Teacher's Resourcebook
for Honolulu Harbor and Shoreline Cruises

A joint project of Robert's Hawaii, Inc. (*Ali'i Kai* Catamaran Company)
and the
University of Hawaii Sea Grant College Program

HOW TO USE THE TEACHER'S RESOURCEBOOK FOR HONOLULU HARBOR AND SHORELINE CRUISES

This resourcebook was specifically developed to enrich the harbor and shoreline cruises offered by Alii Kai Catamarans for schools at special reduced rates. The resourcebook is based on the well-known educational principle, "reinforcement," and will give teachers materials and information on the many fascinating aspects of Honolulu's shoreline and harbor activities that can be used to augment and reinforce the students' actual cruise experience with pre- and post-cruise activities. We have compiled information from numerous sources that may not be readily accessible to teachers and have attempted to make information on the marine environment and resources and societal uses of these resources fun with a purpose.

This resourcebook was produced as a mastercopy to enable teachers to photocopy sections, as needed, for use in the classroom. Teachers will be able to provide their students with maps or activity sheets by running off copies on the school's copying machine.

SUGGESTION: Make a working mastercopy of the mastercopy we have provided you with so that your school will retain a clean original set. In this way, coffee spills or smudges will not ruin the mastercopy we have provided you.

Arrangements for the shoreline and harbor cruises can be made by calling:

Mr. Chris Akau
Alii Kai Catamarans
Pier 8
Telephone: 522-7822

For additional information and copies of this *Teacher's Resourcebook for Honolulu Harbor and Shoreline Cruises*, please contact Chris Akau.

We will appreciate receiving any comments you might have on student reaction or suggestions on use or improvement of this resourcebook. Send your suggestions to:

Dr. Rose T. Pfund
UH Sea Grant College Program
1000 Pope Road, MSB 220
Honolulu HI 96822

HAPPY CRUISING!

UNIVERSITY OF HAWAII

Sea Grant College Program

September 1,1989

Dear School Administrators and Science Teachers:

The University of Hawaii Sea Grant College Program is pleased to transmit this ***Teachers' Resourcebook for Honolulu Harbor and Shoreline Cruises*** to your school for use in conjunction with the harbor and shoreline cruises conducted by Alii Kai Catamaran from Pier 8.

The resourcebook was written by Ms. Dottie Wendt as a labor of love with financial and logistical support from the University of Hawaii Sea Grant College Program and Robert's Hawaii, Inc. through Alii Kai Catamarans. It is the result of a unique marine education project involving the direct participation of a business which is willing to promote marine education by accommodating schools with reduced fees and which had a desire to provide high quality experience for our children and youth. We hope we have succeeded. As users, you will be the final judge. Please consult the "How to Use this Resourcebook" information sheet for suggestions on best use.

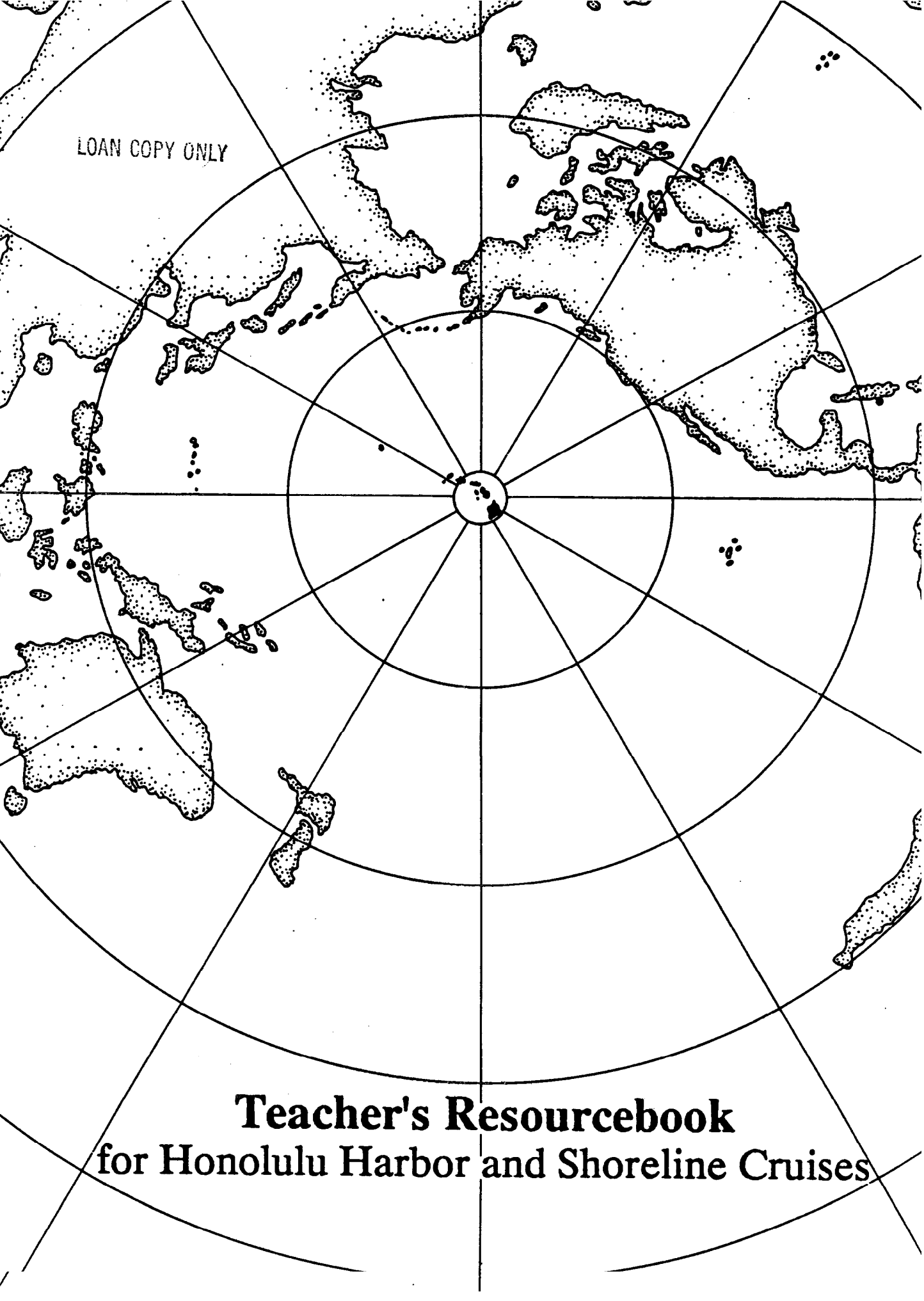
The University of Hawaii Sea Grant College Program is happy to have been a participant in this project to provide the children and youth of the islands an opportunity to experience the wonder and excitement of Honolulu's marine environment and resources. In addition, in studying Honolulu Harbor, the students will gain an understanding of the vital role the harbor plays in linking Hawaii to the world of commerce.

We, UH Sea Grant College Program and Robert's Hawaii, Inc., hope you and your students will have many opportunities to use this resourcebook.

Aloha,

Rose T. Pfund, Ph.D.
Associate Director

1000 Pope Road, Room 220 · Telephone (808) 948-7031. Honolulu, Hawaii 96822/Cable Address: UNIHAW



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Dottie Wendt

April 1989

UNIHI-SEAGRANT-MR-89-03

This Miscellaneous Report is the result of a joint project (project M/PM-2, "Program Development and Rapid Response") funded by the University of Hawaii Sea Grant College Program under Institutional Grant No. NA85AA-D-SG082 from NOAA Office of Sea Grant, U.S. Department of Commerce, with in-kind support by Robert's Hawaii, Inc. *(Ali'i Kai* Catamaran). The U.S. Government is authorized to produce and distribute reprints for governmental purposes notwithstanding any copyright notations that may appear hereon. This report was published by the University of Hawaii Sea Grant College Program.

The National Sea Grant College Program is a network of institutions working together to promote the wise use, development, and conservation of the nation's coastal, marine, and Great Lake resources. Provisions of the National Sea Grant College and Program Act of 1966 called for the creation of Sea Grant Colleges, and in October 1972, the University of Hawaii was designated one of the first five Sea Grant Colleges in the nation. Locally, Sea Grant is a unique partnership of university, government, and industry focusing on marine research, education, and advisory/extension service.

PREFACE

Thousands of adults drive past or fly over Honolulu Harbor every day, but few take note of a facility that ranks among the ten largest container-handling harbors in the United States. Youngsters rarely have an opportunity to be exposed to the harbor. Similarly, many Hawaii residents see Honolulu every day, but far fewer have observed their city and island from the unique offshore perspective.

In late fall of 1987 the University of Hawaii Sea Grant Extension Service introduced classroom materials and activities to acquaint students with the history, functions, and importance of Honolulu and Honolulu Harbor to Hawaii. The *Ali'i Kai Catamaran* Company donated the use of a ship so students and teachers could experience the harbor world first hand.

The cruise experience introduces new job and career possibilities for students to consider. Communications skills are promoted in the classroom through writing, speaking, acting, and using visual arts. Students learn research skills by using newspaper files or talking with relatives and adult friends who may provide valuable anecdotal information.

The text herein, for use by teachers, is written by a marine-oriented teacher. Suggested activities are adaptable to all student levels, with the possible exception of the lower elementary grades. An annual introductory workshop for public and private school teachers is held during the summer, and a precruise classroom visit by a cruise leader is available upon request.

ACKNOWLEDGMENTS

Because of the efforts and generosity of many people (some of whom are thanked below), Oahu public and private school students now have the opportunity to cruise through Honolulu Harbor or along the Waikiki shoreline onboard a catamaran or trimaran. The ships were made available to the University of Hawaii Sea Grant College Program (UHSGCP) by Ted Cook, business manager of the *Ali'i Kai* Catamaran Company.

I am indebted to Rose Pfund, associate director of the UH Sea Grant College Program, who asked me to write the student pre- and posttrip activities for the cruises and a general trip guideline for teachers. Chris Woolaway, UHSGCP education coordinator and urban waterfront specialist, was a special source of encouragement and help throughout the writing and 6 months of field testing of the first draft, as well as the revision.

Ali'i Kai Catamaran Company personnel were helpful. Chris Akau, sales manager, handled reservations and smoothed scheduling problems. Senior Captain Dave Hart and Captain Jack Thompson helped identify ships, clarify concepts of marine traffic regulation, and update my knowledge of the harbor.

Dave Higa, chief of the state Harbors Division, provided information from his files and gave permission to use materials from the new *Port Hawaii Handbook 1988-1989.* Stan Melman of the Hawaii Maritime Center reviewed the harbor draft and Rick Klemm, formerly at Sea Grant, produced the harbor and shoreline slideshows. Karen Stockton, Bishop Museum librarian, located and photocopied maps. Permission for their use was given by Marguerite Ashford-Hirano, head librarian. Mae Sanchez of the Hawaiian Telephone Company management department gave permission to excerpt materials from *Hawaiian Tel's Official Yellow Pages Directory***.** Brooks Bays, illustrator in the University of Hawaii Department of Geophysics, finished maps. He also designed a new Waikiki recreation area schematic based on observations made by the cruise narrator and redrew the azimuthal map donated by Claire Shultis for the cover. Matt Sanders, UH Sea Grant editor, contributed his editorial expertise, and Sister Edna Demanche, SS.CC, patiently critiqued my first efforts.

I'm humbled by the extent of help and encouragement given me. For whatever errors may be found, I accept full responsibility.

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SECTION I

GENERAL INFORMATION

Special Student Cruises

- Honolulu Harbor Circle Cruise
- Waikiki Shoreline Cruise

Reservation

Call Chris Akau, sales manager for the *Alii Kai* Catamaran Company, at Pier 8, Aloha Tower, 522-7822, to schedule a cruise or request information. If arrangements are made well in advance, a confirmation call a few days prior to the cruise is appreciated.

Cruise Course and Schedule

The usual harbor cruise originates at Pier 8 or Pier 5, depending on the ship being used. It heads west along the shore side of the harbor, then turns to head east along the inner side of Sand Island. If the channel is clear and time is available, the ship makes a short run out of the harbor channel, then returns to the pier.

The shoreline cruise also leaves from Pier 8 or Pier 5, heads out the harbor channel, then turns toward Diamond Head before reaching the end of the channel in order to stay in shallow waters. Weather permitting, the ship stops at the fish-feeding station just outside the Waikiki Beach surfline then returns to port.

A cruise is l-hour long, but harbor traffic conditions or other unavoidable delays may alter the schedule. Allowance for these delays should be considered when scheduling a field trip. The increased use of Pier 8 by large cruise ships and the dredging operation scheduled sometime in 1989 will mean temporary catamaran displacement to a nearby pier.

Maritime Customs, Cruise Clothes, and Cruise Activities

Other than ship personnel, no one boards or leaves a ship until permission is given by the captain or a crew member. The captain and crew are appreciative of students who do not leave personal belongings or litter (especially in glass-bottomed observation wells). Students and teachers should feel free. to talk with crew members. They enjoy sharing their work and training experiences with students.

If weather reports indicate the wind will exceed 25 miles per hour, some students might need a light jacket, otherwise, there are no special clothing considerations. Passengers are protected by the enclosed decks.

Catamarans and trimarans are remarkably stable, so it is unlikely anyone will become seasick. A few have felt “uneasy.” If anyone becomes nauseated, it helps if he or she looks toward the horizon rather than at the water. Some teachers bring a few Saltine crackers because chewing them helps control nausea. Cold water also is helpful and is available from the service center at the stern.

Students are encouraged to move about the ship to observe their surroundings from different points of view. Running or shoving is not safe onboard ship. Students often move very quickly when porpoises, flying fish, or turtles are sighted. The sudden shift of the students' weight may cause a slight ship reaction which may cause them to lose their balance. The old seamen's saying, "One hand for the ship, one hand for the man," means a seaman does his job but always has one hand ready to hang on to save himself. It's a practical suggestion for students.

Each cruise is narrated from beginning to end by a volunteer. The narrator often asks for student opinion or for a quick count of all ships or porpoises. Sometimes the captain joins in with information or a correction. Students sometimes get to "listen in" on a message from a ship offshore to the harbor control tower or from ship to ship.

The narrator always calls attention to a standard procedure followed by all ships. The captain first contacts the harbor control tower operator, identifies himself and his ship, and gives his present location. He then requests permission to enter or leave the harbor. If the harbor channel is free, he is told to proceed. If not, he may be instructed to remain at his current position or move to another and wait for further instruction.

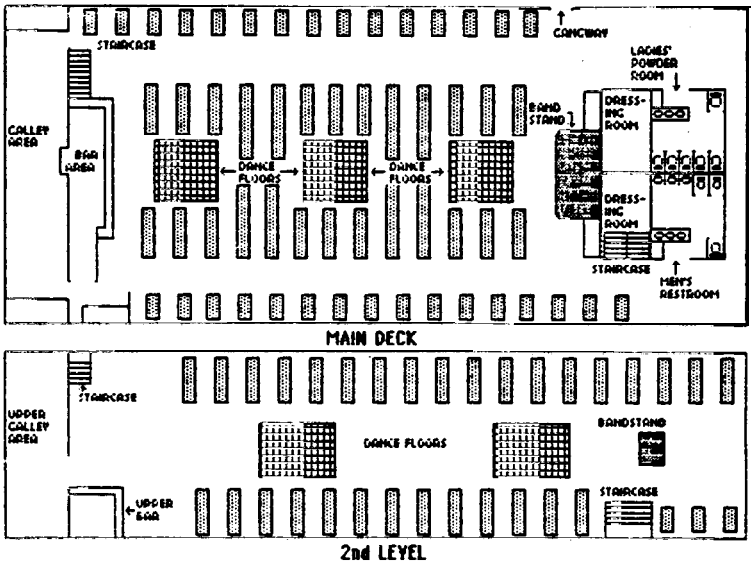
If other ships pass close by, the narrator may ask students to "hail the ship" with aloud "aloha." Sometimes students will hear a response or see passengers waving in reply. However, students should not expect a response as passengers on the other ship may be busy or may accept the hail as a friendly greeting that does not need a response. This greeting is a modern adaptation of an old whaling ship custom. Formerly, whaling ships passing at sea would stop to exchange news, needed supplies, or just for a social interchange. Such midocean get-togethers were called gams. Today, most gams are special meetings of marine-oriented teachers, students, and scientists.

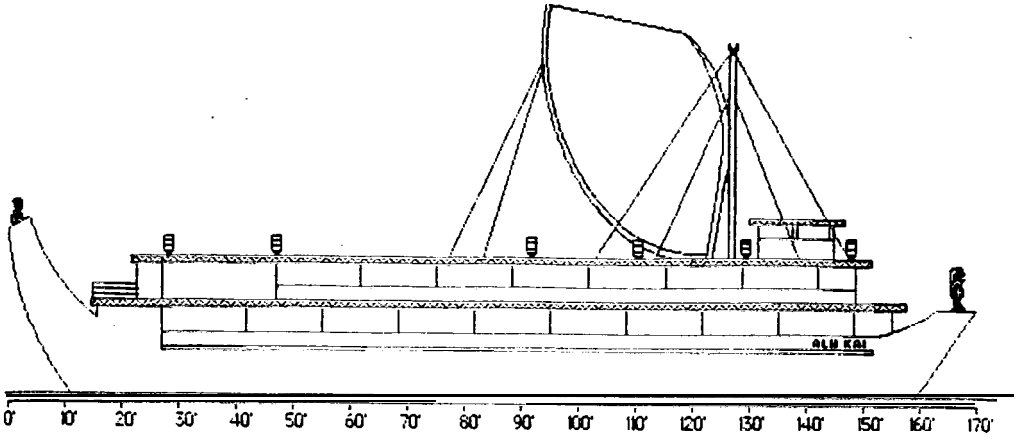
Catamaran and Trimaran Layout and Specifications

Catamaran *Ali'i Kai*

The *Ali'i Kai* is 170 feet long and 50 feet wide. It was built in 1984, has a steel hull, and is registered to carry 1,000 people. It is the largest commercial catamaran (double-hulled ship) in the world.

The lower deck seats 432 passengers for dinner and dancing. The upper deck seats 350 passengers. The upper deck is best suited to students' needs, with better viewing and sense of openness. The captain controls the ship from the enclosed bridge on top of the upper deck.



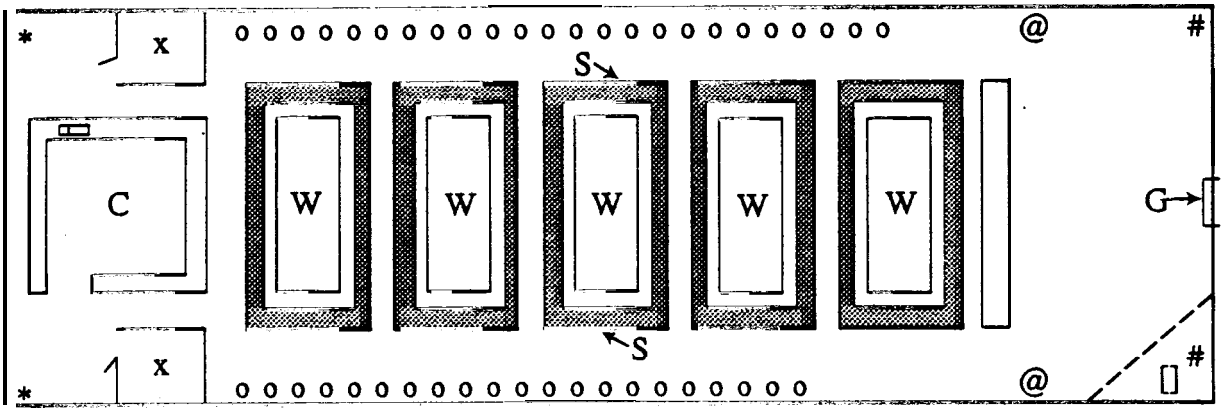


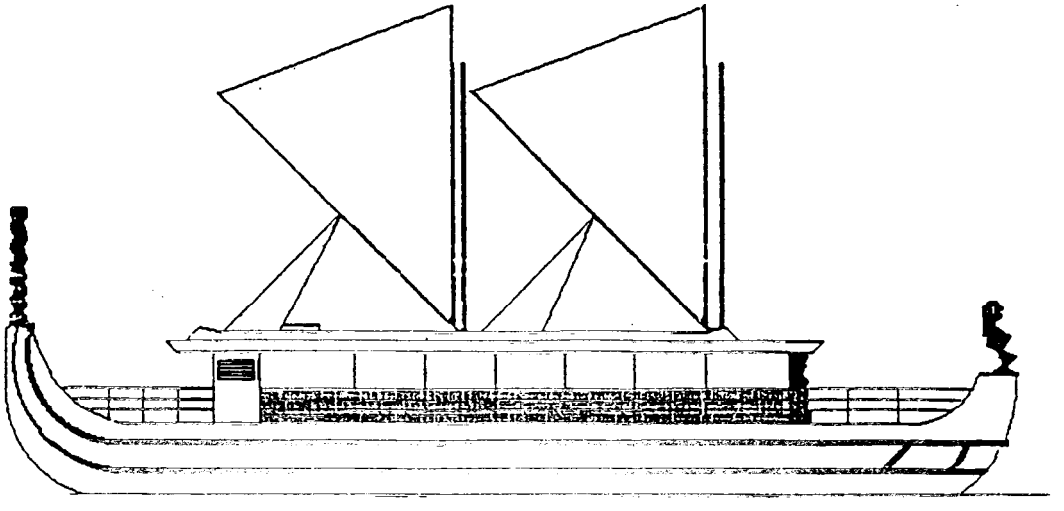
Trimaran *Keana*

The *Keana* is 75 feet long, 25 feet wide, and shallow draft. Cruising speed is 7 knots. Capacity is 130, plus crew.

- All masts, booms, and topping lifts are milo wood.
- The sails are functional.
- All bright work is polished Koa wood.
- Plexiglass shields open area between rail and deck.
- There are 45 swing-away rail seats.
- Carved figures represent the Hawaiian fish god and god of architecture, and a stacked, unknown figure from Honaunau.

*=stern totems
x=restrooms
@=tiki
C=service center
#=bow tiki
W=glassbottom wells
S =well seats (personal flotation devices [PFDs] are under seats)
G=gangway
[]=The helm is forward on the starboard side.





SECTION II

CLASSROOM ACTIVITIES FOR THE HONOLULU HARBOR CRUISE 1988-89

INTRODUCTION

An hour-long cruise around Honolulu Harbor familiarizes students and teachers with strange gantries, huge moving cranes, and a variety of ship types. Tugs tow barges in and out of the harbor around the clock and escort large ships to their berths, helping them manuever in the harbor and snugging them up against the piers. The little pilot boat hustles in and out of the harbor to deliver or pick up the harbor pilot.

The purposes of the cruise are:

1. To develop an understanding of our unique water transport system

2. To foster an appreciation of the importance of our marine transport support system which supplies more than 98% of imported goods vital to our livelihood

3. To promote an understanding that city growth results in harbor facility growth. The Honolulu Harbor extension is the new Barbers Point Harbor, about 20 miles west of Honolulu. The land transport link between the harbor and central Honolulu will greatly change the geography of southwestern Oahu.

Military vessels based in Pearl Harbor are excluded from discussion. Although the Coast Guard (CG) is known as our "Fifth Armed Force," it is under the Department of Transportation, not the Department of Defense, and is included in the discussion. Coast Guard ships are berthed in Honolulu Harbor, and the Coast Guard station is on Sand Island.

COMPARISON OF HAWAII'S TRANSPORT SYSTEM

Students are familiar with most aspects of the land transportation system as well as the interisland air passenger service. However, many are likely to feel they know little about the sea transport system unless they have a family member or adult friend that works aboard a ship, in the harbor, or in some marine-related industry.

This comparison of Hawaii's transport systems is a useful handout when time is limited. It can also be an interesting challenge for a class to use the format and develop lists based on information they gather from television, reading, conversation with adults, or hints from their teachers.

Students can compare their lists with the resourcebook's and perhaps realize they know more than they thought. They might even chuckle a bit over a remark common in maritime circles: "Ships and cars have only one thing in common: the steering wheel."

Transport Mode

Land Transport
ambulances
buses (school, city, tour)
personal automobiles
lunch wagons
taxis
trucks
tankers
fire engines

Sea Transport
barges
cableships
containerships
Coast Guard cutters
CG icebreakers
cruise ships
catamarans
trimarans
tankers
tugs (salvage, tow, fireboat)
ro/ros, lo/los
fishing boats

Parking Spaces and Berthing Spaces

Land Space
stalls
lots
garages (public/private)
street spaces

Harbor Space
berths
docks
piers
terminals
yards
wharves
dolphins

minute, hourly, monthly
rate per vehicle

wharfage rates
variables:
ship footage
ship weight
vehicle
per thous. bd. ft. (lumber)
barrel
passenger

Vehicle Registration/Identification

Land Transport
car licenses
motor vehicle numbers

Sea Transport
ship flags
names, registration numbers

Traffic Control Systems

Highway, Road, Street

traffic laws
road markings
automatic traffic light systems
lane markings
licensed drivers
headlights, turning lights
street maps

horns
emergency flares
helicopter traffic patrols
radio traffic advisories

weather advisories
compass

computer control
experimental

Harbor, Channel, Ocean
oceanic "highways"
"International Rules of the Road"
harbor/channel buoy system
traffic control by harbor master

licensed captain and officers
ship running lights
navigation charts
harbor range markers

whistles
flares, day "shapes"
harbor tower mast ball/cone/flags
radar, harbor master voice communication

weather advisories
compass, fathometers
celestial navigation

computer-controlled navigation

harbor pilots

Moving Vehicle Behavior

Land Transport	*Sea Transport*
steering wheel control	wheel and rudder
stops quickly	stops slowly
brakes	no brakes, reverse engine
manueverability	turnaround space wide
normally no sidewise motion (except on snow/ice)	"dead ship" motions by currents/wind modem ships have side thrusters for positioning, wide movement, and close turns
stable except in high wind	rolls/pitches in high winds except as controlled by vanes, stabilizers
computer control experimental	computer control important

Sea and Air Transport Systems

Air "Ports"	*Marine "Ports"*
airport	harbor
captain is in charge	captain is in charge
second in command is usually the navigator	second in command is usually the navigator
control tower	harbor master control tower
voice: tower operator	voice: tower operator
required identification	required identification
formal request to land	formal request to make port
identification:	identification:
ship registry number	ship registry number
airport origin	port origin
speed, altitude, location	speed, location
ship weight, type	ship weight, length
no near/in port movement without permission	no near/in port movement without permission
entry fees	entry, dockage, pilot fees
number of citizens aboard	number of citizens aboard
number of aliens aboard	number of aliens aboard

HONOLULU HARBOR HISTORY

A natural, protected deepwater harbor is considered one of the most prized possessions of any country, state, or island. Honolulu Harbor is one of the 10 largest container-handling ports in the United States. It is a centrally located, natural link between the Far East, the emerging Pacific Rim areas, and U. S. mainland.

