

Eleven Appointed to Commerce Department Marine Fisheries Advisory Committee

Secretary of Commerce Juanita M. Kreps has announced 11 appointments to the Department's top level Marine Fisheries Advisory Committee. The Committee advises the Secretary on programs carried out by the National Oceanic and Atmospheric Administration.

Topics of concern to the Committee include international fisheries, conservation, aquaculture, biological and environmental research, fisheries technology, certain sections of the Marine Mammal Protection Act of 1972, and advisory services for marine recreational and commercial fisheries.

Members of the Committee are chosen for recognized competence and proven interest in the marine fishery resources of the United States and are appointed by the Secretary for a term of 3 years. Approximately one-third of the Committee members are selected each year to achieve both balanced geographical representation as well as a broad view of the U.S. commercial fishing industry, marine recreational fishing, the academic community, conservation interests, State governments, and the consumer.

The new members are: Henry J. Cofer, Jr., President, Rich-Sea Pak Corporation, St. Simons Island, Ga.; Charles H. W. Foster, Dean, School of Forestry and Environmental Studies, Yale University, New Haven, Conn.; William C. Lunsford, Jr., Assistant Secretary, Zapata Haynie Corp., Towson, Md.; Fred Maly, Outdoor Editor, San Antonio Light, San Antonio, Tex.; Edward P. Manary, Manager, Washington State Commercial Passenger Fishing Vessel Association, Olympia, Wash.

Also named were Stephen B.

Mathews, Associate Professor, College of Fisheries, University of Washington, Seattle, Wash.; Ann McDuffie, Food Editor, *The Tampa Tribune*, Tampa, Fla.; Kathryn E. Poland, State Senator, Juneau, Alaska; Haakon Ragde, Seattle, Wash., a practicing physician; Dorothy F. Soule, Director, Harbors Environmental Project, Allan Hancock Foundation, University of Southern California, Los Angeles, Calif.; Christopher M. Weld, Sullivan & Worcester, attorneys, Boston, Mass.

Other members of the Committee are: Richard B. Allen, Westport, Mass.; Edward Chin, Director, Marine Resources Program, and Director, Sea Grant Program, University of Georgia, Athens; E. Charles Fullerton, Director, California Department of Fish and Game, Sacramento; Ronald R. Jensen,

Chairman of the Board and President, Pan-Alaska Fisheries, Inc., Seattle, Wash.; Joe R. Lee, President, Red Lobster Inns, Orlando, Fla.; Edward G. McCoy, Morehead City, N.C., Director, Division of Marine Fisheries for North Carolina; Guy R. McMinds, Director, Quinault Resource Development Program, Taholah, Wash.; Frank T. Moss, New York City, Associate Editor, *Yachting Magazine*, and staff member of the National Coalition for Marine Conservation; Julius R. Nelson, New Haven, Conn., President of Long Island Oyster Farms, Inc.; Mary DePoe Norris, home economist with Seattle (Washington) Power Company; Oliver A. Schulz, Manager for Fisheries Relations, Del Monte Corp., San Francisco, Calif.; Clement Tillion, Alaska State Legislator, Homer, Alaska; Claude Ver Duin, Executive Secretary, Midwest Federated Fisheries Council, Inc., Grand Haven, Mich.; Robert B. Weeden, University of Alaska, Fairbanks, Alaska; Melvin H. Wilson, Vice President and Associate Trust Council for Security Pacific National Bank, Los Angeles, Calif.; and Charles Yamamoto, President and General Manager of C&E Radio of Hawaii, Honolulu.

Clam, Oyster, Mussel Supplies Threatened

The supply of oysters, clams, and mussels available to consumers is in jeopardy, because waters that grow shellfish are inadequately protected, and because of a tangle of Federal, State, and local regulations which threaten the industry, a Commerce Department agency report claims.

The report, "The Molluscan Shellfish Industries and Water Quality—Problems and Opportunities," has been issued by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service in response to a requirement of the Coastal Zone Management Act Amendments of 1976. The law requires the Secretary of Commerce to review all aspects of the molluscan shellfish industry, including

an evaluation of the impact of Federal law on water quality.

