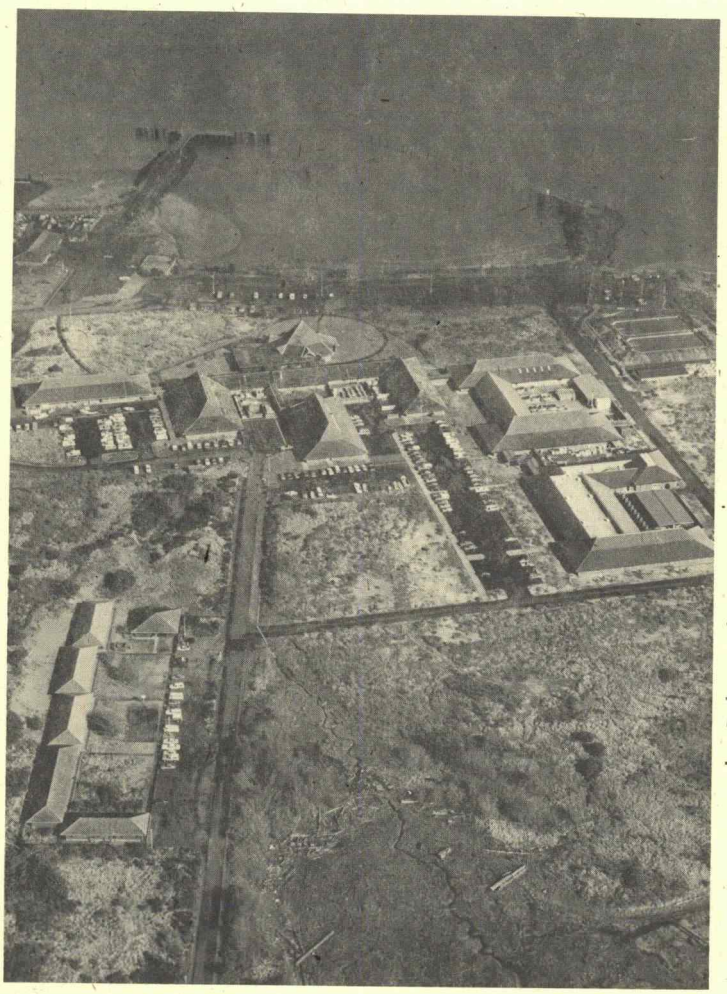

OREGON STATE UNIVERSITY Mark O. Hatfield Marine Science Center 1965-1988

The First Two Decades

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By
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Mark O. Hatfield Marine Science Center
Newport, Oregon

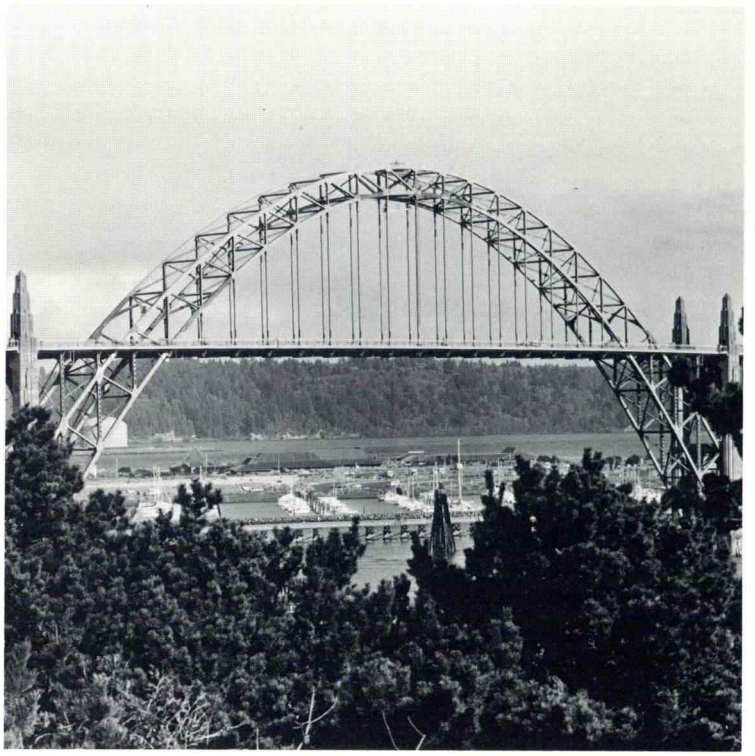
Acknowledgments

I would like to thank all the staff at the Hatfield Marine Science Center for their cheerful patience with all my questions and for their helpful responses. I especially wish to thank Dr. Lavern Weber for entrusting me with such a fascinating and challenging opportunity.

Preface

This monograph is a brief overview of the first twenty-three years (1965-1988) of the Hatfield Marine Science Center in Newport, Oregon—its growth from an unknown field station to one of the finest marine science facilities in the world. It is not intended to be an exhaustive or detailed history. Many individuals who have not been mentioned by name would deserve recognition in a more comprehensive volume.

A number of sources were used to compile this history. First, personal interviews were conducted with HMSC staff members and former staff members Willie Breese, Clay Creech, Don Giles, Jefferson Gonor, Marilyn Guin, Lee Kuhn, Jim Lannan, Bill McNeil, Bob Olson, Austin Pritchard, Jerry Rudy, Dale Snow, Gene Stewart, Lavern Weber, Bill Wick, and Dave Zopf. Many other individuals were asked questions about specific areas. Second, the HMSC archives, carefully collected and organized by Anita Stuart, were searched and information derived from files, course brochures, telephone lists, newspaper clippings and student class lists. Third, a draft was written and then reviewed by John Byrne, Jeff Gonor, Joel Hedgpeth, Bill McNeil, Bob Olson, and Lavern Weber. Dr. Hedgpeth wrote most of the first section, "Origins of the Concept of Marine Stations." The author, however, claims full responsibility for any errors and omissions in this history.



Origins of the Concept of Marine Stations

Marine stations, or laboratories by the sea, had their beginning in the middle of the 19th century as the result of several almost simultaneous events: the development of reasonably inexpensive microscopes, the improvement of access to seashore localities by the development of railroads, the interest aroused by the publication of popular books about seashore life and the resulting fascination for marine aquaria, and the intense interest in the study of all kinds of living organisms stimulated by the publication of Darwin's *Origin of Species* in 1859. At the same time there was concern for fishery resources, and the first permanent station (that is still existent) was the laboratory at Concarneau in Brittany, founded in 1859 by J. J. Coste for the study of oysters and oyster culture.

The first permanent station for general research of marine organisms and the sea was founded in 1871 by Alexander Kovalevsky as the Zoological Laboratory of the Imperial Academy of Sciences at Sevastopol, in the Crimea. This laboratory is now one of the major marine laboratories in the Soviet Union. In 1872 Professor Henri Lacaze-Duthiers of the University of Paris initiated summer teaching programs at Roscoff, on the rocky coast of Brittany. The programs developed into the building of the Biological Station of Roscoff, which has been administered as a branch of the Sorbonne. In 1881 Professor Lacaze-Duthiers founded a second marine station, the Laboratoire Arago at Banyuls-sur-Mer on the Mediterranean coast near the Spanish border.

The Stazione Zoologica at Naples (commonly known as "The Aquarium") was founded in 1874 by Dr. Anton Dohrn, a German zoologist, as an international enterprise supported by subventions and subscriptions for research space (traditionally known as "tables") by governments, universities and scientific societies from many parts of the world. A large part of the original expense for the buildings came from Dr. Dohrn's personal fortune, and the site was leased to the Dohrn family by the city of Naples for 90 years.

All the maritime nations of Europe now have marine laboratories, most of them associated with universities and fisheries bureaus. The Marine Laboratory of the Marine Biological Association of the United Kingdom was founded in the wake of the great International Fisheries Exposition in London, held in 1883. Studies of economic significance have been an important aspect of the research program and there are also several government fisheries laboratories in the United Kingdom. The Plymouth laboratory opened its doors in 1888, the same year that the Marine Biological Laboratory at Woods Hole, Massachusetts, was established.

The MBL, as it is familiarly known, was inspired by the famous summer school held by Louis Agassiz on Penikese Island in Buzzards Bay, Massachusetts, during the summer of 1873. The Woman's Education Association of Boston raised the funds for the establishment of a permanent teaching laboratory at Woods Hole, and the first small building was ready in July 1888. For most of its existence

MBL has been a teaching and research laboratory open only during the summer months. Most of the major universities of the country required experience at a field station as part of graduate training in biology, and Woods Hole became the most popular place for aspiring zoologists. The MBL now operates on a year-round basis with a resident staff and a regular research program.

Woods Hole has developed through the years as one of two major centers of oceanographic studies in the country. The advantages of Woods Hole were recognized by Spencer Fullerton Baird, our first commissioner of fisheries, who was responsible for establishing the country's first fisheries laboratory there in 1885 in response to the declining stocks of fisheries. He was also responsible for the construction of our first deepwater fisheries research vessel, the Albatross, launched in August 1882. From June 12 to August 22, 1914, Waldo L. Schmitt, naturalist of the Albatross, and research assistants were based at Newport, Oregon, to undertake fisheries research while the ship was dispatched to Alaska for an inspection trip by officials from Washington. Thus it may be said that Newport's first fisheries investigations were begun in 1914.

