

## Northwest and Alaska Fisheries Center Technical Memoranda

In addition to its formal scientific publications, the National Marine Fisheries Service uses the NOAA Technical Memorandum series for informal publications of specialized reports that require multiple copies, but when complete formal review and editorial processing are not appropriate or feasible. However, documents in this series reflect sound professional work and are referenced in formal journals.

This month, the first 29 Technical Memoranda produced by the NMFS Northwest and Alaska Fisheries Center, Seattle, Wash., are listed. Copies may be ordered by number from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

**"Annotated bibliography of inter-specific hybridization of fishes of the subfamily Salmonidae,"** by James R. Dangel, Paul T. Macy, and Fred C. Withler. U.S. Dep. Commer., NOAA Tech. Memo. NMFS NWFC-1, 48 p., 1973.

**"Food of the Pacific white-sided dolphin, *Lagenorhynchus obliquidens*, Dall's porpoise, *Phocoenoides dalli*, and northern fur seal, *Callorhinus ursinus*, off California and Washington; with appendices on size and food of Dall's porpoise from Alaskan waters,"** by Hiroshi Kajimura, Clifford H. Fiscus, and Richard K. Stroud. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-2, 30 p., 1980. (NTIS number is PB80 223274.)

**"Summary of northern fur seal data and collection procedures, Volume 1: Land data of the United States and Soviet Union (excluding tag and recovery records),"** Robert H. Lander (editor). U.S. Dep. Commer., NOAA Tech.

Memo NMFS F/NWC-3, 315 p., 1980. (NTIS number is PB81 106502.)

**"Summary of northern fur seal data and collection procedures, Volume 2: Eastern Pacific pelagic data of the United States and Canada (excluding fur seals sighted),"** Robert H. Lander (editor). U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-4, 541 p., 1980. (NTIS number is PB81 123413.)

**"Summary of northern fur seal data and collection procedures, Volume 3: Western Pacific pelagic data of the Soviet Union and Japan, 1958-1978 (excluding fur seals sighted),"** Robert H. Lander and Hiroshi Kajimura (editors). U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-5, 304 p., 1980. (NTIS number is PB81 165904.)

**"Releases of anadromous salmon and trout from U.S. and Canadian Pacific coast rearing facilities, 1960-1976,"** by Robert Z. Smith and Roy J. Wahle. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-6, 411 p., 1981. (NTIS number is PB82 196452.)

**"Changes in relative abundance and size composition of sablefish in the coastal waters of southeast Alaska, 1978-80,"** by Harold H. Zenger and Steven E. Hughes. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-7, 27 p., 1981. (NTIS number is PB81 181935.)

**"Changes in relative abundance and size composition of sablefish in the coastal waters of Washington and Oregon, 1979-80,"** by Norman B. Parks and Steven E. Hughes. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-8, 25 p., 1981. (NTIS number is PB82 202368.)

**"Economic impacts of the Alaska**

**shellfish fishery: An input-output analysis,"** by Walter Butcher, Joanne Buteau, Kenneth Hassenmiller, Glenn Petry, and Samih Staitieh. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-9, 103 p., 1981. (NTIS number is PB82 169723.)

**"Gulf of Alaska bottomfish and shellfish resources,"** by Miles S. Alton. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-10, 51 p., 1981. (NTIS number is PB81 224347.)

**"A summary of foreign Pacific whiting catches and trawl positions in the Washington-California region, 1977-1980,"** by Kathleen D. Edwards, Thomas C. Dark, Robert French, Russell Nelson, Jr., and Janet Wall. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-11, 206 p., 1981. (NTIS number is PB82 109554.)

**"Transplantation and homing experiments on salmon, *Oncorhynchus* spp., and steelhead trout, *Salmo gairdneri*, in the Columbia River system: Fish of the 1939-44 broods,"** by Leonard A. Fulton and Roger E. Pearson. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-12, 97 p., 1981. (NTIS number is PB82 124314.)

**"Trawl survey of groundfish resources in the Gulf of Alaska, summer 1978,"** by Gene C. Feldman and Craig S. Rose. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-13, 44 p., 1981. (NTIS number is PB82 124504.)

**"All-nation removals of groundfish, herring, and shrimp from the eastern Bering Sea and northeast Pacific Ocean, 1964-1980,"** by Sueto Murai, Harold A. Gangmark, and Robert R. French. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-14, 40 p., 1981. (NTIS number is PB82 148693.)