The report notes that shellfish-growing waters continue to be closed at a rate of 0.6 percent each year, although the rate for 1971-74 is one-half that of the previous 5-year period. The closures are blamed on inadequate domestic waste treatment and on urban runoff, which pollute the shellfish waters.

The fragmented nature of the industry also subjects it to many problems, according to the report. The molluscan shellfish industry consists largely of small businesses, many family owned, and most lacking mechanization. A joint government-industry revitalization program and a mechanism to address problems of overregulation are needed, the report says.

Cooperative Federal and State research is also needed to validate the criteria presently used to define "safe" harvesting areas. Present testing methods may well be restricting the use of resources that are, in fact, safe.

The report recommends that actions be taken and funding be provided to carry out programs authorized to protect shellfish-growing waters, and that Federal and State fish and wildlife agencies be given the resources they need to review permits and the effects of waste discharges. It also urges increased aquaculture and habitat rehabilitation.

The report was submitted to Congress by Secretary of Commerce Juanita M. Krebs. Copies are available from the U.S. Government Printing Office, together with support studies prepared by the National Marine Fisheries Service and the Sea Grant Universities of Delaware and Maine, with assistance from the University of Washington. The water quality study was prepared by Stanford Research Institute.

Contributing to the study were 22 shellfish producing states, 5 Federal agencies, the Shellfish Institute of North America, the National Shellfisheries Association, and the Pacific Coast Oyster Grower's Association.

Foreign Fish Vessels Off U.S. Coasts Drop to 437 in September

The number of foreign fishing and fishing support vessels sighted off U.S. coasts in September, 437, decreased slightly from the 492 sighted in August, according to preliminary figures released by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, a Commerce Department agency.

The 437 vessels sighted are also below the 514 sighted off our coasts in September of 1976. The decrease, primarily off the Atlantic Coast, is due to the 1977 prohibition on hake fishing, only 15 days fishing permitted in the squid fishery, and a vast reduction in

the herring allocation over 1976 quotas. Normal seasonal decline in fishing activities and reduction in the number of foreign vessels permitted to fish within the 200-mile zone contributed to the reduction.

The foreign vessels, from eight nations, were sighted off the coasts of New England and the mid-Atlantic States, west coast, and Alaska. The largest number, 325, was from Japan, which had 322 vessels fishing for groundfish and pollock off Alaska, and 3 fishing for squid off New England and mid-Atlantic.

The Soviet Union had 66 vessels: 47 fishing for hake off the Pacific coast, 2 fishing for squid off New England and mid-Atlantic, and 17 catching pollock in Alaskan waters.

Foreign vessels sighted off the coasts in 1976 were as follows: January-420, February-510, March-435, April-560, May-924, June-970, July-842, August-543, September-514, October-452, November-258, December-240. In 1977: January-319, February-314, March-180, April-235, May-374, June-767, July-786, August-492, and September-437.

The September sightings were made

by representatives of the National Marine Fisheries Service and by personnel of the U.S. Coast Guard, conducting joint fisheries enforcement patrols from Coast Guard aircraft and cutters.

A summary of foreign fishing vessels operating off U.S. coasts during September 1977 and September 1976 follows:

Area	Nations	No. of vessels	
		Sept. 1977	Sept. 1976
New England and mid-Atlantic	E. Germany	6	24
	Soviet Union	2	37
	Poland	6	7
	W. Germany	0	10
	Spain	16	23
	Japan	3	13
	Italy	1	4
	S. Korea	0	1
	Greece	0	1
	France	0	1
		34	121
West Coast	Panama	0	3
	Japan	0	1
	Soviet Union	47	38
	S. Korea	0	8
	Bulgaria	0	6
	Poland	3	9
		50	71
Alaska	Japan	322	222
	S. Korea	13	54
	Taiwan	1	4
	Soviet Union	17	42
		353	322
	Total	437	514

NOAA AWARDS BUOY CONTRACT

The National Oceanic and Atmospheric Administration has awarded a contract to Polar Research Laboratories in California to design and fabricate a set of drifting buoys which will gather information on ocean currents as part of a large federal and university-sponsored research experiment in the North Pacific.

The \$53,200 contract was let to the Santa Barbara, Calif., firm by the Commerce Department agency's Environmental Research Laboratories of Boulder, Colo.