Hawaii is the only state consisting entirely of islands. Because virtually all imported goods are shipped to Honolulu Harbor, it is most practical to think of our marine transport system as Port Hawaii. Honolulu Harbor is the primary port, and seven deep-draft harbors and one medium draft harbor located on the five other islands are the secondary or satellite ports.

Several fortuitous events have contributed to the harbor's rapid transition from a small, shallow, protected anchorage to one of the largest American container ports: its discovery just at the beginning of Pacific ocean trading, fishing, and exploration; its strategic mid-Pacific location; the development of steampower; and the business acumen of Hawaii's leaders. Serial harbor maps and highlights of harbor history listed below serve to illustrate this development.

1790s	British Captain Brown is the first European to anchor in "Fair Haven." (Earlier arrivals thought the narrow, coral-filled passageway was too dangerous.)
1795	The first harbor master is pilot John Harbottle. Early recognition that regulations were necessary for safety.
1796	First harbor chart is produced. It was recently discovered.
1820-60	Hawaii's whaling spree period. Unimaginable crowding in the harbor. Some reports claim 100 ships were anchored in the harbor at one time.
1820	The Brig *Thaddeus* arrives. Its 160-day voyage from Boston brought the first missionary passengers.
1825	First harbor regulations are issued and enforced.
1826	First American naval vessel visits Honolulu.
1853	First interisland steamship company is founded. It is hard to believe that steam vessels were already in use 135 years ago. As late as 1928, some steamships were required to carry a full set of sails in case of engine failure.
1853	*Akamai*, first sidewheeler, enters interisland service.
1854	First steam tug, *Pele*, arrives. It replaced the oxen that were used to pull ships into the harbor. The oxen had taken the place of men who trudged up Richards Street pulling ships toward shore.

1857 Honolulu boasts five “good wharves” and at least five stone houses.

1860 Five sidewheelers are in interisland service. *Annie Laurie* #5 is the first steam schooner built in Hawaii.

1865 Arrival of first Chinese immigrants.

1869 Honolulu Harbor light is built and lighted in harbor area.

1877 Samuel G. Wilder enters interisland trade with the steamer *Likelike*.

1878 The first interisland steamer, *James Makee,* goes into service.

1878 Arrival of Portuguese immigrants.

1898 The United States annexes the Kingdom of Hawaii.

1917 The first wireless station is established at Kahuku.

1918 A civilian coaling station is constructed at Pier 27.

1918 Union and Associated Oil companies sublease tract from Dowsett estate where Honolulu Coaling Station was built.

1919 Pier 2 near the entrance to the harbor is under construction. During recent renovation of this pier, very large, hand-hewn ohia timbers used to build the original wharf were discovered in perfect condition.

1921 Aloha Tower complex construction begins in response to increasing tourist trade.

1920s Interisland steamship company adds air service, but inter-island steamers remain popular until World War II.

1920s Sugar cane area is cleared for tiny John Rogers Airport (site of the Honolulu International Airport).

1926 Aloha Tower and Piers 8,9, 10, and 11 are opened for business.

1930s A ferry boat landing is constructed on Sand Island, now built up above the high-tide level. A remnant of the landing still exists.

1937 Coal-handling equipment on pier finally scrapped, and wharf converted to a profitable addition to the Interisland Overseas Terminal.

1941 Construction of Pier 29 by Interisland Steam Navigation Company is started early in the year.

1941 Oahu Rail and Land Company acquires the defunct Overseas Terminal.The company also owned large land areas in Iwilei and Kapalama as well as Piers 31-32 on the reserved channel between the two harbor basins. In addition, the company owned Piers 18,19, and 20. The company owned one third of the harbor land. The remaining two-thirds were controlled by the Territory of Hawaii.

1950s A bascule drawbridge connecting Sand Island to Oahu is built but rarely used.

1954 Diamond Head Terminal is built along the west side of Honolulu Harbor adjacent to Fort Armstrong and occupied by Matson Company.

1980s Matson Company moves to Sand Island Terminal.

1985 Countries receiving exports from Hawaii (in order of decreasing monetary value)

Japan
China
Korea
Australia
Taiwan
Singapore
Sweden
New Zealand
Hong Kong
U. S.-affiliated Pacific islands

Countries sending import materials to Hawaii (in order **of** decreasing monetary value)

Japan
Indonesia
Australia
Singapore
Taiwan
India
Philippines
United Kingdom
Korea
Hong Kong

1985 Barbers Point Harbor, the extension of Honolulu Harbor, is dedicated.

1986 More than half of our international trade is focused on petroleum products.

1986 **Half of our imports are automobiles. Electronic products account for much of the balance.**

1986 **Total ship movements number 4,300. Of these, 1,968 were overseas voyages.**

Excerpted, by permission, from *Port Hawaii Handbook 1988-1989*

Gala Harbor Days

From the mid- 1800s to the late 1930s Honolulu Harbor was the focus of attention whenever a ship arrived. The crew and passengers were sources of news from the rest of the world. The letters and parcels the ship carried were prized personal news. Other festive occasions centered around the harbor. The sheltered waters offered good conditions for favorite sporting activities such as rowing and canoe paddling. Spectators thoroughly enjoyed the many excellent vantage points around the harbor.

1. Boat Day

In the early days, a mainland-Hawaii trip might take up to 11 days. Today it takes 4 to 5 days. A run from Hawaii to New York, with overnight stopovers in San Francisco and on each side of the Panama Canal, took 30 days or more. Today it takes less than half that time.

The first steamships arriving off Waikiki in the evening sometimes anchored offshore overnight. The shore was dark except for one strange, ominous-looking strip of fitful fires sending up clouds of smoke. It was an exciting, puzzling show. Newcomers to Hawaii were told it was a live volcano called Mount Swilauea. Later, of course, the joke was obvious. Today we know the area as Ala Moana Park. Back then, it was the infamous city dump.

Townspeople were alerted to boat arrivals by a lookout stationed on top of Puowaina (Punch-bowl). A tar barrel was set afire and rolled down the hill. Later, a less dangerous semaphore system was installed in the Kaimuki "saddle" area. Because each ship and shipping company insisted on its own signals, no one could recall what the various signals meant. The system quickly collapsed, but Kaimuki was known as "Telegraph Hill" for a long time thereafter. Once a telegraph system was established with the West Coast and sail was replaced by steampower in the mid- 185Os, ships could maintain schedules. By the early 192Os, passenger ships and cargo ships were arriving about every 12 days.

Cargo ships were greeted by stevedores and merchantmen, but passenger ships were greeted by anybody who could get to the port on time. Some residents arranged to ride out on the pilot boat so they could board the ship offshore, meet their friends on board, and enjoy acting like passengers when the ship docked. The transfer from tug to ship was sometimes scary. Most ships were boarded through an open cargo port about 3 feet above the level of the pilotboat deck. Alongside the steamship the tug rose and fell easily on normal waves. The steamship also moved in the waves but with restraint because of its great weight. A heart-thumping transfer from tug to ship depended on timing and crewmen with strong arms who waited at the open port. The visitor had to wait until the tug's deck was at the same level as the port. When all conditions were "go," a crewman hollered "jump!" That split second in midair between two vessels was enough of a thrill-scare to last a lifetime. Small wonder most people chose to greet the ship at the pier.

Passenger ships were greeted dockside by the Royal Hawaiian Band, a troupe of hula dancers, and crowds of friends, relatives, and the curious. Paper streamers thrown ashore by passengers bound the ship to the shore. While the ship was being eased into its berth, canoes of all

descriptions floated nearby, their dark-skinned young paddlers signaling the tourists to throw coins their way. Ceremonies were colorful but brief. Passengers were anxious to get ashore and locate friends.

Until 1941, leaving Hawaii was a mixture of sadness and excitement. Anyone could go aboard and move about freely. Farewell cabin parties were "open house" more often than not. Passengers were nearly smothered with fragrant leis. After a time, a repeated announcement enforced by melodious chimes played by stewards passing through the corridors warned visitors of imminent departure. As the ship eased away from the pier, the band played "Aloha Oe" and tears fell unrestrained. Hundreds of colorful paper streamers that created a web to hold ship and pier together were torn apart The throaty resonance of the ships' departing blast and calls of "aloha" made indelible impressions. Occasionally, a visitor failed to disembark in time. For a fee, they were returned to port with the pilot. Passengers usually stayed topside until the ship was off Waikiki, when they threw leis overboard to drift ashore, a guarantee that they would return.

Before World War II, the port often hosted two liners at the same time. Today ocean cruise vessels are frequent visitors, and the number of cruise liners is expected to increase. Revival of the "Traditional Hawaiian Welcome" has been suggested as a project for the 1988-89 tourist season.

2. Visitations by Famous Ships

The adventures of ship captains, passengers, and crew hold a particular fascination for readers. The following is an incomplete list of famous ships that visited Honolulu Harbor. Any additions will be welcomed.

- *Falls of Clyde*, four-masted sailing ship, 111 years old, now a museum ship
- *Kaimiloa,* catamaran built here by famous sailor-explorer Eric De Bisschop in the early 1930s
- *The Walrus,* small boat sailed by preacher, mid-1930s
- *Seth Parker,* four-masted missionary ship, mid- 1930s
- *CUSS II,* deepsea driller, 1978
- *FLIP,* floating instrument platform, 1970s
- *Lomonsov,* Russian research vessel, 1970s
- *SEDCO 445***,** a manganese nodule mining vesssel, 1978
- *Sagres,* Portugese training vessel, 1978 and 1983
- *Glomar Explorer '75***,** U. S. research ship, 1978
- Coast Guard ships *Corwin, Newagen, Jarvis, Mellow***,** and *Munro*
- *Nippon Maru* and *Kauwo Maru***,** Japanese four-masted training ships, 1979
- *The Golden Hind***,** 1979
- *Pacific Swan***,** nuclear waste ship, 1979
- *Sonne,* German manganese research ship, 1978
- *Glomar Challenger,* 1978
- *Juan Sebastian de Elcano***,** Spanish training ship, 1979
- *Greenpeace,* ecology ship, 1985-86

- *Alcyone,* Jacques Cousteau's boat, 1987
- *Deep Rover,* Canadian bubble deep dive ship, 1986
- *Stars and Stripes II,* America's Cup Winner, 1987
- *Hokulea,* Polynesian sailing vessel, 1987
- *Esmerelda,* Chilean cadet training ship, 1980
- *Xiangyanghong,* Chinese research vessel, 1986
- *Queen Elizabeth II,* ocean liner, 1988
- *Anastasias,* mercy ship, 1985
- *Tole Mour,* medical aid ship from the Marshall Islands, 1988 (maiden voyage)
- *Shin Co-op Maru,* oil tanker with computer-operated sail and navigation equipment, 1986
- *Nissan Maru,* exceptional car carrier, 1984
- *Canterbury,* New Zealand frigate, 1985
- *Mariegalante,* The Galleon, 1988

3. Regatta

Venetian gondolas have never been used in Hawaii, but the Venetian term gondola, which means "regatta," was well known to islanders as long ago as the early 1860s. By 1863, the Fourth of July was celebrated with festive Regatta Day events in Honolulu Harbor. King Kalakaua was so interested in racing six-oared shells he acquired one and manned it with his soldiers. In his honor, the race day was changed to his birthday, November 16. About 1891 a new type of shell was introduced from San Francisco. It was somewhat heavier and wider than the six-oared shell, but it was easier to row and it was fast. It was aptly named the six-oared, sliding seat boat (later called a barge).

By 1879, the races were set for the third Saturday in September. If in port, the crews of foreign warships were invited to join in the races. The activities lasted an entire day. There were races for large and small sailboats and for whaleboats. Canoe paddling races and canoe sailing races were especially popular because they were ancient Hawaiian events. Tub races were held. Two-oared boats, possibly English sculling boats or the familiar one-man rowboats, were raced. Added swimming races, diving contests, and tug-of-war contests must surely have-exhausted the participants and the audience.

A spectacular event in the 1879 regatta was the double-banked, l4-oared cutter races, unfortunately not described in literature. Equally notable was the defeat of Coxswain Princess Kekaulike by Coxswain Princess Liliuokalani in an eight-oared canoe race. On the same day, King Kalakaua and his crack crew were soundly defeated by Caucasian employees of the Sorenson and Lyle Marine Railway Company. By 19 11, the regatta boasted 59 events.

The regatta was an annual highlight, but by 1936 the harbor was busy around the clock, so the event was moved to the Ala Wai Canal. It was unsatisfactory from any point of view. The newly built Ala Wai Boat House, specially built to harbor the racing shells and barges, eventually

became a city Department of Parks and Recreation meeting hall. An attempt was made to revive shell and barge rowing in the 1950s and 1960s, but the problem of a suitable race place was never solved.

Fifty-six big regattas and seventy-six other annual ocean sport contests such as swimming, surfing, boating, and canoeing events are already scheduled for 1989. King Kalakaua would be delighted, even though his favorite six-oared racing shell events are only history.

Honolulu Harbor Development: Using Maps to Visualize Changes

As the population of Honolulu increased, the Honolulu Harbor area expanded and developed, and the city expanded first along its eastern shoreline and then into nearby valleys. Business-oriented Caucasians tended to remain near central Honolulu. Others moved eastward along the interior coastal plain into the nearby Makiki area, 1ower Manoa Valley, and Pauoa Valley. Prized shoreline areas in the Waikiki area, which once belonged to Hawaiian royalty, gradually became the property of financially successful businessmen.

Maps of Honolulu Harbor and the adjacent shoreline provide considerable subject matter to help students understand the sequence of alterations to "Fair Haven" anchorage and the adjoining settlement which became the harbor and city of Honolulu. The maps in this section focus on the gradual, extensive alteration of the south Oahu coastline from the east side of Pearl Harbor to Kewalo Basin.

Use of these maps:

1. Assists students in visualizing the development of the city and the harbor
2. Familiarizes students with the informative nature of maps, especially when map sequences are used
3. Increases knowledge of the gradual process of harbor and town development
4. Motivates students who discover how interesting it is to compare a map series to understand area changes more readily

Map 1.1840 Harbor Area Map With Channel Depths

The shoreline and offshore reef areas are indicated as are the location of channel buoys.

The channel has been thoroughly surveyed, as indicated by the numerous notes showing soundings regarding the nature of the bottom It is reasonable to presume that depths are recorded in feet rather than fathoms. It required considerable time, effort, and skill to record a single sounding. Sailors had to maintain an exact position of their clumsy boat while each sounding was made. Soundings near the harbor entrance were seldom easy because of ship traffic, nearby breakers, and tidal movement.

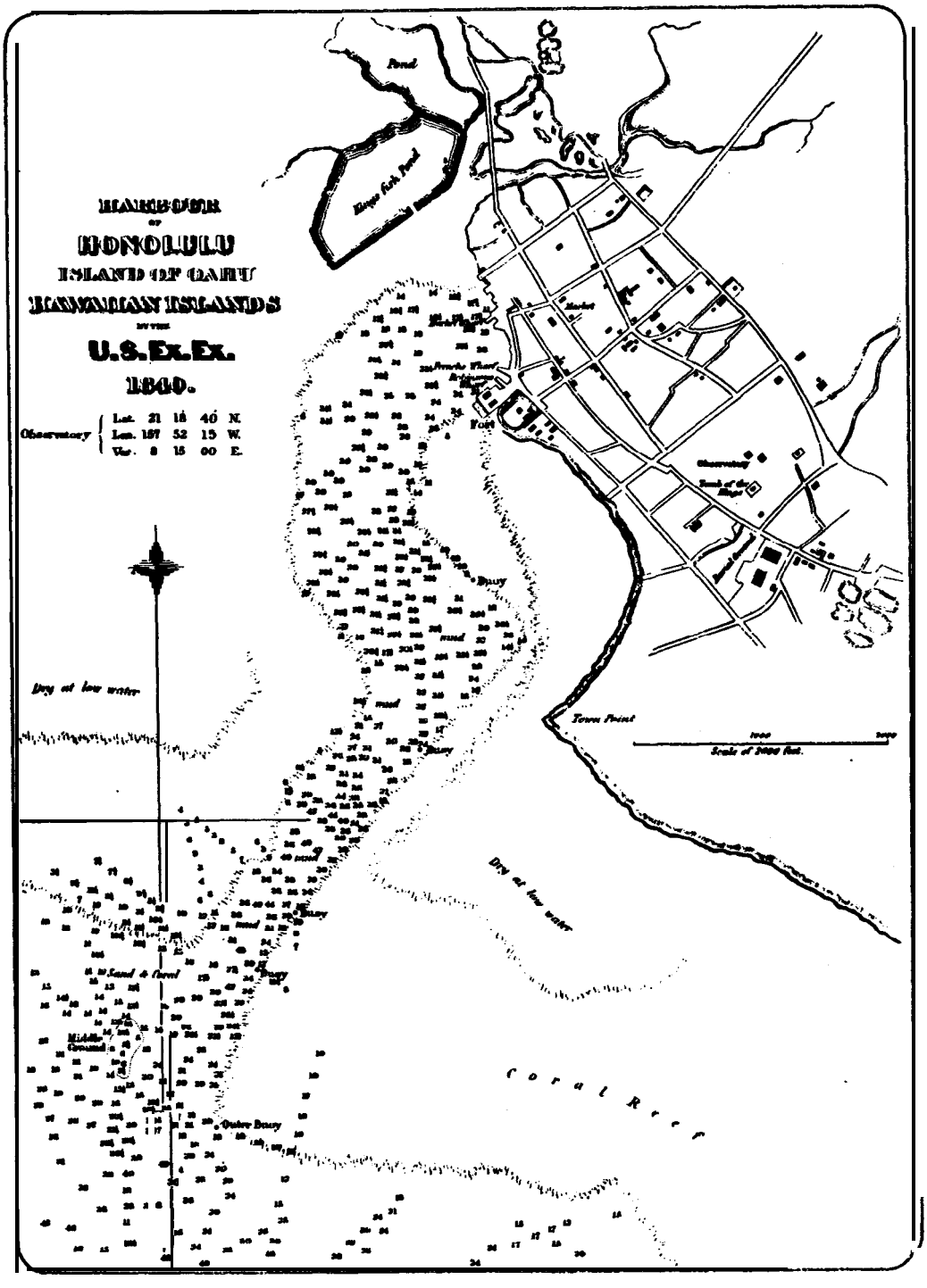
Small rectangular or square-shaped clusters of buildings are most likely Hawaiian family compounds. Few became permanent structures.

A market wharf is shown as well as two privately built wharves which served as loading and offloading platforms. Along the shore were makeshift shipyards for repairs. Most ships anchored in the harbor.

Today, the Tombs of Kings is at the Waikiki end of the Iolani Palace grounds on the King Street side. It is a simple grassy mound.

The fort area is the small park and nearby parking lot at the foot of Fort Street fronting the Aloha Tower complex, A roadway grid system of muddy or dusty paths was already in existence.

Nuuanu stream, the primary architect of the harbor, is now under wide street bridges and reduced to a small stream. There is a faint indication of the offshore reef area that provided protection for the shoreline that eventually became the harbor. Today the reef area is called Sand Island.



Atlas of Hawaii
Used by permission

Map 2.1901 Honolulu Harbor, Kalihi Channel, and Important Land Features

The harbor shoreline is greatly improved.

The coastal plain west of Nuuanu Stream is now subdivided into land tracts (mostly used for farming).

The Aala and Iwilei districts (primarily business) are defined.

A new executive mansion and a jail are located at opposite ends of the business area.

A railway exists to connect the port with the southwestern coastal area (military Pearl Harbor area).

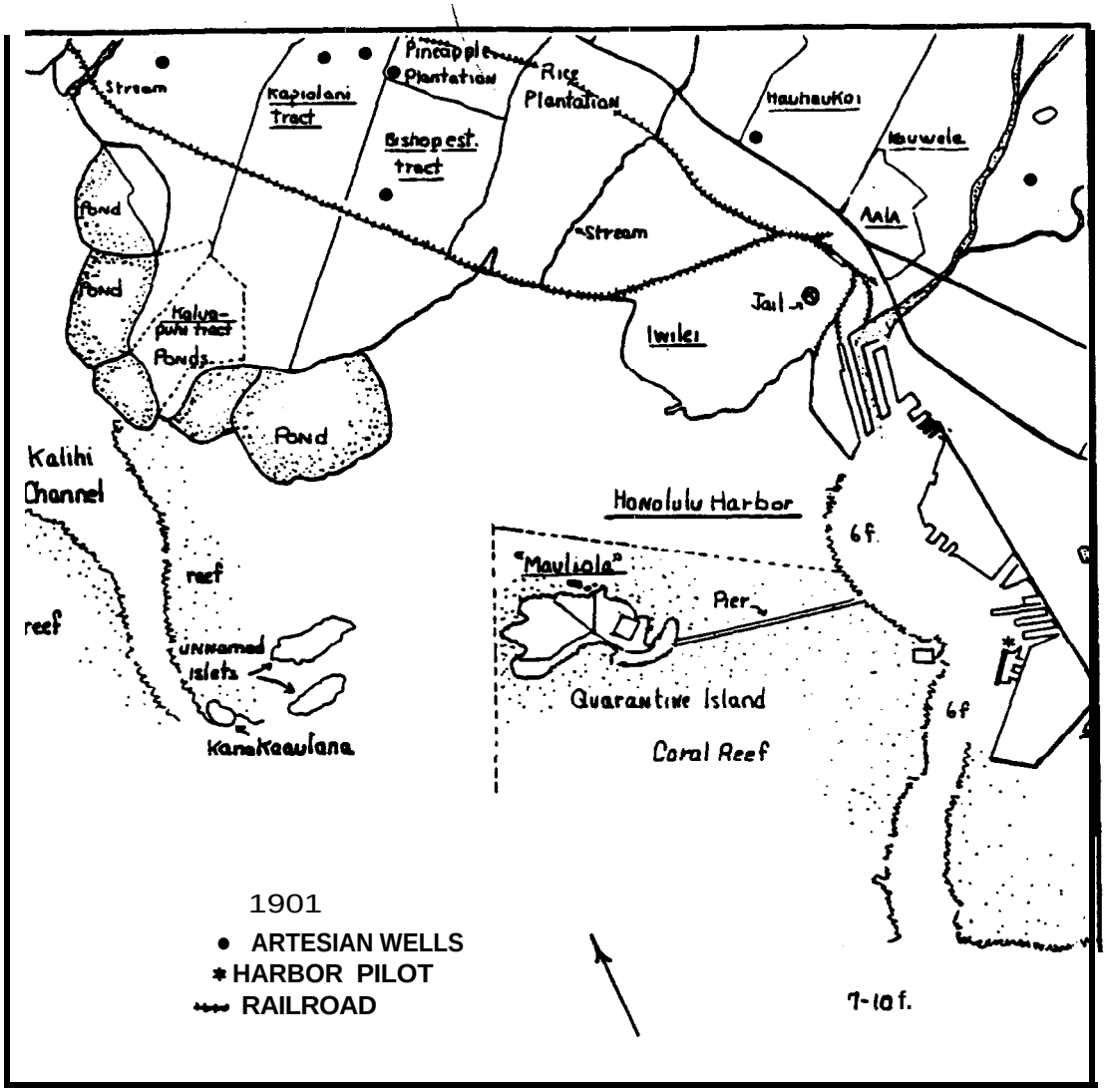
King and Beretania streets are principal thoroughfares.

Quarantine Island was constructed on the harbor offshore reef area, an indication of public health concerns due to an influx of immigrants and increasing visits of ships from everywhere.

Honolulu, which formerly had a limited brackish water supply, is supplied water by seven artesian water wells.

The harbor has a pilot, a sure sign of a busy, growing port.

A pineapple plantation and a rice plantation near the current site of Bishop Museum are typical of land use in the area at that time.



Bishop Museum Library Map
Modified
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Map 3.1923 Honolulu Harbor and Developing Town Districts

The Iwilei district has been extended seaward by considerable landfill to join Quarantine Island. Fill was obtained primarily from dredging of the inner harbor areas.

Quarantine Island, in turn, has been enlarged by landfill. Part of the island became a U.S. reservation area.

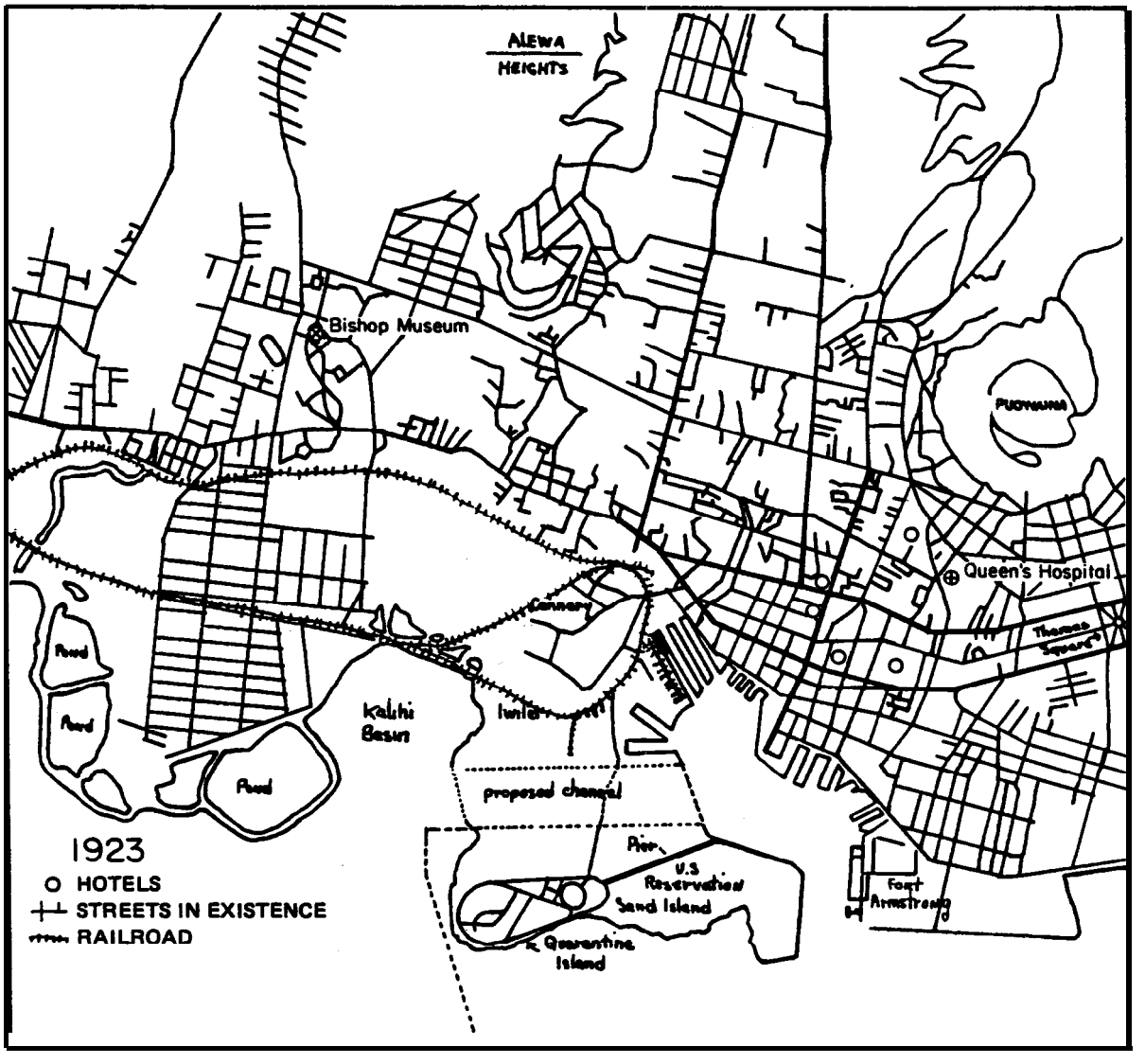
Harbor wharf areas are improved and enlarged, and Honolulu town has expanded eastward and into lower valley regions.

