaps disabled and adrift on the currents, may have made very early contact with the Hawaiian islands. Documents record disabled junks making exactly this type of landfall in historic times, as well as survivors of several disabled junks being rescued in near island waters. (In 1832 a Japanese junk wrecked on Oahu's north shore, an event covered by local newspapers.¹³) Nautical archaeology may be the only method to pursue such questions of early outside contact.

Nonetheless, for many reasons Cook's encounter and death at Kealahou Bay on the island of Hawaii in 1779 remain etched in European narratives as a certain turning

¹²Joseph Farber, *Ancient Hawaiian Fishponds: Can Restoration Succeed on Molokai?* (Encinitas, California: Neptune House Publishing, 1997).

¹³John Harden Connell, "Typhoon and Shipwreck Brought First Japanese to Hawaii over Century Ago; Old Records Tell of Arrival on Junk," *Honolulu Advertiser* June 20, (1933). Documents also refer to a Chinese junk wrecked at Kalaupapa on the island of Molokai.

point for the island's maritime history. Archaeological investigation in Kealahou Bay has only recently begun. Students in the Marine Option Program's 1997 summer maritime archaeology field course conducted a magnetometer survey of a significant portion of the inner bay, as well as a diving survey of the inshore perimeter. A small handful of objects associated with 18th century European encounters are stored with the Kona Historical Society. Class members, though, discovered only traditional Hawaiian stone artifacts, as well as more contemporary remains such as 19th-20th century anchors and railroad tracks. The class located several anomalous magnetic targets in the bay for future investigation, as well as historic and prehistoric cultural materials from a variety of sources along the shore.

There was no distinct cultural line between what was traditionally Hawaiian and what was imported from the West, both styles existed and adapted to the other. Western ships, though, did begin to introduce changes in the Hawaiian maritime scene. At first, very few European vessels actually made it to Hawaii, yet their uses, especially in war, soon became apparent. Kamehameha I, a chief from the island of Hawaii, was the first to unify the Hawaiian islands into one kingdom by the first years of the 19th century. Swivel guns and cannon, as well as a captured vessel, the *Fair American*, contributed to his military campaign both at sea and on land. Following the successful unification, Kamehameha I promoted the purchase as well as the construction of western styled vessels, until finally there were some 30 plus western ships in his inventory.¹⁴ The discovery of the profitability of sandalwood, one of the few commodities accepted in exchange at Canton, had granted the *alii* or chiefs increased purchasing power. Topsail schooners and brigs, some of them in the advanced stages of rot, went immediately into

¹⁴Ralph S. Kuykendall, *The Hawaiian Kingdom: 1778-1854* (Honolulu: University of Hawaii, 1938), 86-97.

the inter island trade. Some were outfitted by Hawaiians for trading ventures to China or the South Pacific.¹⁵ Many were lost around the islands, grounding onto reefs.

The maritime scene in Hawaii was quickly becoming very culturally mixed, as Hawaiian men found employment on board European vessels, as Western ships purchased by Hawaiians sailed between islands, and as missionaries and whalers and sandalwood hunters increasingly altered local society.¹⁶ Dr. David Chappell, history professor at UH, refers to this period as a "second diaspora" of renewed Hawaiian travel throughout the Pacific on European ships. (The first diaspora consists of the initial discovery by Polynesians, and the third is comprised of modern migrations on airliners.) At one point Hawaiian and other Polynesian sailors comprised 1/5 of the American whaling fleet. Some local researchers suggest that there are at least 33 Western shipwrecks on the Big Island alone.¹⁷ Archaeologists might expect the physical record of these wrecks to reflect these dynamic social changes. This is exactly the case.

In 1995 Dr. Paul F. Johnston, curator of maritime history at the Smithsonian Institution's National Museum of American History in Washington D.C., began his first season of survey work in Kauai's Hanalei Bay, searching for the remains of *Cleopatra's Barge*, an American hermaphrodite brig built as a luxury yacht by George Crowninshield Jr. at Salem, Massachusetts in 1816. The ship, 100 feet long on deck and lavishly fitted out, was eventually sold to Kamehameha II in 1820 for 8,000 piculs of sandalwood, and then renamed *Ha`aheo o Hawaii* or *Pride of Hawaii*. As often happened with these ships in Hawaiian waters, the brig soon went into inter island service, conducting the royal court between locations in the kingdom. Members of the Sandwich Island Shipwreck Museum, as well as Steve James of Panamerican Maritime Ltd., based in Memphis Tennessee, assisted Dr. Johnston in his search and subsequent excavations. The

¹⁵Ibid.

¹⁶David Chappell, *Double Ghosts: Oceanian Voyagers on Euroamerican Ships* (New York: M.E. Sharpe, 1997).

¹⁷Personal communication with Rick Rogers (Sandwich Island Shipwreck Museum), 8-15-98.

magnetometer survey located a promising area close inshore where test trenches confirmed the contemporary historical account by Boston missionary Hiram Bingham regarding the presence of the wreck. Hydraulic removal of the sand overburden preceded the recovery of remains. After four seasons, the collected artifacts indeed portray a Pacific/Western mixed culture on board.¹⁸ Dr. Johnston has published a series of reports in the *Underwater Archaeology* series of the Society for Historical Archaeology.

