

More Than \$10 Million Paid to Fish in U.S. 200-Mile Fishery Conservation Zone

Foreign nations have paid the United States more than \$10 million for fishing within 200 nautical miles of the U.S. coast this year, Secretary of Commerce Juanita M. Kreps has announced. The 1977 payments were due 1 May from nations already fishing within the zone. Payments are for fees charged under the Fishery Conservation and Management Act of 1976 and include both permit fees, based on vessel tonnage, and poundage fees. Payments are made to the General Treasury.

The largest total fee—fully \$5,842,626—was paid by Japan, which has the largest poundage allocation. Japanese ships will be permitted to catch 1,190,960 metric tons of fish during the year within the U.S. 200-mile zone. The second largest fee—\$3,567,224—was paid by the Soviet Union, which has been allocated 648,700 metric tons. The Japanese allocation is primarily for pollock, and

the Soviet allocation primarily for pollock and hake, two species that are not sought by U.S. fishermen.

Other nations which have paid fees, and the amount of catch allocated to them, are: South Korea, \$366,828, 81,190 metric tons; Poland, \$245,672, 64,460 metric tons; and Bulgaria, \$55,380, 8,070 metric tons. In addition, \$176,147 is due from Spain for 14,400 metric tons and \$25,816 from Taiwan for 5,510 metric tons.

Another estimated \$350,000 in fees is expected later in the year when Romania, the German Democratic Republic, the Federal Republic of Germany, France, and Italy begin their fishing operations.

The 1977 allocations were made to foreign nations from totals remaining after determining the total catch for each species that would permit the fish stocks to be maintained in a healthy condition, and after subtracting the es-

timated U.S. catch of each species.

The total amount of fish allocated to be caught by foreigners in 1977 is approximately 2.04 million metric tons. In 1974, foreign fishing vessels caught about 3.3 million metric tons within 200 miles of the U.S. coasts.

The fee schedule provides for a fixed annual fee of \$1.00 per gross registered ton (GRT) for any vessel catching, taking, or harvesting fish. A fixed annual fee of 50 cents per GRT, up to a maximum of \$2,500, is charged for "factoryships"—those that process but do not catch fish. A fee of \$200 per vessel is levied on vessels that assist the fishing and processing vessels.

The 1977 poundage fee is 3.5 percent of the 1975 ex-vessel price (price of the fish as sold at the dock)—the latest published record in the United States. Charges by country are based on allocations so they can be collected in advance as the law requires. If the actual catch is substantially lower than the amount allocated, the foreign nation can apply for a refund. Catch will be determined by U.S. observers on board some foreign fishing vessels and by vessel records.

Pacific Northwest Salmon Plan Amendments Okayed

Revised regulations for managing salmon fisheries off the Pacific Northwest coast, to help conserve chinook salmon stocks and give commercial trollers a longer season, have been announced by Secretary of Commerce Juanita B. Kreps.

The revisions permitted midseason commercial troll fishing from 1 to 15 June (2 weeks longer than previously), and increased the minimum size for commercially caught chinook north of Tillamook Head from 26 to 28 inches. They also extended the rights of the Makah Indians to include an all-species season from 1 May to 1 October, running seaward from the Makah Reservation about 50 miles to the proposed international U.S.-Canada fishery boundary. They went into effect at midnight, 24 May.

Salmon fishery management regula-

tions were instituted by Secretary Kreps as an emergency action on 26 April. Designed to produce optimum yield for U.S. commercial and recreational fishermen, the plan was prepared by the Pacific Fishery Management Council. Upon instituting the plan, Secretary Kreps suggested that the Council consider certain changes to the plan. Those of her suggestions that the Council adopted are contained in the announced revisions.

The original regulations, as approved, were expected to increase the number of harvestable fall chinooks that return to the Columbia River system by 23 percent and the number of coho returning to the system by 2 percent. Also, the 1974 commercial catch of approximately 595,000 coho salmon was expected to be reduced 18 percent by closing the season north of Point Grenville 45 days earlier than previously and by requiring the use of barbless hooks. Recreational catch of

chinook and coho north of Tillamook Head is not expected to change from the numbers of fish caught last year, the first season when recreational fishing was under similar regulations.