Scientists from the Physical Oceanography Laboratory (part of NOAA's Atlantic Oceanographic and Meteorological Laboratories in Miami, Fla.) plan to deploy 14 of the buoys in the open ocean between Hawaii and Tahiti as a part of the equatorial program of the North Pacific Experiment

(NORPAX) in November and an additional seven in January. NORPAX is funded by the National Science Foundation and the Office of Naval Research.

As each of the buoys drifts along, an electronics package mounted inside will automatically transmit its position to the National Aeronautics and Space Administration's experimental Nimbus-6 satellite orbiting overhead. NOAA scientists will receive geographic position reports from the satellite for tracking the meandering and elusive currents.

The buoys will aid scientists in the long-range goals of NORPAX: to understand fluctuations in the upper layers of the Pacific Ocean and to determine the relationship of oceanographic fluctuations to the overlying and adjoining atmosphere.

RV *Townsend Cromwell* Continues Resource Assessment in Northwestern Hawaiian Islands

The NOAA vessel *Townsend Cromwell* returned to her home port in Honolulu in early November after 2 months in the waters of the northwestern Hawaiian Islands. Fishery scientists on board the research ship were continuing a survey and assessment of the living resources of that little known area begun in October 1976 and planned as part of an intensive 5-year cooperative effort with the State of Hawaii and the U.S. Fish and Wildlife Service. The *Cromwell* is operated by the National Ocean Survey and presently attached to the NMFS Southwest Fisheries Center's Honolulu Laboratory.

Using lobster and fish traps as sampling tools, scientists aboard the *Cromwell* found relatively high densities of spiny lobsters along the southern edge of the bank at Necker Island, and also at Maro Reef, Laysan Island, and Raita Bank.

Catch rates as high as 6.9 lobsters per trap were found at Necker and, according to Chief Scientist Richard N. Uchida, only 31 percent of the lobsters caught there were "shorts" or under the legal limit of 1 pound. Many of the "legals" and all of the "shorts" taken during the cruise were tagged and released at the place of capture. When recaptured, tagged animals can provide information on growth and movement.

In the fish catches made at Middle Bank, Nihoa, and Penguin Bank was a notable abundance of "taape" or blue-line snappers, introduced into Hawaiian waters from Tahiti in 1955 by the Hawaii Division of Fish and Game.

Handline fishing was excellent along the 70-120 fathom contour around some of the islands and banks, said Uchida. Snappers, including such commercially valuable species as ehu and kalikali, were plentiful around Nihoa and Necker Islands. Other commercially important fishes such as thick-lip ulua, hapuupuu, and opakapaka were abundant around Maro Reef and French Frigate Shoals. Kahala also occurred in considerable numbers

at some of the areas fished by the *Cromwell*.

Trolling produced some good catches of kawakawa, ahi, and ono, particularly at Nihoa, Raita Bank, Laysan, and Maro Reef. However, trawling for bottom fish using a Norwegian fish trawl was generally unproductive. The *Cromwell* was scheduled to continue the resource assessment survey of the northwestern Hawaiian Islands early this year.

Coastal Zone Planning Symposium Is Scheduled

"Coastal Zone '78," a national symposium on the technical, environmental, and socio-economic aspects of coastal zone planning and management, will be held 14-16 March 1978, in San Francisco, Calif., the National Oceanic and Atmospheric Administration's Office of Coastal Zone Management has announced. The Commerce Department agency, with the American Society of Civil Engineers and the Conservation Foundation, will sponsor the conference—at the Jack Tar Hotel—which is expected to attract more than 1,000 participants.

More than 200 papers will be presented covering topics such as "Planning and Management Considerations," "Environmental Considerations," and "Engineering and Other Technical Considerations." The conference will be preceded by a 1-day short course on the "History and Implementation of Coastal Zone Management." NOAA's National Ocean Survey, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the U.S. Bureau of Land Management, the U.S. Geological Survey, the U.S. Environmental Protection Agency, and various California State agencies are cosponsors. A list of paper titles and authors is available from J. Robert Edmisten, Executive Director, Coastal Zone '78, P.O. Box 26062, San Francisco, CA 94126.