Common goods of French, British, and Chinese origin, as well as local Hawaiian stone, bone, shell and gourd artifacts and what may be the King's royal *puu* or conch shell trumpet, are currently undergoing conservation both at the Smithsonian in Washington D.C. and at Texas A&M University. All artifacts will be returned to the State of Hawaii following conservation. Exactly why the *Ha`aheo* struck the reef is unclear, though according to project members it is possible that the ship was sunk by natives on Kauai in retaliation for the forced removal of their king, Kaumualii, to Oahu.¹⁹ Reverend Bingham's and other contemporary accounts attribute the loss of the storied yacht to alcoholic spirits, the presence of which is confirmed in the archaeological record.²⁰ Dr. Johnston and the *Ha`aheo* project add an important multicultural dimension to traditionally one-sided maritime studies, finding a special Hawaiian significance to these 170-year distant events. Often the history made available by maritime archaeology cannot be solely claimed by any single national entity. Such culturally mixed phenomena have, ever since Hawaii's initial encounter with Europeans, become a noted hallmark of the islands. Pacific, Asian, and Western cultures continue to coexist in uniquely cooperative style in Hawaii.

Dr. Johnston's work represents the first full-scale maritime archaeology excavation in the islands. (There have been no applications so far for any commercial

¹⁸Personal communication with Dr. Paul Johnston, 7-23-98.

¹⁹Ibid.

²⁰Ibid.

shipwreck excavations in Hawaii.) Consequently, the bureaucratic processes involved proved to be a learning experience for various State institutions, and no easy task for Dr. Johnston. What he went through stands as an example of various State and Federal regulatory agencies being indoctrinated into unfamiliar terrain, precisely the situation in Hawaii. Land development in Hawaii takes up most of the State Historic Preservation Office's resources, there being little left over for the investigation of what are seen as lower priority underwater sites. The question here really deals with the implementation of the Federal Abandoned Shipwreck Act at the State level, something that has yet to be perfected in Hawaii. The permitting process for the small scale archaeological work in Hanalei Bay, therefore, was identical to what large commercial developers faced, there being no other model for such a new project. The survey alone involved six separate permits: 1) Army Corps of Engineers, 2) Coastal Zone Management, 3) Department of Health Clean Water Board, 4) Department of Land and Natural Resources Master Permit CDUA (Conservation District Use Application), 5) a Coast Guard permit, and 6) a "non-permit" from the office of Conservation and Environmental Affairs, Kauai County. Ultimately some 26 State and Federal agencies were involved in some way in the review of the project.²¹ Of course, each office must be approached separately in the permit application process. Other considerations in regard to State procedures for granting survey and excavation rights are relatively familiar: the principal investigator must have a Master's degree (at least) in archaeology; a full description/research plan for review; a commitment to complete a full inventory survey report; an agreement on curation of objects recovered, with the encouragement for these to be returned to the islands. (There are no conservation facilities for marine cultural objects on the islands...yet). Hopefully this process will become more streamlined in the future.

²¹Dr. Paul Johnston, *Environmental Assessment for Archaeological Research in Hanalei Bay, Kauai, Hawaii* (Washington DC: Smithsonian Institute, 1994).

The importance of the Hawaiian islands to whalers needs no special emphasis.²² As Pacific whaling grounds became more and more dominated by American vessels in the mid 19th century. There is not much indication that Hawaiians took whales at sea, though beached whales provided important resources. Soon after the *Balaena* and the *Equator* harpooned the first whale off the coast of Maui in 1819, Hawaii won its place on the maps of whale ships. Grog shops and brothels soon made their appearance in Honolulu on the island of Oahu and in Lahaina on the island of Maui. Some residents in Hawaii today can trace their lineage to the frequent deserter from a whaling ship. Currently Lahaina, once known as "one of the breathing holes of hell," hosts a whaling museum, though no underwater survey of the anchorage there has yet been completed.²³ Hawaii's Maritime Center on Oahu also features a whaling exhibit at the museum, the trypots, whaleboats and implements of a truly global industrial pursuit. Offshore of Honolulu harbor are the remains of the brickworks from an as yet unidentified whaler, the bricks broken apart following a successful voyage. Local researchers allude to 18 other documented wrecks of whalers in and around the Hawaiian island chain.²⁴

Additionally, the burned remains of a whaler of Hawaiian registry the *Harvest*, along with three other ships, have been tentatively located on Pohnpei in the Caroline Islands of Micronesia.²⁵ The four vessels were burned and sunk by the CSS *Shenandoah* in 1865, the infamous Confederate raider which captured more than 37 prizes in the Pacific during (and after) the American Civil War. Ironically, while local Hawaiian museums display whaling era artifacts, as well as the *Carthaginian II*, a reconstruction of a 19th century square-rigged brig operated as a museum ship by the Lahaina Restoration

²²One useful resource is Robert Langdon, *American Whalers and Traders in the Pacific: a Guide to Records on Microfilm* (Canberra: Australian National University, 1978).

²³See Maui Historical Society (Wailuku), *Lahaina Historical Guide* (Honolulu: Star Bulletin Printing Company, 1964).