Westward street system development is poor, perhaps because much of the area is farm plots. Only some in-town streets and main access streets, such as King, Beretania, Fort, Liliha, Nuuanu, and Makiki, are well tended and have some hard surfacing.

There are a surprising number of hotels indicating a steady transient population. They bear little resemblance to hotels as we know them today.

Note placement of the pineapple cannery close by the railroad.

The 1901 trial pineapple plantation in Bishop Tract vanished, but pineapples flourished in the higher elevations of central Oahu. Fruit was hauled to the new cannery close to the harbor. Canned fruit rolled over a short railroad spur directly to the loading dock in the harbor.



Bishop Museum Library Map
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Map 4.1938 Sketch Map of South Oahu Shoreline

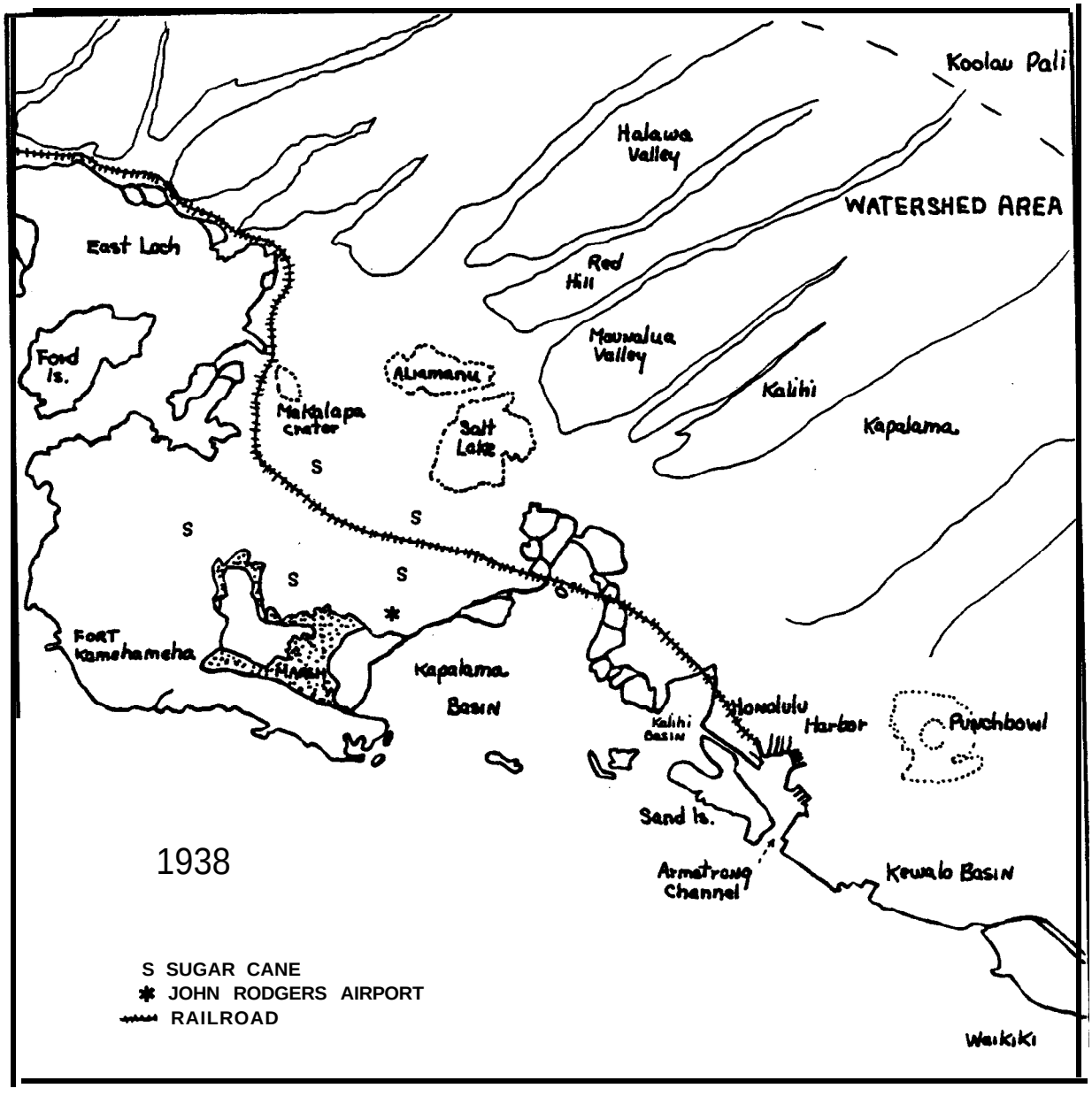
Many fishponds in the Kalihi Basin have been filled to create more land.

The landfill connection between Iwilei and Sand Island has been severed, creating a channel between Kalihi Basin and Honolulu Harbor. A possible reason might have been to promote better circulation.

The railroad extends to Barbers Point, up the leeward coast, and around Kaena Point to Haleiwa, a favorite gathering place. A single track, mile-long trestle bridge spans the inner area of Kapalama Basin from the prison to the other side near the present-day intersection of Nimitz Highway and Lagoon Drive. Nearby Mapunapuna district is part of the lagoon.

A narrow two-lane road from Honolulu westward to Barbers Point crosses the inlet on an elevated dike scarcely wider than the road. It runs parallel to and inshore of the trestle bridge. The dike was discontinuous to allow free flow of water in the basin. The two bridges were not noted for their sturdy build. During spring tides, the road was frequently underwater. The other access to west Oahu was an ill-kept inland road over Red Hill just beyond Moanalua Gardens and through seemingly endless cane fields. Eventually it connected with the main road near Aiea plantation.

Tiny John Rodgers Airport is surrounded by sugar cane.



Bishop Museum Library Map
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Map 5.1962 Honolulu Harbor, Kapalama Basin, and Keehi Lagoon

Extensive wartime changes have occurred in Shafter Flats, Moanalua Gardens, and the large fishpond area inland of Keehi Lagoon.

The entire area inland of the trestle bridge has been filled with dredge material from Keehi Lagoon.

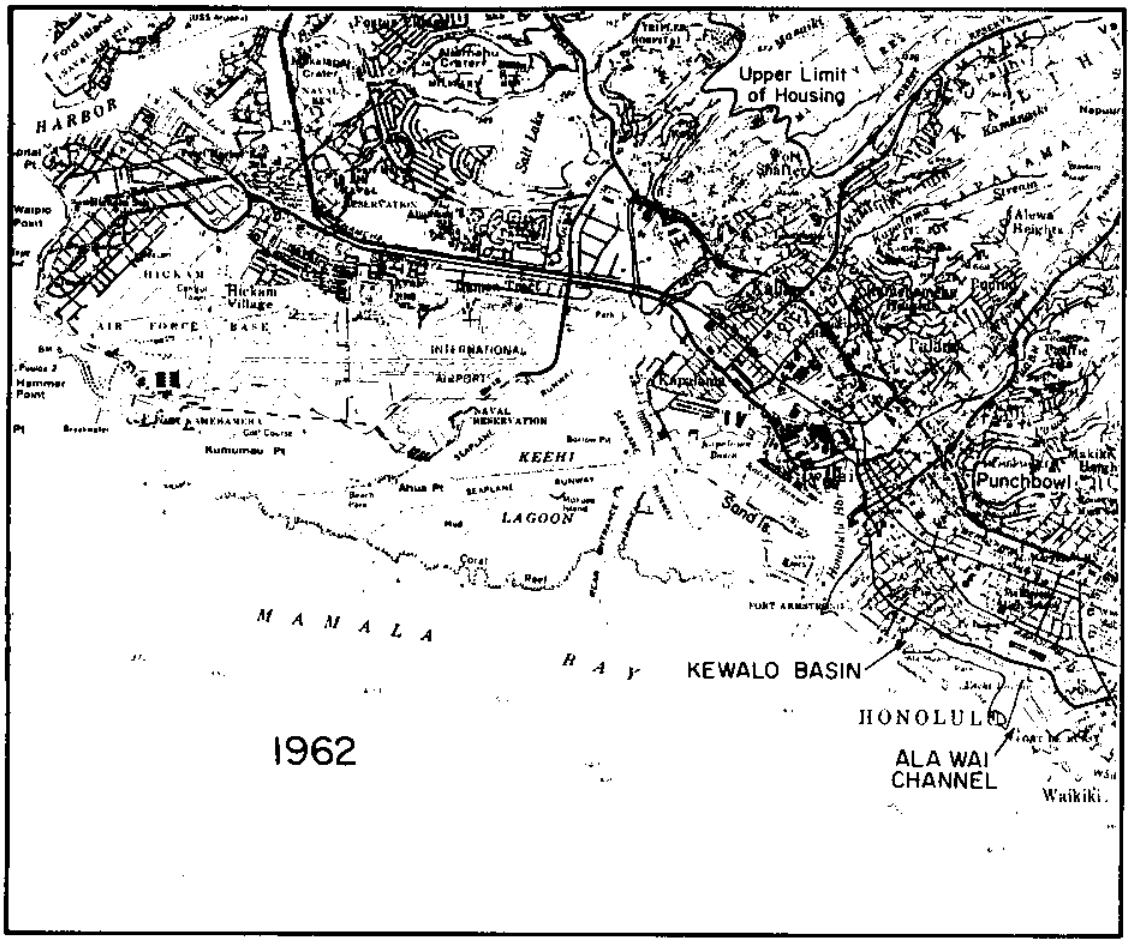
The marshy southwestern edge of Keehi Lagoon has been filled. Two seaplane runways were dredged from the lagoon during World War II.

A rear entrance from Honolulu Harbor to Kapalama Basin has been dredged across the old fill that once connected Sand Island to the shore.

During the war the islands were under military rule. The gradually built-up Honolulu reef that protected the harbor was used as an internee camp. Large areas were awash during very high tides.

Quarantine Island, also known as Sand Island, was renamed Anuenue Island for a brief period. It was finally renamed Sand Island. During the 1950s and the 1960s the undeveloped seaward side of Sand Island was a favorite place for townspeople to enjoy sack lunches and watch waves. It was also the happy hunting ground of artists and craft-people interested in wave worn colored glass. For several years, one or more incinerators dumped solid residue along a section of the shore as fill.

The ocean wave action produced small quantities of very nice frosted glass. School children used the glass for Christmas tree ornaments. Elegantly designed and crafted frosted glass jewelry is still seen on occasion.



Bishop Museum Library Map
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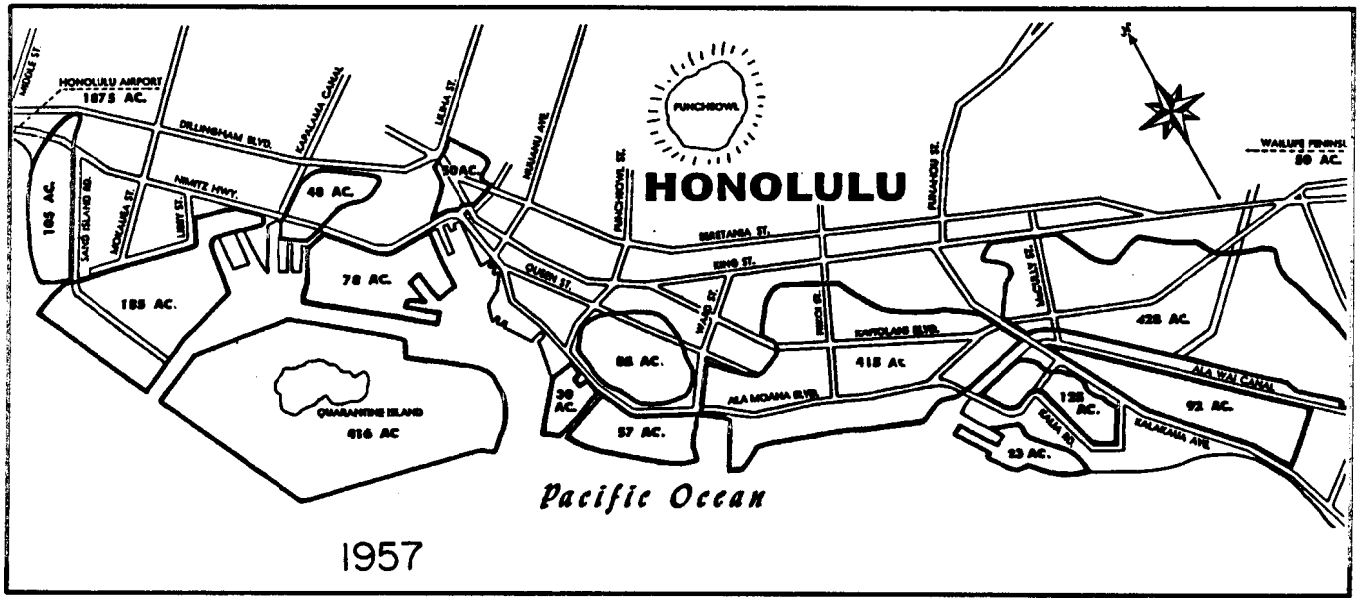
Map 6. 1957 Diagram of Changes in Honolulu Harbor and South Shoreline by Landfill

By the mid-1800s harbor anchorages were not easy to get and shoreline space for marine facilities was at a premium. Slowly, marshy shorelines and fishponds were drained and filled. Between 1900 and 1957 the Honolulu Construction and Draying Company completely changed the original harbor and much of the Kewalo-Waikiki area configuration. Fill material from its construction and wrecking operations were distributed over 16 carefully selected acres to add more than 4,300 acres of sorely needed land to the harbor and the Kewalo-Waikiki shoreline.

Harbor space use changed considerably since World War II because ship types and shipping methods changed radically. Matson and Sea Land containership facilities expanded to meet the needs of increased containership use. Today, they occupy a large portion of the formerly unusable harbor side of Sand Island. The Coast Guard occupies all but a fraction of the remaining shore space.

Sand Island was once a small, nearly submerged reef fronting the harbor. Over time, it was elevated and enlarged by harbor dredge materials, construction debris, and solidified incinerator wastes. Today the ocean and channel side is a large public park

Just outside the harbor between Fort Armstrong and Kewalo Basin students may notice the “dirt pile.” It is the last section of the Honolulu shoreline to be filled. The single, tall smokestack near Kewalo marks the site of the defunct incinerator that produced the consolidated wastes that shaped Sand Island.



Bishop Museum Library Map
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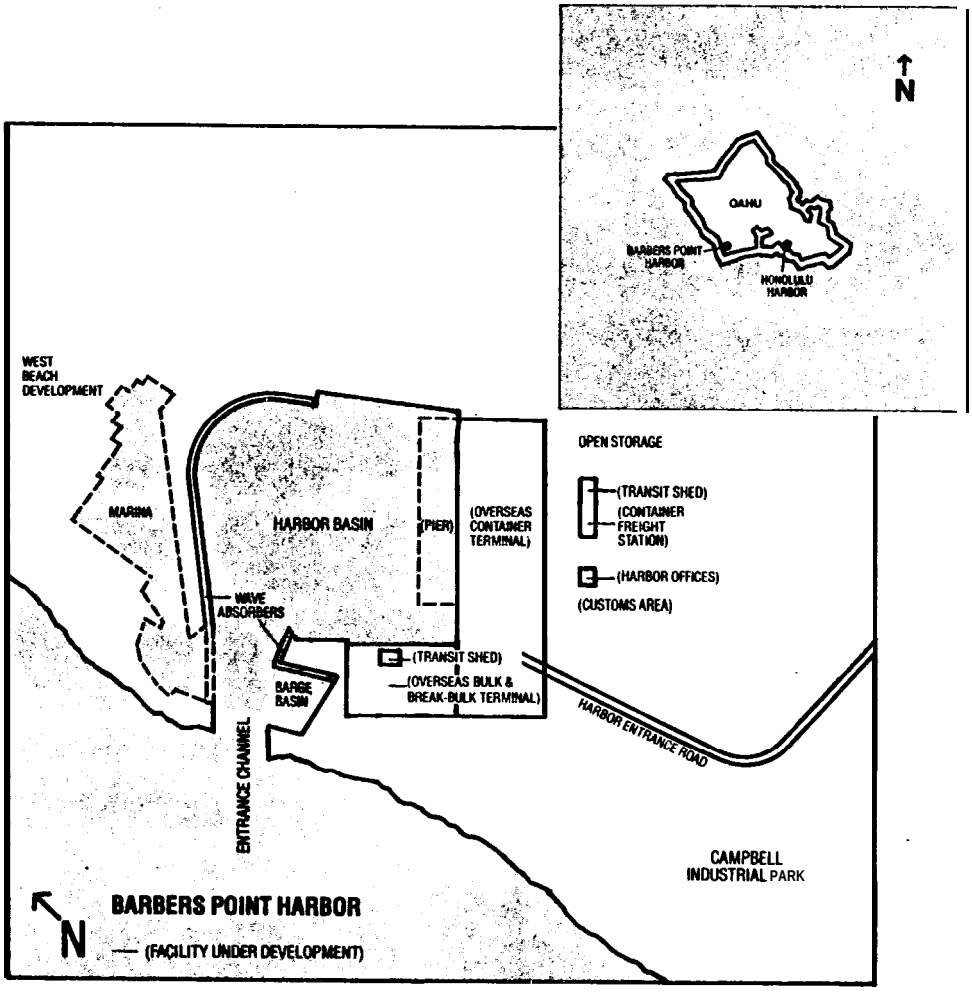
Map 7. 1987 Barbers Point Harbor

Containership operations, interisland shipping, and the increase in ocean cruises necessitated additional harbor space not available in Honolulu. Fortunately, space was available on the leeward coast, close to the refinery. The space was a small private barge harbor blasted out of the fossil coral coast by the Damon estate for its private use. The harbor was used only as an emergency ship shelter because the entrance was narrow, berthing space was limited, land access was poor, and there were no shore facilities.

By 1982 the state acquired jurisdiction over the area and initiated major improvements. The harbor was dredged to 38 feet, and the entrance was widened to accommodate tugs and barges. The turning basin was enlarged and redesigned. The surrounding area is now being prepared for necessary shore facilities. Although unfinished, the Barbers Point Barge Harbor was officially dedicated in 1985 and is in limited use.



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NAME AND NUMBER IDENTIFICATION OF BOATS AND SHIPS

Boats and ships are christened before they go to sea. It has been so since earliest times. There were four reasons for giving boats or ships a name. Some owners believed a name with religious connotations would protect the vessel. Some vessels were given names based on sentiment or a sense of pride in ownership. Ships were also named after people important to the owner. No matter what the reason, a name of some kind was necessary to designate legal ownership and establish identity. There might be many vessels of the same build, size, and color, but only one bore a particular name. The registration process would note the duplication and deny the second registrant use of a name already granted.

Within the last quarter century, changes in ship size, specialized uses, and an increase in total numbers has resulted in the election of a standard NUMBER-LETTER REGISTRATION SYSTEM replacing names. All ships must have registration numbers. Names are optional. At one time it was fun to walk through a local marina and observe ship names. A recent walk through the Ala Wai Boat Harbor showed numbered crafts far outnumbered those with names.

The Coast Guard has a well-organized system for naming its ships.

High endurance cutters (378 ft) are named for Coast Guard heroes: e.g., *CG Jarvis.*
Polar icebreakers are named for winds: e.g., *CG Northwind.*
Medium endurance cutters (210 ft) are named for desirable human traits: e.g., *CG Confidence.*
Oceangoing tugs are named for Indian tribes or places: e.g., *CG Cherokee.*
Large patrol craft are named for capes: e.g., *CG Cape Corwin.*
Seagoing buoy tenders are named for flowers, shrubs, or trees: e.g., *CG Balsam.*
Small harbor tugs are named for marlin pike seamanship terms: e.g., *CG Towline.*

Naming ships is not always easy. One man whose job it was to name ships discovered he had almost named a ship after a star an astronomer had named after his mistress' poodle. Submarines were usually named for fish, but this presented problems, because many fish species names were difficult to pronounce. The desperate boat namers finally arranged with ichthyologists to assign English names to subspecies of fish previously having only scientific names. Submarines were given the English names.

Because numbers are required for identification, several vessels can have the same name. The Hawaii-based Matson Company lists seven *Lurlines;* including a launch, a yacht, a brigantine, a steamer, two liners, and a ro-ro freighter. The company also lists four *Matsonia.* They include a steamer, two liners, and one ro-ro freighter.

Ship names are often changed when ownership changes. Sometimes a change is made for less obvious reasons. In 1927, the Matson-owned *Malolo* had too many mishaps on its early Pacific crossings. After renaming the ship *Matsonia,* there were no further problems. Another local vessel named *Malolo* was wrecked on Diamond Head. After the vessel was refurbished it was renamed *Diamond Head* and suffered no further accidents.

From 1789-1968 a sampling of every fifth page of ship registers from four American East Coast harbors showed miscellaneous names accounted for about 59% of the sample, feminine names ranked second with 20%, place names accounted for 12%, and male names for 11.3%. Religious names, classical mythology names, and animal names accounted for the remainder. No matter what the name, however, all ships are traditionally considered feminine.

Recently, acronyms have appeared in place of names. POP stands for Perpendicular Offshore Platform. FLIP (Floating Instrument Platform) spent some time in Honolulu in the mid-1970s. Neither vessel looks like a "ship." Each has served well, but no more have been built.

Abstract names for small craft have increased markedly. Local owners are expressive: e.g., *An-Den?, Big Deal, Hi-Fi,* and *Dunwerkin.* Hawaiian feminine names are common. One local ship company gives Hawaiian names to all its vessels.

Suggestions for Student Activities

Students can easily acquaint themselves with cruise ship logos, names, courses, itineraries, and passenger fares by searching through magazines such as *National Geographic, Sunset,* and *Aloha.* Regional libraries usually have stacks of magazines that are free.

Many students may have adult friends and relatives who have traveled or worked on ships. Some students may have traveled by ship. They can share their experiences in "Talk Story" sessions, cartoon strips, or written narratives.

A librarian would be delighted to direct students to collections of short, true sea stories about famous ships.

HARBOR BOAT AND SHIP TYPES

The central Pacific location of Honolulu Harbor assures visitations by a wide variety of ships. Newspaper, radio, and television items alert residents when a special vessel is due in the harbor and the length of its stay. Sometimes a vessel holds "open house." The ship is "dressed" with flags, and crewmembers conduct ship tours. Today, long lines of interested islanders preclude the festive refreshment tables that used to be the highlight of a ship's tour. Even so, the satisfaction of curiosity and the added knowledge are well worth the wait-in-line time invested.

Suggestions For Student Activities

If student interest is keen and time is available, group project work might include collecting pictures or student drawings of ship types and writing notes regarding their use and area of operations. For example, a student discovered a picture in a 10 cent *National Geographic* magazine of two Portuguese cadet training ships he knew were frequent visitors to Honolulu. A quick check through *The Honolulu Advertiser* and *Honolulu Star Bulletin* indexes provided him with further information.

Activities such as student reports on ships, either fictional or nonfictional accounts garnered from newspaper and magazine articles, are especially interesting when they are shared with the class. Newspaper files are excellent sources of information and usually include pictures. Student reports on newsworthy ships and their passengers involve considerable practice in the use of newspaper indexes and operation of the viewing machine. Students have said the attention given such reports made the effort worthwhile.

Military dependents, who often travel to interesting places, might share knowledge of military ship types, or foreign boats and ships not common to Hawaii.

Island children may find an easy source of information in their adult friends. The students can present their findings in written, comic strip, or "Talk Story" form.

For some, development of a crossword puzzle based on ships or ship types is a challenge. Three or four person groups often work best for this project. Innovative students might use a hull shape rather than a standard square or rectangular shape for their puzzle.

Listed below are a variety of boat and ship types that are marina residents or visit Honolulu Harbor or Pearl Harbor regularly. Teachers may find the list useful as a "starter" to which students may add boat and ship types they know or discover on their own. The "History" section has a list of famous ships that have visited Honolulu Harbor.

The following is a list of boat and ship types found in Honolulu Harbor:

- Barges, boats of adventurers (often solo sailors), breakbulk carriers

- Cabin cruisers, cableships, cadet training ships, catamarans, Coast Guard buoy tenders, Coast Guard cutters, Coast Guard icebreakers, college ships, containerships, cruise ships
- Deepsea drillers, "dryboats"
- Ecology ships
- Ferryboats, fireboats, floating drydocks, freighters
- Hospital ships, hybrid boats (FLIP, *Rella Mae*)
- Junks (Chinese)
- Ketches
- Landing crafts, lo/los, longliners
- Mercy ships, minisubs, motor launches, museum ships
- Oilers
- Pilot boats
- Replicas of ancient ships, research vessels, ro/ros, rowboats
- Salvage ships, sampans, schooners, seiners, semisubmersibles, submarines
- Tankers, trailerboats, training ships, trawlers, trimarans, tugs, tuna boats
- Warships (pre-World War II), water taxis, whalers, workboats
- Zodiacs

HARBOR PIER USE AND USERS: 1988

Most students are unfamiliar with harbors and tend to believe ships that call Hawaii their home port get the best "parking spaces" and others use whatever space is left. They compare the harbor to parking lots, where one stall is the same as another. But harbors are not just like parking lots. Many harbor spaces are owned or under long-term leases. Others are specially designed or have facilities for certain types of vessels. A ship does not take the best available space; instead it takes the space it is assigned.

Harbor facilities include equipment, space, and services for a wide variety of specialized ships of many sizes and shapes. Honolulu Harbor must also provide storage space necessary to protect supplies intended for transshipment to other island harbors. Oahu relies totally on vehicular transport of goods from the harbor, hence considerable space on or near the pier must be available as a holding area.