The Secretary suggested to the Council, however, that it consider possible further restrictions on recreational fishermen. The major aspects of the regulations are listed below.

North of Tillamook Head, Commercial Troll Fishermen: Early season for chinook from 1 May through 15 June; All-species season from 1 July through 15 September, and a late season all-species fishing season from 16 September to 31 October south of Point Grenville; A 28-inch minimum size for chinook and a 16-inch minimum size for coho.

North of Tillamook Head, Recreational Fishermen: All-species season Saturdays closest to 1 May through 31 October; A 24-inch minimum length for chinook, 16-inch minimum length

for coho; One rod per fisherman; A three-fish daily bag limit.

South of Tillamook Head, Commercial Troll off Oregon: Oregon chinook season 1 May-31 October; Oregon coho season 15 June-31 October; Minimum size 26 inches for chinook; 16 inches for coho.

South of Tillamook Head, Commercial Troll off California: California chinook season 15 April-30 September; California coho season 15 May-30 September; Minimum length 26 inches for chinook, 22 inches for coho.

South of Tillamook Head, Recreational Fishermen, Oregon: Season 1 May-31 December; No size limit; One rod; Bag limit of three fish. For California: Season, all year north of Tomales Point; Saturdays, closest to date of 15 February through 15 November south of Tomales Point; 22 inches minimum size; Daily limit of three fish, two of which must be greater than 22 inches and one between 20 and 22 inches.

NOAA SHIPS SPEND MORE TIME AT SEA

The National Oceanic and Atmospheric Administration's Seattle, Wash., based ships are spending less time in port these days. Operating schedules for some of the 10 research and survey vessels have been extended to allow NOAA scientists to conduct a growing number of environmental research projects.

The ships range in size and type from the 95-foot (57-meter) fishing vessel *John N. Cobb* to the sister ships *Oceanographer* and *Discoverer*, 303-foot (182-meter) ships especially designed for oceanographic research. The 10 Seattle-based ships, and three others that operate out of Honolulu, San Diego, and Juneau, are managed by the Pacific Marine Center in Seattle, part of NOAA's National Ocean Survey.

A NOAA ship's normal "season" has been 180 days at sea. Time in port is necessary for maintenance, repairs, fueling, provisioning, crew changes, training, or simply because winter weather is unfavorable either to navigation or research. But now, largely because of major environmental projects

that NOAA has undertaken, and because of the Commerce Department agency's responsibilities under the new law extending jurisdiction of the U.S. resource zone to 200 miles, the ships will spend more time at sea. The ships' in-port times have also been staggered, so that they are rarely all at home at once.

This year, the *Discoverer* will spend a total of 210 days at sea, working on the Outer Continental Shelf Environmental Assessment program. This study, being conducted by NOAA's Environmental Research Laboratories for the Interior Department's Bureau of Land Management, is aimed at evaluating the potential environmental impact of oil development on the Alaskan continental shelf. It includes research in Puget Sound, a probable route for oil tankers carrying Alaskan crude to refineries.

The *Miller Freeman*, a 215-foot fisheries research vessel, has had its schedule extended to 250 days for outer continental shelf and extended jurisdiction projects. Because of the increased demands on the ship and its personnel, NOAA has also supplemented its crew. The *David Starr Jordan*, which operates out of San Diego, and the Honolulu-based *Townsend Cromwell*, have also had their schedules extended to 250 days.

The *Surveyor's* season has been extended to 210 days for the outer continental shelf project and also for extended jurisdiction work. "Extended jurisdiction," explains Commander Mike Fleming of the Pacific Marine Center, "means extended effort for NOAA." The extended jurisdiction is jurisdiction over living and nonliving resources. If a resource exceeds U.S. needs, other nations may harvest the surplus. In the case of living resources—fisheries—research is needed to determine the standing stock of different species, as well as the health of that stock, to decide how much it can be fished. "In the case of mineral resources," Fleming continues, "we need to know how mining or drilling will impact on the environment."