²⁴Personal communication with Rick Rogers, 8-15-98.

²⁵Toni Carrell (ed.), *Micronesia: Submerged Cultural Resources Assessment* (Santa Fe: National Park Service, 1991), 286.

Foundation, there has been very little emphasis on underwater survey for any other remains in nearby historic whaling locations.

Not only American whalers, but vessels of every description making the long passage across the Pacific, perhaps bound for the rich trading port of Canton, found it expedient to make calls in Hawaii. Boston traders circumnavigating the globe in search of profits often traded guns and liquor for seal skins, salmon and lumber from the Pacific Northwest. The fur trade really got underway in the 1780's.²⁶ Russian explorers competed for the same kinds of resources in the North Pacific. They also laid claim, albeit for a very brief period, to a share of the islands. In 1816 three Russian forts were constructed on the island of Kauai, the remains of two of which can still be seen. In 1993-94 James Allen, a nautical archaeologist and director of the Western Institute of Nautical Archaeology based at the University of California at Berkeley, participated in a visual survey for the rudder and associated remains of a Russian vessel wrecked at Fort Elizabeth off the Waimea River. Historic accounts describe the loss of a cannon; unfortunately no magnetometer was available for survey. Researchers did inspect a bronze pintle and gudgeon recovered earlier, estimating their age to the 18th or 19th century.²⁷

At the turn of the century, what had been a sailing trade between the islands had become the domain of iron ships and steam navigation. Companies like Wilder Steam Navigation Company and the Hawaiian Inter Island Steam Navigation Company operated many locally well-known and well-loved vessels in the cargo and passenger trades in the early decades of the 20th century. Sugar and cattle were, of course, major concerns in Hawaii, and steamers were often required to moor in small exposed ports near hazardous reefs. Some 60 sugar mills were scattered around five main islands in 1884, these

²⁶A good survey of this trade which includes much information on Hawaii is James R. Gibson, *Otter Skins, Boston Ships, and China Goods: the Maritime Fur Trade of the Northwest Coast* (Seattle: University of Washington Press, 1992).

²⁷Personal communication with Jim Allen, 8-2-98.

serviced by dozens of small private landings.²⁸ The Marine Option Program has recorded two such sites. The SS *Kauai*, lost at Mahukona Port in 1913, has long been a popular dive and snorkeling destination. The wooden-hulled ship went onto the reef while carrying railroad parts and bags of sugar between islands. Both the steamer remains (boiler, engine, propeller, scattered cargo) and the ruins of the port itself combine to record a major era of Hawaii's economic and social development, particularly as the days of the commercial sugar industry in Hawaii have drawn to a close. Recent storms have since placed the boiler ashore, as well as destroying the old government wharf at Mahukona. The SS *Maui*, an iron-hulled wreck located further south on the Kona coast of the island of Hawaii, was also employed in the sugar industry when it broke its back on the lava reef in 1917. Built in 1898 by Union Iron Works of San Francisco, her triple-expansion steam engine, boiler, hull plates, and stern section remain scattered atop an underwater lava field. Plans are in the works for a more thorough investigation of the extensive remains of the ship, a vessel which was once such an integral part of life among the islands. The remains of other landings and associated shipwrecks tell the same story of this once prevalent industry. The Marine Option Program is currently in the process of beginning a long term inventory project for these locations, the first of its kind for Hawaii.

As anthropologists and historians become more aware of non-western perspectives, nautical archaeologists must appreciate a more complex world as well. In other words, not all cultural influence took place from the West to the Hawaiian Islands. As new visitors to Hawaii quickly find out, Asians have made up a significant proportion of the population in the islands for a long while. For maritime historians and nautical archaeologists this cultural influence takes the form of a unique style of fishing vessel known today as the Hawaiian sampan, celebrated locally in restaurants, on cocktail

²⁸Mifflin Thomas, *Schooner from Windward: Two Centuries of Hawaiian Interisland Shipping* (Honolulu: University of Hawaii Press, 1983), 64.

napkins, books and film. The origins of the Hawaiian sampan, in fact, are purely Japanese. In 1899 a Japanese fishing craft was imported to Hawaii on the deck of a steamer by Gorokichi Nakasugi.²⁹ Such fishing boats retained features of very ancient Yamato-gata style vessels as recorded in a study by Basil Greenhill.³⁰ Mr. Nakasugi, a fisherman and shipwright, was soon employed in the *aku* or tuna fishing industry, and the design elements of Japanese fishing vessels were thus imported "across the beach" as it were to Hawaii.

Eastern and Western construction methods truly blended in the small boatyards on Oahu, Maui and the Big Island. Such vessels continued to be built by Japanese shipwrights in Hawaii throughout the 1920's and 1930's, the same shipwrights who repaired many Western vessels visiting from the mainland.³¹ Diesel engines and prominent deck houses replaced the traditional square sail of Japanese design. In the years before World War II there were hundreds of large and small sampans throughout the islands. Sometimes students were sent to Japan to study traditional ship construction, then returned to their homes in Hawaii. Today the remains of these far ranging vessels might be found anywhere within the long Hawaiian island chain, stretching from the main Hawaiian islands to the northwest.