The first marine biology laboratory on the Pacific coast was Stanford University's Hopkins Marine Station at Pacific Grove, founded in 1892. Hopkins Marine Station was operated as a year-round station from the outset and has excelled through the years in its teaching program and the many distinguished students it has produced, especially in invertebrate zoology and algalogy. In 1903 professors Trevor Kincaid and T. C. Frye of the University of Washington began a summer teaching program at Friday Harbor on San Juan Island that has developed into a major teaching program and has operated on a year-round basis since the construction of additional laboratories and housing facilities in 1961.

The University of California's extensive system of research laboratories by the sea began with the efforts of William Emerson Ritter, professor of zoology at Berkeley. Ritter had become involved with a group of influential citizens, including Ellen Browning Scripps, who committed financial support and organized the San Diego Marine Biological Institution in 1903. Later the present property north of La Jolla was purchased from the city of San Diego and in 1912 the institution became part of the University of California. In 1925 the name was changed to Scripps Institution of Oceanography under the directorship of Dr. T. Wayland Vaughan. At that time, however, oceanography was not a major concern of American scientists and no academic major in the subject was available. Dr. Vaughan did more than name Scripps an oceanographic institution—he literally founded the subject in the United States and was an influential member of the National Academy of Science committee on oceanography that was set up in 1927.

The National Academy of Science committee made significant and major contributions to public awareness of oceanography and the most

immediate result of its deliberations and reports was the establishment of the Woods Hole Oceanographic Institution (WHOI) in 1930 with funds provided by the Rockefeller Foundation.

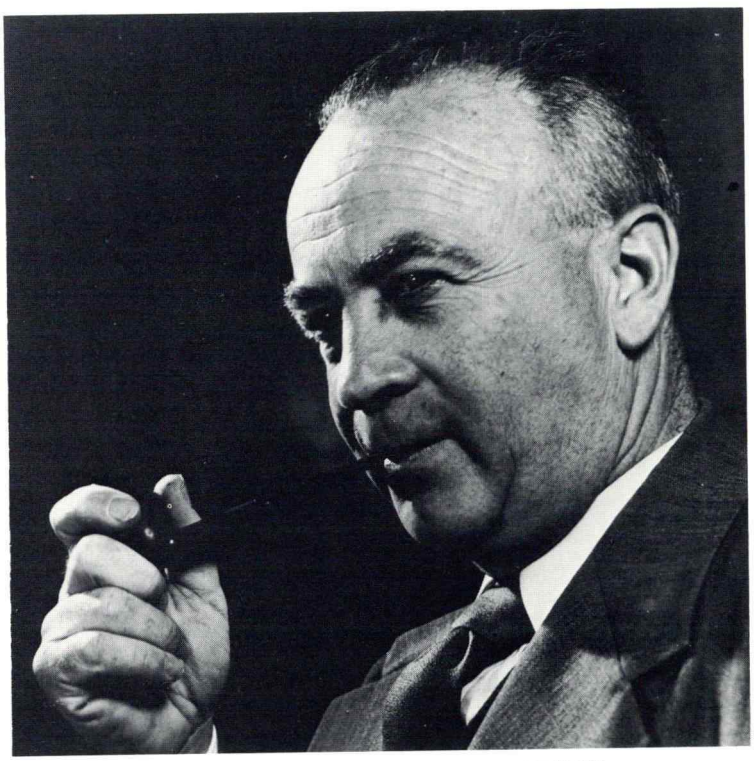
Oceanography and oceanographic institutions did not get into higher gear until the United States became involved in the worldwide naval warfare phase of World War II. Scripps and Woods Hole expanded like novas and the Navy learned the value of, and need for, oceanographic information of all sorts. Even the early charts of the Pacific Islands made by the Wilkes Expedition in the 1830s proved to be of strategic value and for a while the first great textbook of oceanography, Sverdrup, Johnson, and Fleming's *The Oceans* was restricted to circulation within the United States. The Navy set up an Office of Naval Research (ONR), which at the outset had a liberal policy of support that included substantial subvention of preparation of the Treatise on Marine Ecology, and whose ONR structure influenced the establishment of the National Science Foundation.

Early Marine Science in Oregon

Within this national and international setting, Oregon's involvement with the sea has undergone similar changes. Summers at the seashore and Chatauqua-like "educational institutes" were very popular in the late 1800s and early 1900s. Although conditions were primitive on the coast, Oregon State University (then Oregon Agricultural College) felt an obligation to share its knowledge with all citizens and for several summers at the turn of the century provided a lecture series at Nye Beach. Families would travel to Newport, set up tent cities on the beaches, and then hear distinguished scientists discuss their specialities. These sessions did not last, but OSU classes continued to visit the coast for field trips.

Between 1925 and 1930 the University of Oregon held summer classes in a camp at Charleston. The organizers of the original summer camps were Henry B. Yocom, zoologist, and Ethel I. Sanborn, botanist. Four courses were offered.

In 1939 Roland Dimick, head of the OSU Department of Fisheries and Wildlife, set up the Yaquina Bay Marine Laboratory at Sally's Bend on Yaquina Bay. Later a small laboratory was constructed on the east side of the bay. Scientists did basic research on forms of bay life, developed water quality bioassay techniques and conducted applied research on oyster and clam aquaculture. A brass plaque at the Hatfield Marine Science Center honors Professor Dimick "in recognition of his pioneering achievement in the establishing and in fostering the development of the University's original marine biological laboratory on Yaquina Bay, which was located at Yaquina from 1939 until 1965."



Roland Dimick, Head of Department of Fisheries and Wildlife. Courtesy of L. Kuhn

In 1940 the federal government deeded an old Civilian Conservation Corps camp in Charleston to the University of Oregon. Before much could be done, however, the Army took over the site from 1941 to 1945. In 1946 the facility was again available and Dr. Ivan Pratt of Oregon State University became the director and conducted summer sessions in the old buildings in conjunction with the University of Oregon, Portland State University and OSU. Funding shortages forced the closing of this facility in 1952 and it did not reopen until 1956 when the University of Oregon assumed its administration.

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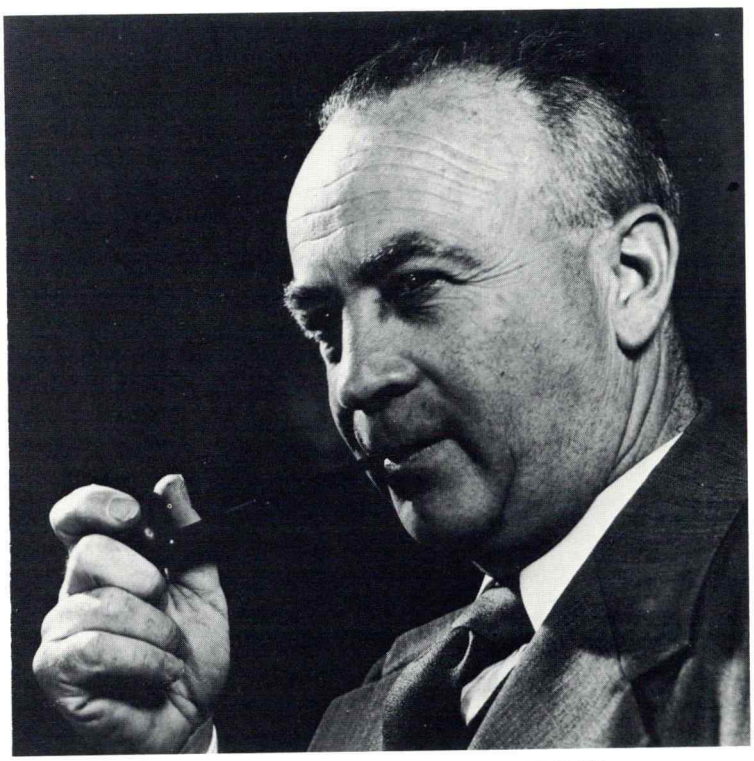

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The National Science Foundation Act, passed by Congress in 1950, was a significant event in the development of ocean and marine studies. The act, which was strengthened in 1958, provided nonmilitary funding for basic scientific research. Oceanographic research had taken tremendous leaps forward during the war because of the military's interest in the development of sonar and in other defense-related research. In 1954 Wayne Burt was hired as a member of the OSU Department of General Science. In the fall of 1958, Oregon State reacted to the first Office of Naval Research ten-year plan for oceanography budget by establishing a new graduate Department of Oceanography to begin in July 1959 with Dr. Burt as the first chairman.

With funds from the Office of Naval Research and the National Science Foundation, Oceanography was able to build the *Acona,* an 80-foot, 154-ton vessel, the first vessel designed and constructed specifically for oceanography research in the United States since 1932. With the increased funds from ONR and with the *Acona* under construction, Dr. Burt was able to attract top quality research workers, who in turn began to attract other funds for research. By the early 1960s increasing government funding was available for oceanographic and marine research and the opportunity arose for OSU to establish a permanent marine sciences laboratory at the coast.