NOAA's National Marine Fisheries

Service has responsibility for protecting marine mammals—whales, seals, and porpoises. All NOAA ships now keep records of marine mammals they happen to sight. In addition, the *Surveyor* and *Discoverer* dedicate a month to study of marine mammals. The *Surveyor* has proven especially valuable for such studies because it carries a helicopter. People on the ship had no way of knowing how the presence of the ship affected their counts of porpoises or whales. So while the ship makes its normal transects of a section of ocean, observers on the helicopter watch from above to see how the animals react to the ship—whether they approach it or flee.

Tuna Fishing Enforcement Regulations Clarified

A clarification regarding the enforcement of regulations for tuna fishing on porpoise now permits fishermen to continue a set on porpoise even if eastern spinner—a depleted species—is identified after the set has begun, the National Marine Fisheries Service has announced.

Regulations provide that schools that contain eastern spinner cannot be encircled with a purse seine net. Under the clarification, when the tuna boat captain is satisfied that a school does not contain eastern spinner, he may begin his set. If eastern spinner are subsequently sighted and accidentally encircled or killed in the course of completing the set, this will not be cause for issuance of a notice of violation provided all other procedures required by applicable regulations have been followed.

The number of eastern spinners which is encircled or killed during the fishing operations will be recorded and this policy will be reviewed periodically to see its effect on the spinner population.

The clarification results from hearings held last fall, during which testimony was presented on the difficulty of identifying different species and on the degree of error in attempting identification. At the hearing it was established that in a small percentage of sets

an unintentional and accidental mortality would occur. Under the law fishermen would, as a result of such unintentional taking, be subject to penalties under the Act. Moreover, there is evidence that once a set involving porpoise has begun, aborting the set is extremely difficult, if not impossible, and there may be more harm done to porpoises by attempting to abort the set than by continuing it.

Following the close of testimony, both the Environmental Defense Fund and the Marine Mammal Commission recommended to NMFS that an accidental take of up to 6,500 eastern spinners be permitted.

USSR-U.S. Cooperate in Fishery Research

A National Marine Fisheries Service (NMFS) team of eight biologists from the Northeast Fisheries Center Laboratories in Narragansett, R.I., Sandy Hook, N.J., and Woods Hole, Mass., was in Moscow from 17 to 21 January to discuss the joint U.S.-USSR program of fisheries research in the northwest Atlantic within the new U.S. 200-mile fisheries zone. The U.S. scientists met with Soviet specialists from the All-Union Scientific Research Institute of Marine Fisheries (VNIRO) and the Atlantic Institute of Marine Fisheries and Oceanography (AtlantNIRO).

The director and other top officials of VNIRO opened the meetings with a review of their current research on fisheries production and assessment and of current and proposed environmental studies. The U.S. team began its presentation with a call for the continuation of scientific studies, the systematic sharing of survey work, and the initiation of a series of joint scientific workshops.

Following a review of current U.S. research on fishery assessment and environmental and ecosystems studies, Richard Hennemuth, head of the U.S. team, introduced the overall program of the Northeast Fisheries Center. In particular, the U.S. team stressed six areas of U.S.-USSR cooperative research in

fish life history studies: 1) Investigation of movements, stock intermixing and mortality rates; 2) age validation on studies for silver and red hake; 3) food habit studies; 4) silver and red hake life history studies; 5) hydroacoustical testing to improve surveys of pelagic species; and, 6) the continuation of Soviet studies aimed at determining the area and time of squid spawning.

The U.S. team also noted the mutual interest in studying marine ecosystems in order to develop prediction models of fish biomass and distribution. Two areas proposed for this study were Georges Bank and the Gulf of Maine. For 1977, three Soviet cruise periods were suggested: 15 May-15 June, 15 July-15 August, and 1 October-5 November.

The U.S. team recommended a series of joint workshops and suggested the following schedule for 1977: 1) 10-20 April at Szczecin, Poland (the plankton sorting and identification center); 2) 15-20 June, also at Szczecin (a workshop on larval herring); 3) 15-20 December at Narragansett, R.I. (a workshop on larval fish food and ecosystem model development).