200-Mile Limit Foreign Fishing Fees Set

A schedule of fees for 1978 to be paid by foreign vessels and foreign nations fishing within 200 nautical miles of U.S. coasts has been announced by the National Oceanic and Atmospheric Administration, a Commerce Department agency. The fees are required by the Fishery Conservation and Management Act of 1976, which extends U.S. fisheries jurisdiction to the 200-nautical-mile limit.

Permit fees will be \$1.00 per gross registered ton for each foreign fishing vessel; 50 cents per gross registered ton, not to exceed \$2,500 per vessel, for vessels that only process fish; and \$200 per vessel for support vessels that neither catch nor process fish. Additionally, each foreign nation with fishing vessels in the zone will be charged a poundage fee of 3.5 percent of the total dockside value of fish allocated to the nation. The only change from the 1977 schedule is the use of updated fish prices as the basis for calculating the poundage fee for 1978, computed on the basis of 1976 average dockside prices.

The average dockside value per metric ton follows for each species: butterfish, \$622; Pacific cod, \$282; Tanner crab, \$441; Pacific flounders, \$387; Pacific hake, \$32; red hake, \$185; silver hake, \$184; Atlantic herring, \$87; Pacific herring, \$100; river herring, \$96; Atlantic mackerel, \$259; Atka mackerel, \$138; jack mackerel, \$110; other Atlantic finfish, \$334; rockfish, \$298; sablefish, \$399; Pacific ocean perch, \$280; seamount groundfish, \$172; other Pacific groundfish, \$48; Alaska pollock, \$84; snails (meats), \$600; Atlantic squid, \$414; and Pacific squid, \$55.

Sonar-Like System "Hears" Ocean Sediment Movement

An underwater acoustic system, similar to sonar equipment on submarines, has been developed by engineers and scientists with the National Oceanic and Atmospheric Administration (NOAA) for monitoring the movement of sediment in water. The unique system will enable scientists with the Commerce Department agency's Environmental Research Laboratories to detect and measure sediment in the water column and let them characterize, track, and map this material.

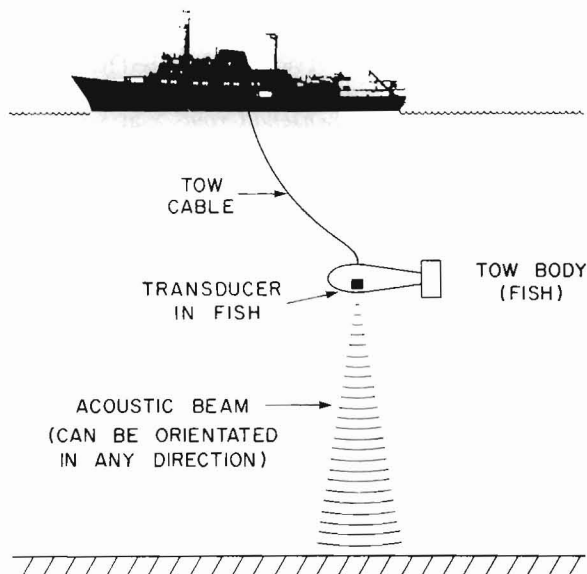
According to the NOAA scientists, the system, which is relatively portable, has broad potential for use in general oceanography, biology, chemistry, pollution research and control, and environmental impact studies. Specifically, the system can be used to study the effects of ocean and lake mining operations, dredging, the dumping of sewage sludge and other materials, and beach erosion problems.

Until now, scientists were limited in monitoring sediment transport because they could not obtain continuous measurements of the movements of the sediments in the water over a sufficient period of time, according to John R. Proni, an oceanographer with the Sea-Air Interaction Laboratory, one of NOAA's Atlantic Oceanographic and

Man-made "fish" carries portions of a portable underwater acoustic system, developed by the National Oceanic and Atmospheric Administration, which can measure small amounts of sediment to within a few centimeters of the sea or lake floor. When used for tracking dredged or dumped material, the equipment would be towed behind the ship in a metal, fish-like device around the area of activity. For studying long-term events, the new device would be mounted in a fixed position on a tripod or existing structure, such as a dock, bridge, or oil rig.

Meteorological Laboratories in Miami, Fla.

