NMFS Outstanding Publications Cited

Winners of the National Marine Fisheries Service's Outstanding Publications Award for papers published in the *Marine Fisheries Review* (vol. 46) and the *Fishery Bulletin* (vol. 82 and 83) have been announced by NMFS Publications Advisory Committee Chairman Ben Drucker, along with special recognition of a nine-paper section in the *Marine Fisheries Review* entitled "The Status of Endangered Whales."

"Groundfish Fisheries and Research in the Vicinity of Seamounts in the North Pacific Ocean" by R. N. Uchida and D. T. Tagami of the NMFS Southwest Fisheries Center's Honolulu Laboratory was selected by the Awards Committee as the best paper in the *Marine Fisheries Review*, 46(2):1-17. Selected as the best papers in the *Fishery Bulletin* for volumes 82 and 83, respectively, were: "Morphology, Systematics, and Biology of the Spanish Mackerels (*Scomberomorus*, Scombridae)" by Bruce B. Collette and J. L. Russo, 82(4):545-692; and "Using Objective Criteria and Multiple Regression Models for Age Determination of Fishes" by George W. Boehlert, 83(2): 103-117. Collette is with the NMFS National Systematics Laboratory in Washington, D.C., and Boehlert is with the NMFS Southwest Fisheries Center's Honolulu Laboratory.

In all, six papers were nominated from volume 82 of the *Fishery Bulletin*, seven papers from volume 83, and six papers were nominated from volume 46 of the *Marine Fisheries Review*, along with the nine whale papers.

Earning special recognition from the Awards Committee was a collection of nine papers in the *Marine Fisheries Review*, 46(4):1-64, entitled "The Status of Endangered Whales" which was prepared by scientists with the National Marine Mammal Laboratory at the Northwest and Alaska Fisheries Center, Seattle, Wash. Papers in that collection, which were edited by Jeffrey M. Breiwick and Howard W. Braham, included: "The Status of Endangered Whales: An Overview," by Howard W. Braham; "The Gray Whale, *Eschrichtius robustus*," by Dale W. Rice, Allen A. Wolman, and Howard W. Braham; "The Blue Whale, *Balaenoptera musculus*," by Sally A. Mizroch, Dale W. Rice, and Jeffrey M. Breiwick; "The Fin Whale, *Balaenoptera physalus*," by Mizroch, Rice, and Breiwick; "The Sei Whale, *Balaenoptera borealis*," also by Mizroch, Rice, and Breiwick; "The Humpback Whale, *Megaptera novaeangliae*," by J. A. Johnson and Allen A. Wolman; "The Right Whale, *Balaena glacialis*," by Braham and Rice; "The Bowhead Whale, *Balaena mysticetus*" by Braham; and "The Sperm Whale, *Physeter macrocephalus*," by Merrill E. Gosho, Rice, and Breiwick.

The five other papers nominated in volume 82 of the *Fishery Bulletin* were: "Spring and Summer Prey of California Sea Lions, *Zalophus californicus*, at San Miguel Island, California" by G. A. Antonelis, C. H. Fiscus, and R. L. DeLong, 48(1):67-76; "Age, Growth, and Mortality of Gray Triggerfish, *Balistes capricus*, From the Northeastern Gulf of Mexico" by A. G. Johnson and C. H. Salomon, 82(3):485-492; "Calibration of Dental Layers in Seven Captive Hawaiian Spinner Dolphins, *Stenella longirostris*, Based on Tetracycline Labeling" by A. C. Myrick, Jr., E. W. Shallenberger, I. Kang, and D. B. MacKay, 82(1):207-225; "Documentation of Annual Growth Lines in Ocean Quahogs, *Arctica islandica* Linne" by J. W. Ropes, D. S. Jones, S. A. Murawski, F. M. Serchuk, and A. Jearld, Jr., 82(1):1-19; and "Selection of Vegetated Habitat by Brown Shrimp, *Penaeus aztecus*, in a Galveston Bay Salt Marsh" by R. J. Zimmerman, T. J. Minello, and G. Zamora, Jr., 82(2):325-336.