The U.S. delegates added that fishery specialists from other countries might also be invited to participate in these workshops to maximize the exchange of scientific data. There seemed to be a general feeling among the U.S. scientists, and perhaps among the Soviet participants as well, that it would be pointless for the USSR and United States to organize scientific research in northwest Atlantic waters without the participation of other nations that were already doing similar important research in the area.

The U.S. team also brought up the possibility of establishing a routine procedure for processing and analyzing samples from commercial catches, noting that such a procedure would be essential for checking the adequacy and accuracy of data supplied by foreign fishing fleets, a responsibility of NMFS. The Soviets agreed in principle that such a uniform procedure would be useful. To facilitate communications, the United States proposed the establishment of a telex link between At-

lantNIRO and the Northeast Fisheries Center. The Soviets agreed that better communications were necessary, but pointed out that certain "technical difficulties" would have to be overcome before the proposed link could be established.

Discussions among scientists interested in environmental matters and pollution were completed on 20 January. Both sides agreed to exchange reprints and publications on these subjects. The kinds of field research which might be mutually supportive of the environmental programs in the United States and Russia were also discussed, but no definite arrangements were made for cooperative work at these meetings. (Sources: U.S. Embassy, Moscow; Memorandum, Chief, Division of Environmental Assessment, Sandy Hook Laboratory, NMFS, NOAA; IFR-77/25).

According to the NMFS Office of International Fisheries, the U.S.-USSR joint fisheries research program in the northwest Atlantic began a decade ago. In 1967, the United States and the Soviet Union, for the first time, included provisions for cooperative research programs in the Mid-Atlantic bight in a bilateral fisheries management agreement.

To date, more than 200 United States and Soviet scientists and officers and the crews of 13 research vessels have participated in 49 cruises and in the development of research programs. About 100 major studies have been generated entirely or in part by the data accumulated during the cruises. Research vessel findings on species distribution and abundance have become an important part of the data base used for resource assessment in the entire northwest Atlantic.

Surveys and related studies on the fishing power of various trawls have been the key elements of the program. In addition, significant studies have been made on the development of fish stock surveys and on the spawning, growth, feeding, and mortality of major species such as cod, silver hake, red hake, yellowtail flounder, and redfish.

United States scientists and vessels have been affiliated primarily with the

NMFS Northeast Fisheries Center in Woods Hole, Mass. Soviet scientists and vessels have come from AtlantNIRO in Kaliningrad on the Baltic Sea.

Jellyfish Research May Aid Swimmers, Fishermen

Research into the toxins contained in the venom of the Portuguese man-of-war, or jellyfish—which scientists refer to as cnidarians—is underway at the University of South Florida in Tampa. The aim is to develop both an antiserum to assist persons who have been stung, and an immune serum to protect those likely to be stung, the National Oceanic and Atmospheric Administration reports.

The research, now in its second year, is being carried out by David Hessinger under a grant from NOAA's Office of Sea Grant. The Commerce Department's National Sea Grant Program provides support to colleges, universities, and other institutions for research, education, and advisory services in marine-related areas.

"Most people who are stung are not killed," Hessinger explained. "But the sting is excruciatingly painful and, if stung badly enough, a person may go into shock, drown, or succumb to a heart attack." There are no accurate statistics on just how many people are stung, nor on deaths. However, in a number of fatal instances, the stings have been considered a factor in the fatality, and there have been frequent occasions when beaches have been forced to close down because of the invasion of jellyfish.

Hessinger's work is concentrated on determining the effect of the toxins from the cnidarian venom on cell tissues. The venom from the Portuguese man-of-war is every bit as strong as that of a cobra, he said, but not as dangerous because the sting does not penetrate as far as the fangs. The Portuguese man-of-war stings with a microscopic syringe-like organism at the end of the tentacle which releases the venom. The tentacles on some Portuguese men-of-war are known to have grown to 90 feet in length, Hessinger said, which adds to the danger they pose to unsus-

pecting divers who might not see anything on the surface near them.