Ivan Pratt, leading pioneer of marine biology in Oregon.
Courtesy of OSU Archives

The Founding of the Marine Science Center

The history of the founding of the Marine Science Center has had a great bearing on the direction it has taken since 1965. Three threads of development came together in Newport during that decade. The first was the economic depression on the Oregon Coast in the 1960s. Local people and state and federal legislators were looking for ways to revive the sagging economy. At the same time Wayne Burt of the newly formed Oceanography Department on campus was searching for dock and ship support facilities for his NSF-funded research vessel (first the 80-foot *Acona* which was replaced in 1964 by the 180-foot *Yaquina).* Finally, the Yaquina Bay Marine Lab founded by Professor Dimick was looking for more research space and facilities. All three came together when an opportunity arose to get a grant from the federal Area Redevelopment Administration. It seemed that all three groups could benefit from a marine science center in Newport. A grant proposal was developed, submitted, and approved. Four sites in the Newport area were studied and the current one (site of the old Yaquina Bay ferry dock) was chosen largely because of its proximity to the ocean and the availability of sufficient land for a major marine science complex.

The Area Redevelopment Administration provided a $959,590 grant for the buildings and docks, augmented by $23,500 from the state to complete the service building, and by $75,000 from the National Science Foundation to equip the east wing. The Port of Newport gave OSU the land on a

Aerial view of Marine Science Center in 1970, with R/V Yaquina at dockside. Courtesy of OSU Archives

99-year lease, and OSU agreed to run the facility. A key component in the plan was the public aquarium/museum facility, which was intended to increase tourism. The Center was officially dedicated in June 1965 with an open house.

The aquarium displays were designed by Mark Sponenburgh of the OSU Art Department with input from a professional scientific team headed by James McCauley of the Oceanography Department. The aquarium was designed to be self-guiding, and it was assumed that since the researchers would be using the specimens in the aquarium for research, they would see to their care and feeding.

Early Problems

Shortly after the dedication, several problems became increasingly evident. The public response to the aquarium was beyond expectation. Despite the fact that there were no education programs or guides, buses of school children began arriving, and 50,000 visitors came in the first fiscal year. Researchers were called upon to answer questions and welcome visitors and the aquarium took far more upkeep than the researchers could handle. The seawater system was built on the assumption that research at the Center would be estuarine, requiring only the highly variable salinity available from the bay, rather than marine, requiring high salinity ocean water. In addition, there was no backup system so the pipes got clogged with silt, marine animal and plant growth and shut off completely at times, destroying experiments in progress.

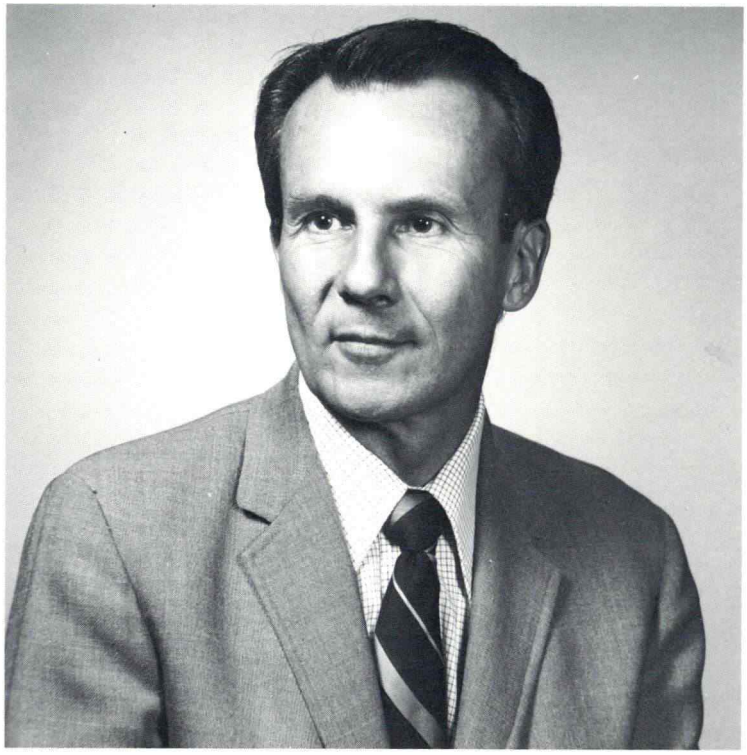
Very little money was available to operate the Center, and researchers wrote grants to obtain operating money. One of the first researchers, Willie Breese, solicited the public on radio for "investment" in oyster breeding research. The Center programs had not been the result of years of careful planning by departments at the University, but the result of seizing a sudden funding opportunity. Furthermore, the MSC was established essentially as a facility to provide nearness to the ocean and a seawater system, and development occurred without involvement of many of the regular departments to create educational programs.

Dr. Joel W. Hedgpeth was brought to the MSC from the University of the Pacific Marine Station at Dillon Beach, California, and was designated head of the Yaquina Bay Biological Lab (east wing). Dr. William J. McNeil was brought in from the National Marine Fisheries Service Auke Bay Lab in Alaska and put in charge of the west wing or Pacific Marine Fisheries Laboratory. Captain Richard Redmond was the port captain in charge of the ship support area and the physical plant. Originally the Department of Fisheries and Wildlife moved its Yaquina Bay laboratory into the west wing of the main building and researchers from oceanography, zoology, botany, and other departments, moved into the east wing. These wings operated as completely separate entities. The ship support people were stationed in the ship support service building in a region of their own. Over all,

Wayne Burt, first head of Department of Oceanography. Courtesy of OSU Archives

the director of the Marine Science Center was Wayne Burt with Thomas Scott of the Department of Fisheries and Wildlife as co-director, but both of them remained in Corvallis. Since the on-site administrators had little authority (all individuals at the Center were under the jurisdiction of their own campus departments), a tiny budget, and no clear goals, they lacked the means to build a strong dynamic program.

Another handicap was the lack of a strong library at the Center. Researchers and students had to be in Corvallis to do library and computer work, so the usual pattern was to travel to the Center to collect specimens and do experiments—and then go back to campus to write them up. The physical isolation of the Center was a strong factor working against its full integration into the University community.



John Byrne, Acting Director of Marine Science Center from 1972-1977.

Changing Administrative Structure

The administrative tangle of the beginning years of the Center has gradually been unraveled. During those early years the different groups had little reason to cooperate with each other. In 1972 John Byrne was appointed acting director of the MSC—a critical organizational change because it vested responsibility for the Center in a single individual for the first time, even though he remained in Corvallis.

Dr. Byrne prepared a report recommending reorganization of the Center. The immediate objective was to create a feeling of unity among Center personnel by emphasizing common interests rather than differences. In this reorganization the port captain was relieved of his physical plant manager responsibilities, Dr. Hedgpeth was freed from administrative duties to concentrate on the development of the instructional program, and David Zopf was made responsible for nontechnical management of the Center until a resident director chose to perform those functions. In 1976 interviews were conducted for the position of resident director, another step toward putting the major responsibility at the site rather than 60 miles away.

In 1977 Dr. Lavern Weber of the Fisheries and Wildlife Department and the Pharmacology/Toxicology faculty was chosen as the first director in residence at the Center. At last one individual had as his sole responsibility the on-site guidance and nurturing of the Center. The staff now had a champion willing and able to represent the interests of the whole MSC. The seeds of earlier efforts began to bear fruit.

Lavern Weber, first Resident Director of Marine Science Center, 1977-present.

History of the Public Wing

From the first day of operation it was apparent that a marine facility such as this was timely. Not only was the general public attracted, but teachers brought their classes in increasing numbers. A learning opportunity was present, but organized programs were needed to enhance the experience of a visit by school children.

The Sea Grant College program was created in 1966 by an act of Congress, and the Oregon Sea Grant program was officially established in 1968. OSU was one of the first four colleges so designated nationwide. The presence of a major research facility on the ocean was an important factor in selecting Oregon State University as a Sea Grant institution. In 1967 Bob Jacobson became the first full-time marine extension agent in the United States and he was assigned to Lincoln County (Newport). In the spring of 1967 operation of the public education programs at the Center became the responsibility of the Cooperative Extension Service and a Marine Extension coordinator, William Wick, began directing education activities. He developed the marine advisory program which is now known as Extension/Sea Grant. A full-time aquarist was hired in 1967 to develop and maintain aquarium displays.

Wick developed programmed guide sheets to the aquarium-museum for school groups, and a summer series of marine-related films and illustrated evening talk programs was offered. The Newport Chamber of Commerce manager reported in January 1968 that gross sales in the Newport area were up 40 percent since the Center was opened and that much of this increase was directly attributable to the presence of the Center. In 1968 the first marine education specialist, Don Giles, was hired, and a second, Vicki Osis, was employed in 1971. Marine education specialists have been instrumental in organizing a statewide Marine Science Educators Association. When Bill Wick became head of Oregon Sea Grant and moved to the Corvallis campus in 1973, Ken Hilderbrand, seafood processing specialist, moved down from the Seafood Laboratory in Astoria to become the new marine advisory program leader.

A 2,500-gallon aquarium was installed in 1966. Seven small aquaria and the museum display panel describing biological marine resources were constructed a year later. In 1971 a display of coastal birds was erected. The very popular touch tank, started in 1968, was originally 14 inches deeper than today. However, after one week during which five students fell into the tank trying to reach specimens, a false floor was added to bring it up to its current level.

Ship models and other memorabilia have been added through donations. Earphones added a dimension of sound to the displays after their installation in 1972. A weather station monitor with its continuous recording of wind, waves, and tides was installed in 1973 and the coastal archaeology display, constructed in 1984, was made possible by money from a Gannett Foundation grant.