The six other papers nominated from volume 83 were: "Dolphin Habitats in the Eastern Tropical Pacific" by D. W. K. Au and W. L. Perryman, 83(4):623-643; "Confidence Limits for Population Projections When Vital Rates Vary Randomly" by T. Gerrodette, D. Goodman, and J. Barlow, 83(3):207-217; "Egg Production of the Central Stock of Northern Anchovy, *Engraulis mordax*, 1951-82" by N. C. H. Lo, 83(2):137-150; "Long-term Responses of the Demersal Fish Assemblages of Georges Bank" by W. J. Overholtz and A. V. Tyler, 83(4):507-520; "The Rock Shrimp Genus *Sicyonia* (Crustacea: Decapoda: Penaeoidea) in the Eastern Pacific" by I. Perez Farfante, 83(1):1-79; and "Age, Growth, and Distribution of Larval Spot, *Leiostomus xanthurus*, off North Carolina" by S. M. Warlen and A. J. Chester, 83(4):587-599.

The five other MFR papers nominated from volume 46 were: "Using Charterboat Catch Records for Fisheries Management" by H. A. Brusher, M. L. Williams, L. Trent, and B. J. Palko, 46(3):48-55; "Dungeness Crab Leg Loss in the Columbia River Estuary" by J. T. Durkin, K. D. Buchanan, and T. H. Blahm, 46(1):22-24; "U.S. Tuna Trade Summary, 1983" by S. F. Herrick, Jr., and S. Koplin, 46(4):65-72; "Assessing the Accuracy of a Method to Determine the Amount of Minced Fish in Mixed Mince-Fillet Fish Blocks" by J. P. Lane, J. J. Ryan, and R. J. Learson, 46(3):76-79; and "Fish or Fish Oil in the Diet and Heart Attacks" by M. E. Stansby, 46(2):60-63.

Developed in 1975, the annual outstanding publication awards program recognizes NMFS employees who have made exceptional contributions to the knowledge and understanding of the resources, processes, and organisms studied as a part of the NMFS mission. Authors must have been employed by the NMFS at the time the paper was published. *Marine Fisheries Review* papers must be effective and interpretative contributions to the understanding and knowledge of NMFS mission-related studies, while *Fishery Bulletin* papers must document outstanding scientific work.

At the close of each volume, nominations are solicited from the NMFS Center, Regional, and Office Directors for the the awards by the Awards Com-

mittee Chairman—the editor of the *Fishery Bulletin*, currently Andrew Dizon at the NMFS Southwest Fisheries Center. Other Committee members include the editor of the *Marine Fisheries Review*, W. L. Hobart, and former *Fishery Bulletin* editors Bruce B. Collette, Reuben Lasker, Jay Quast, William J. Richards, and Carl Sindermann.

Data Resources of the NODC

The National Oceanographic Data Center (NDC), which this year celebrated its 25th anniversary, is the U.S. national repository and dissemination facility for global oceanographic data. Established in 1961 as an interagency facility uner the management of the Naval Hydrographic (now Oceanographic) Office, the NODC has been part of NOAA since NOAA was created in 1970. Today the NODC operates within the NOAA National Environmental Satellite, Data, and Information Service (NESDIS). The environmental data files of the NODC and its sister centers (the National Geophysical Data Center (NGDC), Boulder, Colo., and the National Climatic Data Center (NCDC), Asheville, N.C.) are installed on a central NESDIS computer facility located at the NCDC in Asheville.

Through the NODC, researchers have access to data from government agencies, universities and research institutions, industry, and foreign agencies and organizations. Foreign data are acquired through bilateral and multilateral exchanges. Since 1962 the U.S. NODC has operated World Data Center A for Oceanography, one of the U.S. components of a global network that facilitates international data exchange. The NODC receives data from dozens of other countries including the U.S.S.R. and other eastern-bloc nations and the People's Republic of China.