Proni and Fred C. Newman developed the scientific concept, while the engineering was done by project engineer, Charles A. Lauter. The equipment includes a new feature, invented by Lauter, which he said will enable researchers to obtain information about the nature of the sediment within a "cloud" of material.



Using the acoustic system in conjunction with such conventional instruments as current meters, scientists can indicate the relationship between sediment movement and ocean currents. This information can be used to construct mathematical models for predicting what will eventually happen to lakes, harbors, river deltas, and inner continental shelf areas where sediment transport is a problem.

Fish Retail Price Index Up in August, September

The retail price index (seasonally unadjusted) for fish rose again in August by 0.7 percent over July (15.2 percent above August 1976) and in September by 2.1 percent over August according to a monthly statistical analysis by the National Marine Fisheries Service.

Of the 17 frozen and canned fishery products surveyed in August by the agency, part of the Commerce Department's National Oceanic and Atmospheric Administration, 11 increased, 4 declined, and 2 were unchanged. In September, 12 increased, 4 declined, and 1 was unchanged.

Prices increased for cod, flounder, haddock, and whiting fillets; halibut steak; king crab meat; canned chunk light tuna; canned pink salmon; canned Maine and Norway sardines; and fish portions in August, while prices decreased for ocean perch and turbot fillets, fish sticks, and breaded shrimp. Unchanged were canned solid white tuna and canned red salmon.

September prices increased for cod, flounder, haddock, turbot, and ocean perch fillets; halibut steak; canned solid white tuna; canned pink, and red salmon; canned Norway sardines; fish sticks; and fish portions. On the other hand, prices decreased for whiting fillets, king crab meat, canned chunk

light tuna, and breaded shrimp. The price of canned Maine sardines was unchanged.

Compared with July, August retail fish prices increased more than did prices for poultry and meat. Retail poultry prices in August rose 0.9 percent from July, while meat prices rose less than 0.1 percent. Higher sirloin steak and cold cut prices were offset by lower chuck and round steak prices. When compared with 1976 levels, meat prices were 4.2 percent higher, and for poultry 2.8 percent higher.

Retail meat prices declined 0.7 percent in September from August, based on lower sirloin, chuck steak, loin pork chop, and liver prices. Retail poultry

prices advanced 0.4 percent in September from August, based on higher chicken prices. When compared with 1976 levels, prices for poultry were 6.1 percent higher and for meat 2.7 percent higher.

Ten cities are surveyed every month by officials of NMFS, who report prices of selected items of fish, meat, and poultry items for "Operation Fish Watch." They visit three different chain stores in each city and check the prices for the same representative brand names and types of products to determine any changes from the previous month.

The cities surveyed are: Atlanta, Ga.; Boston, Mass.; Little Rock, Ark.; Galveston, Tex.; San Francisco and Los Angeles, Calif.; Pascagoula, Miss.; St. Petersburg, Fla.; Seattle, Wash.; and Washington, D.C.

Moffatt Wins NOAA Fellowship At SWFC

Izadore Barrett, Southwest Fisheries Center Director, National Marine Fisheries Service, NOAA, La Jolla, Calif., has announced that Nancy Moffatt has received the National Research Council/National Oceanic and Atmospheric Administration Post-Doctoral Research Fellowship at the Center's La Jolla Laboratory. Moffatt, who received the Ph.D. degree in May 1977 from the University of Arizona, is the second woman to be honored with the NRC/NOAA Fellowship at the Center since its national inception in 1970.

Moffatt received her early education in San Diego and Escondido, Calif. public schools and completed the first 2 years of her college training as a biology major at the University of California, San Diego. Her interest in marine biology and ichthyology led her into graduate study at the University of Arizona. Moffatt has written six papers on the biology of the Gulf of California grunion and its close relative, the California grunion of the Pacific.

At the NMFS Southwest Fisheries Center, Moffatt is conducting a series of feeding and rearing experiments designed to verify survival and growth

rates reported by earlier researchers for several larval fishes reared at extremely low food densities. Moffatt has set up 20-gallon glass aquariums into which she has introduced anchovy larvae hatched from eggs spawned in the laboratory. She has begun a series of experiments, initially feeding the tiny fish with *Chlorella*, a green algae, supplemented with wild plankton which she obtains each morning with a fine-meshed net off the Scripps pier.