Some users of harbor facilities, such as the Aloha Tower complex and the Coast Guard, remain in the same place for a long time. Matson Navigation Company recently moved from its longtime place on Pier 2 to the harbor side of Sand Island. Because most piers are built and equipped to handle either general or special cargo, many companies use the same piers except in cases of emergency. For some piers, such as those specially equipped to handle tugs, fuel, concrete, sugar, grain, containers, or interisland cargo, the operating companies have very long leases.

Sometimes harbor-housework, such as dredging a berth area deeper to safely accommodate a new regular visitor, means that several other vessels originally assigned that pier space must be temporarily berthed elsewhere.

Suggestions for Student Activities

On the cruise, students will learn and see how harbor spaces are organized and assigned according to a precise plan. Students will better understand the necessity for order through discussions about space use in homes, telephone books, bus schedules, or the arrangement of merchandise in stores.

Have students sketch maps of the harbor and identify special areas they recall. Student groups then can compare their information and create a composite. They can then check their map against a printed harbor map.

Posttrip discussions might focus on why cruise ships are at Piers 8, 9, 10, and 11, or why the Coast Guard station has two areas so close to the harbor entrance. Much will be conjecture, but students begin to understand the necessity of careful planning if results are to be satisfactory.

Students might also be interested in harbor traffic control (especially if they had to stand by while a barge moved through the harbor or the channel). Others may have heard about the harbor patrol. Investigating harbor traffic control operations from Aloha Tower or learning about the duties and responsibilities of the islandwide harbor patrol are interesting, informative projects.

HARBOR PIER USE AND USERS

Pier #	Cargo/Pier Use	Users
1	Containers, automobiles, lumber, heavy machinery, paper products, general cargo	ACS Agencies Alaska Cargo Transport Hawaii Pacific Marine Lines Fred L. Waldron, Ltd. Hawaiian Marine Lines PAD Lines PM&O Lines U.S. Customs SubSea Workboats
2	Foreign Trade Zone #9, containers, automobiles, heavy machinery, lumber, cable ships, general cargo, paper products	Hawaiian Marine Lines American Telephone and Telegraph
4	U.S. Coast Guard facility	U.S. Government
5	Small cruise ships, automobile parking	The Webe Corporation
6	***Ali'i Kai*** Catamaran, Oceania	***Ali'i Kai*** Catamaran
7	Hawaii Maritime Center, ***Falls of Clyde,*** small cruise ships	Hawaii Maritime Center Windjammer Cruises
8	Cruise ships and passengers, automobile parking	Aloha Pacific Cruises Sea Link of Hawaii The Webe Corporation
9	Cruise ships and passengers, automobile parking	American Hawaii Cruises Caleb Brett (USA) Inc. Hawaii Exam Prep Center Hawaii Pilots Association
10	Cruise ships and passengers, automobile parking	U.S. Customs S.G. Lam

Pier #	Cargo/Pier Use	Users
11	Cruise ships and passengers, automobile parking	American Hawaii Cruises Hawaii-Pacific Maritime Inc. McCabe, Hamilton & Kenny Co., Ltd. Harbors Division Administration Theo Davies Marine Agencies
12	Small cruise ships, automobile parking, ***Hokule'a,*** emergency tie-up space	Nahoku Catamaran Polynesian Voyaging Society
13	Tugs, automobile parking, barges, bunker fuel	Mid-Pacific Towing American Workboats
14	Tugs, automobile parking, bunker fuel	American Workboats Uaukewai Diving, Salvage & Fishing
15	Fireboat	Honolulu Fire Department
16	Commercial fishing boats	Fishing boats
17	Commercial fishing boats	Fishing boats
18	Fish loading, storage and repair sheds, pilot boats	Hawaii Pilots Fishing boats
19	Sugar, lumber, general cargo, barges, containers, conveyor/gantry for bulk raw sugar	Oahu Transport Company Brewer Chemical Company Diversified Distributors Hawaii Transfer Company, Ltd. Sause Bros.
20	General cargo, automobiles, liquid fertilizer, lumber	Brewer Chemical Company Sause Bros.
21	Tugs, fuel pipelines, bunker fuel	Hawaiian Tug & Barge Hawaiian Flour Mills, Inc.
22	Tugs, bunker fuel	Hawaiian Tug & Barge

Pier #	Cargo/Pier Use	Users
23	Grain storage, conveyor gantry, feedmill	Manna Pro Corporation Hawaiian Flour Mills Inc. Kotake Company
24-25	Interisland cargo, containers	Young Bros. Hawaiian Tug & Barge Manna Pro Corporation
26	Interisland cargo, fuel, pipelines, ro/ro	Young Bros.
27	Interisland cargo, automobiles, ro/ro	Young Bros.
28	Interisland cargo, bunkering barges, petroleum products	Young Bros. Hawaiian Independent Refinery Hawaiian Farmers Co-op Association
29	Interisland cargo, petroleum products	Hawaiian Bitumuls Young Bros.
30	Petroleum storage	Chevron U.S.A. (long-term lease)
31-33	Petroleum products, general cargo, lumber, automobiles, bulk, commodities, caustic soda, asphalt, steel products, chemical products, newsprint	Pauley Petroleum Shell Oil Company Hawaii Transfer Brewer Chemical Company
34	Petroleum products, bulk cement, bunkering vessels, Unocal refining, cement	Hawaiian Independent Refinery Pacific Resources Terminals Union Oil Company
35	Scrap metal, general cargo	Flynn-Learner
36	Pineapple, general cargo	Dole Hawaii
37	Commercial fishing boats	Chevron U.S.A.
38	Liquified petroleum gas	Gasco, Inc.

Pier #	Cargo/Pier Use	Users
39	Automobiles, general and bulk cargo, steel products	Transport Express
40	Automobiles, general and bulk cargo, lumber, cement, grain	Holo Lani Servco P & R Water Taxi
41	Ship repair	Honolulu Shipyard, Inc.
42	Container freight station	Island Movers
44-45	Oceanography, research vessels (Snug Harbor)	University of Hawaii Marine Expeditionary Center NOAA
51A	Containers, jet fuel	SeaLand Service Honolulu Fueling Facilities Corporation
51B	Containers	Matson Navigation Company SeaLand Service
52-53	Containers, general cargo, molasses, automobiles, ro/ro	Blue Star Line Columbus Line Matson Navigation Company Nippon Yusen Kaisha (NYK)

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DISCOVERING SIGHT LINES AND THEIR USEFULNESS

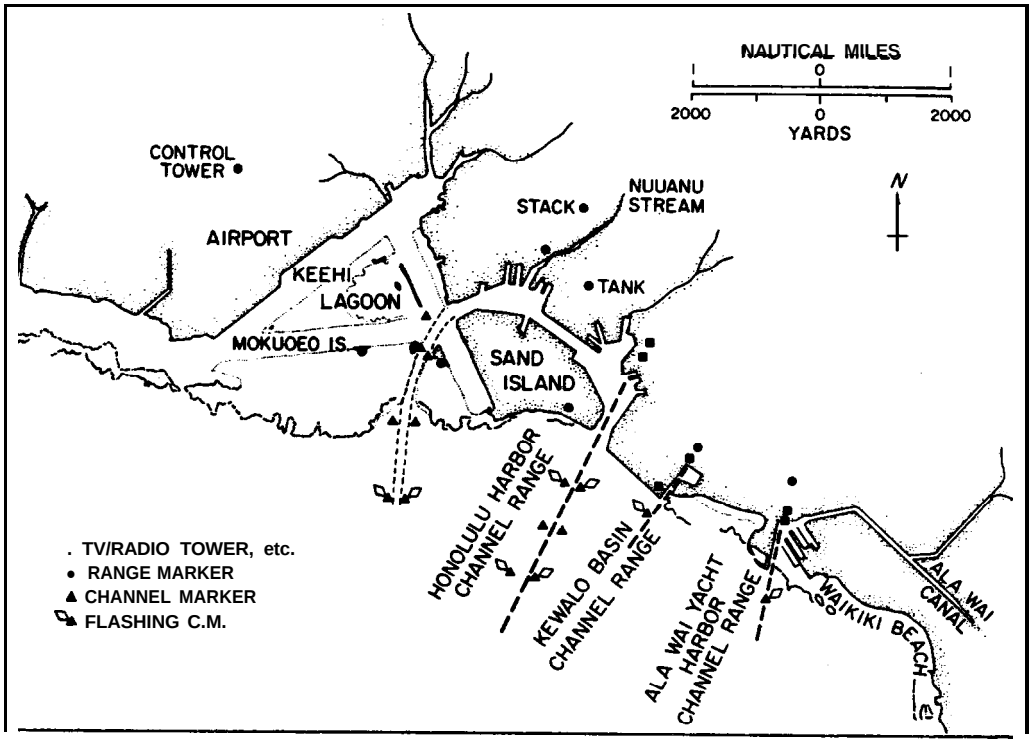
If students are told that permanent sight lines mark the center line of a harbor entrance, or that sight lines are important to shoreline cruise narrators, it means little. However, if they hear that a diver or fisherman uses sight lines to drop anchor in the same spot, time after time, that's a different story. They are interested in knowing what sight lines are.

Standardized, Permanent Harbor Range Markers

Safe entrances or exits from Honolulu Harbor are virtually foolproof. That's partly because there are rows of colored markers or buoys on each side of the channel that define its width. The two tall masts, or range markers, are most important.

Once a ship receives permission to enter the harbor, the pilot simply keeps the top and bottom markers in line with each other as he moves safely through the entrance channel. One range marker is at the end of Pier 7. A taller marker is on the topside corner of Pier 8, about 75 feet behind and 10 feet above the other and in line with the center of the entrance channel. Each mast supports a red fluorescent, double-striped marker. At night, red lights replace the stripes. When both markers are in line, the "line of sight" passes right through the rigging of the *Falls of Clyde*. The museum staff had to readjust the angle of one of the ship's spars so the rangeline would be unobstructed.

A ship leaving the harbor first obtains permission from the control tower operator then heads outward bound down the center of the channel. Once past the last two channels buoys, the harbor pilot is picked up by the pilotboat and the ship is on its way.



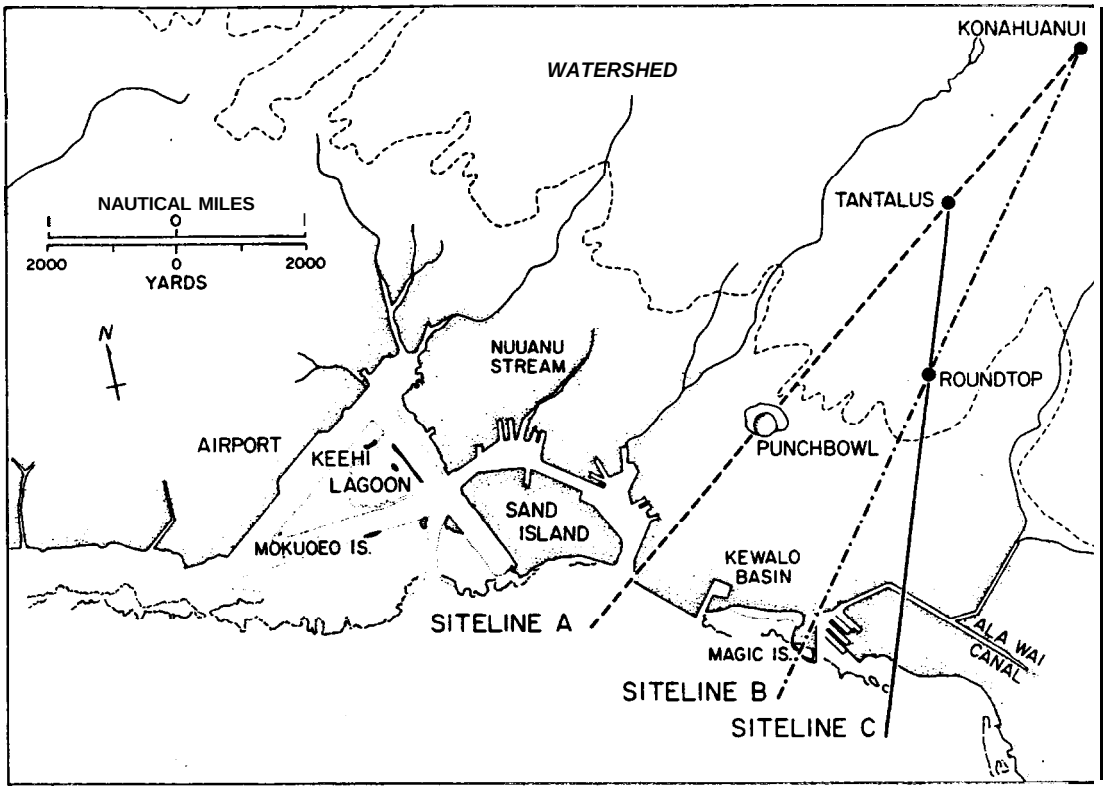
Channel Range System for Harbor Traffic (Marine Atlas of Hawaii 1974, Sea Grant Miscellaneous Report, modified by Brooks Bays, used by permission)

Using Temporary Sight Lines to Locate Landmarks

On a shoreline cruise, there is opportunity to practice lining up two easily located objects for a sight line. Because the boat is moving, by the time a line is described or located, it's out of line but should still be recognizable. Either the high or low sight can be selected first, as long as both are in line with each other. Good sight lines include anything high and distinctive, such as mountain peaks or dips, edges of tall buildings, flagpoles, or radio towers.

Students should familiarize themselves with the Honolulu area on the outward bound leg of their cruise to Waikiki, then practice locating sight lines on the return to the harbor. Konahuanui, a 3,000-foot high peak above Nuuanu Pali, presents a good target. Konahuanui and easily spotted Punchbowl are in line with the Fort Armstrong area on the east side of the Honolulu Harbor entrance (Sightline A, Map 1).

When the ship is in the Ala Wai Boat Harbor area, the western edge of the lagoon at the seaward end of Magic Island can be lined up with the western edge of Round Top to locate Tantalus (Sightline B, Map 1). Off Waikiki it may be possible to line up the middle portion of Round Top with Tantalus (Sightline C, Map 1).

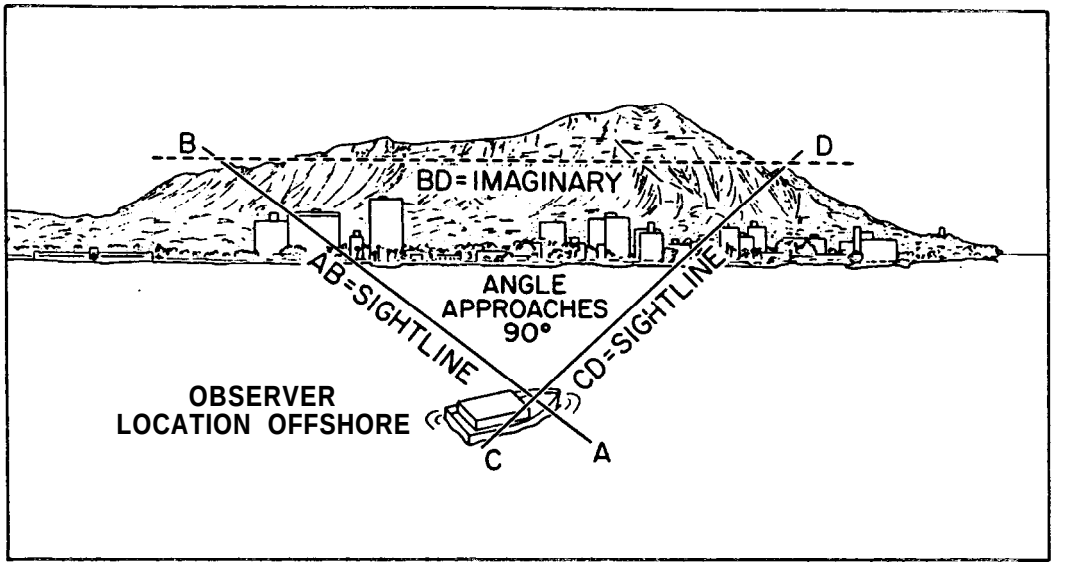


Marine Atlas of Hawaii 1974
Sea Grant Miscellaneous Report
Modified by Brooks Bays
Used by permission

Locating Diving or Fishing Areas by Triangulation

If students understand the use of temporary sight lines, it shouldn't be a mystery how divers or fishermen motor offshore and drop anchor right over their favorite areas. They use a technique known as triangulation, which requires only two sight lines and a good memory. The first time a choice area is found, someone onboard locates a good sight line. Then, without changing his location, he turns 90 degrees right or left to locate a second sight line. These two sight lines cross where he stands. "X" marks the spot, so to speak. Each time they return to the area they relocate the memorized sight lines and drop anchor within a few feet of their target.

On land, a single sight line is fine for pointing out a particular feature, but on the water, to come back to the same spot, it takes two to triangulate. But even triangulation isn't "failure-proof." Flag poles and older buildings are not wise choices for triangulation. Sometimes the building is obscured by a new structure raised seemingly overnight or is demolished. Flagpoles disappear too. It just takes wind or termites to bring them down.



Triangulation used by divers and fishermen (illustration by Brooks Bays)

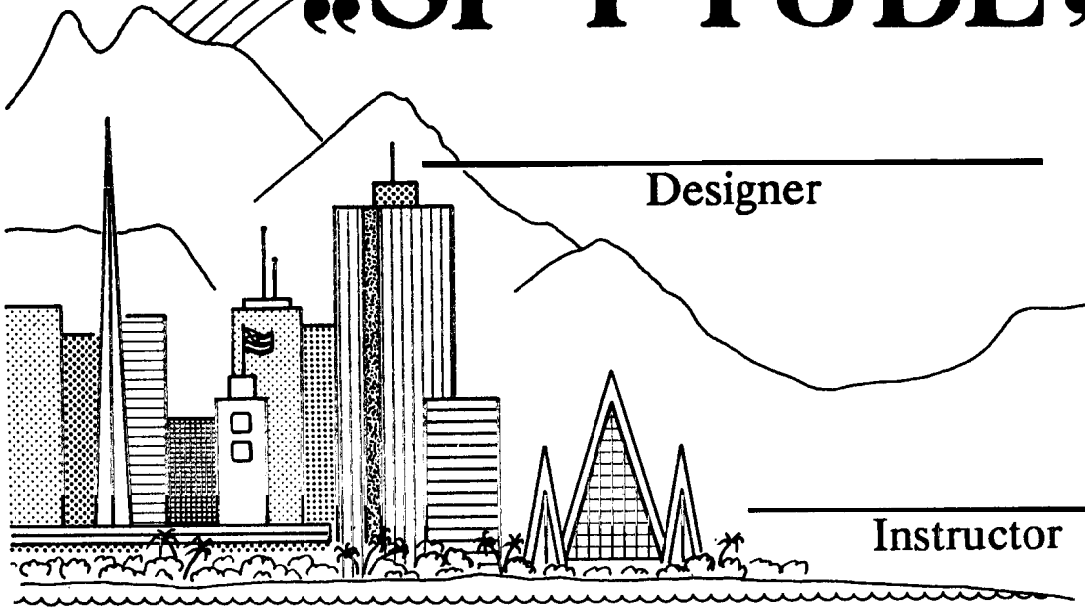
Spy-Tube Construction and Use
A Classroom Cruise Activity

Spy tubes made from cardboard tubes inside rolls of gift wrapping paper are excellent sight line finders. Toilet paper tubes are too wide to be useful. Students and adults who have used different lengths say 5-inch tubes are the most helpful in focusing eyes "on the target," and were "fun to use."

One class, after using the spy tubes on a cruise, held a contest for the most beautiful, most creative, and most radical spy tubes. Certificates were given to the winners. The following pages are copies of the certificates and may be reproduced for classroom use.

MOST CREATIVE!

"SPY TUBE"



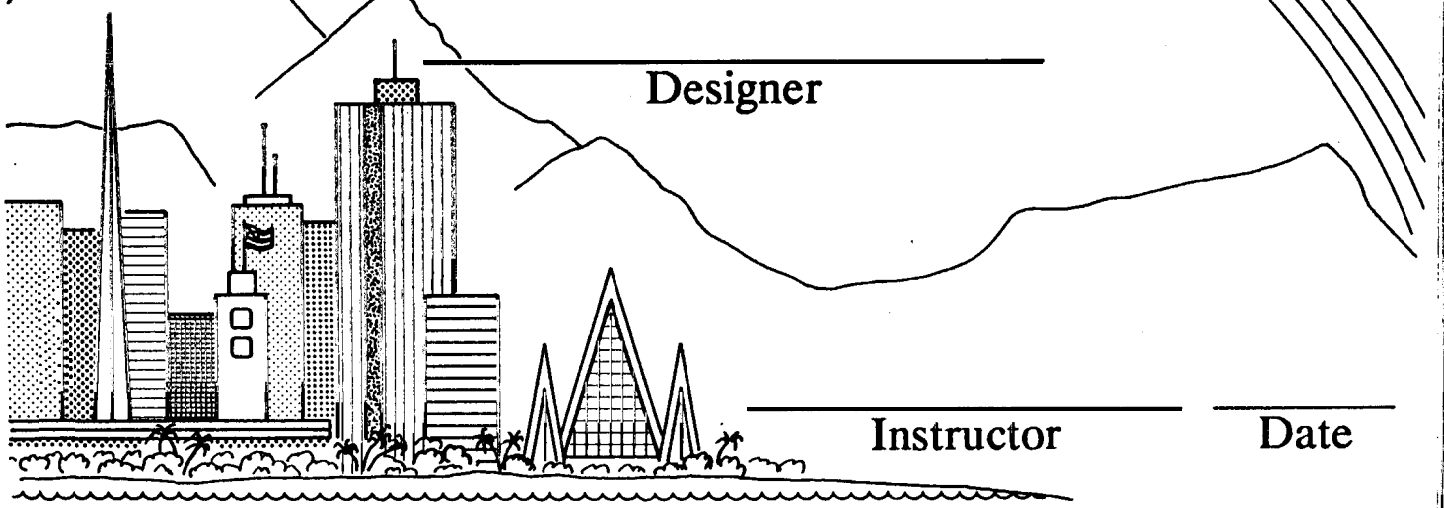
Designer

Instructor

Date

MOST RADICAL!

"SPYTUBE"



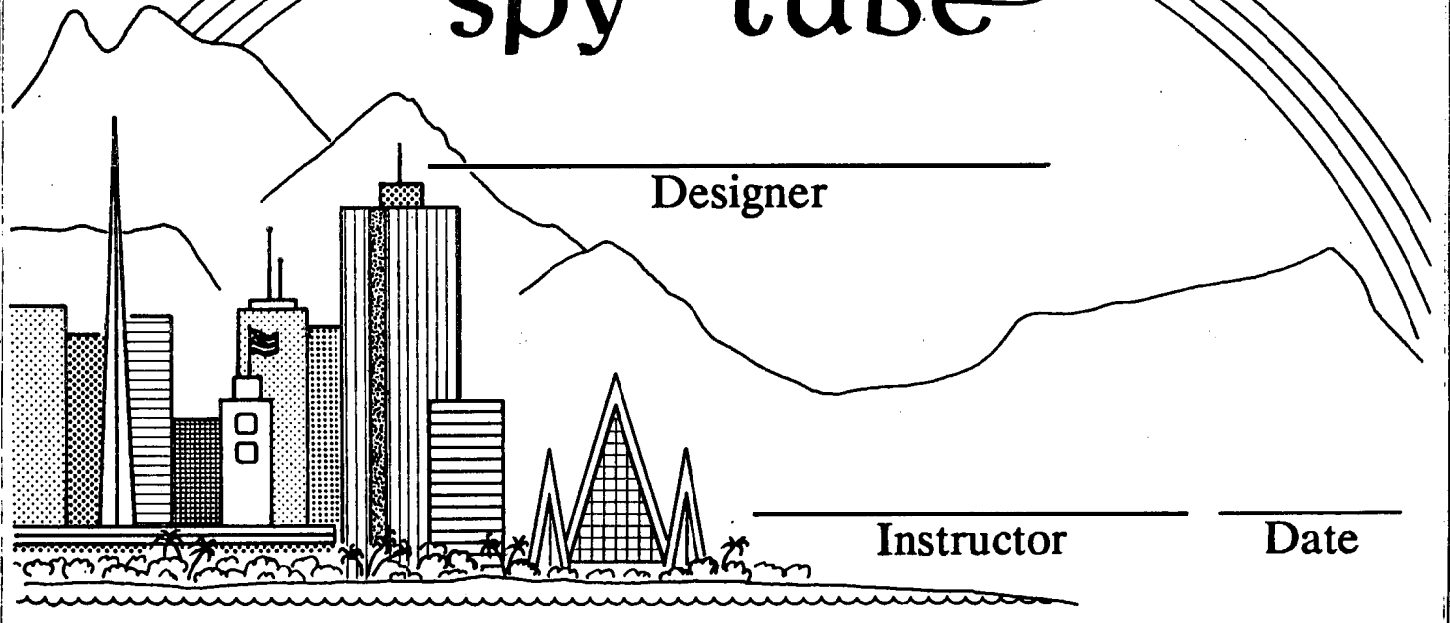
Designer

Instructor

Date

Most Beautiful!

"spy tube"



Designer

Instructor

Date

PRECRUISE AIDS

Classroom Visits

A pre- or postcruise classroom visit (by a volunteer) has been available on request since 1987. The visit includes a short discussion of shipboard etiquette and demonstration of mandatory personal flotation devices. Several PFDs are left in the classroom so all students have the opportunity to put them on. There also is a brief harbor slideshow and time for questions.

These volunteer visits are expected to continue. Arrangement may be made by calling the Sea Grant Extension Service office (948-8191). The slideshow is also available from Sea Grant. Teachers are responsible for pick up and return.

Slideshow Narrative

The harbor slideshow narrative is included here because it contains some information not appearing elsewhere in the harbor materials. Teachers wishing to show the slides may make arrangements by calling Chris Woolaway at the University of Hawaii Sea Grant Extension Service (948-8191).

The slideshow sequence follows the normal route of the harbor cruise but may be used in any order.

SLIDE

1 THIS IS ALOHA TOWER, ONCE THE TALLEST STRUCTURE IN HAWAII. NOTICE THE MAST. VERTICAL POSITION (UP OR DOWN) OF A LARGE CONE ON ONE SIDE OR A BALL ON THE OTHER SIDE INFORMS SHIPS OF MOVEMENT IN THE CHANNEL. SHIPS ARE ALSO IN RADIO COMMUNICATION WITH THE CONTROL TOWER OPERATOR.

2 PIER 11 IS RESERVED FOR CRUISE SHIPS. THE UPPER GALLERY IS WHERE PASSENGERS BOARD OR LEAVE SHIP. BAGGAGE, SHIP SUPPLIES, AND PERSONNEL ENTER AND LEAVE FROM A LOWER DECK. PIER 8 ON THE OPPOSITE SIDE OF THE TOWER COMPLEX WILL BE READIED FOR CRUISE SHIPS IN THE NEAR FUTURE. THE FIRST STEP, IN THE SPRING OF 1989, IS TO DREDGE THE AREA TO 35 FEET.