From the public health standpoint, Hessinger's work offers particular promise to three groups of individuals: 1) lifeguards, divers, fishermen, and others whose occupations might force them to work in waters where these organisms might be present; 2) tourists and beachgoers who might be relatively ignorant about the seriousness of a sting and blunder into them while swimming; and 3) individuals who might have a high sensitivity to a sting, such as a person with a heart condition or high blood pressure, or an individual with allergy problems.

As Hessinger sees it, methods ultimately will be developed to help all three groups against the painful stings. With the occupational group, he thinks that eventually a means will be found for injecting nontoxic venom into individuals to let them form antibodies against the venom, thus building up an immunity. For beachgoers he anticipates that a serum can be developed, containing the antibodies, for injection into a victim at the time of the stinging. For those with high sensitivities, Hessinger said, some type of program would have to be worked out through a series of sensitivity tests so these individuals would have a less serious reaction to a sting.

Because of their annual cycle of movement, the marine organisms pose threats in many areas of the world. With the man-of-war, for example, the cycle takes them along the Gulf Stream from the Gulf of Mexico, through the Florida Straits to Miami, and then up the Florida and East Coasts to Cape Cod. There, the animals are picked up by the Labrador Current, which takes them to Plymouth, England and down the coast of Africa to the Equator, where they head west again, passing the Azores to the coast of South America, and north to the Gulf of Mexico.

Unable to swim, the organisms move by sea currents and wind. They use their tentacles to get help from the currents and, through the use of muscular manipulation, they can form a sail out of their float and thus travel with the wind.

Coast Information Center Planned for New England

A network of coastal information centers for planners, marine resource managers, scientists, and the public will soon get its start with the establishment of the New England Regional Coastal Information Center, located at the University of Rhode Island's Pell Library on Narragansett Bay.

Funds for the new service, in the form of a \$50,000 grant, come jointly from three bureaus of the Commerce Department's National Oceanic and Atmospheric Administration: the Office of Sea Grant, Office of Coastal Zone Management, and Environmental Data Service. An additional \$25,000 has been pledged by the University of Rhode Island.

The New England center will be a prototype for a system of highly specialized facilities in as many as eight other locations on the Great Lakes and along the Atlantic, Pacific, and Gulf coasts, according to Robert J.

Shephard, program manager for Sea Grant's Marine Advisory Service. The centers, said Shephard, will allow members of state agencies, coastal planners, legislators, environmentalists, and the general public to obtain information and guidance on coastal area subjects, including laws and zoning regulations, scientific data, and sources of publications. Shephard added that the regional information centers would be administered through local Sea Grant programs.

In addition to providing information on coastal zone activities to a number of different groups in New England, this first regional center will also act as a referral service, exchanging information and publications among state and local governmental agencies, citizen groups, special interest groups, and the general public on the wide-ranging subjects of coastal resource planning and management.

FCMA Curbs Foreign Fish Vessels off U.S. Coasts

Implementation of the Fishery Conservation and Management Act (FCMA) of 1976 has caused a dramatic reduction in the number of foreign fishing vessels off the coasts of the United States. Preliminary reports from the National Oceanic and Atmospheric Administration (NOAA) indicated that 180 foreign fishing and fishing support vessels were sighted off U.S. coasts during March—a 40 percent reduction from the 435 vessels sighted in March of 1976.

The foreign vessels were sighted only off the coasts of New England and Alaska, whereas prior to the implementation of the 200-mile-limit act on 1 March foreign fishing vessels were found off all U.S. coasts. The ships were from five nations, as compared to 12 nations a year ago.

With the implementation of the 200-mile fishery zone, foreign fishermen are required to have permits specifying the locations, times, and species of fish they may catch.

The March counts were made by representatives of the Commerce Department agency's National Marine Fisheries Service and by personnel of the U.S. Coast Guard, conducting joint fisheries enforcement patrols from Coast Guard aircraft and cutters.

The largest number of foreign fisheries vessels, 87, were from Japan, which had 73 ships off Alaska and 14

off New England. Second was the Soviet Union with 70, of which 46 were off Alaska and 24 off New England. Third was Spain with 21, all of which were off New England. In addition, Coast Guard and NMFS personnel sighted vessels from South Korea and Canada. A summary of foreign fishing vessels operating off the U.S. coasts during March 1977 is given in the accompanying table.