Moffatt's career goal is fisheries research and university teaching at the undergraduate level.

Bowhead Whale Research and Management Planned

Formulation of an expanded research program on bowhead whales and initiation of the development of a management and conservation regime that would permit limited subsistence hunting by Eskimos have been announced by Richard A. Frank, Administrator of the National Oceanic and Atmospheric Administration.

These actions followed a mid-October decision by the Department of State that the United States government had decided not to present an objection at this time to the June action of the International Whaling Commission (IWC) removing the Alaskan Eskimo exemption for subsistence hunting for bowhead whales. In addition, the Department of State said that at a special meeting of the IWC in December the United States would work for Commission approval of a subsistence hunt by the Eskimos.

Frank indicated that the major objective now is rapid development of a sound management and conservation regime in cooperation with the Eskimo communities involved in hunting for bowheads. The Commerce Department official noted his deep concern for the welfare and culture of the Eskimos and pledged that he would personally work for IWC approval of a reasonable subsistence hunt. He added that the development of an adequate management and conservation regime would require the cooperation and efforts of other interested and affected parties—the Es-

kimos, the environmental community, and state governments.

NOAA also initiated contacts with the Alaska Eskimo Whaling Commission to begin discussion on the elements to be included in a management regime. Those discussions were to be continued over several weeks to prepare a proposal for the IWC on subsistence hunting based on the United States' management regime and research program.

Hussey Chairs CZM Committee

The National Coastal Zone Management Advisory Committee has elected John F. Hussey, Director of Legislative Affairs for Monsanto Company, as Chairman, Secretary of Commerce Juanita B. Kreps has announced. The Committee also elected Janet K. Adams, President of the California Coastal Alliance, as Vice-Chairman. The 11-member committee advises the Secretary of Commerce on implementation of the Coastal Zone Management Act of 1972.

Hussey formerly was Director of the Senate National Ocean Policy Study, and has had extensive experience with coastal zone and related legislation during his 10 years in various staff positions on Capitol Hill. Primary role of the Committee is to act as an independent advisor with respect to activities of the Office of Coastal Zone Management, part of the Commerce Department's National Oceanic and Atmospheric Administration.

Hussey has indicated that the Committee plans to initiate immediate effort, through Committee task groups, to obtain a "grassroots" assessment of the program, and to determine the extent to which the program, designed by Congress in 1972, is meeting today's coastal zone problems and conflicts. The Committee represents industry, environmental, and public interest groups. It addresses energy exploration, development and facility siting; housing; recreation; environmental protection; economic development; and other policy issues affecting the Nation's ocean and Great Lakes coastal regions.

NOAA Current-Sensing Radar Helps Monitor Marine Oil Pollution

A current-sensing radar developed by the National Oceanic and Atmospheric Administration (NOAA) may become a major tool for monitoring sea pollutants and setting environmental baselines where petroleum and other explorations are planned. The radar permits monitoring of surface currents up to 50 miles and enables production of current-movement computer maps over 750 square miles every half hour, according to NOAA scientists.

Developed by Commerce Department scientists with NOAA's Wave Propagation Laboratory in Boulder, Colo., the new radar system could provide an effective alternative to surface drifters, drogues, and other ocean current determination methods now used that measure water motion only at a single point.

In the 12 October issue of *Science*, Donald Barrick, who leads the ocean remote sensing effort at the Boulder laboratory, and his co-workers described the results of recent tests of the experimental system conducted from southern Florida's east coast with the aid of Nova University. Subsequent tests last summer in Alaska's Cook Inlet, noted for its large tidal currents and the proposed site of offshore petroleum development, largely confirmed the Florida results.

According to Barrick, the Alaska results showed that "... we can produce a single current-vector map covering thousands of square kilometers after only 15 minutes of operation; we can gather at least a thousand times more data in a given twelve-hour period than any alternative technique; and our system error is at worst half a knot of current velocity, and probably much better."