In the years before World War II, Americans and especially the navy became increasingly suspicious of these vessels and their operations. Such feelings reflected the general growing apprehension in Pacific relations with Japan. United States Customs officials seized many of these sampans on discovering that some of the domestic fleet was being operated by Japanese nationals. The US navy, facing a critical shortage of boats, then purchased many of these sampans, which were fitted out for harbor salvage and inshore patrol duty. Many of them were operated by the US Coast Guard during the

²⁹Jesse Bowman, "The Trouble with Aku," *Beacon* 13 no.11 (1973): 16.

³⁰Basil Greenhill, *The Archaeology of Boats and Ships* (Maryland: Naval Institute Press, 1995), 107.

³¹Leslie Nakashima, "Sampan Boat Building," *Advertiser*, 10 March 1934.

war years. After 1945 the Japanese tuna fishing industry never recovered its prewar levels, though, and today there are only a handful of these wooden pre-war sampans left in operation.³² These can still be seen motoring in and out of Kewalo Basin, crewed by Korean, Micronesian, and Hawaiian local fishermen. They are oil-stained paint-flaking work horses in a continual state of fly-by-night repair. They are, however, not without their own kind of dogged salt-laden charm. Wreckage on reefs and beaches and lava flows throughout the islands marks the final resting spots of unique vessels, sampans endemic to the Hawaiian islands. Students from the University of Hawaii's Marine Option Program documented one such wreck site, the remains of the *Fuji Maru*, a.k.a. YP-183, at Mahuiala Bay on the Kona Coast. The sampan had been built by Japanese shipwrights, operated in the tuna industry, purchased by the US navy before World War II, and eventually lost in a storm. Portions of the deck lie scattered on a lava flow, while the engine and fuel tanks remain underwater. Another locally famous sampan, the *Bluefin*, which even appeared in Elvis Presley's 1962 movie "Girls! Girls! Girls!" was a candidate for official preservation. Unfortunately, due to a lack of funds, only her stern now resides at the Hawaiian Maritime Center museum. Many other such locations, such as Lanai's shipwreck beach, harbor the remains of these once popular yet scarcely documented craft, a favorite with Islanders and a symbol of the prewar days in Hawaii. As a class of vessels the sampans are unique, and they are associated with the origins of commercial fishing in Hawaii as well as World War II.

Of course, except for their original discovery, many of these previous events and remains pale in comparison to the kind of local impact that World War II had on the islands. Although the events on December 7th have been relatively well documented, with only a few exceptions almost no underwater survey has been done in Hawaii concerning submerged World War II cultural resources. Only slowly are the State and

³²Robert P. Chenoweth, "Hawaii's Aku Sampans: Historic Treasures Still at Work," (unpublished report, anthropology department, University of Hawai'i, 1990).

military becoming more cognizant of under water resources and the legacy of World War II remains, some of which lie in shallow water directly off local beaches.

Some of the finest work and certainly the best known report on underwater archaeology of World War II in Hawaii was completed by the National Park Service in partnership with the US Navy Mobile Diving Salvage Unit in 1989, entitled "A Submerged Cultural Resource Study of the USS *Arizona* and Pearl Harbor National Historic Landmark."³³ The project began in 1988 with a survey of mooring quays and Japanese plane crash sites within the harbor, as well as a deep water search for Japanese midget submarine. Both the USS *Arizona* and the USS *Utah* sites were well documented, and a side-scan and magnetometer survey of major areas of Pearl Harbor was also carried out. Other events, such as the West Loch explosion in 1944, also contributed significant amounts of debris to the material record. Archaeologists Dan Lenihan and Jim Adams of the National Park Service briefly inspected the remains of the landing craft, several of which are intact, at the bottom of the Loch. Most of what was discovered still lies at the bottom of Pearl Harbor, though one artifact, an Imperial Japanese Navy type-91 torpedo, is currently on display.

The initial survey of the USS *Arizona* proved to be particularly important. The battleship, which had been topped off with fuel before the attack, has since become a well-known memorial visited by over 1.5 million people a year, over 1,000 per day. Following the survey, which took note of artifacts associated with the salvage as well as the initial destruction, a monitoring program for the USS *Arizona* was initiated. This is an effort which continues to this day, as the amount of biofouling and corrosion continue to change the integrity of the ship and its rate of decay. Photo stations were set up on the ship, allowing consistent recording from a number of locations. Information from depth measurements of the sediments on deck, as well as a species count of biofouling

³³Lenihan, *Submerged Cultural Resources Study*.

organisms, contributes to the evolving model of corrosion potential of the whole structure. Additionally, an unknown amount of oil remains within the structure, prompting a certain degree of urgency to understand what is happening to the USS *Arizona*.³⁴ This, of course, is in addition to its significance as a symbol of an era, its importance as a war grave, and its interpretive value.³⁵ Recently the USS *Missouri* has taken its place alongside the *Arizona*, adding to the importance of Pearl Harbor National Monument as a whole.