NODC's primary resources are its archive data files. Data received by NODC that are processable into standard formats enter its data processing/quality control system and are merged into the appropriate data files. Data in these files can be selectively retrieved (either by cruise or by geographic area and time period) and provided to customers in a variety of media and forms. Besides printouts and magnetic tape copies of selected data, the NODC provides a wide selection of customized data summaries, analyses, and graphic plots. All NODC data products are provided at cost. Standard charges are imposed for some relatively simple products; cost estimates are provided for more complex jobs.

For certain standard types of ocean data such as hydrographic stations and bathythermograph temperature profiles, NODC data files have worldwide coverage. NODC holds other types of physical, chemical, and biological data primarily for U.S. offshore and outer continental shelf areas. For example, the NODC receives and archives wind and wave data from automated buoys operated by the NOAA National Data Buoy Center. NODC's physical/chemical data files (Table 1) include ocean temperature and circulation data that are finding increased application to climate studies. A computerized data inventory system enables NODC personnel to respond quickly to customer inquiries about the quantity of available data meeting specified selection criteria.

In addition to its archive files, NODC also provides copies of special data sets held in originator formats. For example, NODC holds data tapes prepared by S. Levitus, NOAA/GFDL, in conjunction with the "Climatological Atlas of the World Ocean." These tapes include global objective analyses of major ocean parameters on a one-degree grid.

From the NOAA Ocean Products Center (OPC) the NODC is receiving quality-controlled marine data products. Global Blended Sea Surface Temperature analyses (which combine in situ and satellite data prepared in support of the Tropical Ocean Global Atmosphere (TOGA) program) are now available at NODC. The initial data were received in December 1985. NODC is also receiving and archiving monthly IGOSS data tapes. These data are received at NODC within several working days after the end of each month. Detailed information about NODC's data holdings, products, and services is provided in the NODC Users Guide, which is

Table 1.—Major NODC physical/chemical data files.

Data type	Volume (as of 4/86
Oceanographic Stations	713,268 stations
Mechanical BT data	980,222 stations
Expendable BT data	531,799 statons
CTD/STD data (high resolution)	38,176 stations
CTD/STD data (low resolution)	36,368 stations
Surface current (ship drift) data	4,175,000 stations
Current meter data	17,292 obs.-mo.[1]
Lagrangian current measurments	1,258 obs.-mo.[1]
Coastal wave data	51 obs.-mo.[1]
NDBC buoy data	6,043 obs.-mo.[1]
Pressure gauge data	473 obs.-mo.[1]
Water physics and chemistry	71,538 stations
Marine toxic substances and pollutants	11,159 stations

[1]Time series data are reported as observation-months, i.e., measured parameters recorded for 1 month.

NODC and WDC-A Offices Move

The Washington, D.C., offices of the U.S. National Oceanographic Data Center (NODC) and the World Data Center A (WDC-A) for Oceanography have been moved. The new NODS/WDC-A address is: National Oceanographic Data Center, NOAA/NESDIS, 1825 Connecticut Avenue, N.W., Washington, DC 20235.

The new telephone numbers, which are both commercial and FTS, are as follows: Gregory W. Withee, Director, 202-673-5594; User Services Branch, 202-673-5549; WDC-A, Oceanography, 202-673-5571; Ocean Pollution Data and Information Network (OPDIN), 202-673-5539; and the Data Acquisition and Management Branch, 202-673-5643.

available free. Customers orders and inquiries should be directed to: National Oceanographic Data Center, User Services Branch NOAA/NESDIS E/OC21, Washington, DC 20235; Telephone, 202-634-7500 or FTS 634-7500; Telemail: Mailbox "NODC.WDCA". (Source: Richard J. Abram.)

Omega-3 Fatty Acids for Cardiovascular Research

Since the 1950's, scientists have recognized the unique properties of fish oils in preventing heart disease. Greenland Eskimos and Japanese fishermen are unusually resistant to atherosclerosis and, during World War II, Norwegians recovered from heart attacks more rapidly than previously. Both of these effects are attributed to consumption of fish, but the specific beneficial compounds are yet to be identified. The complex nature of fish oils has hampered isolation and evaluation of individual compounds for physiological activity.