The experimental system is a pair of

transportable, high-frequency pulsed radars, each controlled by a minicomputer. Echoes from the sea surface at points about 2 miles (3 km) apart on an imaginary grid are received by two sets of antennae. The antenna frames are placed on the beach near the waterline, where wet sand grounds them and helps push their signals out beyond the horizon over the ocean's electrically conductive surface. Conventional over-the-horizon radar requires a signal-relaying bounce off the ionosphere to move the pulses out beyond a line of sight.

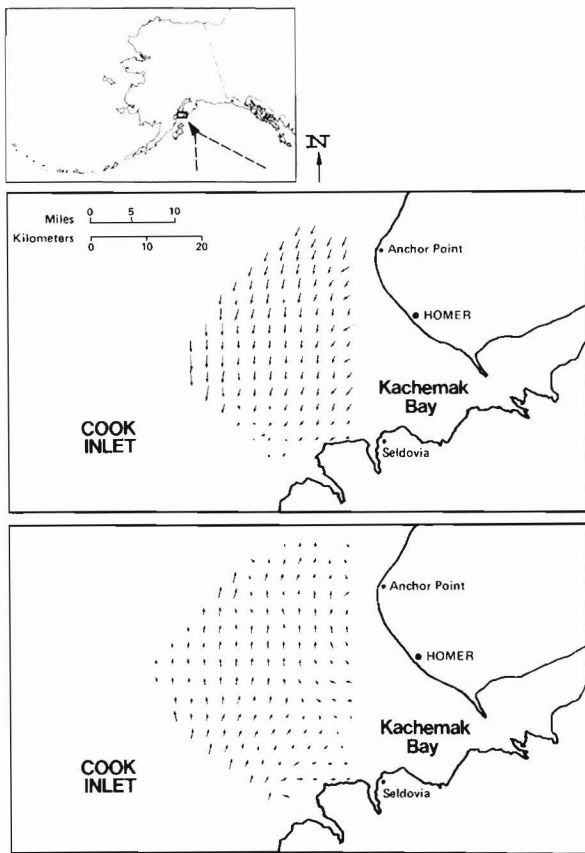
The radar-controlling minicomputer processes the signals and current data while the system is operating and draws a map of the surface current velocity at each grid point, clearly showing the speed and direction of surface currents over the area scanned.

NOAA's new radar system deduces ocean current velocity by sensing the scattering of radar echoes by ocean waves. The underlying principle of the system was first demonstrated experimentally by Douglass Crombie, now director of the Commerce Department's Institute for Telecommunications Science in Boulder. Nearly a decade later, in the mid-1960's, the observed phenomenon was confirmed theoretically by Barrick, in what is considered a breakthrough in wave propagation theory.

Support for developing and testing the prototype current-sensing radar has come from the Coast Guard, Energy Research and Development Administration, and, through NOAA's Outer Continental Shelf Environmental Assessment Program, from the Interior Department's Bureau of Land Management.

Fish Product Export Market Study Slated

The Department of Commerce will fund a study to identify domestic and foreign markets for fish and shellfish found within the U.S. 200-mile conservation zone and in the Great Lakes but not fully used by U.S. fishermen, Secretary Juanita M. Krebs has announced. The study also will determine the finan-



A novel radar system developed by scientists with the National Oceanic and Atmospheric Administration produced these maps of water movements in Alaska's Cook Inlet at two different times on 1 July. A pair of transportable, high-frequency antennas stationed on the coast can sense ocean currents up to 50 miles (80 km) from shore to generate computer-drawn maps of current movements over 750 square miles (2,000 km²) every half hour. The newly developed radar, also tested on southern Florida's east coast, could help monitor the trajectories of spilled oil or other pollutants. The radar was developed by scientists with the Commerce Department agency's Environmental Research Laboratories.

cial, technological, and institutional barriers to the development of these resources in the United States.

"We are harvesting about 2.8 billion pounds of edible seafood now and have the opportunity to catch 24 billion pounds," she said. "The Fishery Conservation and Management Act provides us an excellent export potential since almost the entire catch being made by foreign vessels in the 200-mile zone is consumed abroad. It would be reasonable to assume we can win a significant share of their seafood market."