The story of the Japanese midget submarines in Hawaii is typical of involved archaeological recovery efforts. Of the five midget submarines participating in the December 7th attack, one ended up on the beach at Bellows airfield, three were sunk by the US navy, and one remains missing. Three submarines have subsequently been recovered. (The deep water target discovered during the 1988 survey turned out to be World War II era Douglass- built flying boats.) Two submarines remain unaccounted for. In 1992 a private group, working in conjunction with the Hawaii Undersea Research Laboratory, operated by the University of Hawaii and the National Oceanic and Atmospheric Administration, conducted a survey for these Douglass aircraft. Surprisingly, they located what was thought to be a midget submarine off Pearl Harbor 1,500 feet deep. It was determined from the visible portion of the submarine that the vessel was not involved in the attack on Pearl Harbor.³⁶ Nonetheless claims of ownership were then filed in Federal court. In 1993 the Federal Court ruled that Japan owned the submarine, which was then turned over to the US State Department, allowing the US government to assert its ownership of the vessel, temporarily ending the legal battle.

³⁴The USS *Utah* still lies within the harbor as well, also slowly leaking oil.

³⁵Please see Michael Slackman, *Remembering Pearl Harbor: the Story of the USS Arizona Memorial* (Honolulu: Arizona Memorial Museum Association, 1984).

³⁶*ibid.*

Besides this work, though, there are many places around the islands where rumors of downed World War II aircraft and other material exist, but which have not yet been fully investigated. One such contact led to a 1994 Marine Option Program field school, this time in conjunction with East Carolina University's program in Maritime History and Nautical Archaeology, focusing on a PB4Y-1 wrecksite in Kaneohe Bay. This particular aircraft, still connected to its mooring cable, was one of several strafed and destroyed on the bay on December 7th 1941. Wing, tail section, and fuselage settled in close proximity on the bottom, where teams of divers later produced measured sketches from the murky waters. The position of the throttle levers, as well as historical documents and oral reports from survivors, suggest that the crew were hastily attempting to get the PB4Y in the air in the moments before the explosion sent the craft to the bottom. Plans are currently in the works for another joint project, this time a magnetometer survey of a large portion of Kaneohe Bay, to be carried out between the Hawaii and North Carolina university programs. Much of the salvaged material after the attack may have been dropped in the bay in a quick effort to clear the air base for operation. Other significant aircraft wrecksites are coming to light as well. Archaeologist June Cleghorn at Marine Corps Base Hawaii (MCBH) is preparing to investigate a P-40K Warhawk, one of 211 downed in the Hawaiian islands, which crashed in 1943 in shallow waters off the windward side of the island of Oahu.³⁷

Though not part of the main island group, and also not under the legal or administrative jurisdiction of the State of Hawaii, Midway Atoll is the second most northerly island location in the greater Hawaiian Archipelago. Currently managed under the responsibility of the United States Fish and Wildlife Service (FWS), Midway Atoll is jointly operated by the FWS and a private group Phoenix Air Incorporated. Most people associate Midway with the World War II naval battle of the same name, most of which

³⁷Personal communication with June Cleghorn, 7-23-98.

actually occurred on the open ocean hundreds of miles to the north of the atoll. From the perspective of nautical archaeology, the waters and resources immediately around Midway remain untouched. In 1998 the Marine Option Program was invited to make a brief initial survey of submerged cultural resources at Midway. It is now possible for a maximum of 100 visitors to visit Midway at any one time, appreciating both the natural setting and abundant wildlife as well as the historical significance of the location. The FWS has charge of preserving and managing the extensive historic resources at Midway Atoll, which include pre and post-war era artifacts. Sailing barks from the 19th century and shipwrecks from the 1950's lie alongside wartime vessels and aircraft.³⁸ The island was also an important way station for the early Pan Am Clipper flying boats, one of four important fueling stops (besides Honolulu, Wake Island, and Guam) between San Francisco and Manila.³⁹

Known underwater sites within and around the atoll include the wreck of the bark *Carrollton*, a wooden British collier which went aground in 1906. Copper fasteners are scattered over a wide reef area, along with the donkey boiler and windlass and assorted pieces of twisted rigging. A tangle of anchor chain leads to an admiralty style anchor, still projecting above the surf. An F4U Corsair World War II fighter aircraft lies in deeper water, its fuselage and wings separated from the engine and propeller. A US navy submarine rescue vessel, known as the *Macaw*, is at the bottom of the channel entrance. Apparently involved in the rescue of the USS *Trigger*, the *Macaw* became a total loss and navigational hazard, and had to be destroyed in place. A large portion of a wrecked water barge projects from the same channel, and a navy garbage scow and two landing craft are located in shallow waters near the runway, as well as another boiler, barrels, and assorted debris. The incident as well as the remains of the *Macaw* are currently the topic of study

³⁸Tane Renata Casserley, *A Maritime History of the Northwestern Hawaiian Islands from Laysan to Kure*, (unpublished report, Marine Option Program, University of Hawaii, 1998).

³⁹Stan Cohen, *Wings to the Orient* (Missoula, Montana: Pictorial Histories Publishing Company, 1985).

for Marine Option Program students. Historical documentation suggests several other World War II vintage aircraft nearby, the lagoon and reef areas immediately adjacent to the ends of runways being prime candidates for survey.⁴⁰ The popularity of aviation wreck sites, as well as the successful management of other underwater resources, makes some kind of maritime survey of the waters closer to Midway itself an important task for the future.