As numbers of school groups and general visitors increased, additional part-time help has been added on a seasonal basis. During summer months, aquarium aides

show films and answer visitor questions. In 1973 the intern cooperative program began. During fall and spring, environmental interpretation interns from various OSU departments help with school programs while gaining on-the-job experience in their chosen field. Fall interns work primarily with indoor programs and spring interns concentrate on outdoor activities at Yaquina Head. An intern from the Journalism Department works on the summer Seatauqua publicity. A docent (volunteer teacher) program was started in the spring of 1974 to help the marine specialists work with the great numbers of school groups in the spring and the tourists in the summer.

By 1974 the Extension program had outgrown its original small quarters. The original plan had provided one room with a counter for the telephone operator/ receptionist by the front door. As staff increased, Don Giles and Vicki Osis were housed in offices back in the main building. At that time money became available to build the office extension which currently houses the three extension specialists, three support staff, and the numerous aides and interns.

The bookshop was started in 1968 at the request of visitors to the Center who wanted something to take home with them. A decision was made then that the bookshop would not be another souvenir store with trinkets, but rather would provide educational service as a first-class bookshop with books on marine and coastal topics. It started with a very small inventory and has continued to grow. It has generated enough income to pay several support staff salaries and cover shortfalls from Seatauqua programs.

This added income has been quite helpful because the Center has never charged admission to the aquarium. An OSU Economics Department study done in the 1970s revealed that charging admission would be counterproductive and that the great goodwill enjoyed by the Center would be diminished without much added revenue generated. In fact, the aquarium's hours have increased from six days a week to seven. It is closed only on Christmas Day.

In 1972, two- and three-day short courses on marine and coastal topics were added to existing summer educational activities and the name Seatauqua was created for summer programs. The activities include coastal geology, fossil identification, clamming, bay crabbing, Northwest Indian carving, and seafood cookery, to mention only a few of the topics. Nature walks became a part of Seatauqua in 1975.

In 1983 the name of the Center was changed by action of the Oregon State Board of Higher Education to the Mark O. Hatfield Marine Science Center (HMSC) as a token of appreciation for Senator Hatfield's continuous backing of the Center, which had been built during his term as governor of Oregon.

When Vicki Osis was hired in 1971 for the marine education specialist position, only a few teachers were actually teaching marine science and oceanography units. Teachers in the Beaverton area had just established the Northwest Association of Marine Educa-

tors which served as a starting point. Teacher workshops were begun and curriculum (such as *The World of Water)* was written. The school field trips to the Center continued to grow ever more popular as they could be integrated into units or courses. To reach out more into the schools themselves, the Mr. and Mrs. Fish program was developed in 1983, based on a similar program in Maine. This lighthearted educational approach to teaching marine biology consists of a forty-five minute program with two skits and a short slide show to reinforce concepts presented in the skits at schools. OSU students are hired to present the program, which is scheduled through the Center and is usually booked far in advance. In 1987, ninety-six schools with a total of 17,352 students were visited.

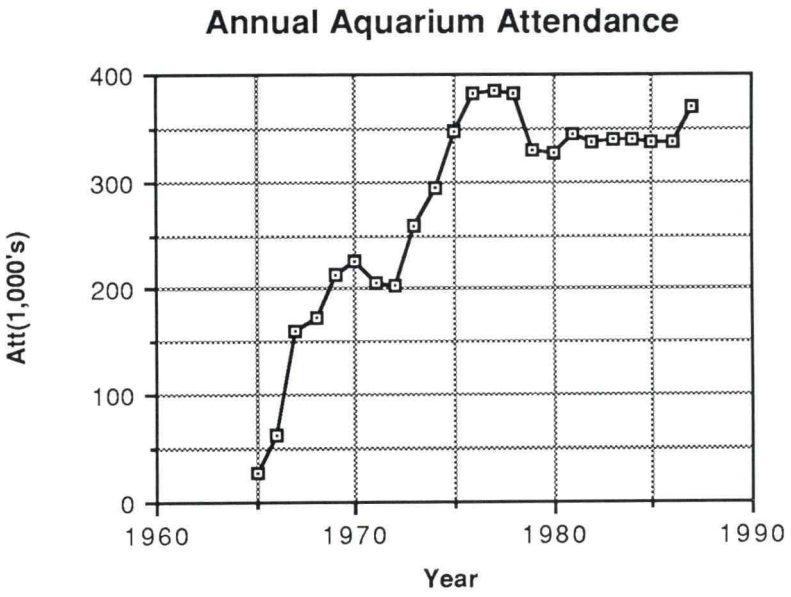
The most recent fruit of the last 15 years has been the approval of the master's degree in science education with an emphasis in marine education through OSU. Vicki Osis has organized the needed courses through the School of Education to make this degree a reality. From a handful of interested teachers in 1971 to the inclusion of marine education units or courses into virtually every school district in the state, the HMSC's marine education specialists have been the catalyst for improvement.

In 1987 an additional full-time position was added, that of marine education specialist, and Dr. Kathleen Heide was chosen to fill the position. This added person allowed Don Giles to specialize in the areas of tourism and economic development. Dr. Heide is specifically charged with improving the training for the aquarium volunteers and increasing the number of volunteers to better serve the public. In addition, Vicki Osis' position changed from three-quarter to full-time to provide the additional time needed to establish classes and training opportunities for the new Master of Science program emphasizing courses in marine education.

A cooperative agreement with OSU's Museum Studies Program, which offers courses toward the Master of Arts in Interdisciplinary Studies (MAIS) degree brought a museum intern to the Center to develop new displays for the aquarium-museum. Susan Gaughan, under the direction of Center faculty and staff, has designed the new gray whale display and the marine mammal stranding exhibit and has begun work on interpretive signs for the recently funded estuarine nature trail.

The estuary nature trail, funded by Coastal Act 306(a) funds from the Oregon Land Conservation and Development Commission in late 1987, will be built with donated labor from the Angell Job Corps and support from Road and Driveway Company. The new self-guided trail, which is to be fully handicapped-accessible, will circle the bay side of the Marine Science Center and will be equipped with interpretive signs, benches, and a covered observation area. This will increase opportunities for educational programs for the general public and visiting school groups.

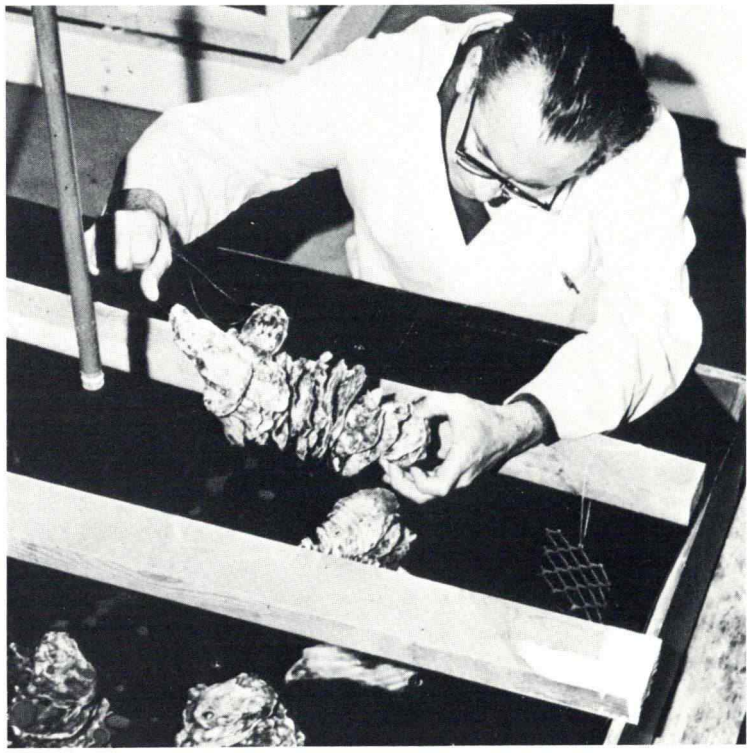
From a modest 50,000 visitors during the first fiscal year of operation, the number of people using the facility for an educational experience has grown. Today, with almost 370,000 visitors a year, the Center is a key factor in the coastal economy, as it was originally intended to be by the Area Redevelopment Administration. The popularity of all the public education programs has contributed immensely to public knowledge and awareness of estuaries, nearshore and ocean resources, ecology, and marine-related research at OSU.



Research Development at the Center

Early research at the Center included a continuation of the water quality and pulp mill waste studies that were first conducted at the old oyster lab. The work done by Roland Dimick, Charles Warren, and Wilbur Breese at the old Yaquina Bay Marine Lab had international recognition and gave Oregon State University a presence in shellfish research, important leverage in attracting the original development grant. Professor Breese brought over his ongoing research from the Sally's Bend lab and continued his work in molluscan aquaculture (oysters, clams, mussels, and scallops), molluscan hatcheries (feeding, spawning, and larval rearing), algal culture, and water quality work with industrial waste, pesticides, herbicides, and toxic materials. He headed up a pilot oyster hatchery project in 1966 that has made a major contribution to development of an oyster seed production industry. The Public Health Service water quality group (which eventually became part of the Environmental Protection Agency) had researchers stationed in the west wing from 1965. The Oregon Fish Commission (which combined with the Game Commission to form the State Fish and Wildlife Department in 1975) had offices in the west wing. The staff of the Oregon Department of Fish and Wildlife has worked closely with the staff at the Center on numerous projects from the beginning.

