

# The Hawaii Institute of Marine Biology



UNIVERSITY OF HAWAII  
HONOLULU, HAWAII





A scenic view of a tropical coastline. In the foreground, a white boat with a canopy is on the water. The middle ground shows a sandy beach with a line of palm trees and a small building. The background features a large mountain under a clear sky.

## foreword . . .

Situated in the middle of the Pacific Ocean, the University of Hawaii is ideally suited to make significant contributions in the field of marine biology. Our central location naturally focuses our attention on the rich, but relatively unknown, "inner space" of the tropical sea.

With the increasing emphasis on ocean studies during recent years, the Hawaii Institute of Marine Biology has helped Hawaii to establish its potential as a leading center of marine science. This standing was recognized in 1972 when the University of Hawaii was made one of the six Sea Grant colleges in the United States.

HIMB facilities, including the Coconut Island laboratory, are open to marine scientists the world over so that the maximum value of these installations may be fully realized.

John E. Bardach, Director





## INTRODUCTION

The Hawaii Institute of Marine Biology (HIMB), has a history of marine research dating from the early 20th century. The Institute carries on work in marine biological sciences, including fisheries, and provides facilities for faculty members, graduate students, and visiting scientists. Though much of HIMB's activities are based at Coconut Island, it also maintains a laboratory installation at Kewalo Basin in

Honolulu and works in close cooperation with the Waikiki Aquarium, which has research and public display facilities. Thus HIMB is one of the few well-equipped marine laboratories in the world both close to a good university and with access to a near tropical biota on a tradewind island's lee and windward shores.

Representative ongoing research programs include tropical aquaculture; studies on the ecology, physiology, and behavior of marine animals; investigation of all aspects of marine toxins in the Pacific basin; inshore marine ecosystems studies, including ecological systems modeling; and research at Kewalo Basin on sensory perception and learning ability of porpoises. Other projects cover hydrographic and geological studies of Kaneohe Bay, studies of fish populations, and the microbiology of tropical inshore waters.





The Hawaii Institute of Marine Biology does not offer courses or grant degrees but is a research institute under the graduate division of the University of Hawaii. Course credits and degrees are obtained from UH departments affiliated with HIMB, such as botany, chemistry, microbiology, oceanography, and zoology (to mention only some major ones). Students interested in obtaining a graduate degree

in marine biology should apply to the UH department representing their area of special interest. Affiliation with HIMB can then be arranged through a faculty member of that department. Normal tuition and fees will apply and fellowship and scholarship aids (if available) are apportioned through those departments. Additionally, some financial aid is also administered by HIMB.





## MARINE ENVIRONMENT

Kaneohe Bay, seven miles long and approximately fifteen square miles in area, opens broadly to the sea over a protective elevated reef. The northeast tradewinds sweep directly into the Bay, resulting in an exchange of water in the northern and central sections. Salinities range from brackish conditions close to the mouths of streams to almost normal ocean conditions in the more open area.

The fringing reef platform surrounding Coconut Island is a State of Hawaii marine preserve. Within the Bay one can find sand; rubble and mud flats; patch, fringing, and barrier coral reefs; sandy and rocky shores; mangrove swamps; and estuarine biotopes. Contributing greatly to the varied ecological conditions in Kaneohe Bay are the true deepwater oceanic conditions found just outside the Bay—with depths as great as 500 fathoms—within a half-

hour's trip by launch from the HIMB laboratory.

Over 2,000 species of invertebrates and more than 500 species of fish inhabit the reef and inshore areas of Hawaii. The phyto and zooplankton of the bay waters and of the deep waters just outside the Bay are exceedingly varied and abundant. A marked gradient in the biota is evident, ranging from oceanic at the northwest end to a eutrophic estuarine situation in the extreme southeastern end of the Bay.

## COCONUT ISLAND FACILITY

HIMB's main laboratories on Coconut Island have access to the protected waters of Kaneohe Bay which surround the island. Twenty-four acres in area, this verdant island is surrounded by numerous lagoons and pools dredged in the fringing reef. Coconut Island is served by a







ferry operated nine times from Liliupuna Dock in Kaneohe.

The island is privately owned by Edwin W. Pauley and associates. Mr. Pauley (shown with Mrs. Pauley in the photo to the left) has always shown active interest in the furtherance of marine sciences and utilization of the wealth of the sea. He contributed toward construction funds for the present laboratory building and sustains a fund to support the work of a few University of California scientists at HIMB.