To date little historical or archaeological work has ever been conducted in the whole of the northern island chain. Tane Casserley's report on shipwrecks in the northern island chain is the first of its kind.⁴¹ The inventory records 26 vessels wrecked in the northern island reefs and atolls. One specific potential project in the Hawaiian island chain that continues to tempt researchers is the wreck of the USS *Saginaw*. The mission of the *Saginaw*, a side-wheel sail assisted steamer, was to carry supplies to Midway in order to establish a coaling station. En route to San Francisco, the *Saginaw* passed by Kure atoll in order to confirm its position, as it was a navigational hazard. Indeed it was, and on May 30th, 1870, the *Saginaw* went aground on a reef.⁴² The remains of the ship still lie there on distant Kure. No one is stationed at the small island since the US Coast Guard abandoned the LORAN station there, though Midway as a possible base of operations is nearby.

3. Maritime Archaeology at the University of Hawaii

Stone tools and lures, fish ponds and fish traps, traditional voyaging canoes, parts of Hawaiian-owned American built brigs, Western merchant vessels, scattered whalers

⁴⁰Personal communication with Rob Shallenberger (FWS Refuge Manager), 6-14-98.

⁴¹Casserley, *A Maritime History*.

⁴²Kieth Robertson, *The Wreck of the Saginaw* (New York: Viking Press, 1956).

and whaling implements, wrecksites of Russian ships and Japanese fishing vessels, traditional Japanese junks, boilers and engines from inter island steamers, ruined landings, midget submarines and World War II aircraft...these are only a part of the underwater material record representative of the history of the islands of Hawaii. With this legacy in mind, as well as the (then) recent passage of the 1987 shipwreck act, the Marine Option Program at the University of Hawaii, under the direction of Dr. Sherwood Maynard, committed itself to expanding its vision and taking on an historical and archaeological role in the Pacific.

The system-wide Marine Option Program, located at the UH School of Ocean and Earth Science and Technology (SOEST), currently offers interdisciplinary certificate curricula to undergraduate and unclassified graduate students at four of the ten Hawaii campuses: UH Manoa, UH Hilo, Maui Community College, and Windward Community College. Previous to 1989, the Marine Option Program (MOP) had primarily focused on topics in the marine sciences. Thousands of students have participated in marine education through the program, which features a very hands-on approach to work in the field. The program currently awards an undergraduate certificate, a graduate ocean policy certificate, and a graduate certificate in maritime archaeology and history. Graduate certificates document specialized training within a certain field and may serve as minor topics for double-majors or stand alone as independent specialties, but they are not equivalent to individual academic degrees. Mentors and associated professionals are available to assist students both on and off campus, in academia and in marine-related industries. The UH system is fortunate to have access to some of the best sources of Pacific archival information in the world. The Manoa campus houses the Hamilton Library, the Hawaiian and Pacific collections, and the Government Documents collection. Hawaii's East-West Center is also located on campus. Nearby are the Hawaiian Historical Society collection, the Hawaiian Mission Children's Society archives, the Hawaiian State Archives, Hawaiian Maritime Center archives, and the

Bernice P. Bishop Museum, one of the preeminent institutions for anthropological work in the Pacific.

The initial workshop and symposium on maritime history and archaeology was held in 1989, the very first of its kind in Hawaii. A number of different organizations and a variety of community members as well as professionals in the field contributed to this inaugural effort. A two day in-water skills workshop for 26 Marine Option Program students initiated the first field training in Hawaii. A shoreline tower which had been blown into the ocean at Kahe Point by Hurricane Iwa provided a training site for the class. The four day symposium, open to the public, featured 20 speakers and a wide array of Pacific topics. Nainoa Thompson from the Polynesian Voyaging Society introduced traditional open ocean navigation, with Yoshi Sinoto from the Bishop museum and Ben Finney of the University of Hawaii addressing aspects of Hawaiian maritime culture and voyaging as well. Other speakers presented current research on sunken whaling ships at Lahaina, the excavation and conservation of Spanish galleon remains, Hawaiian fish pond construction, the USS *Arizona* memorial, the recreational use of shipwrecks at Chuuk (Truk) lagoon, as well as talks on the technical aspects of survey and underwater recording. Excellent meeting facilities for the first (and all subsequent) symposium were made available at the newly completed Hawaii Maritime Center on Oahu (Oahu meaning "the gathering place" in Hawaiian) located right on Honolulu Harbor, the historic downeaster *Falls of Clyde* immediately alongside. From the beginning, contributions from local businesses, such as Atlantis Submarines and Unitech Environmental Consultants provided some additional support for students to travel from neighboring islands and attend the symposium.