William McNeil worked on hatchery production of oyster seed, hatchery production of chum salmon, and the uses of heated water in aquaculture. Raymond Millemann studied "salmon poisoning" disease and the effects of pesticides on estuarine organisms. Jefferson Gonor did work on rocky shore ecology, larval biology, and reproductive biology of molluscs and echinoderms. Joel Hedgpeth, on a grant from the National Science Foundation Antarctic Research Program, did sea spider taxonomy and had two graduate students who spent a summer in Antarctica.



Wilbur Breese, pioneer in molluscan aquaculture, in his lab. Courtesy of OSU Archives

In addition to the resident staff at the Center, a number of faculty from the main campus had laboratories at Newport where they would come to work during summers and weekends. Among them were Austin Pritchard and Ivan Pratt of zoology, and Harry Phinney and C. David McIntire of botany. Dr. Pratt was a parasitologist and had graduate students stationed at the Center. Then, as now, graduate students usually completed the

majority of their course work on the main campus and then moved to Newport to conduct their research and experiments.

In 1967 the OSU Department of Oceanography used part of its Project THEMIS grant money to study the use of on-line computers in environmental research to construct meterological instrument platforms. TOTEM I, a 185-foot spar buoy developed as a prototype at a cost of $20,000, was deployed at sea for five months during the spring and summer of 1968. The tower was constructed in front of the Center, rolled into the bay, and towed out to sea. Unfortunately, the use of satellites rendered it obsolete almost before it was completed.

One of the earliest research areas at the Center was the National Weather Service/Oceanography research station that operated from 1967 to 1982, initially under the direction of Gerry Burdwell, assisted by Clay Creech. Work was done on coastal winds and wave forecasting, as well as regular weather reports for the research vessels.

When Sea Grant began funding projects at the MSC in 1969, the original Office of Naval Research and contract funds were supplemented with money that provided consistent renewal support for specific areas. When Bill McNeil left in 1973, James Lannan was given responsibility for his ongoing research projects at the Port Orford research station and Netarts experimental fish hatchery. He had already been working on projects at the Center while still stationed in Corvallis.

In 1965 Ivan Pratt established a parasitology laboratory at the Center and in 1968 assigned a resident research associate, Robert Olson, to work on marine pathogens. In the corridor connecting the education building to the original building is a brass plaque honoring Ivan Pratt. A member of the Department of Zoology, he taught, conducted research, and directed graduate programs in invertebrate zoology and parasitology from 1946 to 1973. He was resident director of the Oregon Institute of Marine Biology in the summer sessions from 1946 to 1952 while serving on the faculty of the institute as the marine biologist. Very active in the group that planned the development and building of the Marine Science Center, Dr. Pratt maintained an extensive research program and directed student research in marine biology at the Center from its opening in 1965 until his death in 1973. He was one of the founders of the Oregon Marine Biological Association and a leader in urging the Legislature to establish statutory control of the harvest of intertidal nonfood animals.

Since 1958 there had been a continuously outside-funded program on fish health at Oregon State University in the Microbiology Department, and in 1973 John Fryer of the department also established a laboratory and stationed graduate students (first David Ransom, then Warren Groberg, and finally James Winton) at the Center to study bacterial and viral pathogens.

A report written in 1972 listed the following areas of research: parasitology of marine fish and shellfish, hatchery techniques for clams and oysters, offshore sea and weather sensing, coastal sand transport,

improved commercial fishing methods, early life histories of food fish and shellfish, relations between ocean bed conditions and fish abundance, and relations between estuary conditions and shellfish abundance.

In 1975 the various agencies in Oregon concerned with estuarine management or involved in estuarine research formed the Oregon Estuarine Research Council (OERC) to coordinate their various research needs and interests. One of their objectives was to maintain an estuarine library for use by all members. The Northwest Coastal Information Center (NCIC), administered by the University of Washington, Oregon State University, and the OERC, was established to meet this goal. It was one of three pilot regional coastal information centers—one in New England, one in the Great Lakes river basin and one in the Northwest. Originally the Northwest center consisted of two stations, one at Oregon State University's Marine Science Center, established in 1978, and the other at the University of Washington's Coastal Resources Program. Robert Holton directed the Oregon station from the Corvallis campus and Linda Marston was stationed at the Center as a research literature analyst, managing the collection of state coastal management plans and other related scientific and technical materials. The NCIC was to be a part of a national network of nine such centers by the 1980s. However, by August 1979 the Washington station was closed and lack of funding closed the Newport station in July of 1981.

In 1978 Oregon State University received a four-year grant from the National Institute of Environmental Health Science Center for the establishment of a Marine and Freshwater Biomedical (MFB) Center. The MFB Center facilitated research and graduate teaching in examining the impact of environmental factors on aquatic animal organ functions and how that compares with the impact on man. It had two separate physical units: food toxicology and nutrition which was housed on the main campus in Corvallis and the comparative toxicology and pharmacology program at the Marine Science Center.

Although the grant wasn't renewed in 1982, it greatly expanded the scope and reputation of the HMSC. The relatively long-term funding had several effects on the Center. First, it brought in a number of new researchers, such as John Smith, and funded several graduate students. Second, it increased the visibility of the Center and highlighted an area of expertise for the whole University. Third, the original researchers and their publications drew other researchers with similar interests and different funding sources to the Center. Among them were George Mpitsos, Thomas Murray, and Donald Campbell. Dr. Mpitsos' area of expertise was the neurophysiology of learning and behavior using sea slugs. In 1984 Dr. Murray arrived from the College of Pharmacy, working in the areas of nicotinic receptors, and in 1985 Dr. Campbell joined the Center staff, doing work on sodium channels on a completely self-funded basis.

In the 1970s Oregon State University made the decision that aquaculture research and instruction would be a major mission of the Marine Science Center. Several aquaculture research projects—principally under National Oceanic and Atmospheric Administration-Sea Grant sponsorship—had been under way for years, and the instructional program offerings were refocused toward students interested in aquaculture. As a result of this mission concentration, and with the encouragement of Oregon's Congressional delegation, the National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS) was asked to consider the establishment of an aquaculture laboratory at the Center for joint NMFS-OSU aquaculture research. Programs for this new 30,000-square-foot laboratory were designed to promote the establishment and rehabilitation of marine fish and mollusc stocks by research and development in genetics, hatchery techniques, nutrition, and disease prevention. The Newport Aquaculture Laboratory, completed in 1979, was designed with these areas in mind. The state-of-the-art fish disease wing was specifically designed with quarantine rooms and pathogen-free seawater.

Because almost all of the research facilities at the Center consisted of wet (seawater) labs, there was a shortage of large, dry areas suitable for experimental engineering and analytical activities. The scientific and engineering personnel required to support the NMFS-OSU aquaculture program would need additional dry space. Therefore, the 33,000-square-foot research support facility was proposed, designed, and funded to provide shop and staging areas for shipboard and independent sampling instrumentation, instrumentation test areas, general purpose dry analysis labs, and office-administrative areas. In addition, the research support facility building featured a specially designed necropsy room where sea mammals could be dissected and studied, along with sufficient freezer space to store specimens. This building, completed in 1981, was funded by NOAA/NMFS and is operated by OSU.

In 1982 the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, and Oregon State University officially signed the memorandum of agreement establishing the Cooperative Institute for Marine Resource Studies (CIMRS). From 1983 to 1985 William Pearcy was director and he was succeeded by William McNeil. The purpose of the institute was to foster collaborative research among NOAA, NMFS, and OSU in aquaculture, fisheries, oceanography, and other marine-related fields. As part of this agreement, NMFS was responsible for assigning personnel to CIMRS at the Marine Science Center where appropriate and possible.

NOAA/NMFS established a new Central Oregon Coast office at the Center for the fish and wildlife agent responsible for enforcing federal fish and wildlife laws from Lincoln City to Florence. Larry Hilton opened the office in November 1981, coming from the Anchorage office where he had been supervisor.

A few years later, in 1983, a fish behavioral specialist, Bori Olla, was assigned to the Center, and in 1984 the Pacific Marine Environmental Laboratory assigned two geophysicists, Stephen Hammond and Robert Embley, and two support staff to the Center to work on a hydrothermal research program. From this small start the Marine Resources Research Division has grown rapidly to a staff of thirty (half stationed in Newport and half in Seattle) and has gained national attention for its discovery of hydrothermal vents along the Northeast Pacific sea floor spreading center system.

The National Coastal Resources Institute was created in 1984 by federal charter to serve an economically neglected sector of the United States—the coasts. From its base at the HMSC, the institute works with communities along U.S. seaboards and the Great Lakes. Its goal is economic diversification and development of coastal communities through compatible multiple uses of marine and coastal resources. It does this through the solicitation, review, and funding of grant proposals, approximately $100,000 per year, distributed all over the United States coastlines and Great Lakes. John Harville was the first director, and Thomas Maginnis took over the helm in 1985.

In the early 1900s the United States Fish and Wildlife Service established the first western wildlife refuge, Three Arch Rocks, near Oceanside. There are now four refuges along the Oregon coast alone. Until 1985 a single individual, based at the William Finley Wildlife Refuge in the Willamette Valley, had been responsible for both coastal and valley refuges. With more than half of the breeding birds in the lower 48 states along the Oregon, Washington, and California coasts, the need for another wildlife biologist to protect, monitor, and study marine resources was keenly felt. In September 1985 Roy Lowe opened the coastal office of the USFWS Western Oregon Wildlife Refuges at the Center. He is responsible for all coastal refuges in Oregon and is heavily involved in studying and monitoring coastal wildlife populations and changes in their environment.