New Northeast Pacific Chart Printed by NOS

Publication of a new international nautical chart has been announced by the National Oceanic and Atmospheric Administration (NOAA). Prepared by the Commerce Department agency's National Ocean Survey (NOS), the chart, number 50, covers the Northeast Pacific Ocean from Hawaii to the North American continent. It is the final chart of five small-scale metric nautical charts to be issued by NOS as part of a multination international charting program sponsored by the Monaco-based International Hydrographic Organization (IHO).

The scale of the new chart is 1:10,000,000. In addition to showing depth measurements in metric units, the chart shows the newly established Fishery Conservation Zone limits along the continental U.S. coast. The zone around Hawaii, previously not delineated, will be added at the next regularly scheduled printing of the chart.

The IHO program is designed to provide a standard series of nautical charts which can be used and reproduced by all nations. Each member nation is authorized to reprint the charts in native language, but must employ the same form of navigational information, including depth curves, sounding spacing, aids to navigation, and nautical symbols.

The nations which have agreed to produce and issue international charts are: the United States, Canada, West Germany, United Kingdom, France, Brazil, Argentina, Chile, Italy, Netherlands, Japan, India, New Zealand, Australia, and South Africa.

The four previous charts of the series prepared by NOAA's National Ocean Survey are Chart 501, which was published almost 2 years ago and covers a vast area of the Pacific Ocean off the west coast of the United States and Canada; Chart 514, which shows the northern portion of the Bering Sea; Chart 513, which covers the southern portion of the Bering Sea, including the Aleutian Islands; and Chart 500, which covers the northeastern Pacific from Alaska to Hawaii, including the U.S. west coast. The scale of these charts is 1:3,500,000.

The new chart 50 is priced at \$3.25, and may be obtained from the NOS Distribution Division (C44), Riverdale, MD 20840; NOAA Chart Sales and Control Data, 632 Sixth Avenue, Room 302, Anchorage AK 99501; National Ocean Survey (CPM14), 1801 Fairview Avenue East, Seattle, WA 98102, or on the U.S. west coast from authorized National Ocean Survey nautical chart sales agents.

USES SOUGHT FOR SHELLFISH WASTE

Shellfish wastes, now a disposal problem to seafood processors, one of these days may be the source of materials to wrap food, heal wounds, strengthen paper and cloth, and bond paper, wood, and leather. The shells of shellfish contain chitin, a cellulose-like material with great commercial potential, according to Sea Grant researchers at the Massachusetts Institute of Technology. In addition to possible use in the food, medical, and paper products industries, the material also can be used to remove radioactive heavy elements from nuclear power plant wastes and metal contaminants from drinking water.

Interest in chitin and chitosan, one of its derivatives, has taken on new dimensions recently as shellfish processors respond to regulations prohibiting the dumping of untreated shellfish waste in the sea.

"It's an instance where enforcement of pollution requirements may spawn a whole new industry," Benjamin L.

Area	Nation	No. of vessels
Off New England	Soviet Union	24
	Spain	21
	Japan	14
	Canada	1
	Total	60
Off Alaska	Japan	73
	Soviet Union	46
	South Korea	1
	Total	120
Grand total		180

Foreign vessels sighted off the coasts in 1976 were as follows: January-420, February-510, March-435, April-610, May-928, June-970, July-842, August-543, September-514, October-452, November-258, and December-240. In 1977: January-319, February-314, and March-180.

Averbach, of M.I.T.'s Department of Materials Science and Engineering, said. He is investigating ways to produce and use chitosan, funded by the M.I.T. Sea Grant Program, a national matching-fund program of research assistance for colleges and universities. The program is part of the Department of Commerce's National Oceanic and Atmospheric Administration.

Averbach said chitosan, because it readily absorbs heavy metals from both fresh and salt water, can be used to treat industrial waste streams which often contain heavy metals. Among studies at M.I.T. is one investigating the potential of chitosan for use as films for food wraps. These films, Averbach said, are twice as strong as most plastic wraps, and, more importantly, are not depen-

dent upon petroleum products for their manufacture. The scientists also are investigating medical and pharmaceutical applications for chitin and chitosan. Chitosan, Averbach said, may be used in kidney dialysis machines, with the absorptive properties of chitosan membranes removing waste materials from the blood when kidneys are not functioning properly.