Now, the Fish Oil Research Group of the NMFS Northwest and Alaska Fisheries Center's Utilization Research Division (URD) has found a way to prepare EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) in purities up to 94 percent. EPA and DHA are the omega-3 fatty acids present in fish oils in the largest amounts. Omega-3 fatty acids, thought to inhibit the plaque formation and blood clotting responsible for heart attacks, are found in substantial quantities only in marine oils. Oils from terrestrial sources contain mainly omega-6 compounds which appear to contribute to cardiovascular disease. Consequently, availability of EPA and DHA in adequate quantities will facilitate the biochemical and clinical studies needed to elucidate the exact physiological properties that make fish oils beneficial to human health.

A state-of-the-art method, supercritical carbon dioxide fractionation, allows EPA and DHA to be separated from numerous other fatty acids normally present in fish oils. To expedite the process, short-chain saturated and monounsaturated fatty acids are removed selectively beforehand by urea complexation. In this way, the amount of material involved in the supercritical fractionation is reduced and also the effectiveness of the separation is enhanced. Supercritical extraction is already used to extract residual petroleum from oil wells and in the food industry to decaffeinate coffee. The advantage of supercritical carbon dioxide are low temperatures required, exclusion of oxygen, ready availability, low cost, nontoxicity, and absence of solvent residues.

To date, menhaden oil, the fish oil produced in largest quantities in the United States, has been used for our studies. It represents a good source of both EPA and DHA (Table 1). Because of the similarity of these two compounds, the presence of one makes isolation of the other more difficult. Now, however, we are investigating two regional resources which appear to have special potential as starting materials for the isolation of EPA and DHA. Alaska pollock liver oil is especially attractive for production of EPA, as are tuna oils for DHA production. Nonspawning pollock liver oil contains 17 percent EPA and 5 percent DHA. The high ratio of EPA to DHA, 3.5, should simplify isolation of EPA in high purity. Tuna oils are very attractive sources of DHA because of unusually high concentrations in the starting oils, 25-29 percent, and even more because of the low concentrations of EPA, 6.7-7.7 percent.

Pollock livers represent a vast untapped resource, a byproduct currently without a market. For maximum utilization, they should be collected from nonspawning animals because during spawning, the EPA content drops and the DHA content rises (Table 1). Tuna oils are recovered from the precook liquor and have little commercial value. Purification and production of these oils would dramatically enhance the value of the waste products. Production of EPA and DHA for biochemical and chemical studies and potentially for sale as nutritional supplements and pharmaceutical agents would provide attractive markets for two unused regional products. Source: Virginia F. Stout, URD, NWAFC, Seattle, Wash.

Table 1.—Fatty acid profiles of menhaden, Alaska pollock, and tuna oils.

Oil source	Palmitic 16:0	Oleic 18:1	EPA 20:5	DHA 22:6	EPA/DHA
Menhaden	16.8	9.4	16.0	8.4	1.9
Pollock liver					
Nonspawning	18.6	18.7	17.3	4.9	3.5
Spawning	15.9	18.7	15.6	6.4	2.4
Spawning	14.5	17.0	13.8	7.6	1.8
Tunas					
Albacore	17.7	13.7	7.7	29.4	
Skipjack	18.5	12.4	7.4	27.9	0.27
Yellowfin	17.7	15.1	6.7	25.3	0.26

Pressurized Containers for Dispensing Fish Oils

Pressurized containers show promise for easy, effective storage of fish products, reports the Utilization Research Division (URD) of the NMFS Northwest and Alaska Fisheries Center, which has been looking for a convenient means of storing and dispensing fish oils for clinical studies on their efficacy in preventing and treating cardiovascular disease. The physiologically active components of fish oils, omega-3 polyunsaturated fatty acids, decompose readily in air. That is one of the reasons for cod liver oil's taste, but flavor is not the only issue. Oxidation of the active components of fish oil reduces the potency; even more important is actual toxicity. Adding to the problem is the fact that the whole process, formally called autoxidation, is a chain reaction; once initiated, autoxidation keeps expanding as it goes. Oxygen in the air is the driving force.