The study will determine marketing opportunities and provide specific information on market structures, product packaging, and labeling requirements, as well as identifying tariff and nontariff barriers of 15 major fish and shellfish consuming nations in Western Europe and the Far East. In addition, the study will consider the feasibility of establishing an Export Market News Service to provide current market information in major foreign markets. An assessment of the domestic market requirements over the next 10 years also will be made and evaluated in light of the resources available to U.S. fishermen.

After the opportunities in the domestic and foreign markets are defined, an analysis will be made of the current status of domestic harvesting and processing capabilities, including legal and institutional barriers that inhibit productivity, increase costs, and limit opportunities for growth.

The study will be funded by these Commerce agencies: NOAA's National Marine Fisheries Service and the Office of Sea Grant; the Economic Development Administration; the Coastal Plains Regional Commission, New England Regional Commission, Pacific Northwest Regional Commission, and the Upper Great Lakes Regional Commission.

Marine Oil Pollution Study Contracts Let

The National Oceanic and Atmospheric Administration has awarded contracts totaling \$125,822 to three research facilities to make studies of the

effects of oil spills on certain birds and mammals which inhabit the west coast, and on the vulnerable salt marshes, tidal flats, and beaches of the Beaufort Sea coast of the Arctic Ocean. The awards were made to the University of South Carolina, the University of California at San Diego, and the Point Reyes Bird Observatory at Stinson Beach, Calif.

The contracts are part of a major marine environmental study conducted by the Commerce Department agency's Environmental Research Laboratories for the Interior Department's Bureau of Land Management as part of its Outer Continental Shelf Environmental Assessment Program. These studies seek to determine the probable ecological impacts of oil exploration and development activities on Alaska's outer continental shelf.

Scientists at the University of California's Scripps Institution of Oceanography and its Physiological Research Laboratory in La Jolla were awarded \$59,088 to study the effects of oil contamination on the fur of sea otters. Results of the research will be compared with data from current studies on northern fur seals and other fur-bearing species.

Ornithologists at the Point Reyes Bird Observatory were awarded \$27,234 to make an in-depth study of the influence of petroleum on egg formation and embryonic development among Cassin's auklets which inhabit the Farallon Islands 20 miles west of San Francisco. These small gray birds are representative of the many birds breeding along the Pacific coast that are at risk from oil pollution during their reproductive period.

As part of ongoing research, scientists from the University of South Carolina's Department of Geology received \$39,500 in supplemental funds to continue work on the oil spill vulnerability of the Beaufort Sea coast. Results of their work will include maps of the comparative vulnerability of the entire coastal zone between Point Barrow and Demarcation Point, which is near the eastern border of Alaska and Canada. The University scientists will also produce a general environmental

geologic map—a basic inventory of the surface geology in terms of resource utilization and preservation—of the Beaufort Sea coast. NOAA has awarded a total of \$183,643 to the University of South Carolina for this study during the past 2 years.

OCEANLAB CONTRACT AWARDED BY NOAA

A \$1.167 million contract for defining the physical characteristics of the planned OCEANLAB mobile underwater laboratory has been awarded to the Re-entry and Environmental Systems Division of the General Electric Co.¹, Philadelphia, Pa., the National Oceanic and Atmospheric Administration (NOAA) has announced. The 11-month contract will provide preliminary specifications for the OCEANLAB system, as well as program plans for subsequent phases.

NOAA, a Commerce Department agency, is establishing mission and performance requirements on which the final system configuration and specifications will be developed by the contractor. NOAA's Office of Ocean Engineering, through its Manned Undersea Science and Technology program, is carrying out the project.

General Electric has formed an OCEANLAB team with Perry Oceanographics, Inc., Riviera Beach, Fla., and M. Rosenblatt and Son, Inc., Arlington, Va. GE and Perry conducted a preliminary study of the system for NOAA, which was completed in December 1976.

OCEANLAB will provide the United States with a capability for advanced underwater scientific research and exploration during the 1980's. Its mission capabilities will help scientists and engineers meet growing needs to develop and use offshore oil, gas, mineral, and fishery resources, and conduct research to better understand and protect the ocean environment. The system will be equipped with laboratory facilities to provide occupants with comprehensive research capabilities.

¹Mention of trade names or commercial firms does not imply endorsement by the National Marine Fisheries Service, NOAA.