### **Laboratory Installations**

The Laboratory's buildings, ponds, docks, and shops are located on the windward shore of Coconut Island. The main building houses multiple laboratories as well as the administrative offices, library, and data processing center. Large outdoor aquaria and smaller seawater tables line several of the lab buildings.

Major items of equipment available include a Hewlett

Packard CHN analyzer, Orion digital pH meters, Beckman DU and DBG spectrophotometers, Zeiss photomicroscope, as well as other microscopes of all types. Also a sonifier, radio isotope equipment including a liquid scintillation counter, controlled growth chambers, continuous culture equipment, Unitherm circulators, temperature recorders, electronic recorders, photographic darkroom, and SCUBA support. The use of other research equipment may be obtained by special arrangement with individual researchers at the Manoa Campus of the University of Hawaii.

### **Boats and Field Equipment**

HIMB owns and operates three launches at Coconut Island—the 40-ft. research vessel *Salpa*, a 26-ft. Stamas fiberglass boat, and a 24-ft. personnel boat. In





addition, the 55-ft. fishing vessel *Valiant Maid* is under charter to HIMB for nearshore and interisland work.

The Coconut Island facility also maintains a fleet of skiffs with motors up to 40 hp and three boat trailers with a capacity of up to 3,000 pounds. There is also a small floating laboratory. Routine gear includes dredges, seines, trawls and nets of various types, traps, plankton nets, current meters, Nansen bottles with reversing thermometers, bathythermographs, and SCUBA gear.

Since the opportunity for investigators to observe marine species in their natural environment and the potential of experimenting with them close to that environment are the main attractions of HIMB, every effort is made to assist researchers on projects of this type.

Investigators planning research at HIMB are advised to inquire

well in advance concerning their particular requirements so as to assure availability of special gear and equipment they may need.

### **Library**

The Hawaii Institute of Marine Biology maintains an immediate-need reference library at Coconut Island. A much wider selection of research material is available through the University of Hawaii's two large libraries on the Manoa Campus and customary inter-library loans can be arranged.

### **Computer System**

HIMB operates a general purpose digital computer system for use in data acquisition and processing. The equipment consists of a 16K Nova 1200 computer with 1.2 million words of disk storage and teletype input-output. It supports

Fortran IV, Algol, and Basic languages under a disk operating system.

The computer, housed in the main laboratory building at Coconut Island, also has a time-sharing data link with a computer system in Honolulu.







## RELATED RESEARCH FACILITIES

### **Kewalo Basin Laboratory**

HIMB has additional research facilities at Kewalo Basin on the Honolulu waterfront. There are two 50-ft. diameter circular concrete holding tanks, with viewing windows, where a cetacean research program is presently underway. The basins are fed by a circulating seawater system which pumps 600 gallons per minute from a well beneath the coral mantle.

Many unique audio and visual testing systems, which are monitored both from the outdoor

testing towers and from an indoor control room containing extensive measuring and recording equipment, have been devised. Included are a Hewlett-Packard XY recorder, a spectrum analyzer, signal generators, voltage controlled oscillators, frequency counters, and solid state digital logic modules. A minicomputer with teletype output will be added soon.

### **Waikiki Aquarium**

The Waikiki Aquarium, operated by the University of Hawaii, serves to acquaint casual tourist and scientific specialist alike with a wide variety of tropical Pacific marine life. It also has limited research facilities for work on Oahu's leeward shore.

### **Pacific Biomedical Research Center**

The Pacific Biomedical Research Center, a unit of organized research of the University of Hawaii, maintains





a laboratory at Kewalo Basin. It is primarily engaged in investigation of cell and development biology utilizing marine animals. Circulating seawater labs, biochemistry labs, and electronmicroscope labs are available.

### **Look Laboratory**

Another UH facility at Kewalo Basin is Look Laboratory, a part of the Department of Ocean Engineering. This laboratory has been established for university-level research, education, and public service in ocean and coastal engineering tasks. It also conducts investigations related to water quality and human performance in the sea. Its principal research tools include a model basin and several hyperbaric chambers.

### **East-West Center**

The East-West Center, an international educational

institute established at the University of Hawaii for cultural and technical interchange between East and West, is organized into separate institutes. The Center's great strength is educational interchange, especially with the developing nations of Asia. HIMB interacts with the Center specifically through its Food Institute, which has assigned primary emphasis to a study of fisheries and aquaculture.