Orcas in Yaquina Bay with HMSC and R/V Wecoma in background.

Seawater System

The development of the seawater system has been essential to the success of the HMSC. When the original system was built, the intake pipes were placed in the bay, just off the small boat dock. It was anticipated that the salinity of the bay water would vary with the tides and the flow of the river, but this wasn't expected to be a problem because the main research being done was estuarine, such as work with molluscs and water quality studies. However, the system did cause problems for the aquarium, by severely limiting the types of fish and marine organisms that could be displayed. Too little salinity would kill some species of local fish, while others could not handle the fluctuations in salinity. In 1973 two settling basins were built near the ship support building to solve the problem of the clogging of the lines. Once built, it was possible to use these basins as storage tanks, taking in water when it was a particular salinity and either drawing on it when the salinity in the bay was too low or closing off valves in the laboratories that needed high salinity water. This enabled the aquarium to provide better care for its animals and widen its range of species.

As time went along, funding became more readily available for marine research as opposed to estuarine research and the demand for a higher salinity (ocean water) increased. In 1977 two 10,000-gallon wooden storage tanks were used to provide more storage for salinity control. The demand soon outstripped the supply. When the NAL building was designed, two more large uncovered settling ponds and improved intake structures and pipelines were part of the plans to furnish water for the new laboratories. The RSF building included a 100,000-gallon storage tank to supply the needed volume for that set of researchers. However, it wasn't until the winter of 1986 that the entire HMSC was placed on high salinity water.

With the construction of the new EPA laboratory the need for seawater will again increase. To meet the needs of all parts of the Center, an 800,000-gallon covered storage tank and two more pumps will be built to accommodate the added growth. Without a well-functioning seawater system the Center could not operate, whether it be the aquarium, the educational program, or the research laboratories.

Development of the Instructional Program

Joel Hedgpeth began to develop an instructional program with creative means. National Science Foundation teacher participation funds were used to bring four high school teachers to the Center to work with researchers during the summer and then impart their freshly honed research skills and knowledge in their classrooms. Dr. Jefferson Gonor (and visiting faculty) taught an invertebrate zoology class every summer beginning in 1966. This was the only class offered until 1970. At the time, the main building had two dormitory rooms for overnight use by visiting scientists and graduate students.

Motivation for an instructional program at the Center came partially from the traditional use of marine stations for summer courses by the sea. Another factor was the increasing number of graduate students who were at the Center full time and available for training. The greatest motivators were the people at the Center, who wanted to use this superb facility to enrich the University's offerings. The groundbreaking work of Hedgpeth and Gonor was built on by Richard Caldwell, James Lannan, William McNeil, Robert Olson, Harry Phinney, Austin Pritchard, and others. The instructional facilities were quite limited—one classroom and one instructional lab. In addition, the distance from campus and the lack of student housing limited the original offerings to one- or two-day-a-week marathon sessions. During the regular school year students would be bused to the Center Tuesdays and Thursdays to take one class in the afternoon and one in the evening, returning to Corvallis each night.

Another handicap was the lack of integration with curriculum requirements. Students who spent two days a week at the Center limited their chances to take required courses on campus. Even after student housing became available, it was a luxury to spend a quarter at the Center taking classes that didn't meet major requirements. This problem wasn't solved until 1979 when the Department of Fisheries and Wildlife required one term in residence at the Center for its major students.

Instructional problems were tackled with persistence and determination. The cadre of dedicated people at the Center who wanted to bring the MSC into the mainstream of the University worked to develop courses. Richard Caldwell was in charge of developing the instructional program beginning in 1974. He was successful in arranging new courses in fish disease, fish culture, fisheries biology, and molluscan aquaculture. Mobile labs were brought in during the summers of 1974 and 1975 to provide more space.

No undergraduate student housing was available until Li House was built in 1972. This sixteen-person, four-apartment complex is named for Dr. Jerome C. R. Li, who was the first chairman of the OSU Department of Statistics and who provided substantial support from his estate for the housing unit. The four-room bunkhouse unit was built in 1975. Another tremendous boost to the instructional and research programs came with a $300,000 donation for construction of twelve four-person apartments at the Center in 1985. The money was provided by the John N. Winton family in memory of Mr. Winton

and his lifelong interest in learning. This more than doubled residence capacity at the Center not only for regular students and summer workshop participants, but also for visiting scientists from throughout the United States and abroad. It has greatly increased the number of students that can be enrolled in any one term.

The work of a number of individuals, including then OSU President Robert MacVicar, led to the construction of the education/library building in 1976. The impact of this library and educational building is hard to overestimate. Kerr Library on campus had always been supportive of the Center, paying for journal subscriptions, books, and a student worker. In addition, a librarian was sent out from campus about once a term to determine researchers' needs and work with the card catalog. However, there was no on-site librarian and researchers did not have access to a full service library at the Center, so they had to spend days in Corvallis doing library research.

With the construction of the library came the establishment of a full-time librarian position paid by the Kerr Library and staffed by Marilyn Guin. Moving the library collection from its two rooms in the main building to the new library in September 1976, she began other essential services for a first-class library: exchange of material with Kerr Library, interlibrary loans, computer data base searching, and reference services for students and researchers. The marine science collection has been built up to the point where researchers come from all over to use the Center's library. Federal funding for a new 21,000-square-foot library building has just been received. This new library will be located just south of the education building and will provide much needed room, computer facilities, and conference and study space. It is scheduled to be completed in 1990.

Another major step forward for the instructional program was the establishment of the one-term residence requirement for fisheries and wildlife major students. This requirement was proposed by Dr. Weber and was approved by the instructional committee of the Fisheries and Wildlife Department in July 1979. Winter 1981 saw the first set of students taking a number of their required classes at the Center.

In the spring of 1981 fifteen biology students were given the opportunity to spend the entire term at the Marine Science Center to take an intensive nine-week course in marine biology. This "total immersion" in the marine environment was a first for students in the College of Science. This was the first time College of Science students were able to take a single, comprehensive course in marine biology.

A course of this type had been envisioned by several faculty members over the years—among them the late Ivan Pratt. When it became possible to major in biology with a concentration in marine biology, it seemed very desirable to implement such a course. Robert Becker, professor of biochemistry and chairman of the biology program at OSU, with the strong support of the dean's office; of Dr. Weber, director of the Center; and of the department chairman, was responsible for organizing and coordinating the course.

Another key person was Robert Olson, then assistant professor in the Department of Fisheries and Wildlife, who in addition to teaching a section on marine birds, was also "coordinator in residence." Dr. Olson served unofficially as the educational coordinator at the Center from 1979 to 1985 when he was chosen to fill the actual part-time position established at that time.

Dr. Jane Lubchenco (right) working with marine biology student Fusun Diren.

Looking Ahead

A new project, funded for a ten year period, is just beginning to take root at the Center. In 1987 plans were made to locate the Adaptive COPE (Coastal Oregon Productivity Enhancement) program at the Center. COPE has two components designed to complement each other. *Adaptive COPE* is an interdisciplinary team of OSU College of Forestry scientists who conduct "adaptive" or "practical applications" research and educational programs for Coast Range forest resource managers and specialists. Their primary role is to improve the application of existing information and the implementation of new technology relative to multiple resource management. The Adaptive COPE team has four scientists: Catherine Bacon, silviculturist; Andrew Hansen, wildlife habitat scientist; Thomas McMahon, fish habitat scientist; and Arne Skaugset, soil scientist/hydrologist. The other component, *Fundamental COPE,* located on the Oregon State University campus in Corvallis, consists of scientists from OSU's College of Forestry and the USDA Forest Service Pacific Northwest Research Station. Their job is to conduct fundamental research and develop new technology relative to the management of Coast Range forest resources.

In 1987 the seeds for another leap forward were planted. With federal approval of a $12-million funding proposal, the Environmental Protection Agency will build its own building at the HMSC. Back in 1965 the original Public Health Water Quality group had plans for a building at the Center, but it took twenty-two years for that vision to come true. The 41,000-square-foot laboratory and office building will serve the researchers now crammed into the west wing of the original HMSC building. Part of the funding package includes the new 21,000-square-foot library to replace the Center's overcrowded current library. Once again the west wing of the main building will be available for other programs and/or researchers. The new buildings are scheduled for completion in 1990, ready for a new chapter in the development of the Center.

Summary

The instructional program has come a long way from one course each summer to a full academic year offering in aquaculture, fisheries, and marine biology, plus summer workshops for teachers and other professionals. The extension program continues to be one of the great success stories for Oregon State University, with steady growth in both numbers of visitors and impact on the entire educational system of Oregon through field trips, teacher training, off-site educational programs like Mr. and Mrs. Fish, and the new M.S. degree emphasizing marine education.

The first twenty-three years at the HMSC have seen tremendous changes: from barren sand to a complex of buildings housing over 180 individuals with a budget of $10 million a year. It is the home of a great cross-pollinating complex of federal, state, and university agencies and departments. Hundreds of students have done research and taken courses at the Center, and thousands of people have benefited from the public education workshops and trips. In the next decades the Hatfield Marine Science Center will continue to contribute to the development of Oregon's economic and social welfare.