AT ONE TIME, ALL PASSENGER SHIPS WERE GREETED WITH BAND MUSIC AND A HOST OF DANCERS. THERE IS TALK OF REVIVING THE CUSTOM BECAUSE PLEASURE SHIP CRUISES ARE ON THE RISE AND SUCH GREETINGS IMPART A FEELING OF ALOHA TO VISITORS.

3 NEXT TO PIER 11 ARE THE STUMPY REMAINS OF AN OLD PIER. VISIBLE ONLY AT LOW TIDE, THERE ARE LARGE FOSSIL CORAL BLOCKS THAT PROVIDED A FOUNDATION FOR THE OLD PIER. THEY WERE REMOVED FROM AN ANCIENT HEIAU THAT EXISTED NEARBY. FOR NOW, THE *HOKULE'A*, ONE OF THE MOST FAMOUS SHIPS AFLOAT, IS TIED UP HERE. WHEN THE MARITIME MUSEUM IS OPENED, THE CANOE WILL BE MOVED TO A PERMANENT BERTH AT THE SEAWARD END OF THE MUSEUM PIER.

4 THE SUGAR GANTRIES ARE SOMETIMES IN ACTION AT THE GREEN BUILDING ON PIER 19. THE GANTRIES MOVE EASILY ON TRACKS, AND SUGAR CASCADES LIKE WHITE SNOW INTO SHIP HOLDS. BEFORE WORLD WAR II, SHIP LOADING REQUIRED A LOT OF WORK. RETIRED SUGAR DOCK WORKERS DESCRIBE THEIR "SUGAR WORK" AS LONG TIRING HOURS OF CARRYING HEAVY STACKS. THESE WORKERS HAD A "SECRET SOURCE OF ENERGY." THE HEAVY SACKS OFTEN LEAKED SUGAR THROUGH POORLY SEWN SEAMS. THE MEN SOON DISCOVERED WAYS TO HOLD THE SACKS SO THAT THEY COULD CATCH SOME OF THE SUGAR IN THEIR MOUTHS WITHOUT CHANGING THEIR TIMING OR NORMAL BODY MOVEMENT.

5 HERE'S AN UNUSUAL BARGE, LOCATED ALMOST AT THE CENTER OF THE LONG PIER. THERE ARE FEW FLOATING BARRACKS IN EXISTENCE ANYWHERE THESE DAYS. THIS ONE IS OWNED BY THE NAVY AND IS USED IN OUTLYING PACIFIC AREAS WHERE A CREW IS REQUIRED FOR SOME TIME, BUT LAND FACILITIES ARE NONEXISTENT. THIS FLOATING DORMITORY IS AN ECONOMICAL SOLUTION TO THE PROBLEM. THE ENGLISH USED SIMILAR BARGES TO HOUSE PRISONERS DURING WORLD WAR II. TODAY, NEW YORK IS CONSIDERING USE OF SUCH BARGES TO HOUSE ITS LARGE PRISON POPULATION.

6 FLOATING DRYDOCKS ARE ANOTHER ECONOMIC BARGAIN. THE HOLLOW SIDES AND FLOOR ARE FLOODED SO THE UNIT SINKS TO A SPECIFIED DEPTH. THE SHIP MOVES INTO THE CENTER AREA AND IS FIRMLY SECURED. AS WATER IS PUMPED OUT OF THE SIDES AND BOTTOM, THE DRYDOCK RISES UNTIL THE SHIP RESTS IN A CRADLE. THE REMAINING WATER IS THEN PUMPED OUT, AND THE DRYDOCK IS AGAIN AFLOAT.

7 A CLUSTER OF TANKS SUCH AS THESE MAY BE CALLED A “TANK FARM,” A “PET FARM,” (SHORT FOR PETROLEUM), OR A “POL” STATION. THE LATTER TITLE IS HARBOR-TALK FOR A “PETROLEUM, OIL, AND LIQUID GAS” STATION.

8 FAR BEYOND THE POL STATION, A FOREIGN SHIP LOADS SCRAP METAL FROM AN OPEN PILE RECENTLY REMOVED FROM THE SAND ISLAND LOT. SCRAP METAL WAS ONCE BIG BUSINESS IN HAWAII BUT NO LONGER. THIS HAS CREATED MUCH MORE THAN A FINANCIAL LOSS. HAWAII HAS NO WAY OF DISPOSING OF TRASHED MOTOR VEHICLES.

9 THE NEATLY KEPT FOREIGN STERN TRAWLER IS NOT TYPICAL OF THE FOREIGN FISHING BOATS THAT OFTEN REMAIN AT SEA FOR LONG PERIODS OF TIME AND LACK FINANCES TO SPRUCE UP THE VESSEL. SUCH A FISHING BOAT RESCUED A COUPLE WHO HAD BEEN ADRIFT IN A LIFE RAFT FOR 118 DAYS AND BROUGHT THEM TO HONOLULU. THE STORY IS AVAILABLE IN PAPERBACK.

10 THESE TWO VESSELS ARE REPRESENTATIVE OF OUR LOCAL FISHING FLEET. THE SMALLER IS A MODIFIED WOODEN SAMPAN, AND THE OTHER IS A BRAND NEW, LOCALLY DESIGNED, FISHING BOAT BUILT ENTIRELY OF MOLDED SYNTHETIC MATERIALS AND SPECIALLY DESIGNED FOR LOCAL CONDITIONS.

11 HERE IS ANOTHER FOREIGN FISHING BOAT TIED UP AT A CRUISE SHIP PIER. THIS IS AN EXAMPLE OF THE “MUSICAL PIERS” GAME IN WHICH SEVERAL DIFFERENT VESSELS HAVE TO BE SHIFTED AROUND TO PROVIDE SPACE FOR AN UNEXPECTED VISITOR. THIS SITUATION CHANGES DAILY.

12 THIS IS A LARGE OPEN CARGO SHED FOR TEMPORARY CARGO STORAGE. THE ODD-LOOKING BUMPERS ON THE SIDE OF THE WHARF ARE NOTEWORTHY BECAUSE THEY REPLACED THE HUGE TRUCK TIRES YOU’VE SEEN HANGING ON THE PIERS. UNFORTUNATELY TIRES DON’T LAST LONG. THIS BUMPER MATERIAL COSTS ABOUT $180.00 PER LINEAR FOOT. THE BUMPER IS 6 TO 7 FEET LONG, LASTS ABOUT A YEAR, AND IS CONSIDERED ECONOMICAL.

13 WE CANNOT SURVIVE WITHOUT LUMBER. THIS LOAD IS READY FOR PICK UP OR FOR TRANSSHIPMENT TO ANOTHER ISLAND.

14 HERE ARE CARS, CARS, AND MORE CARS. THEY'RE OUR BIGGEST IMPORT AND OUR BIGGEST HEADACHE WHEN THEY'RE DISCARDED. OLD CARS WERE DUMPED IN THE OCEAN TO CREATE ARTIFICIAL REEFS FOR FISH AND OTHER SEALIFE. BUT THE CARS DISINTERGRATED QUICKLY. IT WAS A COSTLY, DANGEROUS, AND UNSUCCESSFUL OPERATION. TO DATE NO ONE HAS DISCOVERED A NONPOLLUTING, INEXPENSIVE MEANS OF CAR DISPOSAL.

15 THE PRIMARY INTERISLAND GOODS TRANSPORTER IS A BARGE. IT CARRIES ANYTHING THAT CAN BE LOADED ONBOARD. TUGS SOMETIMES TOW SEVERAL BARGES AT A TIME. SOME NEW BARGES ARE CAPABLE OF LOADING AND UNLOADING THEMSELVES. SOME EVEN HAVE BOW THRUSTERS THAT HELP POSITION THEM RATHER THAN HAVING THE TUG DO ALL THE WORK.

16 THIS IS A CONTAINERSHIP. ONE OF THE LARGEST TO ENTER THE HARBOR WAS A SIXTEEN-STORY JAPANESE CONTAINERSHIP LOADED WITH MORE THAN FOUR THOUSAND AUTOMOBILES. HONOLULU HARBOR IS NOT LARGE ENOUGH TO SERVICE SOME WORLD-CLASS CONTAINERSHIPS.

17 THIS IS A SAUSE BROTHERS BARGE EQUIPPED TO HANDLE CATTLE. ITS REMARKABLE HOW MANY BARGE AND TUG COMPANIES SUCH AS SAUSE BROTHERS ARE OWNED AND OPERATED BY FAMILIES. LOCAL COMPANIES SERVICE MANY AREAS IN THE PACIFIC.

18 THIS IS A GOOD-LOOKING CONTAINER BARGE. NOTICE THE LINE OF CRANES. THEY ARE USUALLY BUSY, OPERATING ON A TWENTY-FOUR-HOUR SCHEDULE.

19 THIS CRANE IS THE BIGGEST OF ITS KIND. IT WAS SPECIALLY DESIGNEDFOR ITS HONOLULU HARBOR LOCATION AND BUILT IN JAPAN. IT WAS LOADED ONTO A SPECIALLY DESIGNED SEMISUBMERSIBLE BARGE AND TOWED TO HONOLULU. IT HAD TO BE CUSTOM BUILT TO CONFORM WITH AIRPORT FLIGHT PATH BUILDING HEIGHT LIMITATIONS, AND YET BE ABLE TO HANDLE CONTAINERS FROM WIDE SHIPS. IT COSTS SIX-POINT-FIVE-MILLION DOLLARS TO BUILD. NO FIGURES ARE AVAILABLE FOR THE COST OF THE CRANES' SPECIAL BARGE, FOR THE TRANSPORTATION FROM JAPAN, OR FOR THE HAIR-RAISING TRANSFER PROCESS FROM THE BARGE TO THE DOCK.

20 MOST COAST GUARD SHIPS ARE WHITE, BUT WORKBOATS SUCH AS THIS BUOY TENDER ARE A SENSIBLE BLACK. THIS ONE IS TOWING A DISABLED SAILBOAT PICKED UP ON THE WAY HOME FROM THE SOUTH PACIFIC.

21 PART OF THE OLD FERRY LANDING ON THE INSIDE CHANNEL CORNER OF SAND ISLAND REMAINS AS A MEMENTO OF THE PAST. THERE ARE RUMORS A FERRY SERVICE MIGHT OPERATE WHILE THE SECOND SAND ISLAND ACCESS BRIDGE IS BEING BUILT NEXT TO THE OLD BRIDGE. HOWEVER, THE FERRY MIGHT NOT BE LOCATED HERE.

END

PRE- AND POSTCRUISE WATERFRONT ACTIVITIES

Teachers should consider adding ample contingency time to the cruise schedule. Cruises are subject to harbor traffic control regulation; therefore, they must stand by when priority ships or barges are using the harbor channel. This means a cruise might end well after 10:00 a.m. In this situation, a scheduled 10:15 postcruise activity is impossible. The miniharbor explorations described below are excellent ways to utilize any extra time.

Section A: Activities Located Between Piers 5 and 11

5 to 15-minute investigations by Pier 8

- Lean over the retaining wall along the sidewalk between Pier 8 and Pier 7 to watch reef fish or identify live corals on the reef rock barely 3 feet underwater. (Bring frozen peas or bread to feed fish. They are always hungry.)

- If a ship has just entered or left the harbor, waves created by its wake bounce off the retaining wall near the sidewalk. Waves are sometimes so powerful that when they break against the wall, surf can be seen heading seaward. Watch water patterns the swells create when they bounce off the wall. Notice how vessels along Pier 7 and 8 react to the disturbance.

- If a cruise guide is with the group (never go alone), walk to the harbor end of Pier 8. Watch harbor and channel traffic. Vessels alongside Pier 8 have interesting histories. Ask about them.

- Take time to get a good look at th *Falls of Clyde* berthed at Pier 7. One spar is at a different angle from the rest. It isn't accidental. A crewman or a cruise guide can provide the answer, if a student should ask.

  This beautiful ship is the only one of its kind. It became a Matson ship in 1898 when it was about 10 years old and was later sold. For years it was a familiar ship in the Pacific. In the 1970s it was rescued from the scrap heap in a dramatic last moment effort by local people and brought home and refurbished by former shipmates and local citizenry. In a few years the *Falls of Clyde* will be 120 years old.

A 20 to 35-minute walk from Pier 8 to Pier 5 and return

- The Hawaii Maritime Museum building is modeled after King Kalakaua's famous boat house. He enjoyed water sports and owned his own racing boats. The canoe ***Hokulea*** will be berthed at the end of the pier. Ethnic gardens surrounding the boat house were planted in April and are growing well. Call the Hawaii Maritime Museum for information before making plans to tour the grounds or visit the museum.

- The nearby floating Chinese restaurant is sure to attract attention. The superstructure is modeled after the famous Chinese riverboats, and the bottom portion is a barge. The restaurant has been closed for some time. Note the dolphin on the harbor side of the restaurant, close to the pier.

- Swirling water patterns created by warm water discharge from the Hawaiian Electric plant near Pier 5 are sure to attract attention. Sometimes people fish here.

- Walk across the Pier 5 parking area to the narrow strip of grass along the eastern side, close to the street. When plovers are in Hawaii, there's one that guards this area.

- From the same vantage point, there is a water-level storm drain in the middle of the harbor shorewall between Pier 5 and the Coast Guard Pier 4. About 10 feet in front of the drain a 12 to 16-inch wide strip of white plastic sometimes floats in a wide arc in front of the discharge point. Each end is secured to the shorewall. The white strip is an oil boom. It traps and soaks up oil washed from the street by rain. Once a week it is examined and replaced if necessary. It is most often noticed in rainy weather.

- Unless the huge *Ali'i Kai* is out cruising, it can't be missed. It's the worlds largest commercial catamaran, authorized to carry 1,000 passengers. Just seaward of the wide gangway, there's a square concrete platform that stands by itself in the water. That's a dolphin. The definition of dolphin in ***Webster's New World Dictionary*** doesn't at all describe this structure but be assured this concrete slab resting on piles is a dolphin to mariners. A dictionary of synonyms contains an entirely different definition of dolphin. An example of that type of dolphin is located by the Ford Island ferry landing next to the Pearl Harbor Memorial building.

- Students may notice a small powerboat that shuttles between the Coast Guard building at Pier 4 and the Coast Guard station on Sand Island. It is a time-saving water taxi. Civilian water taxis run around the harbor and through the channel to ships standing off the harbor entrance or ships anchored offshore.

Section B: Activities at the Aloha Tower (Half-Hour Minimum)

The tower is open to the public. No reservations or entry fees are required. If there are more than 20 students, they should be divided into groups because space is limited. If the temporary Maritime Museum is still open on the ninth floor it provides a means to alternate student groups between floors so that congestion on the tenth floor is eased. If the museum is not open, other means of alternating student groups must be used.

Elevator entry is on the second floor of the pier complex. It consists of one small, ancient, slow but reliable elevator with a carrying capacity of nine persons. The stairwell is for emergency use only. Under normal conditions the exit door on the ground floor is locked.

Balconies afford four magnificent views, and the anteroom is filled with pictures, including an excellent, large aerial photo of the harbor.

Outside the west and east side balconies ball and cone shapes are suspended from the tower mast in special vertical configurations which inform incoming ships of the channel traffic conditions. These are backed by voice communications as needed. At night the visual signals are replaced by lights.

Suggested Activities:

Planned tower assignments increase the variety, quality, and amount of information students absorb in a limited amount of time. This is a great time for students to learn that drawings have a place in communications. Students should have sharp pencils, six to eight sheets of blank paper, and a clipboard. Students should divide into four groups and observe and sketch from each balcony, rotating according to a schedule worked out before the trip. The sketches are useful for posttrip discussions in class.

The following can be assigned:

1. Quick sketches of views from each balcony looking out and looking down
2. Quick sketches of harbor water surface rumpled by wind or moving ships
3. Quick sketches of boats, ships, and barges that attract attention because of color, shape, activity, or oddness
4. A record of types of ship activity noted in the harbor
5. Sketches of valleys, notable ridges, or unusual traffic patterns
6. A count of all ships and barges offshore
7. Sketches of unusual or noteworthy buildings or harbor stuctures
8. A collection of spontaneous, descriptive words or phrases brought to mind by a view
9. After the trip write a description of unusual harbor activity or impressions of the real harbor as compared with an imagined harbor or describe central Honolulu as seen from the balcony

Section C. Sand Island Trips (1-hour minimun)

Honolulu waterfront traffic is congested and becomes more so every day. Teachers should allow more travel time than previously needed to move from Pier 8 to any Sand Island or crosstown destination. The trips described below, which require reservations, last about 1 hour.

1. Matson Sand Island Terminal Presentation

To make arrangements contact the coordinator, Mr. Francis Shigemitsu, at 848- 1211. He will try to schedule a visit when the docks are very busy. He requests interested persons to call as early as possible for reservations. Students must be seventh grade or above to visit the Matson terminal.

The presentation consists of an excellent film followed by a question-and-answer session. Ample time is granted to watch Matson terminal activities from the comfort and high elevation of the lecture room. Binoculars are an advantage but not a necessity.

2. The U. S. Coast Guard Sand Island Facility

Coast Guard tours may be arranged by calling the facilities officer at the Sand Island facility (541-2490).

The Coast Guard does not set a limit on the number or age of students in a group. The Coast Guard does request an adequate number of adults, especially for elementary school children.

Each Coast Guard-guided tour differs slightly. Coast Guard ships are seldom "at rest," and personnel changes are frequent. Coast Guard search-and-rescue operations cover a major portion of the Pacific Ocean and are a 24-hour-a-day job. Sometimes a tour of a special ship can be arranged. Otherwise students observe whichever ships are in port. Students learn about the life of Coast Guard personnel first hand.

The guides are pleased when students ask questions. Some topics to consider are:

SEARCH-AND-RESCUE OPERATIONS. Any questions about numbers of searches and rescues, the results, where and when most occur would be pertinent.

TYPES OF COAST GUARD SHIPS AND AIRCRAFT BASED IN HAWAII. What are their functions? A question such as this can produce a surprising amount of information.

SKILLS NEEDED TO QUALIFY FOR COAST GUARD TRAINING. Students can obtain a lot of information with this question, including interesting firsthand experiences of the service personnel.

POSITIONS WOMEN CAN HOLD IN THE SERVICE. Students will be surprised to learn women have been captains of CG cutters and at least one, Lt. jg. Gail Kulisch, was captain of CG cutter *Cape Corwin*.

THE INTERESTING NAMES OF COAST GUARD SHIPS. Guides can describe the naming system as one of the most unusual and sensible systems devised.

THE REASON SOME SHIPS ARE WHITE AND OTHERS BLACK. Coast Guard guides may reply by answering with a funny story, but they'll also give students the practical reasons.

HAZARDOUS SITUATIONS COAST GUARD CREWS FACE. Students will hear about exciting, dangerous search-and-rescue and other missions.

3. A Bus Trip Through Sand Island Beach Park

The park is one scenic area after another. There is plenty of shade. Go to the end of the main road and park near the restroom. Walk to the shore in front of the restroom and take note of the old "lava" rocks that seem out of place because the island is supposed to be an old reef. If students look carefully at these odd rocks, they will discover chunks of glass, pieces of metal, and perhaps even a chunk of wood. It's a puzzle, unless someone knows the nearly submerged coral reef was converted to a low island by long-time dumping of harbor dredge material, construction waste, and incinerated trash.

A quick beachwalk east toward the next restroom area takes students to a coral rubble beach. Walking may be troublesome to bare feet, but the rubble is interesting. The coral is broken into so many different planes it's possible to visualize from it what a coral skeleton is really like. Some pieces are quite nice. Sometimes, however, the area is entirely sand.

Migrant birds rest in this grassy park. It's also interesting to watch the ships. It's hard to believe that the area was once a prisoner-of-war camp or that all but a small section used to be underwater at high tide.

Keehi Lagoon will be developed into an ocean recreation center, and the adjacent completed park will become part of a marine playground designed for local activities.

THE YELLOW PAGES DIRECTORY INDEX

The bulky ***Hawaiian Tel's Official Yellow Pages Directory*** can be helpful to students. Students can use the directory to:

- improve their command of language
- develop an understanding of word classification systems
- uncover marine-oriented careers and jobs
- open a way to learn about local marine businesses
- increase knowledge of government organizations associated with marine affairs
- awaken an interest in businesses that relate to safety, emergencies, and marine disasters
- identify businesses that relate to marine recreation
- compare aerial counterparts of all the above business types

Teachers should ask students to bring to class old directories parents would normally discard when new directories are issued. Teachers may call the Hawaiian Telephone Company in the late fall to request any number of directories they may need. The company will reserve that number of old directories for pick up by the teacher.

Suggestions for Student Activities

A productive, challenging way to introduce students to the *Yellow Pages* is to have small groups collaborate in locating and counting the marine- or aviation-oriented listings in the index. Each group should be assigned a certain number of pages in order to cover as much of the index as possible. Marine listings should be kept separate from aviation listings. If the indexes are recorded in the order in which they are located in the directory, the students' lists will be in alphabetical order.

After the lists have been assembled, portions will be assigned to individual students. Each student will then consider each business or activity and give his opinion of the kind and amount of education he believes is necessary to operate the business or participate in the activity. A partial listing is provided at the end of this section.

Some training/educational categories to consider include:

- high school
- on-the-job training
- associate degree (2 years of college)
- 4-year college degree (B.A. or B.S.)
- military service
- college degree with special certification (5th year teaching credential, for example)
- graduate degrees
- specialized training schools (maritime academy, etc.)

Communications skills to consider include:

- command of spoken English language
- command of printed English language
- command of spoken foreign language
- command of printed foreign language
- typing skills
- basic computer use
- basic math
- understanding and use of advanced math
- understanding and use of diagrams

Special skills to consider include:

- business management
- personnel management
- understanding legal language, processes

Once students have summarized their opinions, their finding should be compared with persons in the appropriate fields or with a person trained in career counseling. If this is not possible, then consider having students talk with adult friends or relatives in these fields. The students' findings could be reported to the class in a short "Talk Story" form or written form. Students and teachers may ask an adult what he wished had been done or not done to make his work more satisfying, better paying, less stressful, and less dangerous. Teachers should determine which questions are most appropriate for students to ask.

Selected *Yellow Pages* Index Listings

Advertising-Airports
Agencies-Steamship
Air Cargo Service
Air Express & Freight Service
Air Travel Ticket Agencies
Aircraft Charter & Rental Service
Aircraft Dealers and Distributors
Aircraft Electronics
Aircraft Engines-Servicing & Maintenance
Aircraft Equipment Parts & Supplies
Aircraft Ferrying & Transporting Service
Aircraft Ground Support & Service Equipment
Aircraft Instruments
Aircraft Insurance
Aircraft Mfrs
Aircraft Radio Service
Aircraft Schools
Aircraft Service & Maintenance
Airport Transportation Service
Aluminum Boats
Anchors-Building & Screw
Attorney-Maritime Law
Aviation Consultants
Aviation Organizations

Bilge Pumping
Boat Builders & Repairers
Boat Cleaning
Boat Covers, Tops & Upholstery
Boat Dealers
Boat Distributors & Mfrs
Boat Equipment & Supplies
Boat Rides
Boat Upholsterers
Boating Instruction
Boats-Charter
Boats-Renting and Leasing
Boats-Sightseeing Trips
Brokers: Yacht

Calking Contractors
Calking Materials & Equipment
Canoes

Selected *Yellow Pages* Index Listing-***Continued***

Cargo **&** Freight Containers
Compass Adjusters
Contractor-Marine
Cruises

Engineers-Marine
Engineers-Oceanographics
Engines-Marine

Flight Instruction
50 Flying Instruction
Freight Consolidating
Freight Damaged Merchandise
Freight Forwarding
Freight-Inter-Island

Glass Bottom Boats

Hang Gliders
Helicopter Charter & Rental Service
Helicopter Servicing & Maintenance
Jet Ski Dealers

60 Kayaks

Life Saving Equipment

Maps
Marinas
Marine Consultants
Marine Electronic Equipment & Supplies
Marine Engines
Marine Paints
Marine Service Stations
Marine Surveyors
70 Marine Transportation Consultants

Naval Architects
Navigation, Marine Instruction
Navigational Charts

Selected *Yellow Pages* Index Listings-*Continued*

Oceanographic Equipment
Outboard Motors
Outboard Motors Parts & Repair

Parasailing
Sail Board Equipment
Sail Boat Renting
80 Sail Planes
Sailing Instruction
Sailmakers
Schools & Specific Kinds of Instruction:
- Aircraft Schools
- Boating Instruction
- Navigation, Marine Instruction
- Parachute Jumping Instruction
- Water Skiing Instruction

Ship Agencies
90 Ship Bilge Pumping
Ship Brokers & Chartering
Ship Builders & Repairers
Ship Building Equipment & Supplies
Ship Chandlers
Shipping Service
Skindiving Equipment
Skin & Scuba Diving Instruction
Skin & Scuba Diving Tours

Tow-Boat Service
100 Transportation: Air Line Companies
Tug Companies

Hawaiian Telephone Company
Yellow Pages Index selections
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PORT HAWAII BUSINESS SERVICES DIRECTORY

The ***Port Hawaii Handbook 1988-1989*** is the only resource of its kind. Copies of this handsome, invaluable handbook are limited. They may be purchased from the

Department of Transportation
Aloha Tower Complex, Pier 11
79 S. Nimitz Highway
Honolulu, HI 96813
telephone: 548-2570

The comprehensive listing provided in this section is especially useful for teachers and advanced students. The list clearly indicates Hawaii's involvement in the international web of maritime activity. For example, air cargo carriers and airline listings number more than 109, of which more than 57 represent U.S. companies from the mainland and foreign countries. International banking is represented by nine local banks.

Organizing the alphabetical listing by categories is a useful introduction to the long list of services required for the maritime business. The following categories may be used:

- education level/special skills required
- safety: personal, legal
- nautical knowledge
- federal/state agencies
- labor orientation
- supply business
- repair/maintenance business
- transport expertise
- knowledge of foreign language skills

A comparison between the *Port Hawaii* list and the *Yellow Pages* listings should be especially interesting for advanced students.

Selected PORT HAWAII HANDBOOK 1988-1989
Maritime Services Directory Headings

1 Air Cargo Carriers
Air Line Companies
Airports, Commercial
Ambulance
Attorneys, Admiralty & Maritime Law
Attorneys, Customs and International Law
Banking, International
Barge Operators, Towing Services
Boilers, Repairing & Cleaning

10 Bulk Liquid Storage
Bunkering Services
Chambers of Commerce
Charts
Charter brokers
Chemicals
Chemists, Analytical & Consulting
Chemical Spill Control
Classification Societies
Coast Guard, U.S.