### **Hawaii State Division of Fish & Game**

At Annuene Fisheries Research Center on Sand Island, the Hawaii State Division of Fish & Game has developed a pilot aquaculture facility. Presently under study is a method for rearing *Macrobrachium rosenbergii*, a fresh-water prawn with a marine larval phase. The Fish & Game Division also maintains a laboratory at Kewalo Basin for marine research and HIMB cooperates

closely in its aquaculture program.

### **National Marine Fisheries Service**

The U.S. National Marine Fisheries Service Honolulu Office and research laboratory are located near the Manoa Campus. In addition, the NMFS installation at Kewalo Basin has outstanding facilities for keeping pelagic fishes as well as docking facilities for research vessels. Cooperative research involving HIMB and the NMFS Kewalo Basin facility is possible.

### **Bishop Museum**

Bernice P. Bishop Museum, founded in 1889, is famous for its extensive Pacific collections, displays, and library. Of particular value to researchers is its large exhibit of Pacific and Polynesian plants and animals which includes a display and reference collection of marine life. Bishop Museum conducts studies in the fields of marine biology, entomology, and





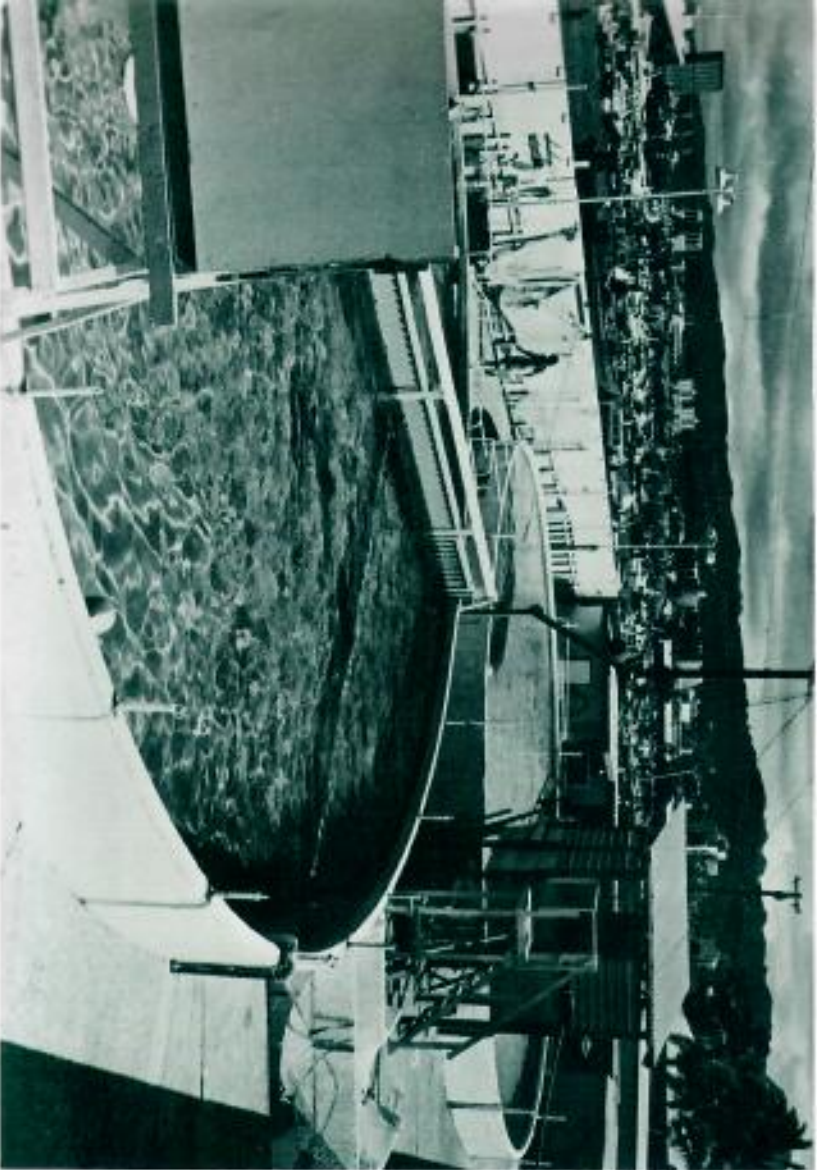
anthropology in the Pacific Basin and HIMB cooperates in several programs with their staff.