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TIMELINE
Marine Science in Oregon

1925	Professor H. B. Yocum, University of Oregon, began classes in marine sciences at Sunset Bay in the Coos Bay region.
1932	U.S. government gave quitclaim deed of 75 acres of the Coos Head River and Harbor Reservation to University of Oregon to be used "solely for scientific and educational purposes."
1925-1934	Summer classes continued in tents under supervision of University of Oregon.
1936-1939	Civilian Conservation Corps (CCC) winter camp established below Coos Head at site of present Charleston facility. CCC moved out in 1939.
1937-1941	Dr. E. L. Packard, Dean of Science at Oregon State College, arranged for summer classes in the Charleston area with Dr. Yocum as Director.
1939	Establishment of a marine biological laboratory by Oregon State College on Yaquina Bay, emphasizing Professor Roland Dimick's interest in oyster and clam culture.
1940	Seafood Laboratory is started in Astoria as an integral part of OSU's Department of Food Science and Technology.
1940	Charleston CCC buildings and 12 acres deeded to the University of Oregon and the Oregon Institute of Marine Biology is formed.
1941-1945	U.S. Army occupies CCC facilities. Summer marine science classes are discontinued during this time.
1946-1953	Dr. Ivan Pratt, OSC, is resident director of OIMB, conducting summer sessions under OSC with faculty from OSC, University of Oregon and later Portland State University. After the summer session of 1952, due to imposed budgetary restrictions, OSC ends its programs at Charleston.
1955	Dr. Wayne V. Burt initiates oceanography classes at OSC.
1956	University of Oregon renovates facilities at Charleston and expands summer session programs.
1958-1967	Summer instructional programs at OIMB under University of Oregon continue with facilities available year round.
1960	OSC Oceanography program acquires first research vessel, the Acona, with National Science Foundation and Office of Naval Research grants.
1961	Oregon State College is renamed Oregon State University.
1961	Interinstitutional Committee chaired by H. P. Hansen, Graduate Dean of OSU, and Harry Alpert, Graduate Dean of University of Oregon, recommends an Oregon Joint Council of Marine Biology.

1964 First Oceanography building on Corvallis campus completed.

1964-1975 Additional research vessels acquired at OSU:
R/V Yaquina, 1964, 180 feet long
R/V Paiute, 1966, 33 feet long
R/V Cayuse, 1968, 80 feet long
R/V Sacajawea, 1969, 37 feet long
R/V Wecoma, 1975, 177 feet long

1968 University of Oregon appoints two permanent resident staff members of OIMB and acquires gift of two excess Coast Guard buildings which are remodeled into offices and laboratories.

1968 Seafood Laboratory at Astoria moves into a new laboratory facility with space for staff of 25.

1969 Dr. Paul Rudy is appointed as Director of OIMB.

1971 OSU is designated as one of the first four Sea Grant Colleges in the nation.

1972 Department of Oceanography at OSU is redesignated the School of Oceanography.

Hatfield Marine Science Center

1965 Oregon State University Marine Science Center at Newport is completed. Facilities include main building and aquarium, dockside service building, and dock for oceanography research vessels.

1965 Dr. Wayne V. Burt, Chairman, Department of Oceanography, and Dr. Thomas Scott, Head, Department of Fisheries and Wildlife, are appointed Director and Associate Director respectively of the MSC.

1967 OSU acquires gift of land on Netarts Bay and builds a modest hatchery and laboratory on Whiskey Creek for research on salmon production.

1967 Dr. John V. Bryne is appointed Chairman, Department of Oceanography, OSU.

1967 OSU acquires U.S. Coast Guard facilities at Port Orford for marine research.

1968 OSU receives first institutional Sea Grant award.

1970 Separate 9,000-square-foot laboratory is completed for Oregon Department of Fish and Wildlife next to main building at MSC.

1972 Port Orford research station is returned to the Coast Guard because of budgetary restrictions.

1972 Dr. John V. Byrne is designated Director of the Marine Science Center.

1972 Li House resident building is completed at MSC.

1973 Year-round instruction at the MSC is established.

1973 Main staff access road is paved and storage/sedimentation tank for seawater system is constructed.

1974 Office addition to the aquarium to handle the Sea Grant Marine Advisory Program staff is completed.

1975 City of Newport connects MSC with water and sewer services. The new high volume seawater facility is operational. The bunkhouse is completed.

1975 R/V Wecoma is stationed at the MSC.

1976 Completion of education/library building at MSC. Dedicated in 1977.

1977 Meeting/dining hall for housing complex is completed.

1977 The position of Director of the Marine Science Center is expanded, placing responsibility and authority for the entire complex with the on-site director. Dr. Lavern J. Weber is appointed to fill this position.

1978 Northwest Coastal Information Center stationed at MSC.

1978 Four-year funding for Marine and Freshwater Biomedical Center received.

1979 Newport Aquaculture Laboratory building funded by National Oceanic and Atmospheric Administration (NOAA) is completed.

1979 Fisheries and Wildlife Department establishes one-term residence requirement at MSC for major students.

1980 Environmental Protection Agency moves its entire Pacific Marine Division from Corvallis to the MSC and leases the newly vacated west wing of the main building.

1980 First intensive one-quarter course in Marine Biology for College of Science students is begun at MSC.

1981 Federally funded Research Support Facility building is completed.

1981 First required winter term for Fisheries and Wildlife majors at MSC.

1981 Northwest Coastal Information Center is closed for lack of funding.

1982 Cooperative Institute for Marine Resource Studies (CIMRS) established at the MSC.

1983 OSSHE officially changes the name of the OSU Marine Science Center to the Mark O. Hatfield Marine Science Center in honor of the man who was governor of the state when the HMSC was established.

1984 Pacific Marine Environment Laboratory assigns Marine Resources Research Division to HMSC.

1984 National Coastal Resources Research and Development Institute is established with headquarters located at the HMSC.

1985 First official educational coordinator position (part-time) established and filled by Robert Olson.

1985 Donation of $300,000 is received and construction begins on a twelve-unit apartment complex, Winton Housing, which will increase student housing capacity at the Center from 40 to 88.

1985 United States Fish and Wildlife Service stations Roy Lowe, coastal wildlife biologist for the Western Oregon Wildlife Refuges, at the HMSC.

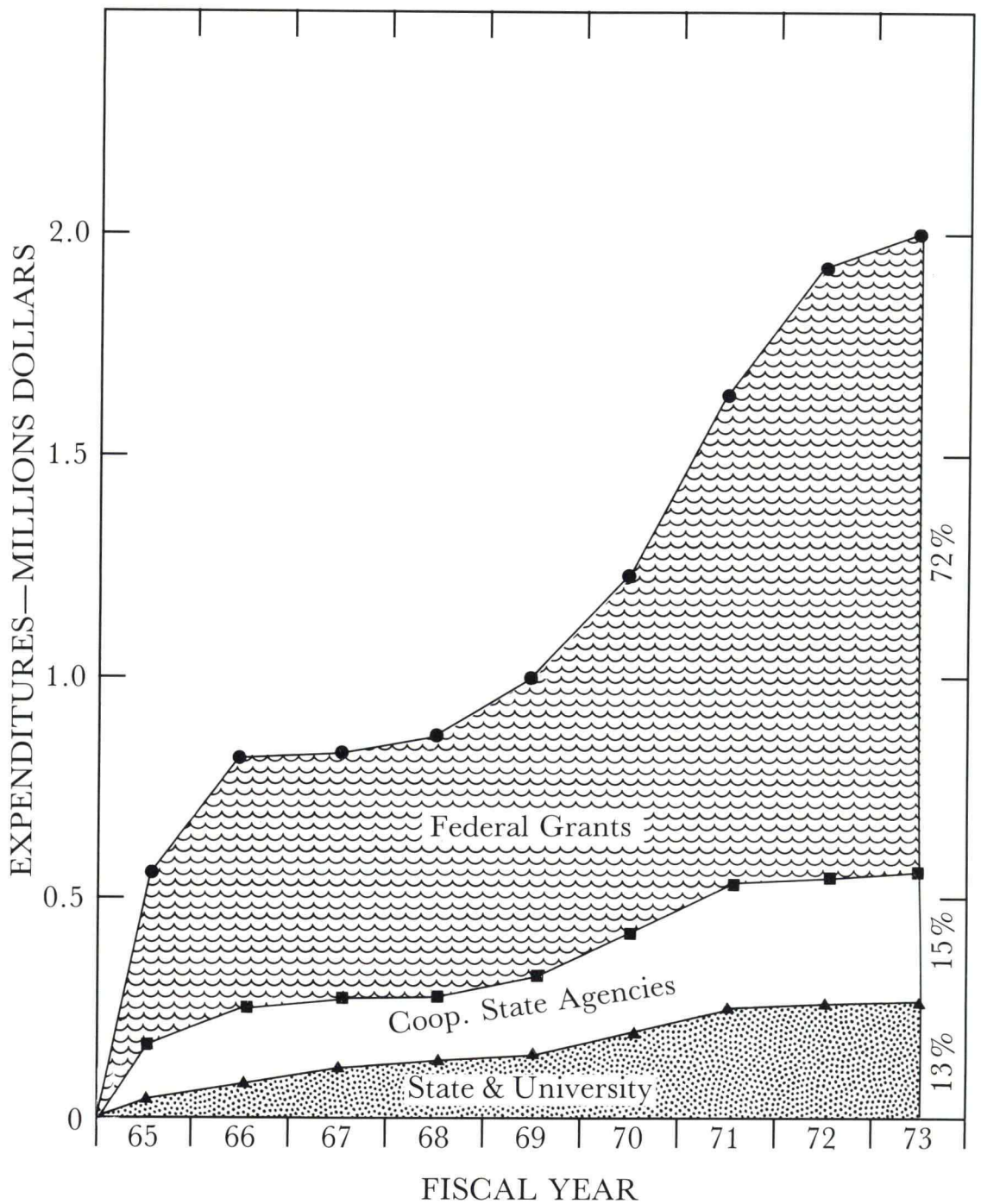
1987 Coastal Oregon Productivity Enhancement Program (Adaptative COPE) established at the HMSC.