For the following three years MOP continued to adopt the combined workshop/symposium model, featuring three or four days of training dives either at Kahe Point or on a landing craft and modern shipwreck near Coconut island in Kaneohe Bay, as well as multi-day conferences open to the public. (Some may recall viewing scenic

Coconut Island in the title sequence to the classic television sitcom "Gilligan's Island.") In addition to previous topics, new information included: Federal and State submerged cultural resource legislation, conservation at the National Museum of the Philippines, maritime archaeology at Bikini Atoll, wrecks at Rapanui (Easter Island), Hawaiian sampans, *Cleopatra's Barge* or *Haaheo o Hawaii*, inter island shipping, Pacific fishing strategies, Dauntless SBD aircraft wreck sites, and the wreck of the SS *Empire* (inter island steamer) off of the Kona coast, to name a few. Featured speakers included: Dr. Marion Kelly, specialist in Hawaiian fish ponds at UH; Dr. William Lee, director of the Los Angeles Maritime Museum; James Delgado from the Vancouver Maritime Museum; Dr. Peter Gesner from Queensland Museum of Australia; and Myrna Clamor, conservator from the National Museum of the Philippines, as well as many others. Both James Delgado and Peter Gesner were also involved in teaching the in-water workshops. In short, the symposia were quite successful, and the diving workshop was popular, though quite limited due to being compressed into its narrow time frame of just a few days.

In 1993 the in-water workshop was expanded to an 11-day project. The Marine Option Program contracted with East Carolina University to bring Bradley Rodgers (staff conservator at ECU) and equipment like the magnetometer and surveying transit out to the Big Island of Hawaii, there to begin to document the wreck of the SS *Kauai*, the steamer wrecked at Mahukona port. Mahukona was one of four official ports of entry for the Kingdom of Hawaii. Working closely with Steve Russell, the Marine Option Program's staff educational specialist, the longer field project attracted students from the University of Colorado, Texas A&M, and all over the Hawaiian Islands. At nearby Hapuna beach both a shoreline map and a plan view drawing of the site were completed, along with lectures presented at the beachside cabins. Accommodations were primitive (blowing sand, constant wind), but the most difficult obstacle seemed to be the lack of trained assistants or experienced crew chiefs. Nonetheless, the session was quite successful, and two television stations picked up on the story, as well as airing an

interview with Dr. Maynard. Pete Hendricks, aquatic resource specialist from the State's Department of Land and Natural Resources (DLNR) and familiar with much of the Kona coast's cultural and physical history, played an important role in assisting with the project.

Meanwhile the annual symposium continued to attract new faces from throughout the maritime field. Dan Lenihan from the National Parks Service Submerged Cultural Resource Unit addressed the topic of resource management in Hawaii and the Western Pacific. Michael Halpern from the Institute of Nautical Archaeology and Mark Staniforth from the Australian Maritime Museum participated as well. Later symposia included Kevin Foster of the National Park Service and Dr. William Dudley, the Navy's Director of Naval History. As always, the symposium included field trips to several different locations: Hawaiian fish ponds, the USS *Arizona* museum and memorial, the *Bowfin* Submarine Museum, coral reef sinkholes, historic tours of the port of Honolulu, and/or the Bishop museum. With every passing year, the Marine Option Program steadily extended its network, contacting more professionals and learning more about the field as a whole.

In 1994 UH and ECU again collaborated on an expanded workshop, now a true summer field school offering six university credits to enrolled students. Bradley Rodgers again returned to Hawaii, this time assisted by Hans Van Tilburg and three ECU crew chiefs, graduate students working towards professional degrees in nautical archaeology. Through Jim Adams, National Park Service employee at the USS *Arizona* memorial, UH had made contacts with Kaneohe Marine Corps Station (now called Marine Corps Base Hawaii). A PBY-5 in Kaneohe Bay had been previously located by military divers, but never documented. The six-week course included introductory lectures in a classroom setting, weeks spent diving in the field, and extensive drawing and report production, capped by a public presentation by the students themselves. The class used *Archaeology Underwater--the NAS Guide* edited by Jeremy Green as a standard text. Still

photography, videotape, and measured drawings accompanied the historical background, methodology, and research design included in the report. A number of questions were raised concerning the final actions of the crew, apparently involved in starting the port engine in an attempt to get the plane into action. The field school brought students from as far away as Chuuk (Truk) island in the Federated States of Micronesia and New York State. In addition to work in Kaneohe Bay, students were also led by Mr. Adams on a dive on the *Arizona*, where they participated in collecting information at the many biofouling and corrosion monitoring stations on the ship. The class as a whole was later awarded the Western Association of Summer Session Exemplary Program Award for 1994. Local newspapers and television coverage, as well as a portion of the "Hawaiian Moving Company" television series, publicized the Kaneohe Bay work.

This successful field experience was followed in 1996 by a survey of lithic artifacts off of Waikiki beach, a traditional Hawaiian fishing site hundreds of years old. Hans Van Tilburg, an M.A. graduate from ECU, relocated to the islands and became the instructor for the summer maritime archaeology course and later the world maritime history course. (At the same time he enrolled in the history department as a PhD student where he is earning a degree in the maritime history of Asia and the Pacific, as well as planning future field schools.) Again, classroom sessions for the maritime archaeology course were followed by field work and report writing. Students came from throughout the United States as well as the Pacific region. Representatives of the State Historic Preservation Office of Micronesia also participated in the class. The documentation of the scattered stones was the first of its kind in the islands. Site selection was assisted by Michael Pfeffer, an anthropology PhD candidate from the University of Washington. A number of issues were raised by the report on the scattered basalt artifacts, highlighting the complexity of this type of prehistoric underwater research.