### **Oceanic Foundation**

Located at Makapuu Point in Waimanalo, Oceanic Foundation is a private non-profit research organization. It accommodates visiting scientists and works in close association with the University of Hawaii in various research and development projects. Current work at Oceanic Foundation includes a study of the grey mullet, *Mugil cephalus*, for maricultural use, environmental research, human life in an undersea habitat, and design of a floating community. On all projects where HIMB's varied expertise dictates, it interacts with Oceanic Foundation.

### **OTHER PACIFIC MARINE STATIONS**

A number of marine stations throughout the tropical Pacific has connections with the University of Hawaii and





provides an active interchange of students and scientific personnel.

### **Eniwetok Marine Biological Laboratory**

The Atomic Energy Commission established this facility in 1954 and continues to support a field laboratory on Eniwetok Atoll to investigate all aspects of atoll ecosystems. Research visits to the Eniwetok laboratory can be arranged through HIMB, which handles its administration.

### **Fanning Island Marine Laboratory**

On Fanning Island, an atoll about 1,200 miles south of Hawaii, the University of Hawaii has leased a small station for the study of marine biology and chemical and physical oceanography of the island's central lagoon and surrounding waters. Facilities are sparsely furnished. Transportation between Hawaii and Fanning Island must be arranged on an individual basis.





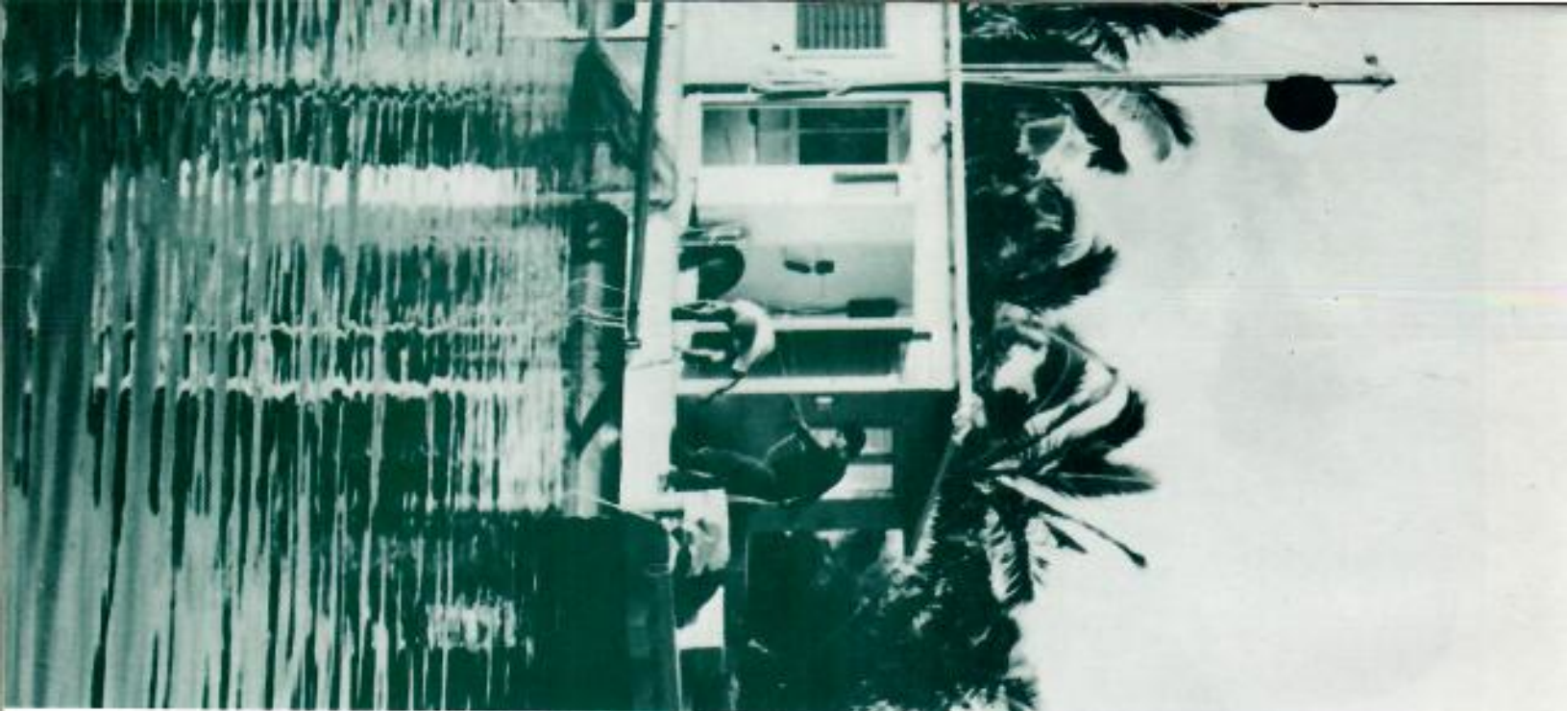
Individual visiting investigators wishing to carry out specific research projects may apply directly to the Director of the Hawaii Institute of Marine Biology. Proposal forms are available from HIMB at Coconut Island. Research programs presently underway at HIMB span a wide range of biological topics; scientists interested in marine biology from all over the world will find it easy to integrate their research quests into those now ongoing at HIMB. In fact, it is the policy of the laboratory to give preference to visiting investigators whose research can be closely linked to the overall programs of HIMB. Individual investigators presently working at the laboratory will make every endeavor to accommodate their colleagues.