Exclusion of oxygen is critical to the preservation of fish oil and omega-3 products. Until recently, two alternatives have been used for storage of fish oils: Sealed, evacuated glass ampoules and nitrogen-flushed, screw-cap bottles. Ampoules are tricky to open and only useful once, since they cannot be resealed easily. Bottles are more convenient for multiple use, but once opened, air is admitted. To avoid autoxidation, the remaining omega-3 material must be flushed again with purified nitrogen, a cumbersome procedure.

Pressurized packaging, so popular for cosmetics, paints and insecticides,

seems to be the method of choice for storing and dispensing fish oils. Preliminary experiments show that the oils are stable in pressurized cans. With ultrapure nitrogen as the propellant, metered doses are easily dispensed. Next, the applicability of the technique to omega-3 concentrates will be evaluated. Source: Virginia F. Stout, URD, NWAFC, Seattle, Wash.

U.S. Salmon Faces More Competition in Europe

European salmon farming was expected to reach record levels in 1986, with Norway, the leading supplier, expected to produce 40,000 metric tons (t) of farmed salmon in 1986. The other major European suppliers, Scotland and Ireland, should have 1986 production levels of 8,000 and 1,500 t, respectively. This level of production, coupled with weakening of the U.S. market for imported salmon, has resulted in lower prices in the German market for salmon. Fresh salmon competes with U.S. exports of frozen salmon.

In 1985, the United States was Germany's largest supplier of frozen salmon with 1,014.9 t. Other suppliers included Canada (790 t), Norway (174.7 t), and Scotland (9.6 t). Summertime German wholesale prices for Norwegian salmon were $3.13/pound compared with $3.55/pound for comparable quality frozen American salmon (at US$1 = DM2.18).

Although the fresh salmon enjoys both a competitive and price advantage over U.S. frozen salmon, German salmon importers stated that they would nevertheless be watching the U.S. salmon prices during the upcoming season. U.S. salmon exporters wishing to enter or maintain their market shares, should be aware of the current market situation in order to set their prices accordingly.

The Federal Association of the German Fish Industry and Fish Wholesale Trade has reported that Norwegian salmon farming is highly subsidized, although there is no information available on Norwegian salmon farming subsidies nor a calculation of the indirect effect of the subsidization on salmon exports to third country markets. The German fish industry association also speculates that the level of the subsidy might be reduced in the next 3-5 years, thereby bringing a corresponding increase in prices for Norwegian farmed salmon. [However, Norwegian authorities have stated in response that their salmon farming is not subsidized.] Source: USDC, Business America.

Cooperative Efforts to Save Endangered Species

A mid-July flight to Hawaii's French Frigate Shoals was made to assist in recovery of the "threatened" green turtle and the "endangered" Hawaiian monk seal, reports Richard S. Shomura, Director of the NMFS Southwest Fisheries Center's Honolulu Laboratory. A private conservation organization paid for the flight which took green turtle hatchlings to French Frigate Shoals for release to the wild and returned to Honolulu with a weaned but underdeveloped female monk seal pup for rehabilitation.

Shomura said the 46 turtle hatchlings were from Sea Life Park's captive turtle breeding program and were released at Tern Island at French Frigate Shoals where they crawled down the beach to enter the ocean. Hopefully, the turtles would imprint there and return someday to nest on that protected island. Tiny metal tags were placed on their flippers so that identification of them would be possible if they are resighted. Other Sea Life Park hatchlings were released on Oahu beaches earlier in the year.

Recovery of the small female monk seal is part of a project being conducted by the NMFS Marine Mammals and Endangered Species Program. According to William G. Gilmartin, Program leader, female pups like that are brought to Honolulu for "fattening" and then reintroduction into the wild at Kure Atoll in the northwestern Hawaiian Islands where the monk seal population is very depleted and in critical need of females. Three other females were collected earlier this year, flown to Honolulu, and were being cared for by NMFS. Gilmartin said five young females collected and rehabilitated in 1984 and 1985 had already been added to the Kure population.

Shomura also reported that a young green sea turtle which was found injured near Kailua-Kona during the summer was taken to Honolulu and treated, thanks to the efforts of several concerned citizens. The turtle was found by personnel aboard a private dive boat who had noticed that the animal was unable to submerge and had a hole in its shell just behind the head.