20 Communications, International
Compass Adjusters
Consulates
Consultants, Marine Transportation
Containers
Contractors, Dredging
Cordage (See Rope, Cordage, & Wire)
Courier Services
Cranes, Heavy Lift
Customhouse Brokers

30 Customs, U.S.
Diving Services
Dry Dock & Repairs
Dry Ice
Education
Electronic Equipment & Supplies, Marine
Equipment & Supplies, Marine Ship Chandlers
Export Packers

Maritime Services Directory Headings--*Continued*

Fishery Consultants
Fishing, Commercial Services

40 Fishing, Organizations & Agencies
Foreign-Trade Zone
Freight Consolidators
Freight Forwarders (See Customhouse Brokers)
Government: Agencies & Services
Federal Government
State Government
Harbor Tours
Heavy Lift (See Cranes)
Helicopter Services
Hospitals
Hull Cleaning & Salvage

50 Insurance, Marine
Island of Maui
Labor Organizations
Launch Services
Lubricants
Marine Chemist
Marine Equipment & Supplies (See Equipment & Supplies)
Marine Engineers
Oil Spill Control, Equipment & Service
Oily Waste Collection Facilities
Organizations

60 Paints, Marine
Petroleum, Products & Oil Bunkers
Pilots
Police (listed by island)
Port Hawaii Administration
Pumping Services, Bilge
Rope, Cordage & Wire
Salvage

Security Services
Ship Brokers

70 Ship Chandlers
Ship Classification (See Classification Societies)
Ship Repair

Maritime Services Directory Headings--*Continued*

Shipbuilders
Shipping Lines
Ships Agents
Stevedoring Agencies (listed by island)
Storage
Surveyors, Marine & Cargo (listed by island)
Translation Services

80 Trucking & Warehousing
Tugboats, Launches, Barges & Workboats
Warehousing, Cold Storage
Waste Removal
Water, Potable
Weather

Excerpted, by ***permission,*** *from* ***Port Hawaii Handbook 1988-1989***

MARITIME GLOSSARY

ANCHORAGE: a place to anchor.

BASCULE: a kind of drawbridge counterweighted so it can be raised and lowered easily (e.g., Sand Island Access Road Bridge).

BASIN: a bay or harbor.

BAY: a wide inlet, not as large as a gulf.

BERTH: space for anchoring or tying up.

BIGHT: a curve in a coastline; a bay formed by such a curve.

BOAT: small, open watercraft propelled by oar, sail, or engine.

BOOM: a floating barrier to keep floating oil contained (There is a small boom around the drainage outlet between Piers 4 and 5 and may also be seen around a container taking on fuel. It is an 18 to 20-inch wide white, or yellow plastic attached at both ends to a retaining wall.)

BUOY: an anchored floating object to mark a channel or warn of rocks. Often with bell or light. Shapes vary.

*BREAKBULK: (containership word) "Bulk"-ship cargo, "Break'‘-indicates cargo is mixed, not of one type.

CABLESHIP: ship specially designed to lay heavy cable, locate cable breaks, and raise and repair cables at sea.

CATAMARAN: a double-hulled seagoing Polynesian canoe. Also a modern racing or pleasure craft.

CHART: map specially designed for marine and air navigation. Coordinates are latitude and longitude. Charts are never called maps.

COASTLINE: along the seaside.

*CRUISE SHIP: modern term for ocean liner or passenger ship. Ships cruise to several ports for passenger pleasure then return to port of embarkation.

CUTTER: formerly a small, fast, Coast Guard revenue sailing vessel. Now larger and motor powered.

DEBARK: to unload from or leave ship. Term uncommon in United States.

*DEEPWATER HARBOR: a harbor with a minimum depth of 40 ft.

DISEMBARK: unload goods or passengers from a ship or aircraft. The term debark, widely used in England, has same definition.

DOCK: a landing pier or wharf. Also to haul or guide a ship into a dock.

DOLPHIN: a nautical term meaning a buoy or spar for mooring a boat. (The small, square, free-standing concrete "block" on top of concrete piling by the *Ali'i Kai* is a dolphin.)

DRAWBRIDGE: a bridge that can be raised, lowered, or drawn aside (e.g., Sand Island Access Road Bridge).

EMBARK: to begin a journey; to go aboard a ship or a plane.

EMBAY: to put into a bay for shelter or protection.

GANTRY: a wheeled framework with a crane (e.g., on Matson pier and sugar Pier 19).

GENERIC: referring to a whole class or group.

HARBOR: a protected branch of the sea used as shelter and anchorage, especially one with port facilities.

HELM: a wheel by which a ship is steered; the complete steering gear including wheel or tiller and the rudder.

HYBRID: anything of mixed origin or parts (e.g., the masts from a sailing vessel were added to a ferry boat to form the hybrid *Rella Mae* cruise ship).

JETTY: a landing pier; a wall built out into the water to restrain currents and protect the harbor.

JUNK: a Chinese flatbottomed ship with battened sails and a high poop.

KETCH: a fore and aft rigged sailing vessel, with its mainmast toward the bow and a relatively tall mizenmast forward of the rudder-post and toward the stem.

LANDING: place where ship is loaded or unloaded.

*LANDING CRAFT (LC): motorized, covered barge with end that drops to form a ramp. (Associated with World War II Marines. Local LCs usually privately owned. Some are operated by Army. Used to transfer cargo where harbor facilities are lacking or inadequate.)

LIGHTER: a large open barge which loads or unloads goods or passengers from vessels anchored offshore. Also to convey by a lighter.

LINER: a steamship or airplane in regular service for a specific line; a company providing regular transport service between two or more points.

*LONGLINER: fishing boats that use lines up to 3 miles long with hook and bait spaced at regular intervals. Longlining is an oceanic deepwater activity.

*LO/LO: acronym for load on/load off containership.

MAP: a drawing or other presentation (usually flat) of part of the earth's surface. Coordinates for small area maps such as street maps are usually numerical and alphabetical, while large geographical maps apply latitude and longitude coordinates.

MARSHALLING: to arrange things in order of array, disposal; to indicate port areas ("yards") set aside for temporary storage of freight. Military origin.

MARINA: a small harbor or boat basin providing dockage, supplies, and services for small pleasure craft.

MOOR: to secure a ship in place by cables or chains to the shore or by anchors offshore.

OFFLOAD: unload.

PACKET: sailboat on regular coastal trips carrying mail, freight, and passengers. Also known as coasters. (Once common locally, especially from Honolulu to Kaneohe Bay.)

PIER: a structure built over water, supported by pillars or piles (piling). Synonym for wharf, dock, quay, slip, berth, jetty, levee.

QUAY: a wharf, usually of concrete or stone. Pronounced **kē**.

*RAGBOAT: somewhat derogatory term for sailboat. Used by owners of motorized pleasure craft.

*RO/RO: acronym for roll on/roll off containership for vehicular cargo.

ROADSTEAD: a place nearshore, not as protected as a harbor, where ships can ride at anchor. (Hampton and Lahaina roads are contractions of roadstead.)

SEINER: a fishing boat that uses large nets held in position by floats along the top edge and weights at the bottom.

SHORELINE: where a body of water meets land.

SLIP: pier or platform sloping into the water to serve as a landing place; inclined plane leading into water where ships are built or repaired; water channel between piers or wharves used as a dock.

SLOOP: a fore and aft rigged sailing vessel with mainsail and jib, sometimes with a spinnaker when racing.

SPAR: any pole, boom, mast, yard, or gaff supporting a ship sail. Spar buoy is a pole buoy that floats vertically or obliquely.

STEAMSHIP: ship driven by steampower, also known as a steamer.

*STINKPOT: a derogatory term for a cabin cruiser. Used by sailboat owners.

TENDER: an auxiliary ship for supplying or servicing another ship. Also, tending to lean over easily under sail (respond excessively to wind or wave action).

TERMINAL: either end of a transport line.

TRIMARAN: triple-hulled Polynesian canoe, now used as racing sailboats and commercial pleasure crafts.

TUG: sturdily built, powerful boat designed for towing or pushing ships or barges, or specially designed for sea salvage and rescue work. Push tugs are primarily river tugs.

UNLOAD: to remove or take cargo off a vessel.

VESSEL: a boat or ship, especially a large one.

WHALER: a ship used for whaling. (Local use refers to the Boston Whaler, a popular pleasure craft.)

WHARF: structure of wood or stone, sometimes roofed, built at the shore of a harbor for ships to lie alongside while loading or unloading.

*ZODIAC: trade name of small motor-powered inflatable rubberized craft.

*Word not found in ***Webster's New World Dictionary, Second College Edition.***

SECTION III

CLASSROOM ACTIVITIES FOR THE WAIKIKI SHORELINE CRUISE 1988-89

INTRODUCTION

Most Pacific island children spend considerable time in, on, or near the ocean. This is not so in Hawaii. Here, student ideas, fashions, fads, and learning materials (with some exceptions) are land-oriented. Oceans, except some coastal areas, play a minor role. Only recently have any number of students begun to consider marine careers.

The Waikiki shoreline cruise project was initiated in late 1987 by the University of Hawaii Sea Grant Extension Service to provide students and teachers an opportunity to see their island and city from offshore. Students begin to realize much of the world surrounding them is actually an ever-moving liquid surface, constantly changing in color and surface texture. Students often are quite surprised to learn the ocean is such a busy place. Nearshore Waikiki waters become showcases for many types of boats, ships, and thrill craft heretofore unknown.

Ocean-related classroom activities give students novel ways of collecting and communicating pertinent information. Student discussions of the soothing effects of open-ocean space, sensations of water movement, or the sound of moving water on their moods and feelings may be beneficial for perceptive students to use to help cope with distressing problems. For others, the same discussions may encourage an artistic way to express themselves not previously considered. Observing and discussing ocean activities may uncover a source of future jobs or careers previously not considered because of lack of information.

USING MAPS TO STUDY SHORELINE CHANGES: 1810-1988

Six serial maps help students visualize the 178-year growth of Honolulu from a tiny shoreline settlement to the present-day 25-mile long city of 370,000 residents and 60,000 or more annual visitors.

Ideally each student should have a set of maps. However, small groups manage well with a single set, especially if the maps are enlarged. A clear plastic adhesive film covering the maps will preserve them for many sessions. The film is available at a reasonable cost in 18 x 60-inch rolls from hardware supply and art supply outlets.

The information provided on each map may be shared with other students through discussions, lectures, or handouts.

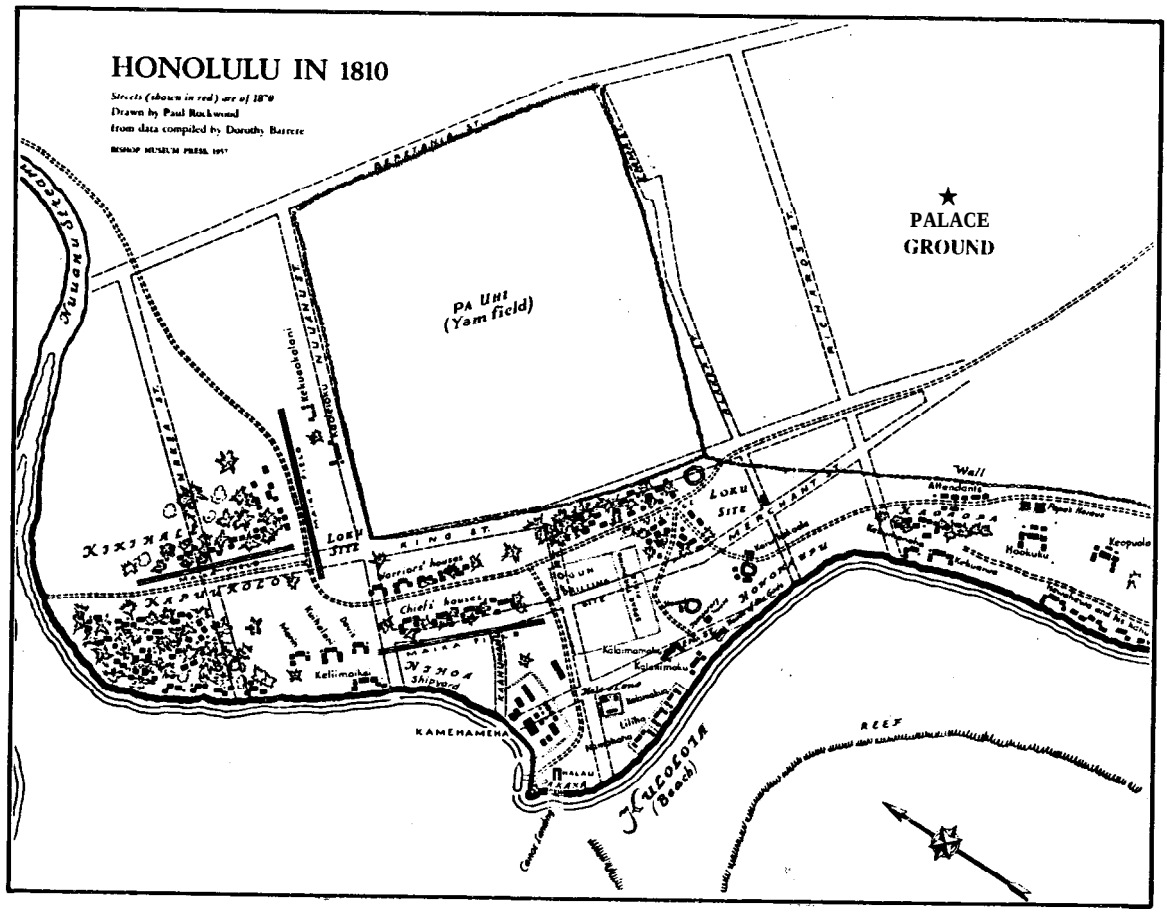
A study session on local history is recommended. This is an ideal time to involve students in verbal research. Have them talk with parents, other relatives, or adult friends about their experiences in Honolulu. Students will discover their elders are valuable sources of information, irrespective of the education they may have had. Students may share anecdotes with the class in a short “Talk Story” session, reenact the episode, or produce a cartoon series about the story. Sometimes the influx of good material may result in the class undertaking a booklet project. The anecdotes can be recorded, illustrated with cartoons or pencil sketches and maps, and assembled. The finished product is useful for future classes and may become a valued contribution to the school library. The students involved gain an increased sense of self-worth from their efforts acknowledged by teachers, peers, and librarians.

Map 1. 1810 Honolulu Beginnings

Until 1957, only an 1825 sketch map made by Lieutenant Charles Malden of the HMS ***Blonde*** and an 1870 government survey map were available for study. The 1810 map of Honolulu is a combination of information from these two maps and descriptions of Honolulu areas from "Fragments of Hawaiian History" written by John Papa Ii between 1810 and 1812. The addition of familiar east-west oriented Beretania and King streets, and the north-south oriented Richard and Alakea streets and Nuuanu Avenue provide a familiar space reference for students.

Vasili Golovnin, a Russian explorer, visited Honolulu in 1818 and later published a map (drawn to scale) of the immediate foreshore of Honolulu. A stone storehouse that belonged to King Kamehameha I was located on Pakaka Point (foot of Fort Street). It was surrounded on three sides by narrow docks or landings. A fort was built adjacent to the storehouse in 1816. It enclosed a small stone building. The storehouse of the king, the fort, and the stone house of Don Francisco de Marin nearby were the only permanent structures in Honolulu. At that time there were 60 Caucasian residents on Oahu and nearly all lived in close proximity to the fort.

The Marin residence shown on the reconstructed map is surrounded by smaller thatch dwellings offered to visiting sea captains and businessmen with whom he did business. The fort is undoubtedly the angular enclosure on the west side of Pakaka Point,



Bishop Museum Library Map
Used by permission

Map 2. 1901 Honolulu to Leahi (Diamond Head)

The 1901 map at first glance gives the impression there were nearly as many streets in Honolulu then as there are now. However, a closer look reveals more streets indicated by dotted lines than with solid lines. Dotted lines indicate planned streets. Such careful planning is a tribute to the foresight of our ancestors.

Fort and River streets were among the first north-south oriented harbor area streets. The first and most used east-west oriented streets were King, Queen, and Beretania (the Hawaiian equivalent of Britannia) streets and Wilder Avenue. These streets remain important thoroughfares.

Waikiki Road, now known as Kalakaua Avenue, approached Waikiki from inland. It moved close to the Waikiki shoreline east of the Moana Hotel and ended by Kapiolani Park. The route has not changed, but the Waikiki section of the avenue has undergone several alterations in the past 20 years in an effort to improve the ambience of the tourist-oriented locale.

A small railroad served the harbor area, and a railroad spur ran toward the dusty plains of west Oahu. A tramcar line operated from central Honolulu to Kapiolani Park. Tramcars, miniature open-sided trolley cars, ran on tracks like streetcars but were pulled by horses. Today, tramcars are popular modes of transportation operated in many scenic parks throughout the continental United States, Canada, and Europe.

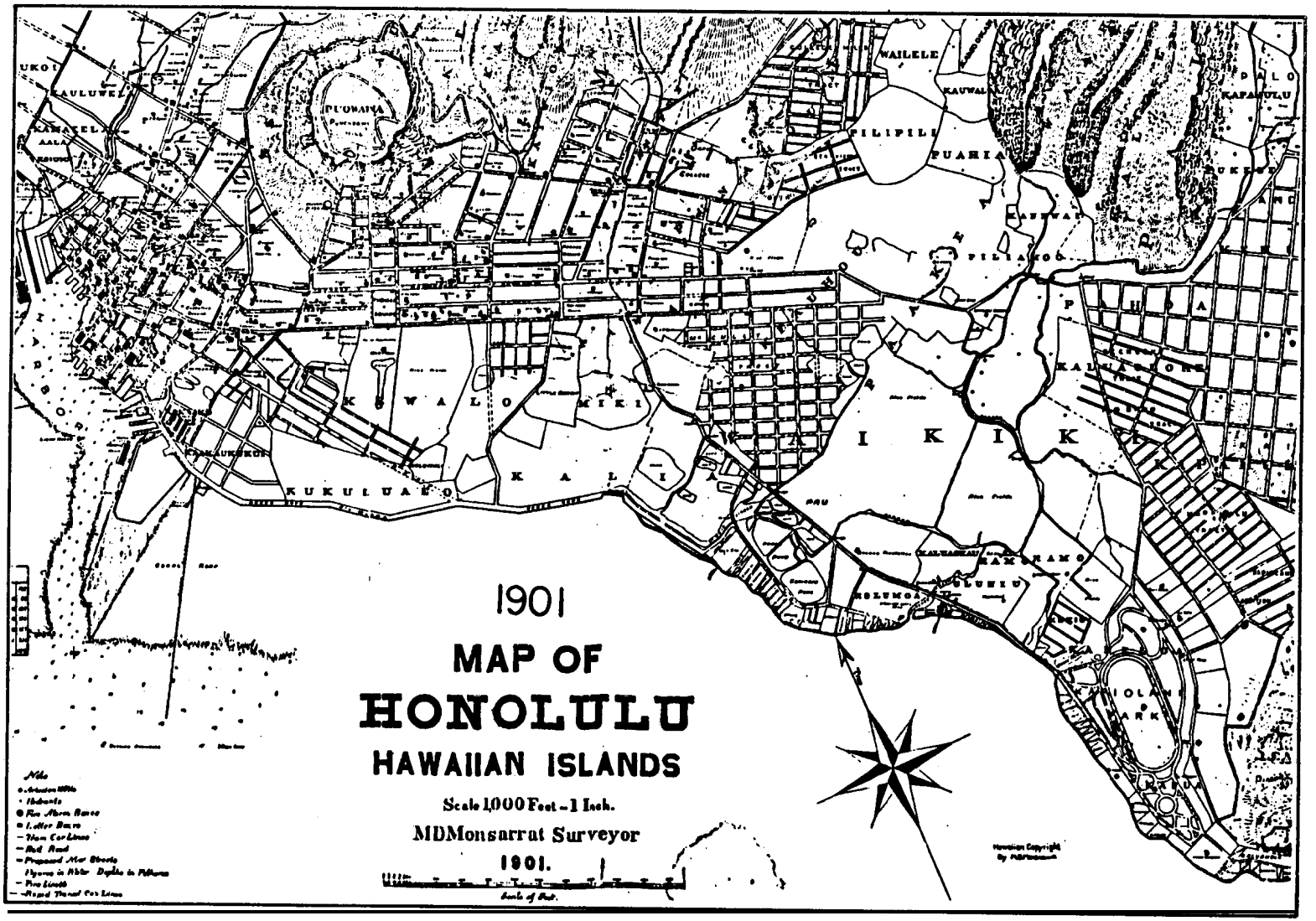
The 1840 discovery of abundant freshwater from wells drilled below the coral reef level changed Hawaiian history. Once freshwater was readily available, fires were more quickly controlled because fire alarms and water hydrants were installed throughout the center of town. Households now had easy access to freshwater. Garden crops were grown more easily by residents near the harbor.

Mailboxes were located on a few streets, indicative of a communication system.

In 1901, Kapiolani Park was a popular Sunday gathering place partly because of the polo field and the large, elegant Moana Hotel nearby.

All the best beach areas were privately owned. Except for a coconut plantation located near the present-day Kapahulu area, the rest of the area was fish ponds, duck ponds, streams that meandered into the ocean, and numerous large inland rice fields or marshy lands ill suited for human habitation.

The marshy inland area between Honolulu Harbor and Waikiki Road was sparsely occupied. A drier section near the present police station on Beretania Street was leased for a short time to Great Britain and was called “Little Britain.” In this section, a hospital was built for English sailors, but it did not remain in operation for long. Shortly thereafter, McKinley High School was established on property just west of the hospital grounds. The property on the west side of the new McKinley campus was known as “The Old Coconut Plantation.” That site is known today as the Neil Blaisdell Center. Only the duck ponds and a few very tall, nearly 100-year-old coconut trees remain of the original plantation estate.



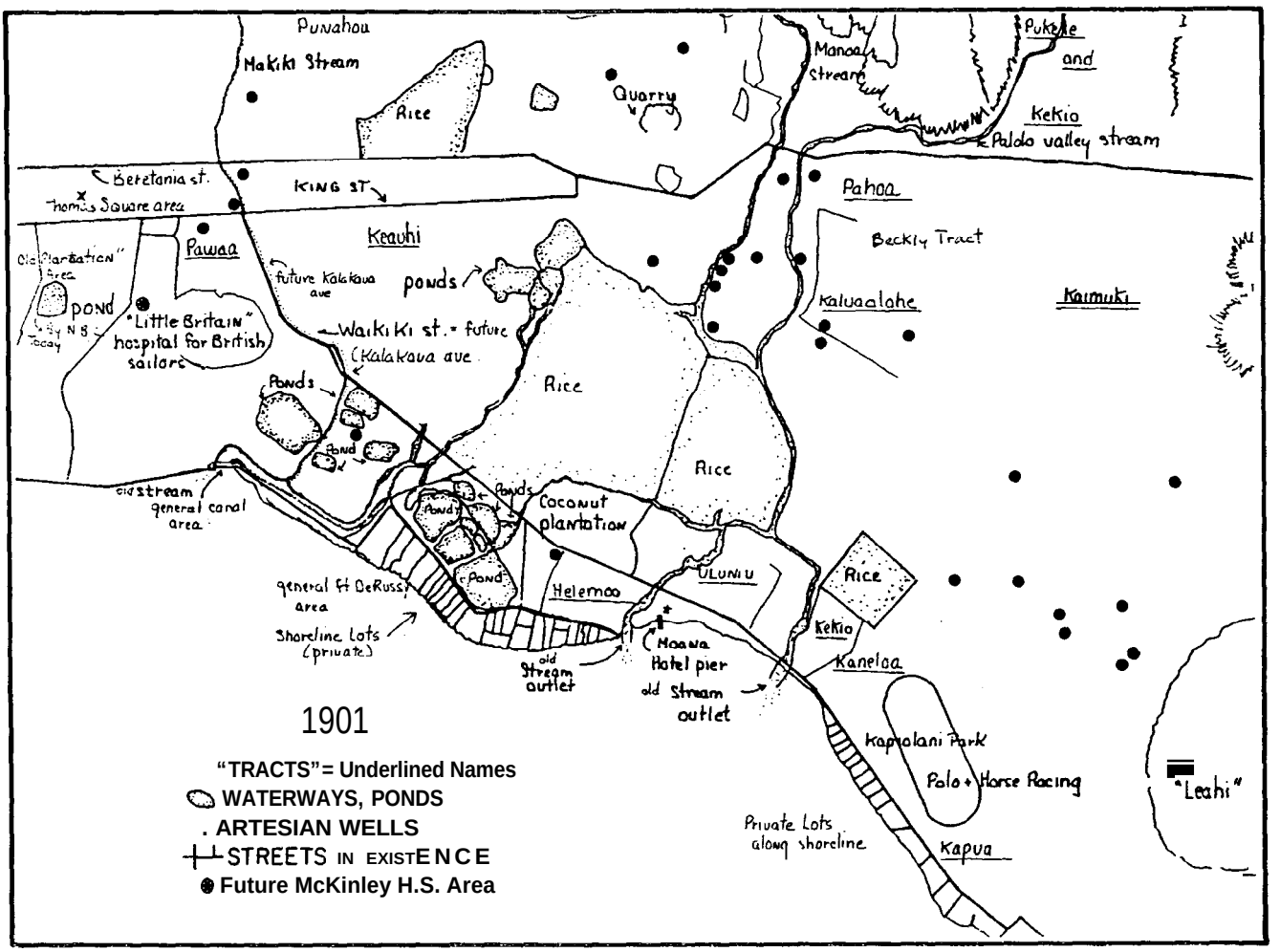
Bishop Museum Library Map
Used by permission

Map 3. 1901 Wetlands and Water Sources

Honolulu was a dry and dusty place. Until the 1840s, when the first artesian well was drilled, limited water supply discouraged every human endeavor. Artesian wells increased rapidly once people learned the principle of selecting a good site and the mechanics of well drilling. Wells made possible the use of many inland areas for small farms and homesteads. The shoreline and backshore areas from the Kewalo area almost to Kapiolani park were best suited for fish ponds, large rice paddies, and taro patches. Much of the shoreline between Kewalo and the Moana Hotel consisted of a wide sandy beach area backed by fishponds. Except for beaches, long the possession of royalty, other highly prized areas soon became the property of successful merchants or Caucasian favorites of the royal family.

The redrawn 1901 map eliminates proposed streets and names of the old Hawaiian kuleanas (land divisions) as well as residences in order to emphasize the wetland area, and the impressive number and the wide distribution of artesian wells.

In addition, mountain streams greatly influenced the shape and character of the shoreline where they entered the sea. The freshwater flow across the shore reefs altered the character of those reefs. Today the streams are greatly diminished in water volume partly because of the forest reserves in the uplands. Now the streams are contained in culverts hidden from view. Honolulu Harbor exists today only because of the long-term influence of Nuuanu and Kalihi valley stream action on the shoreline.