### **General Information**

Since there are no dining facilities or living accommodations on the island, investigators should plan to arrange for their own housing in Kaneohe, in nearby Kailua, or in Honolulu.

Apartments and houses are generally available, but visitors will find that expenses throughout Hawaii are higher than most other areas of the United States.

The sixteen-mile trip between the University of Hawaii's Manoa Campus and Coconut Island takes about a half-hour by car and launch. HIMB operates limited transportation service between the two locations, leaving Manoa Campus in early morning and at noon and returning in late afternoon. Limited parking is available at Lilipuna Dock which serves Coconut Island. The ferry trip takes about five minutes, with boats leaving Lilipuna Dock every hour on the hour from 8 a.m. to 5 p.m. (with the exception of 9 a.m.). Service is less frequent on weekends and holidays.





Hawaii's daily temperatures average between 70° and 80° with the evenings being somewhat cooler. Winter temperatures may fall to the low 60's. Tradewinds blow from the northeast at a normal 5-15 mph. High rainfall occurs between November and March, but showers fall throughout the year.

### Guidelines

- In general, preference will be given to applicants whose study will lead to an eventual scientific publication or report.
- Investigators accepted at HIMB for six months or more can obtain University privileges for the duration of their appointments.
- While every effort will be made to aid investigators, the management of the laboratory cannot promise to provide assistance, facilities, and/or equipment beyond those stipulated. It may be possible, if suitable advance notice is given, to secure student assistance from local sources at prevailing University of Hawaii rates. Activities are carried out with the consent of the management, whose decisions will be final.
- The laboratory management assumes no responsibility for any damage, loss, or theft of personal effects or equipment brought into the field by an investigator. It is suggested that valuable articles be covered by suitable insurance.
- A condition to use of laboratory facilities is that one copy of all publications, theses, reports, maps, or other pertinent information will be given to the Hawaii Institute of Marine Biology.







- It is requested that any published research, a major part of which is accomplished at HIMB, be given a HIMB contribution number upon publication and that the Institute be allowed to purchase 300 copies for inclusion in its collected reprints.
- Any personal or institutional publicity must be cleared with the Director of the Hawaii Institute of Marine Biology.

### **Fees**

Laboratory fees include lab space and limited use of equipment and small boats when available. Investigators may use supplies in stock at HIMB on a replacement basis, but should plan to bring with them or buy locally any unusual items they might require.

#### **Present Lab Fee Schedule**

Visiting Investigator ..... \$100 per month  
Assistant Accompanying Investigator ..... \$ 50 per month

#### **Lease of Vessels**

*Salpa* ..... \$100 per day, or \$15 per hour  
*Valiant Maid* ..... \$250 per day











... To sing, because our task was done,  
When lo! *Bliss* shows and merry songs!  
What fairer yet all the distance stirs!  
A loaded raft with happy throngs  
Of gentle islanders! ...

Song from "Parvatus" by Robert Browning





*This brochure was made possible through support from the Sea Grant College Program, University of Hawaii; Research Corporation University of Hawaii; and the Menckler-Rubenstein-HIMB Fund.*