The divers turned over the turtle to Russell Yim, an agent with the Hawaii State Division of Conservation and Resource Enforcement. All sea turtles in Hawaii are protected, and illegal taking or possession can result in imprisonment and fines of up to $10,000. The turtle was held temporarily in a hotel pond until it could be treated.

"When we were notified," said John Henderson, NMFS Fishery Biologist, "we decided to fly the turtle to Honolulu for treatment. According to Patrick Leadbeater, Honolulu veterinarian, to whom the turtle was taken "the hole appeared to have been made by a spear or arrow." Said Leadbeater, "air had gotten into the animal's body cavity, making it too buoyant to submerge and feed. We treated the turtle with antibiotics and removed some damaged shell and muscle tissue from the wound. After we were confident that there was no infection, we patched the hole with a biologically compatible foam plug and a coating of fiberglass resin. If the air inside the cavity was coming from the hole, the turtle could biologically rid itself of the gas in a couple of weeks. But, if the lungs are damaged and leaking air into the body cavity, it would take a much longer time to heal."

"We have recovered many turtles during the last few years with spear holes, and most of them died," said William Gilmartin, Leader of the NMFS Marine Mammals and Endangered Species Program. Gilmartin believed the effort by many concerned people to get this turtle treated quickly could pay off and allow the turtle to survive. "Even though these turtles are protected by the Federal Endangered Species Act and State law as well," Gilmartin added, "the illegal taking of turtles makes recovery of the population extremely difficult." Gilmartin said the public can be a big help with this by reporting inci-

dents in which turtles are injured or collected by poachers to enforcement officers at NMFS (546-5670) or the State (548-5918, or outer islands, ask operator for toll free Enterprise 5469). The turtle was being kept at the NMFS Kewalo Research Facility, and, should it completely recover, it will be tagged and released, possibly back in the area where it was found.

Gulf Ichthyoplankton Samples for Research

The Gulf States Marine Fisheries Commission has announced the availability of Gulf of Mexico ichthyoplankton samples for loan to qualified researchers. Samples have been and are continuing to be collected for SEAMAP (Southeast Area Monitoring and Assessment Program), a multi-year international Federal/state/university program of the GSMFC. Neuston and bongo nets were employed for specimen collection in a one degree latitude/longitude grid over the entire Gulf from lat. 26°N northward; samples were sorted and preliminarily identified by the Plankton Sorting and Identification Center, Szczecin, Poland.

At present, samples from 1982 (7,057 lots, 93 families), 1983 (8,351 lots, 106 families), and material from one summer cruise in 1984 (4,155 lots, 75 families) are available for loan. Lots of unsorted fish eggs are also available from these years. Most samples are sorted to the family level, although many have identification to generic or species level. Additional 1984 samples are expected to become available by the end of 1986. Specimens are available for loan on a 6-month renewable basis. Researchers interested in obtaining additional information can contact either the SEAMAP Ichthyoplankton Curator, Florida Department of Natural Resources, Bureau of Marine Research, St. Petersburg, FL 33701, or the SEAMAP Coordinator, Gulf States Marine Fisheries Commission, P.O. Box 726, Ocean Springs, MS 39564.