Chitin comes from such shellfish as crab, shrimp, lobster, and crayfish. Depending on the species, only 15 to 25 percent of the live weight of these animals is edible. Shellfish processors dispose of the rest by dumping in the sea or taking it to landfills. But dumping has been outlawed and landfill operators dislike the waste material because in its raw form it decomposes slowly.

In a report, "Industrial Prospects for Chitin and Protein from Seafood Wastes," M.I.T. scientists suggest a two-step production mode. In the first, shellfish processors would separate the loosely bound tissue remaining in the shell and process it into a dried protein product as a supplement for livestock feed. The second step is the actual chitin and chitosan production by regional processing plants.

The study suggests that a network of chitin and chitosan plants should be built, each processing shells brought to it from a 50-mile radius. The lack of widely dispersed plants is one reason, the scientists say, why only a small portion of the 110,000-ton annual U.S. shrimp harvest lends itself to such processing.

Circulation Studied in Lakes Michigan, Ontario

Woods Hole Oceanographic Institution in Massachusetts and the University of Wisconsin have been awarded supplemental research contracts totaling nearly \$50,000 by the National Oceanic and Atmospheric Administration (NOAA) to study circulation properties in two of the Great Lakes. The awards were made by the Commerce Department agency's Environmental Research Laboratories in Boulder, Colo. Woods Hole received \$36,995 and the University of Wisconsin at Madison, \$12,171.

Under terms of the contracts, scientists at the Physical Oceanography Department of Woods Hole will continue to analyze various processes in the water circulation patterns of Lake Ontario for use in preparing forecasts of the horizontal and vertical pathways that lake contaminants are apt to follow.

Oceanographers at Wisconsin's Marine Studies Center will continue their analysis of data gathered from a grid of 12 current meters which were suspended in coastal waters of Lake Michigan near Saugatuck last year. These are part of a wider array set by NOAA's Great Lakes Environmental

Research Laboratory in Ann Arbor and a midlake set operated by the Center for Great Lakes Studies at the University of Wisconsin, Milwaukee.

Data from the current meters will provide information on coastal currents, influence of atmospheric conditions on these currents, and circulation

characteristics in the southern basin of Lake Michigan.

With supplemental funds, a total of \$110,020 has been awarded to Woods Hole, \$42,671 to the University of Wisconsin at Madison, and \$30,000 to the University of Wisconsin-Milwaukee for this continuing study.

Andrews Named NMFS Marine Mammals Chief

Thomas C. Andrews, former Director of Administration in Maryland's Department of Natural Resources, has been named Chief, Marine Mammals and Endangered Species Division of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, NMFS Director Robert W. Schoning has announced.

In his new position in Washington, D.C., Andrews will be responsible for reviewing and evaluating all marine mammal and endangered species

policies and procedures of the Commerce Department agency. He was employed by the State of Maryland as a Water Resources Planner, Natural Resources Planner, and Administrator for about 10 years. Andrews is a native of Ohio, where he received a B.S. degree at Miami University in Oxford. He also holds a M.S. degree from the University of Michigan in Ann Arbor.

Puerto Rico University Receives First Sea Grant

A program of marine advisory services will be started in Puerto Rico under a National Sea Grant Program grant awarded early this year by the National Oceanic and Atmospheric Administration (NOAA). The grant of \$39,900 to the University of Puerto Rico, marks the first time Sea Grant



funds have been awarded in Puerto Rico, according to Ned A. Ostenson, Director of the National Sea Grant Program.

"We are happy to be able to assist the University of Puerto Rico in its efforts to establish an advisory program that will provide assistance to fishermen and others in Puerto Rico," Ostenson said during ceremonies in Washington at which the Commerce Department agency award was presented to Arturo Morales-Carrion, President of the University of Puerto Rico.