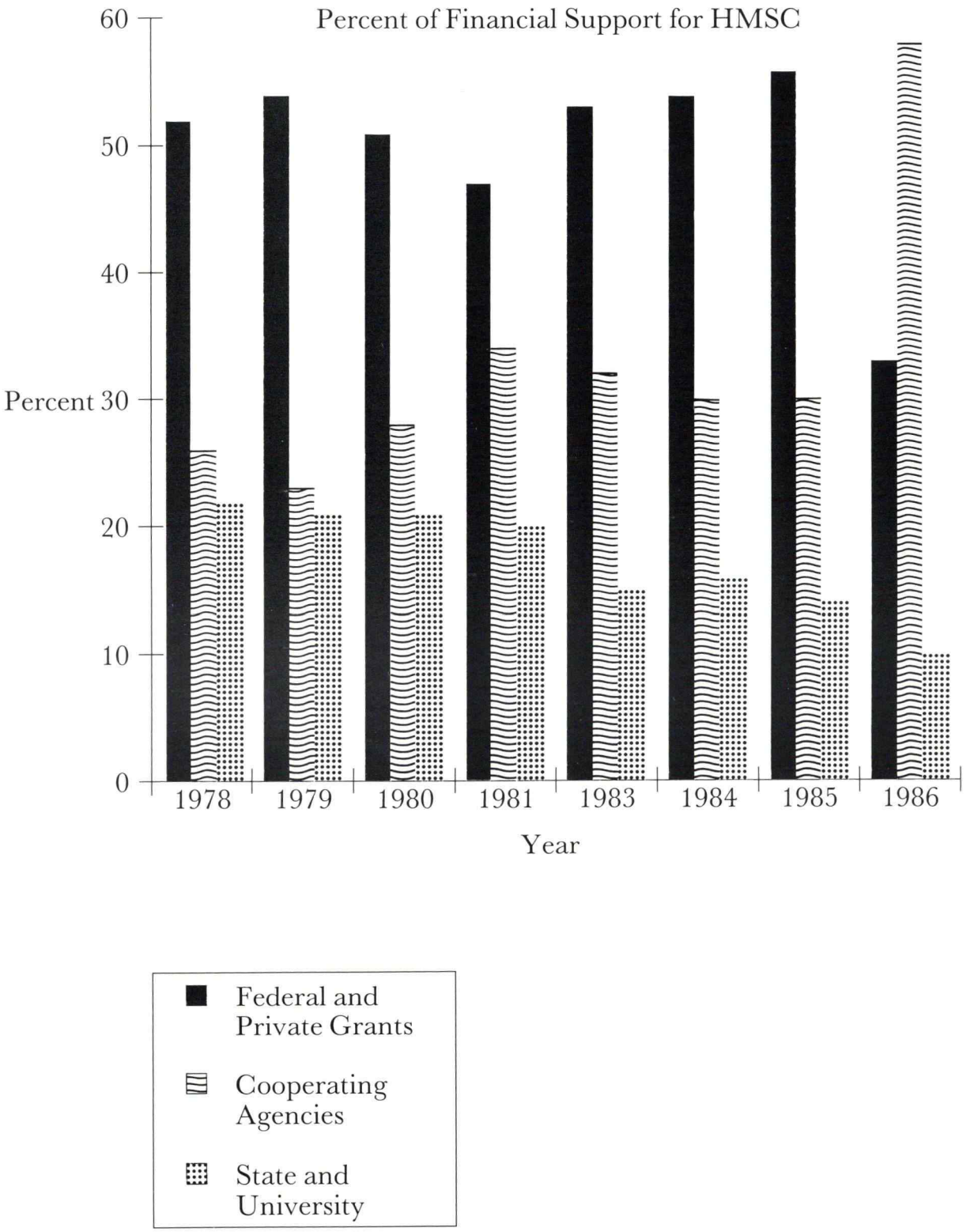
1987 Funding approved for $12-million EPA laboratory building, tow tank, and library at the HMSC to be completed in 1990.

1987 New marine education specialist position established. Public education specialist's responsibilities altered to include tourism.

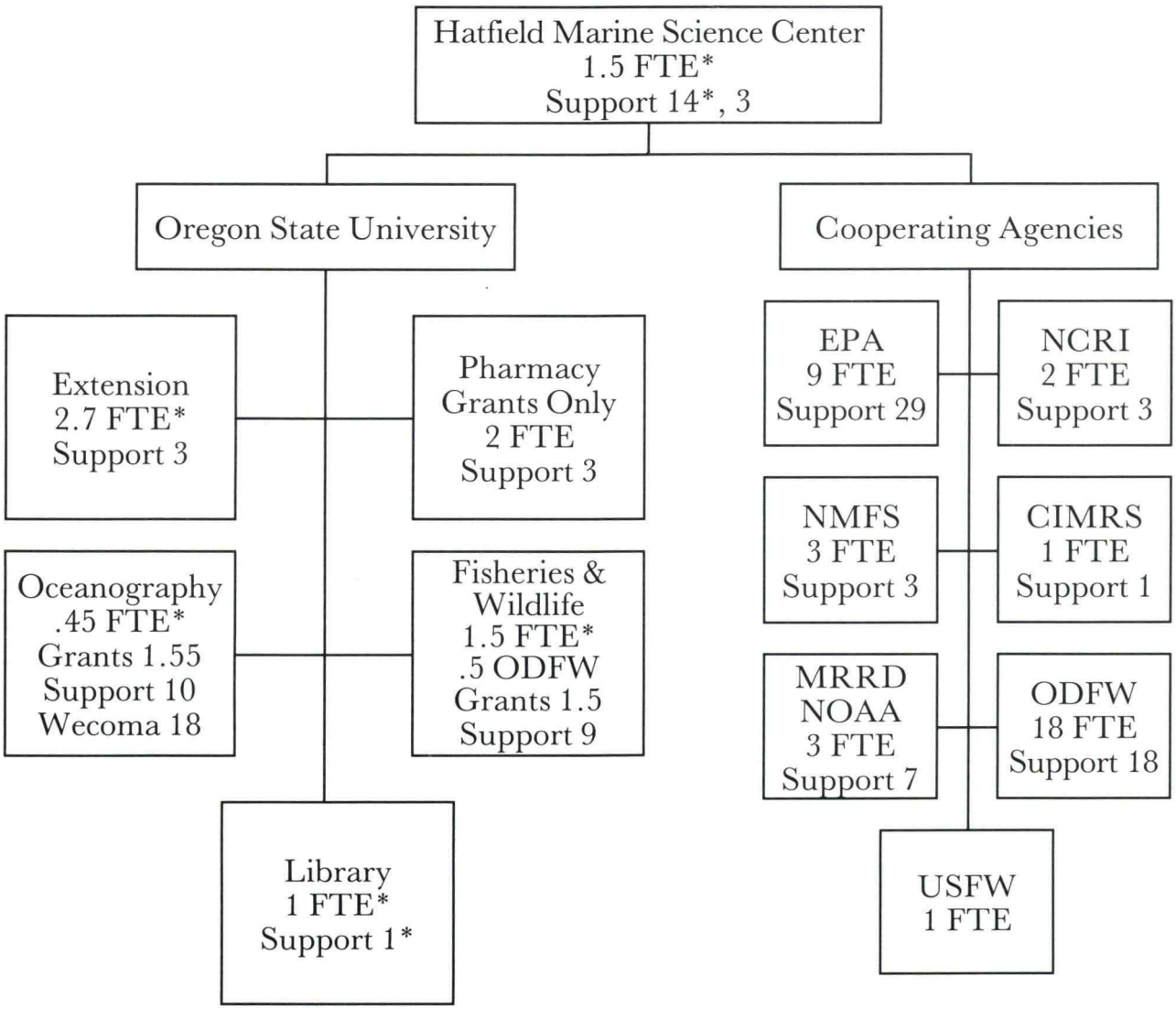
OSU
MARINE SCIENCE CENTER

EXPENDITURE HISTORY




Percent of Financial Support for HMSC
60
50
40
Percent 30
20
10
0
1978
1979
1980
1981
1983
1984
1985
1986
Year
Federal and Private Grants
Cooperating Agencies
State and University

STAFF DISTRIBUTION AND GRANT FUNDING SUPPORT AT THE HMSC
FTE = Full Time Equivalent
JANUARY 1987



* State Supported

USFW = U.S. Fish and Wildlife Service
ODFW = Oregon Department of Fish and Wildlife
EPA = Environmental Protection Agency
NMFS = National Marine Fisheries Service
MRRD = Marine Resources Research Division
NCRI = National Coastal Resources Institute
CIMRS = Coopertive Institute for Marine Research Studies

Graduate Students = 14