Bishop Museum Library Map
Modified
Used by permission

Map 4. 1923 Honolulu, From Kalihi to Diamond Head

The westward and inland expansion of Honolulu becomes evident when the 1901 map is compared with the 1923 map. The inland movement was influenced by the availability of freshwater, more horses for transportation, and the lure of the coolness and natural greenness of the valleys.

The short, angled thoroughfares in upper Kalihi and Pauoa valleys were unpaved footpaths or horse trails, not streets as defined today.

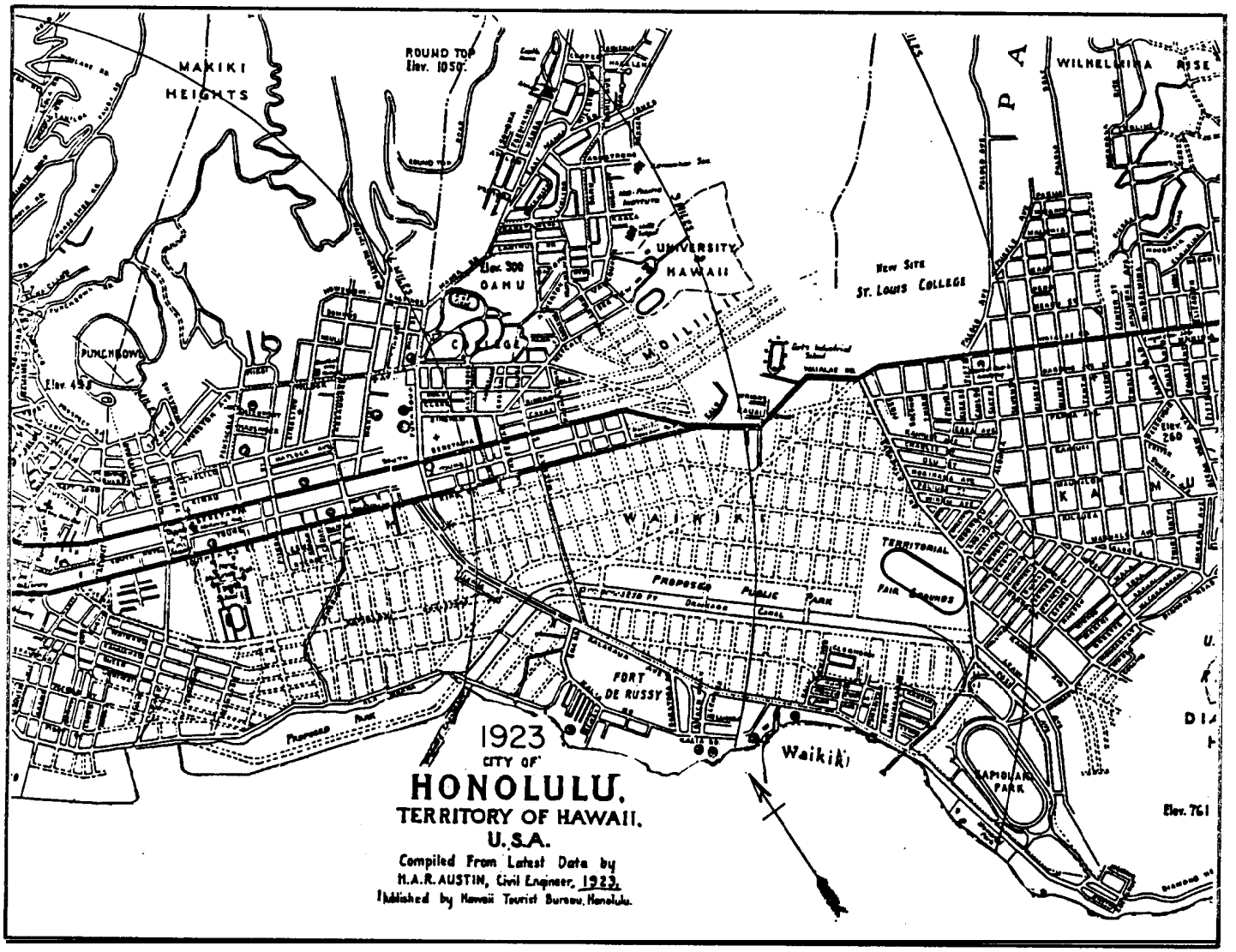
A pineapple plantation occupied an area in Kalihi not far from the current site of the Bishop Museum.

Lower Manoa, Nuuanu Valley, and Makiki were populated increasingly by Caucasians and Chinese who were inclined to farming. Besides sugar cane and pineapple which were destined to become major industries, there was a surprising diversity of crops. Coffee trees, tea plants, tobacco, indigo, and hemp are just a few survivors that may still be found growing wild in these areas.

The Ala Wai Canal was proposed to drain the Waikiki hinterland.

An embayment (a notch) in the shoreline a short distance east of the Honolulu Harbor entrance was ear-marked for expansion to create a small boat harbor. The Kewalo Basin, as it was ultimately named, was constructed to accommodate a fleet of tuna boats and a new tuna cannery on the Kewalo dock. The boats had been berthed in Honolulu Harbor, but the harbor was overcrowded with overseas vessels and local coasters, the small sailing craft servicing Oahu coastal areas and landings on the other islands. Ready access of these crafts to boat repair facilities available only in Honolulu Harbor was needed.

The unsightly city dump that smoldered along the shore between the proposed harbor and the Ala Wai Canal outlet eventually became Ala Moana Beach Park.



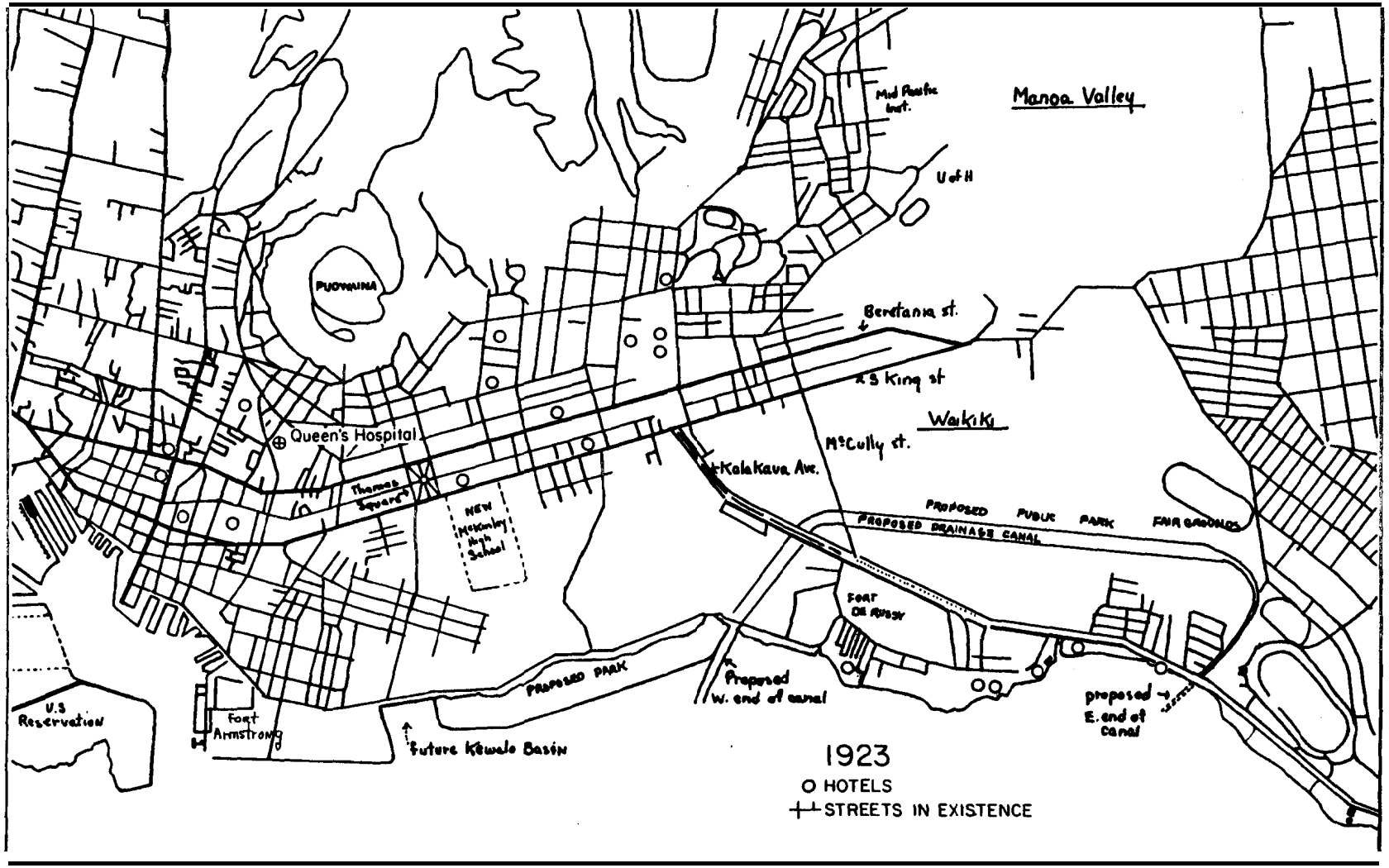
Bishop Museum Library Map
Used by permission

Map 5. 1923 Existing Streets Only

At first glance, the original 1923 map may be mistaken for a recent Honolulu map. Students may observe that all streets are not drawn in the same fashion. Like Map 2, dotted lines indicate planned streets.

The map of existing Honolulu streets shows vacant areas from Kewalo Basin to Kapiolani Park. When students ask "Why so much empty space?" and can't think of logical reasons, challenge them to find answers in Hawaiian historical photographic books now available in most school and public libraries.

It is a surprise to note that Kapahulu and the dry Kaimuki area already had so many streets in such a neat grid formation.



Bishop Museum Library
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Map 6. 1932 Central Honolulu and Ala Moana-Waikiki

By 1932, another access to Waikiki was created when Kapiolani Boulevard spanned the former swampy Kakaako area from South King to McCully streets. For some time, the only building on that lonely street crossing so much empty space was occupied by the new radio station KGU. The typical white, cottage-like building was set a few hundred feet back from the road. The deliberate isolation from civilized Honolulu was the subject of much debate.

By this time the city had extended into all the nearby valleys and as far west as Fort Shafter. Keehi Lagoon was the coastal west end of town. The isolated Kaimuki community, once known as Telegraph Hill, where semaphore signals were used to alert townspeople of the approach of a ship, has become almost a suburb of Honolulu. Streets and houses appeared on every hillside, and many more were hidden deep in the valleys.

The Kakaako district was covered with taro patches.

The reef was a favorite swimming, surfing, and fishing area.

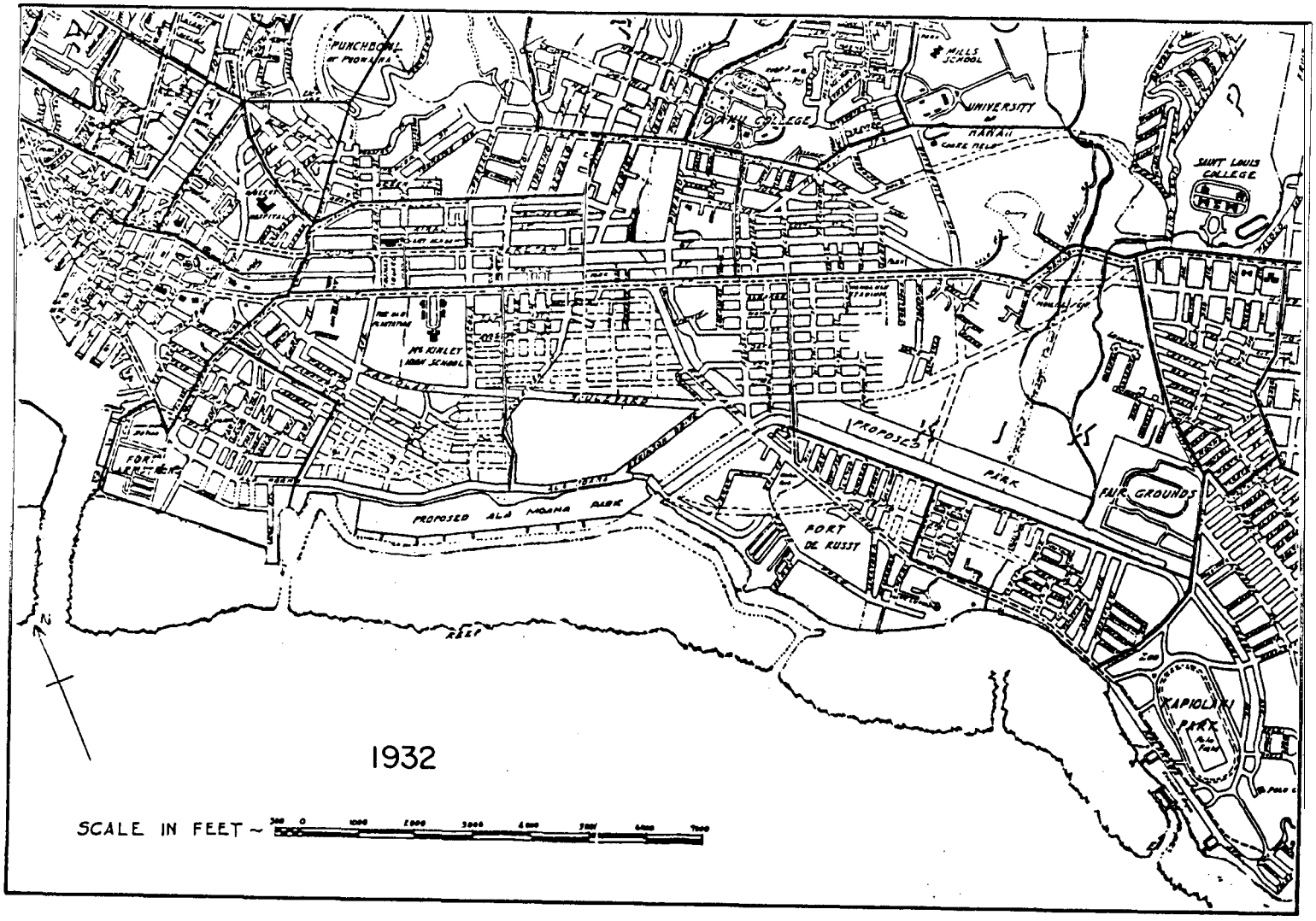
The Ala Wai Canal was dredged, but the broad Waikiki reef blocked its seaward drainage. A west channel and an east channel were to be dredged through the reef for drainage, but only a west channel was dug. At the seaward end, the boat channel made a 90 degree turn west then followed the shoreline to terminate in Kewalo Basin. Sailboats from the small boat harbor by the Ala Wai Canal bridge had to sail the length of the narrow channel, which was only a few feet from the beach, and then make a 90 degree turn inside small Kewalo Basin to enter the seaward channel. Sailors managed with difficulty. The canal water simply spread over the reef flat. Trash went aground everywhere, and the silted freshwater damaged the reef.

Sometime between 1938 and 1952, a shallow Ala Wai boat channel was dredged directly across the Waikiki reef to deep water. The west side of the Ala Moana reef along the new channel became a favorite chair-fishing area and a wonderful place to collect marine invertebrates for study. The channel dredge material was used to block the old boat channel. In a short while, the blocked area was indistinguishable from the reef itself.

By 1936, some areas of inshore Waikiki were sufficiently drained to permit erection of three to five-story buildings of modest size. Multilevel apartment buildings were built along the Waikiki side of the Ala Wai Canal. Such buildings were a rarity at that time. People drove around the area in the evening to look at the new apartments.

Between 1936 and the mid-1950s, Honolulu was recovering from the effects of the war years. Change was slow, but the need to provide housing and entertainment for the ever-increasing numbers of tourists became a paramount concern. The prime Honolulu tourist area was Waikiki.

The first foreigners to visit Hawaii were generally treated well while they recuperated from the trials of marine jobs or voyages. It remains the same today. Hawaii is still a mid-Pacific focal point for rest and recreation for vacationers and military personnel alike.



Bishop Museum Map
Used by permission

Map 7. 1988 Observed Offshore Waikiki Recreation Areas

From the early 1960s to the present, Waikiki has become a maze of tall hotels. The Koolau mountain range, which once provided a natural background for this strip of land, is now hidden behind a barricade of hotels. The area is noisy and overcrowded. Traffic is heavy, and beaches are filled with tourists.

The ocean beyond the reef, once the domain of a few surfers and fishermen, is now a busy place. It is interesting to watch different types of sailboats cruise well outside the wave-break area. It is exciting to see jet ski riders dashing in a whirl of spray between large anchored tourist cruise boats.

Even the airspace above offshore Waikii is occupied. People suspended from colorful parachutes are towed over the area. Powerboats move quickly to keep the parasailer airborne. The parasailer covers considerable open airspace during the trip, but the powerboat must thread its way through increasingly crowded seaspace.

Underwater Waikiki has not escaped invasion. Until Hurricane Iwa swept the underwater area bare in 1982, it had been frequented by novice scuba divers. A few divers still use the area.

The shallow Ala Wai boat channel that denotes the west boundary of Waikiki was deepened in the late 195Os, and the dredged material was dumped onto the Honolulu side of the Kewalo reef to create Magic Island. Some old timers termed it Tragic Island. They mourned the loss of their old fishing spots or favorite marine invertebrate collecting area. Today it is a pleasant picnic area for local people. Some like to proclaim Magic Island as the only “fake” island in the state. However, it is not an island in the true sense of the word. Actually, it is a small peninsula.

Much of the offshore reef that once extended from Honolulu Harbor to the Ala Wai Boat Harbor is now landfill.

The Ala Wai Boat Harbor now accommodates nearly 700 vessels. There is a waiting list of almost that many boat owners. Currently, the Kewalo Basin Boat Harbor is overcrowded with large cruise vessels and smaller charter fishing boats. What remains of the commercial fishing fleet is now located in a corner of Honolulu Harbor.

Today, the city of Honolulu extends along the coast as high onto the hills and as far into the valleys as possible and all the way to Koko Head, the easternmost point of the island. Aiea, Pearl City, Waipahu, and Ewa Plantation, all located west of Honolulu Harbor, and north of Barbers Point, are proposed for development of a port town to service a new barge harbor.

Many students who choose to remain “local people” will understand that their future will be tied to Honolulu and its problems. They will welcome the opportunity to offer well-planned, innovative solutions to Honolulu’s problems.

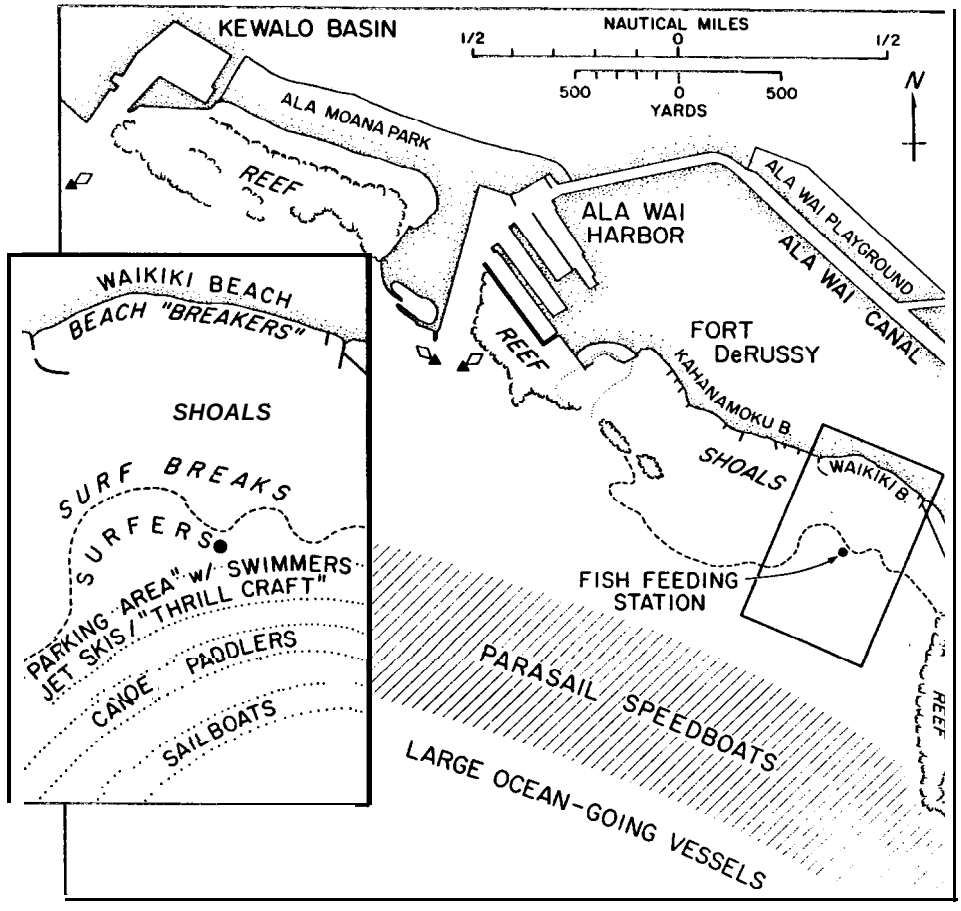


Illustration by Brooks Bays

HONOLULU LANDMARKS FROM OFFSHORE

Hawaii residents usually think they know their city well, but most often, it's land-based and from ground level only. When viewers from a window or a tower, buildings and landmarks are more difficult to identify. A sea-level view of Honolulu from offshore perhaps presents the most unusual view of all.

During a cruise, students will be hard-pressed to see everything because "everything" encompasses buildings, the shore, nearshore and offshore activities, and activities overhead and at sea. The cruise narrator calls attention to familiar sights, but students' eyes and ears may be focused elsewhere so unintentionally they miss much.

Suggestions for Student Activities

Locating Landmarks on Maps

Maps are useful in helping students learn about an area. A wide variety of Honolulu maps are readily available, usually at no charge, from the Hawaii Visitors Bureau or airline ticket offices. The bus company supplies free city route maps. The *Hawaiian Tel's Official Yellow Pages Directory* includes a set of shoreline maps. Old Honolulu telephone directories provide street addresses of buildings. Additional copies of the *Yellow Pages Directory* are available at no cost for classroom use. At least 2 weeks before the material is needed, teachers may call the nearest Phone Mart, request the number of copies needed, and pick them up.

The list of landmarks, though incomplete, is adequate for cruise preparation or a class assignment. Some landmarks are known by several names. Those in parentheses are either unofficial local terms or former proper names familiar to longtime residents. Student groups can locate landmarks on their maps and discuss reasons they believe each landmark was selected.

Landmarks

Aloha Tower complex
Ala Wai Boat Harbor ("Stickfarm")
Ala Moana reef
Diamond Head (Hawaiian name — Leahi)
Konahuanui
Kewalo Basin
Kaimuki (ridge behind Diamond Head once known as "Telegraph Hill")
Moana Hotel
Magic Island ("Tragic" Island)
Nuuanu Valley
Palolo Valley
Punchbowl National Cemetery of the Pacific (Hawaiian name — Puowaina, Hill of Sacrifice)
St. Augustine Church
Whaling wall painting
Ala Moana Hotel
Ala Wai boat channel
Ala Wai heights
Kapiolani Park
Kewalo incinerator stack (only one in Honolulu, now closed)
Manoa Valley
Natatorium
Neil Blaisdell Center ("Silver Mushroom")
Ala Moana Building (revolving restaurant atop known as "Pie in the Sky")
Point Panic
Rainbow Towers
Royal Hawaiian Hotel ("Pink Palace")

Students can also talk with parents, adults, friends, or relatives about their experiences or stories they may have heard about these landmarks. Students may then relate what they have learned in a "Talk Story" form, reenactment, or presentation of a cartoon series narrating the story.

After the trip, give students the rare opportunity to compare their perceptions of buildings or landmarks seen from the ocean, with the more familiar view from the street, from a nearby building, or from an airplane.

Unique Shoreline Map From Old Hawaiian Telephone Company Directories

The annually discarded *Yellow Pages Directory* includes a series of current Oahu shoreline area maps that students and teachers can use. The maps are oriented so that north is always parallel to the vertical side of the map. Map edges always overlap slightly making it easy to piece the separate sections together accurately. These maps provide a view of the south Oahu shoreline that students will observe on the shoreline cruise.

Materials needed for a strip map

- Brown wrapping paper 26 x 60 inches
- Ruler and single-edge razor
- Nonwrinkle glue
- Two Oahu telephone directories per student

Map assembly directions

Small group work conserves time and materials, but individual effort should be encouraged whenever possible.

Overlap the edges of two adjacent maps until the streets are aligned. Hold them firmly in place with a ruler and cut away the overlapping material.

One map section at a time is turned face down, and the cut edge is covered by half the width of a strip of mending tape. The map is then turned face up. The adjoining section is accurately placed on the remainder of the tape strip. The join is complete once both edges are in line and the tape is firmly pressed onto the map edges. The complete map will not be straight because the shoreline is not straight.

To paste the map strip to the paper backing:

1. Lay the map on the paper backing with all compass arrows in a vertical position. This ensures that the pieced together, curved strip map is in correct alignment with the edges of the backing paper.

2. Mark the map outline on the backing paper to ensure proper placement.

3. Cover half the length of the strip outline on the backing paper with an even layer of nonwrinkling glue or stick adhesive and lay the strip map in place. Gently rub the map with a piece of cloth or tissue paper to assure firmer attachment and repeat the process with the remaining portion of the map.

4. Place weight on the map to prevent wrinkling as it dries.

The irregular bottom or top margins of some sections is inconsequential. The excess backing material remaining on the sides of maps may be folded and glued to create a strong edge for the entire assembly. Students may wish to outline the shoreline in dark blue for emphasis. The maps last longer if they are rolled rather than folded. Wooden broom handles make excellent rollers.

MARINE RECREATION

Recreation is one of the fastest growing marine-related businesses in states having coasts or lakefronts. Sports activities require new skills and specialized equipment which create a demand for knowledgeable instructors.

Waikiki Beach is scarcely a quarter of a mile long, bounded by Kuhio Beach on the east and Fort DeRussy Beach on the west. Nearly all students have observed parasailing, several kinds of boating activities, snorkeling and scuba diving near the shore, surfing off Waikiki, and fishing from small boats.

Between January and June 1988, the cruise narrator observed the following activities.