This statement is required by The Act of August 12, 1970, Section 3685, Title 39, U.S. Code, showing ownership, management, and circulation of the Marine Fisheries Review, publication number 366-630, and was filed on 1 October 1986. The Review is published quarterly (four issues annually) with an annual subscription price of $8.75 (sold by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402). The complete mailing address of the office of publication is: Scientific Publications Office, F/NWA1, NMFS, NOAA, 7600 Sand Point Way N.E., Bin C15700, Seattle, WA 98115. The complete mailing address of the headquarters of the publishing agency is: National Marine Fisheries Service, NOAA, Department of Commerce, 2001 Wisconsin Ave., N.W., Washington, DC 20235. The name of the publisher is Jack McCormick and the editor and managing editor is Willis Hobart; their mailing address is: NMFS Scientific Publications Office, 7600 Sand Point Way N.E., Bin C15700, Seattle, WA 98115. The owner is the U.S. Department of Commerce, 14th St., N.W., Washington, DC 20230; there are no bondholders, mortgagees, or other security holders. The purpose, function, and nonprofit status of the organization (agency) and the exempt status for Federal income tax purposes has not changed during the preceding 12 months. The extent and nature of circulation is as follows: Total number of copies (A) (average number of copies of each issue during the preceding 12 months) was 2,400 and the actual number of copies of the single issue published nearest to the filing date was 2,400. Paid circulation (B) is handled by the U.S. Government Printing Office, Washington, DC 20402, and (C) the total number printed for their sales (mail subscriptions and individual sales) was 750 for both the average number of copies each issue during the preceding 12 months and the actual number of copies of the single issue published nearest to the filing date. Free distribution (D) by mail, carrier, or other means; samples, complimentary, and other free copies (average number of copies each issue during the preceding 12 months) was 1,650 and the actual number of copies of the single issue published nearest to the filing date was 1,650. The total distribution (E: sum of C and D) (average number of copies each issue during the preceding 12 months) was 2,400 and the actual number of copies of the single issue published nearest to the filing date was 2,400. There were no copies not distributed or returned from news agents (F). The total (G: sum of E and F) is equal to the net press run figures shown in item A: 2,400 and 2,400 copies, respectively. I certify that the statements made by me above are correct and complete: (Signed) Jack McCormick, Publisher.

NMFS Helps to Preserve Louisiana Wetlands, Fish

The National Oceanic and Atmospheric Administration (NOAA) is helping protect economically vital fish habitat in a Federal-state effort to recover valuable Louisiana coastal wetlands. Biologists with NOAA's National Marine Fisheries Service have developed procedures for the operation of water control structures installed in Louisiana canals to allow fish to enter the marshlands during crucial early life stages.

In 1985, 27 percent of the 6.3 billion pounds of fish harvested in the U.S. were caught off Louisiana. The state's catch that year was worth more than $229 million at dockside. About 90 percent of those fish, including shrimp, menhaden, seatrout, croaker, flounder, and blue crabs, depend on wetlands during some stage of their development. For the past 3 years, Louisiana has been losing about 32,000 acres of coastal land annually.

NMFS biologists at Galveston, Tex., have reviewed plans for about 300,000 acres of wetlands and for the last 3 years have encouraged land managers to control the structures to allow young fish and shellfish to enter the marsh area and return to the Gulf of Mexico after maturing. Land managers used the structures to increase the water level in ponds by the start of the waterfowl hunting season in November to provide better marsh habitat for ducks and geese that migrate to the area during the winter. In the spring and summer they would drain the marshes to allow new plant growth. However, this method prevented several important species of fish and shellfish from entering the marsh area during their peak migratory periods.

The Commerce Department agency has provided guidance for the management of about 200 of the structures installed throughout the state's 2.5 million acres of marshlands. They are installed across man-made canals to alleviate the saltwater intrusion and extreme water levels that often damage plant life.

The canals are built to make the marshland accessible to barges for oil and gas exploration. The control structures regulate the direction, velocity and amount of fresh and salt water allowed to enter or leave the canals. The wetland conservation effort involves marsh owners, the NMFS, Soil Conservation Service, Fish and Wildlife Service, Corps of Engineers, and Louisiana's Department of Wildlife and Fisheries and Natural Resources.

FDA, NMFS, SIGN MOU

The U.S. Food and Drug Administration (FDA) has provided notice of a memorandum of understanding (MOU) between the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, and the FDA of the Public Health Service, U.S. Department of Health and Human Services. This MOU describes the cooperative methods that FDA and NMFS will employ to deal with illegal commerce in molluscan shellfish. The agreement became effective on 24 July 1986 and further information on it is available from: Walter J. Kustka, Intergovernmental and Industry Affairs Staff (HFC-50), Food and Drug Administration, 5600 Fishers Lane, Rockville, MD 20857, (301) 443-1583. (Source: 5IFR, No. 164, 30271.)