This was followed in 1997 by a field school survey of three selected locations on the Kona coast of the Big Island: Mahukona Port (where further documentation and final

completion of the report finished the work begun in 1994 on the SS *Kauai*); Maihuala Bay (Kona Coast State Park), where teams of students documented the wreckage of the sampan *Fuji Maru* (YP-183); and the diving and remote sensing survey of Kealakekua Bay. Rick Rogers, a local researcher, also participated in the remote sensing survey, particularly interested in the possibility of a shipwreck of Spanish origin in or near the bay. Mike Tuttle, survey technician from Panamerican Maritime Ltd. in Memphis, assisted the course with side-scan and magnetometer equipment. Crew chiefs were selected from MOP's maritime archaeology and history certificate candidates who had previously been through the field course. Slowly a pool of local maritime talent was developing in Hawaii which would prove, as it always has elsewhere, to be the true resource for any program's future.

Not all years, though, featured in-water field schools. This is due mainly to budgetary constraints...Hawaii's economy is far from self-sufficient and depends greatly on Asian tourism to the islands. Nonetheless the experiential course has become a permanent feature in the Marine Option Program curriculum. Plans for future investigations include the SS *Maui* on the Kona coast, magnetometer survey in Kaneohe Bay, documentation of four whalers sunk during the Civil War in Pohnpei, submerged aircraft wreck sites around Oahu, and the possibility of multiple field schools held at Midway Atoll. A long term survey of turn-of-the-century Hawaiian private landings and associated shipwrecks has begun. Certificate students are also involved in continuing work on the USS *Arizona*. Two of the Marine Option Program's certificate students are pursuing M.A. degrees at East Carolina University. One MOP student is currently teaching maritime archaeology at the high school level by surveying wreck sites in Chuuk lagoon, where so far three aircraft have been investigated.⁴³ The program itself has developed its connections with the Navy Historical Center, the National Park Service,

⁴³Personal communication with Clark Graham, director of SHIP (Society for Historic Investigation and Preservation). See also JoAnne Lanouette, "High School Maritime Archaeology Program," *Anthonotes* 20, no.1(1998): 17.

the Smithsonian Institution, the US Fish and Wildlife Service, and a wide variety of local museums and agencies.

There are, naturally, obstacles to the program's progress. Given the current economic state in the islands, the Marine Option Program (a relatively small entity compared to regular academic departments) is under the same tight fiscal restraints as all academic projects. UH has been operating under a hiring freeze. There is still no permanent position for a staff underwater archaeologist or maritime historian within the Program. No one is currently available to work the data from field projects into publishable reports. Competition for students for field schools has been increasing. Steady progress in the integration of maritime archaeology and history into the Marine Option Program curriculum, though, has been the pattern from the very beginning, as well as the acceptance of helpful input from numerous professionals in the field. The program has a variety of connections, as well as an academic steering committee, and (so far) a monopoly on the study of underwater archaeology in the Hawaiian islands. The maritime symposium in 1999, officially titled "11th Annual Symposium on Maritime Archaeology and History of Hawaii and the Pacific," will feature individual chaired sessions focusing on underwater archaeology, aviation archaeology, maritime history, and whaling. (The symposium format continues to evolve towards making published proceedings available.) Several options exist for future field schools. From the initial symposium and brief workshops, to extended workshops, to full on summer field schools and recognized graduate certificate course, the Marine Option Program under Sherwood Maynard has made step-by-step progress towards the eventual goal of a graduate degree program in maritime archaeology and history. In conjunction with Hawaii's Undersea Research Laboratory, maritime archaeology in Hawaii is aptly situated for future projects involving side-scan sonar, laser technology, and deep water archaeological investigations.

4. Conclusion

Generalization is always a dangerous undertaking, always best restricted to the conclusion. Maritime archaeology in Hawaii might be summed up by a few chosen phrases: a chronologically ancient and culturally diverse resource base; a vast potential for further work with only a few significant projects as yet completed; a cooperative network of professionals from near and far (and far meaning *very* far); and a major commitment to the field by the system-wide marine-related academic program. Maritime archaeology is in its infancy in the Hawaiian islands, which is why it is possible in a brief summary to include so many seemingly minor details about the handful of projects as yet attempted. In other words, a great deal of survey work needs to be done in Hawaii, and underwater archaeology must become the focus of more serious institutional attention. The small amount of effort being put into submerged cultural resources does not correspond to the much larger amount of development and construction on the coastlines, let alone answer the needs of resource managers at the State and Federal level.

It has been said of many places in the Pacific, but it is certainly true of Hawaii in particular, that the maritime archaeology field seems wide open to further expansion in a number of different and promising directions. Finally, and this surely doesn't need any special emphasis, Hawaii continues to be beautiful and special place to work and live. If you have to do underwater archaeology, there are certainly less agreeable places to do it. *Aloha and mahalo.*

NOTE: The graduate certificate program in Maritime Archaeology and History continued holding field schools and symposia until the program was terminated with administrators at the University of Hawaii in June 2002. Currently there is no maritime program at UH.

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