1. On-the-beach activities:

reading	sun bathing
walking	sleeping
hole digging	people watching
picnicking	

2. Nearshore activities:

swimming	snorkeling
floating	boogey boarding
body surfing	

3. Advanced deepwater activities (professional instruction desirable):

surfing	windsurfing	canoe paddling
canoe sailing	kayaking	roughwater swimming
distance swimming	snorkeling	fishing

4. Solo and group outside-the-reef activities (professional instruction required):

sailing	canoeing
scuba diving	jet skiing
parasailing	motorboating

Forty-three beach and ocean activities have been identified in the Waikiki Beach offshore area. Of these, 21 would definitely be safer if all participants received professional instruction. Currently, a comprehensive recreational water safety program is nonexistent. Such a program could include individual instruction, regulation of ocean sports activities, public safety awareness for nonparticipants, and certification of water-related sports instructors and boat operators.

Suggestions for Student Activities

1. Students should be divided into groups. Each group selects ocean activities (one per student) they believe should be learned with professional training. As groups, the students complete activity information sheets for each activity. If an information request is not applicable, students should write NA. The Ocean Activity Information Sheet (page 100) may be used as is or changed as needed.

   Students gather information from any source they consider credible and note the source on the information sheet.

   Class discussion may add or discount some information. A final review by a knowledgeable person is desirable. Revised information sheets should be made available for use by other students.

2. Ask students to write an account of some incident the student experienced that relates to an ocean activity. A student may read the account to the class, produce a short skit, or create a comic strip illustrating the story. Consider collecting such material in booklet form for use by other students.

3. Discussion

   What values are derived from keeping shorelines open to the general public for recreational purposes? Students could discuss this question with parents or adult friends before the class. Some considerations are:

   - psychological need for visual open space
   - health benefits of breathing ocean air
   - tension relief induced by water activity
   - decrease in high-level noise pollution
   - increase in muscle tone from water exercise
   - healthful hypnotic effect of sea sounds, colors, movement, and wave action
   - that beaches are open to the public at no charge
   - togetherness families may enjoy on the beaches

OCEAN ACTIVITY INFORMATION SHEET

Prepared by _____ Date _____

Activity _____ Age group _____

Equipment _____

Ocean conditions _____

Weather conditions _____

Competitive: Solo _____ Team _____ Local _____ National _____

Typical Accidents _____

Typical Injuries _____

Instructors: needed _____ available _____ good _____ fair _____ poor _____

Instructor Training: needed _____ available _____ good _____

Instructor Certification: available _____ needed _____

Certification organization(s) _____

Student suggestions _____

SEASPACE SIGHTS AND SENSATIONS OFF WAIKIKI

South Oahu is protected from strong tradewinds most of the year, but strong winds from the south may cause big surf off Waikiki in the summer months. Because the cruise is held during the school year, students are unlikely to experience heavy weather.

The motion of water is what causes ships to move in a manner so many people find disconcerting. The motion is initiated by winds of varying strength striking the water surface. Moderate steady winds produce smooth rolling swells characteristic of the south shore area. Errant puffs of wind create patches of small, short, choppy waves. Sometimes the waves break because a stronger puff of wind pushes them harder. These waves are known as cats' paws. Wakes of fast-moving boats or ships create a spreading series of regular smooth waves imposed on the normal wave pattern, easily seen on calmer water but difficult to see otherwise.

Sea colors change constantly in response to:

- the amount and angle of sunlight
- the amount and type of cloud cover
- the movement of clouds
- the presence or absence of freshwater runoff
- the water depth
- the consistency of ocean bottom (shallow areas only)
- the time of year, which affects marine algae growth and plankton reproductive periods

Shoreline cruises are conducted in shallow water so there is little variation in water color unless it has been raining. Hurricane Iwa devastated the underwater area. It will take decades before underwater Waikiki will recover. There is no lava bottom off Waikiki so the bottom consists of tan coral reef rock and sand. Clear shallow waters over rich reefs are a peculiar pea-green color as yet to be explained by scientists. The water over most reef areas such as Waikii is clear turquoise or light blue. Deep ocean waters are blue-purple.

Marine Life Off Waikiki

Ocean animals other than bottom fish are sometimes seen in shallow water off Waikiki.

- A turtle at the surface is hard to discern because its head is small. It doesn't stay there long, and it's a solitary creature. Several have been seen in the spring.
- In the Kewalo area sea birds, which are usually solitary, have been observed by students.
- Several times, small groups of flying fishes were sighted headed away from the ship. The ship noise, vibration, or size may be what triggers their flight.
- Bottom fish are not numerous. Captain Hart and his crew developed a fish-feeding station just outside the surfbreak area, but it took nearly a month for the fish to recognize that a ship's shadow on the bottom and the sound of a motor meant food. When bread is thrown on the water, fish almost immediately rush to the surface.

Suggestions for Student Activities

Precruise Activity Wish List

After the shoreline cruise has been discussed or students have heard the introductory program given by a Sea Grant representative have them record their thoughts on the cruise topic. Suggested format:

- I hope to see...
- I want to experience...
- I don't want to...
- I'm afraid of...
- I'd like to have...happen that day

Students should return papers to the teacher for safekeeping.

Postcruise Reality List

1. The precruise responses are distributed shortly after the cruise so students can recall their answers. They are then given a set of postcruise questions, such as:

   - What was surprising or funny or scary?
   - What different or unusual experience did I have?
   - What did or did not I do or see?
   - What made me laugh or feel sad?
   - What was the most unexpected sight or event?
   - What was the most uninteresting part of the cruise?
   - Would I go again? Why or why not?

   Encourage students to answer fully. Teacher's comparison of student pre- and post-responses will reveal disappointments, fears, or surprising insights. Some responses are meaningful subjects for class discussions that might not otherwise have been considered.

2. Students may draw cartoons of the best or worst, funniest or scariest, dullest or most interesting sight or event during their trip. Remind them that their interaction with the crew is part of the cruise experience. If students say they can't draw, a quick demonstration of stick figure construction solves the problem.

3. Suggest students create a cruise book consisting of a list of participants, autographed cartoons, selected pre- and postcruise remarks, and drawings of shipboard activities or special scenes. Hold a cover design contest, award lifesavers as prizes, and when the booklet is complete throw an authors' party.

Postcruise Arts and Crafts

Expressed feelings and shared knowledge by students with others are realized through the use of communication skills. Sensations may be expressed by:

1. Writing poetry forms such as haiku, free verse, or simple four-line rhymes, preferably illustrated

2. Sketching activities or designs created from wave action, ships' wake patterns, cloud shapes, or animal shapes

3. Creating hula or other dance forms to describe ship movement, animal characteristics, or personal reactions to the cruise

4. Pantomiming to describe reactions to ship noise, food, ship movement, and any other sensations

5. Constructing an "Alphabet Poem." Each student selects a place or activity and writes descriptive sentences, the first word of which begins with a different letter of the alphabet.

6. Sculpting vas-relief bakers dough into shipboard activities, animals, an appealing shoreline, or ocean scene

With the exception of the vas relief bakers dough sculptures, all suggestions could be weekend assignments. The completed assignment could be brought to school for suggestions. Revisions could be homework. The second evaluation would be final. The procedure may be unfamiliar, but most students like the idea when they become used to it.

Dough relief sculpture is a class activity requiring a dough-preparation class period and a sculpting class period. Homework includes a sketch of the final production. After completion, sculpture is either left to dry or baked.

The basic schedule is:

- prepare bread dough in class
- draw relief panel to size at home
- model relief sculpture (at least one period including lunchtime and recess)
- allow dough to dry for 2 to 5 hours depending on weather
- paint sculpture (homework or one class period). Precolored dough may not need extra color.

Several craft books describing this interesting activity are available from bookstores and libraries.

DISCOVERING SIGHT LINES AND THEIR USEFULNESS

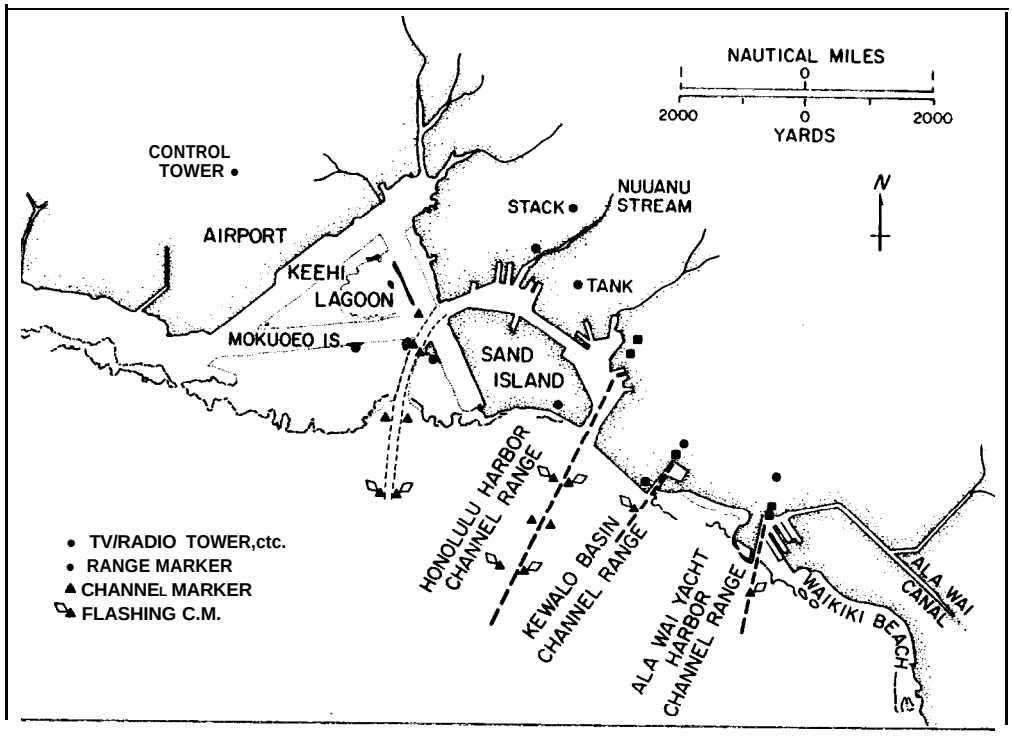
If students are told that permanent sight lines mark the center line of a harbor entrance or that sight lines are important to shoreline cruise narrators, it means little. However, if they hear that a diver or fisherman uses sight lines to drop anchor in the same spot, time after time, that's a different story. They are interested in knowing what sight lines are,

Standardized, Permanent Harbor Range Markers

Safe entrances or exits from Honolulu Harbor are virtually foolproof. That's partly because there are rows of colored markers or buoys on each side of the channel that define its width. The two tall masts, or range markers, are most important.

Once a ship receives permission to enter the harbor, the pilot simply keeps the top and bottom markers in line with each other as he moves safely through the entrance channel. One range marker is at the end of Pier 7. A taller marker is on the topside corner of Pier 8, about 75 feet behind and 10 feet above the other and in line with the center of the entrance channel. Each mast supports a red fluorescent, double-striped marker. At night, red lights replace the stripes. When both markers are in line, the "line of sight" passes right through the rigging of the *Falls of Clyde.* The museum staff had to readjust the angle of one of the ship's spars so the rangeline would be unobstructed.

A ship leaving the harbor first obtains permission from the control tower operator then heads outward bound down the center of the channel. Once past the last two channels buoys, the harbor pilot is picked up by the pilot boat and the ship is on its way.



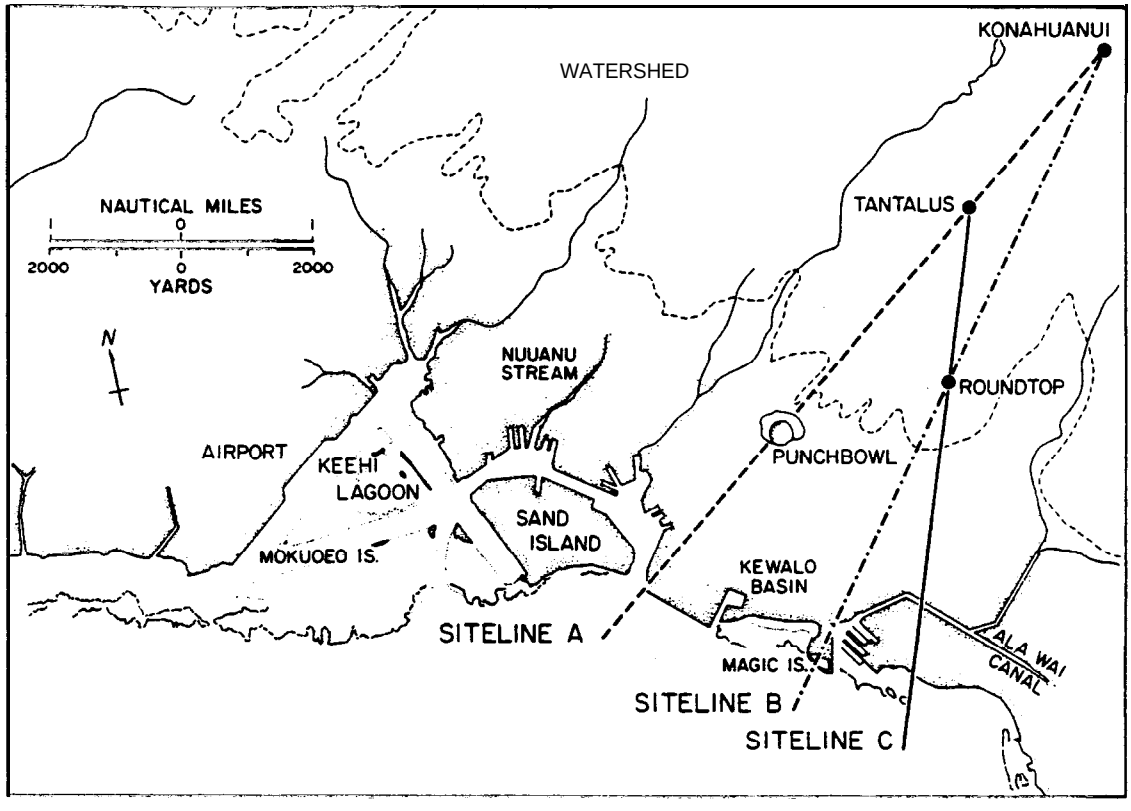
Channel Range System for Harbor Traffic (Marine Atlas of Hawaii 1974, Sea Grant Miscellaneous Report, modified by Brooks Bays, used by permission)

Using Temporary Sight Lines to Locate Landmarks

On a shoreline cruise, there is opportunity to practice lining up two easily located objects for a sight line. Because the boat is moving, by the time a line is described or located, it's out of line but should still be recognizable. Either the high or low sight can be selected first, as long as both are in line with each other. Good sight lines include anything high and distinctive, such as mountain peaks or dips, edges of tall buildings, flagpoles, or radio towers.

Students should familiarize themselves with the Honolulu area on the outward bound leg of their cruise to Waikiki, then practice locating sight lines on the return to the harbor. Konahuanui, a 3,000-foot high peak above Nuuanu Pali, presents a good target. Konahuanui and easily spotted Punchbowl are in line with the Fort Armstrong area on the east side of the Honolulu Harbor entrance (Sightline A, Map 1).

When the ship is in the Ala Wai Boat Harbor area, the western edge of the lagoon at the seaward end of Magic Island can be lined up with the western edge of Round Top to locate Tantalus (Sightline B, Map 1). Off Waikiki it may be possible to line up the middle portion of Round Top with Tantalus (Sightline C, Map 1).

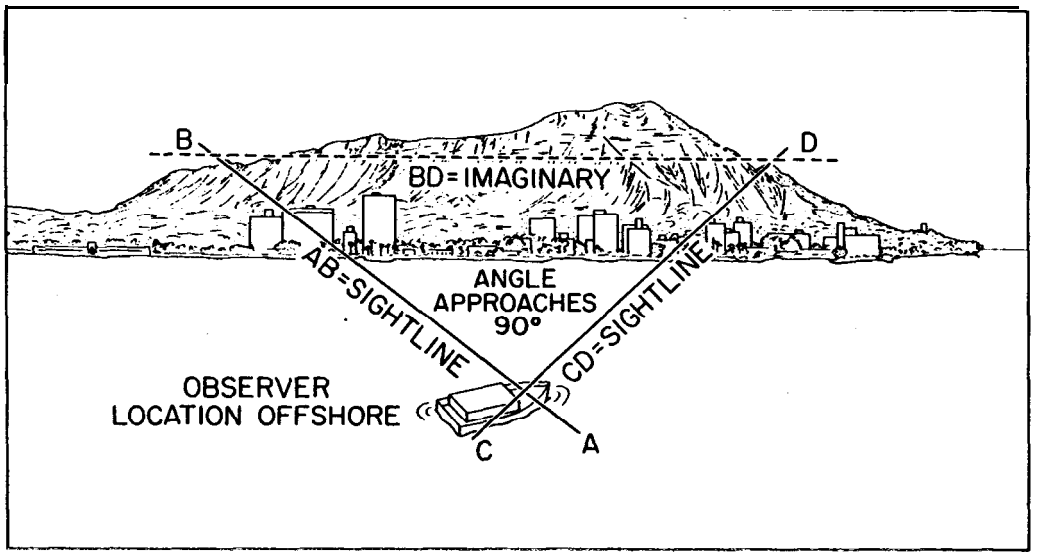


Marine Atlas of Hawaii 1974
Sea Grant Miscellaneous Report
Modified by Brooks Bays
Used by permission

Locating Diving or Fishing Areas by Triangulation

If students understand the use of temporary sight lines, it shouldn't be a mystery how divers or fishermen motor offshore and drop anchor right over their favorite areas. They use a technique known as triangulation, which requires only two sight lines and a good memory. The first time a choice area is found, someone onboard locates a good sight line. Then, without changing his location, he turns 90 degrees right or left to locate a second sight line. These two sight lines cross where he stands. "X" marks the spot, so to speak. Each time they return to the area they relocate the memorized sight lines and drop anchor within a few feet of their target.

On land, a single sight line is fine for pointing out a particular feature, but on the water, to come back to the same spot, it takes two to triangulate. But even triangulation isn't "failure-proof." Flag poles and older buildings are not wise choices for triangulation. Sometimes the building is obscured by a new structure raised seemingly overnight or is demolished. Flagpoles disappear too. It just takes wind or termites to bring them down.



Triangulation used by divers and fishermen (illustration by Brooks Bays)

Spy-Tube Construction and Use: A Classroom Cruise Activity

Spy tubes made from cardboard tubes inside rolls of gift wrapping paper are excellent sightline finders. Toilet paper tubes are too wide to be useful. Students and adults who have used different lengths say 5-inch tubes are the most helpful in focusing eyes "on the target."

One class, after using the spy tubes on a cruise, held a contest for the most beautiful, most creative, and most radical spy tubes. Certificates were given to the winners. See pages 50-52 for copies of the certificates that may be reproduced for classroom use.

SHORELINE SLIDESHOW NARRATIVE

South Oahu Shoreline: Fort Armstrong to Waikiki Beach

These slides acquaint students with special features of the Honolulu-Waikiki area they will see from offshore. Historical information supplements each slide. The slide set may be requested from the University of Hawaii Sea Grant Extension Service. To make arrangements, call Chris Woolaway at 948-8191.

SLIDE NUMBER

1 THE ALA WA1 BOAT HARBOR, HOME FOR NEARLY 700 BOATS, IS OVERCROWDED AS IS TYPICAL OF SMALL BOAT HARBORS THROUGHOUT THE STATE. THE LARGE BOATING POPULATION ON OAHU ENJOYS ESPECIALLY GOOD BOATING CONDITIONS. SOME OF MORE THAN 600 OWNERS OF VESSELS HAVE BEEN ON A WAITING LIST FOR BERTHS FOR 3 YEARS OR MORE.

2 THE ALA WA1 BOAT HARBOR IS SOMETIMES REFERRED TO AS A "STICK FARM" BECAUSE OF THE FOREST OF SAILBOAT MASTS. THIS IS NOT AN ESPECIALLY COMPLIMENTARY TERM TO SAILBOAT OWNERS.

3 THIS LOVELY SHORELINE IS THE ALA MOANA BEACH PARK, A RECREATION AREA FOR LOCAL RESIDENTS AND TOURISTS. IT WAS ONCE THE SITE OF THE CITY DUMP, NICKNAMED MOUNT SWILAUEA BECAUSE OF ITS FIRES, SMOKE, AND OFFENSIVE SMELL. TOURISTS UPON SEEING IT AT NIGHT FOR THE FIRST TIME FROM OFFSHORE WERE TOLD IT WAS A NEW VOLCANO.

4 DIAMOND HEAD, ONCE KNOWN AS LEAHI, IS OUR WORLD-RENOWNED LANDMARK, LOCATED AT THE EAST END OF THE PRESENT-DAY WAIKIKI AREA. ORIGINALLY, THE HAWAIIAN LAND DIVISION OF WAIKIKI EXTENDED PAST DIAMOND HEAD ALMOST TO THE AINA HAINA DISTRICT. THE EARLY BUILDINGS ON DIAMOND HEAD WERE HIDDEN BY SHRUBBERY AND TREES, BUT SINCE 1950, HAVE BEEN REPLACED BY TALL CONCRETE STRUCTURES.

5 THE BEACHFRONT OF THE OLD FORT DERUSSY AREA IS ONE OF THE FEW PLACES WHERE TREES STILL STAND ALONG THE SHORE. OFFSHORE, SURFERS WAIT FOR WAVES. TOURISTS REMAIN ON THE BEACH OR CLOSE TO THE SHOREBREAK.

6 THE ROYAL HAWAIIAN HOTEL, KNOWN AS THE PINK PALACE, IS ONE OF THE MOST FAMOUS HOTELS IN THE WORLD. BUILT IN 1927, THE HOTEL REMAINS A FAVORITE, QUIETLY ELEGANT AND EXPENSIVE PLACE, EVEN THOUGH DWARFED BY TALLER BUILDINGS AND STRIPPED OF ITS BEAUTIFUL GARDENS. STUDENTS MAY NOTICE THE NATURAL BOAT CHANNEL THAT CROSSES THE REEF IN FRONT OF THE HOTEL. IT WAS CREATED BY A FRESHWATER STREAM THAT ONCE CUT THROUGH THE HOTEL GROUNDS AND ACROSS THE REEF.

7 ONE OF THE SMALLEST AND OLDEST BUILDINGS IN WAIKIKI IS SAINT AUGUSTINE CHURCH. FROM OFFSHORE, IT STANDS OUT FROM OTHER BUILDINGS BECAUSE OF THE ELEGANT SWEEP OF lTS ROOF. THE CHURCH WAS RECENTLY SOLD TO A COMMERCIAL COMPANY. ANOTHER LANDMARK IN HAWAIIAN HISTORY WILL VANISH.

8 THE HILTON HAWAIIAN RAINBOW TOWER WAS BUILT ABOUT 25 YEARS AGO AT THE BEGINNING OF THE WAIKIKI TOURIST BOOM. THIS MURAL IS HAWAIIAN IN INTENT AND IS CLEARLY VISIBLE FROM FAR OUT AT SEA.

9 CANOE PADDLERS, WHO PRACTICE OUTSIDE THE REEF BEYOND TOURIST BOATS, APPEAR ISOLATED. THE POPULARITY OF PADDLING, ONCE PREDOMINATELY A HAWAIIAN SPORT HAS SPREAD TO CALIFORNIA, TAHITI, AND SAMOA WHERE, ALONG WITH HAWAII, CHAMPIONSHIP RACES ARE HELD.

10 AN OLD SAMPAN-STYLE TUNA BOAT, ONE OF THE FEW STILL OPERATING, HEADS INTO KEWALO BASIN, THE FORMER HOME OF OUR ONCE BIG TUNA BOAT FLEET. TUNA FISHING IS NO LONGER BIG BUSINESS IN HAWAII.

11 THESE TWO “CATS” (SHORT FOR CATAMARANS) ARE FAST SAILERS. THE NEAREST ONE IS A SMALL PLEASURE CRAFT. THE OTHER IS A TOURIST CATAMARAN. THE WATER DEPTH IS ABOUT 15 FEET HERE, AND THERE IS LITTLE CURRENT, OTHERWISE PEOPLE WOULD NOT BE IN THE W A T E R .

12 THERE IS A TUG TOWING A BARGE ABOUT A MILE OFFSHORE. THIS IS A COMMON SIGHT BECAUSE BARGES AND TUGS ARE WHAT KEEP OUR ISLANDS SUPPLIED WITH NECESSITIES. THE MACHINERY HIGH ON THE STERN OF THE BARGE INDICATES IT IS SELF-LOADING AND UNLOADING.

13 LESS THAN 30 YEARS AGO THE MOUNTAIN RANGE BEHIND WAIKIKI PROVIDED A LOVELY BACKGROUND TO THE TREE-LINED BEACHFRONT. A FEW LOW WOODEN BUILDINGS WERE OCCUPIED BY PEOPLE LIVING IN THE AREA. A SINGLE LONG PIER WAS IN FRONT OF THE MOANA HOTEL. TODAY, THE MOUNTAIN BACKGROUND IS MOSTLY HIDDEN BEHIND A SOLID WALL OF CONCRETE. THE STRIP OF BEACH IS NOT AS WIDE AS IT USED TO BE. IT IS COVERED BY SUNBATHERS. A SAILBOAT LIES AT ANCHOR JUST A FEW FEET OUTSIDE THE SURF BREAK. KAYAKING, WHICH HAS BECOME POPULAR IN HAWAII, IS ONE OF THE WORLD'S FASTEST GROWING WATER SPORTS. THERE ARE HARDSHELL KAYAKS SEEN BALANCED ON TOP OF CARS. MANY PEOPLE OWN SOFTSHELL OR INFLATABLE KAYAKS BECAUSE THEY REQUIRE LITTLE STORAGE SPACE AND ARE EASY TO TRANSPORT.

14 THE NUMBER OF LARGE RAFTS ANCHORED OFF THE KEWALO-WAIKIKI AREA IS INCREASING RAPIDLY. THE MOTORBOAT AND RAFT SHOWN HERE ARE PARTS OF THE NEW PARASAILING ACTIVITY. THE RAFT SERVES AS A LANDING AND TAKE-OFF DECK AS WELL AS AN EQUIPMENT STORAGE AREA AND A PLATFORM WHERE PARASAILERS WAIT THEIR TURN OR REST UNTIL IT IS TIME TO PACK UP AND LEAVE. THE SPEEDBOAT PULLS THE PARASAILERS OFF THE RAFT UNTIL THEY ARE AIRBORNE. THEY ARE PULLED THROUGH THE AIR BY THE BOAT UNTIL RETURNED TO THE RAFT. THESE MANEUVERS REQUIRE CONSIDERABLE OPERATING SPACE AND SKILL. THE SPACE REQUIRED BY THE TOWBOAT HAS BECOME A REAL PROBLEM IN AN INCREASINGLY CROWDED AREA.

15 THE PARACHUTE, THE RIDER, AND THE RAFT BELOW ARE EASY TO SEE. TO TELL WHERE THE BOAT IS LOCATED FOLLOW THE BARELY VISIBLE THIN LINE THAT CONNECTS THE PARACHUTE TO THE BOAT.

END

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