Morales-Carrion said this year's Sea Grant program in Puerto Rico "represents only the beginning of what we contemplate in terms of a substantial participation of the University of Puerto Rico in Sea Grant activities.

"The experience the first year," he said, "will serve as a point of departure for future Sea Grant planning and involvement, not only at the University but in Puerto Rico as a whole."

The grant-funded program will provide technical training to marine extension agents who will serve as a nucleus for a corps of marine advisory service specialists. The program will provide fishing skill training for about 250 commercial fishermen on the east and southeast coasts of the island, including the Vieques and Culebra coastal municipalities. Matching funds of \$20,132 from non-Federal sources will augment the Sea Grant. The program further is designed to increase public awareness, concern, and appreciation for Puerto Rico's marine and coastal resources, as well as the need for proper conservation measures to preserve those resources.

The Sea Grant activities will be coordinated through a program at Humacao University College, on the east coast of Puerto Rico, in collaboration with the University's Mayaguez campus, which has a marine graduate program.

The east and southeast coasts of the island are characterized, Morales-Carrion explained, by a diversity of marine and coastal environments and ecosystems. In addition to edible fish and shellfish, the area is endowed with innumerable estuaries, rookeries, man-

groves, offshore keys, coral reefs, and other living marine systems, he said. The island of Vieques has a spectacular bioluminescent bay, and the coastal waters of Culebra island bear the best coral reefs in Puerto Rico.

Because commercial fishing in Puerto Rico depends largely on bottom fish, Morales-Carrion explained, the conservation of the estuaries, mangroves, coral reefs, and other living marine systems is of great importance to the island's economy.

Contract Awarded for Marine Studies

Science Applications, Inc., has been awarded a \$159,636 contract by the National Oceanic and Atmospheric Administration (NOAA) to help integrate research results from the Commerce Department agency's Marine Ecosystems Analysis Program (MESA). The award was made to the La Jolla, Calif., firm by NOAA's Environmental Research Laboratories in Boulder, Colo., which is coordinating the large, ecological study to assess human impact on marine environments.

MESA currently is conducting three regional projects: the New York Bight Project, the Deep Ocean Mining Environmental Study (DOMES), and the Puget Sound Project. The first MESA study was started because of extremely heavy impact of human activities, particularly ocean dumping, in the New York Bight region.

The other two MESA projects are both based in Seattle, Wash. DOMES was initiated to identify potential environmental problems resulting from deep ocean mining of minerals in the area of commercial interest southeast of Hawaii in the Pacific Ocean, while the Puget Sound study is evaluating the effects of municipal and industrial waste discharges into southern Puget Sound and of increased oil transportation and refining activities on northern Puget Sound.

More than 100 MESA research projects, conducted by numerous universities and other government agencies, are currently underway. They were established to determine the "state-of-

health" of regional marine coastal ecosystems where significant management and environmental quality problems exist or are anticipated.

Research results will be used by MESA to advise environmental managers on how to implement and use effective monitoring programs for maintaining continual evaluation of ecosystem quality, and how to strengthen the ability to make decisions concerning conflicting use of marine waters.

From these results Science Applications personnel will provide a variety of documents for final integration and preparation of new or revised MESA program development plans.

Import Restrictions on Tuna Extended

Changes to the regulations governing importation of yellowfin tuna have been announced by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, a Commerce Department agency. The effective date of an embargo on yellowfin tuna being imported which has not been caught in compliance with the U.S. marine mammal regulations was extended from 1 June to 1 August 1977.

Under the regulations, the Director, National Marine Fisheries Service, must determine that the fish being imported were caught in a manner consistent with the requirements imposed on U.S. fishing operations. Because of the time required to make such a finding and obtain proper import documentation, the 60-day extension was granted to insure the continuous flow of tuna into the country.

Canned tuna marking requirements have been modified so that canned tuna, other than yellowfin tuna, may be imported without documentation if the means used to identify the contents of the can have been approved in advance by the Service. Current regulations require cans to be labeled "Other than Yellowfin Tuna." Because processors' canning codes often identify the species of tuna, the change was made to allow more flexibility in the importation of tuna which did not require documentation.