**"Estimation of a decreasing population size over time,"** by Russell F. Kappenman. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-15, 7 p., 1981. (NTIS number is PB82 161191.)

**"Factors affecting bottom trawl behavior: Results of experiments with 83/112 Eastern trawls towed from the NOAA ship *Miller Freeman*,"** by Charles William West. U.S. Dep.

Commer., NOAA Tech. Memo. NMFS F/NWC-16, 36 p., 1981. (NTIS number is PB82 150400.)

**"Census of northern sea lion (*Eumetopias jubatus*) in central Aleutian Islands, Alaska, 17 June-15 July 1979, with notes on other marine mammals and birds,"** by Clifford H. Fiscus, David J. Rugh, and Thomas R. Loughlin. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-17, 109 p., 1981. (NTIS number is PB82 146218.)

**"A description of the resource database system of the Northwest and Alaska Fisheries Center, 1981,"** by Ralph J. Mintel and Gary B. Smith. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-18, 111 p., 1981. (NTIS number is PB82 161159.)

**"A numerical simulation model of the population dynamics of walleye pollock, *Theragra chalcogramma* (Pallas 1811), in a simplified ecosystem: Part 1, model description,"** by Charles D. Knechtel and Lewis J. Bledsoe. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-19, 212 p., 1981. (NTIS number is PB82 163049.)

**"Relative abundance and size composition of sablefish in coastal waters of southeast Alaska, 1978-81,"** by Harold H. Zenger, Jr. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-20, 42 p., 1981. (NTIS number is PB82 174566.)

**"Bowhead whale radio tagging feasibility study and review of large cetacean tagging,"** by Larry J. Hobbs and Michael E. Goebel. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-21, 68 p., 1982. (NTIS number is PB82 193145.)

**"Differences in susceptibility among three stocks of chinook salmon, *Oncorhynchus tshawytscha*, to two isolates of infectious hematopoietic necrosis virus,"** by Alex C. Wertheimer and James R. Winton. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-22, 10 p., 1982.

**"Trawl survey of groundfish resources off the Aleutian Islands, July-August 1980,"** by Lael L. Ronholt, Franklin R. Shaw, and Thomas K. Wilderbuer. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-23, 84 p. (NTIS number is PB82

189986.)

**"Cohort analysis of catch data on Pacific herring in the eastern Bering Sea, 1959-81,"** by Vidar G. Weststad. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-24, 18 p., 1982. (NTIS number is PB82 193947.)

**"Current abundance of Pacific cod (*Gadus macrocephalus*) in the eastern Bering Sea and expected abundance in 1982-86,"** by Vidar Weststad, Richard Bakkala, and Jeffrey June. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-25, 26 p., 1982.

**"Changes in relative abundance and size composition of sablefish in coastal waters of Washington and Oregon, 1979-81,"** by Norman B. Parks. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-26, 28 p., 1982.

**"Fluctuations of fish stocks and the consequences of the fluctuations to fishery and its management,"** by Taivo Laevastu and Richard Marasco. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-27, 53 p., 1982.

**"Squids taken in surface gillnets in the north Pacific Ocean by the Pacific salmon investigations program, 1955-72,"** by Clifford H. Fiscus and Roger W. Mercer. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-28, 32 p., 1982.

**"Data on fish species from Bering Sea and Gulf of Alaska,"** by Karl Niggol. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-29, 125 p., 1982.

## **International Shrimp Workshop Proceedings**

The second issue of the *Kuwait Bulletin of Marine Science*, edited by A. S. D. Farmer, has been devoted to the "Proceedings of the International Shrimp Releasing, Marking, and Recruitment Workshop" held 25-29 November 1978 in Salmiya, Kuwait. The Bulletin is published by the Kuwait Institute for Scientific Research in Salmiya.

Seeing declining shrimp stocks and catches, the Institute established its

Shrimp Culture Project to develop hatchery techniques suitable for use in Kuwait which would permit the mass releasing of juvenile shrimp into the sea similar to Japan's stocking of shrimp into the Seto Inland Sea. With appropriate techniques developed, they initiated the workshop to address the questions of the efficacy of the mass releasing of shrimps into the sea, whether releasing shrimps is beneficial, optimum releasing numbers, and whether the shrimp culture project should be directed toward commercial culture to marketable size.

The result is an impressive volume divided into five sessions, with the first providing a historical review of the Kuwait Shrimp Culture Project and a bibliography on the releasing, recruitment, mortality and marking of penaeid shrimps by A. S. D. Farmer. Observations on the biology of *Penaeus semisulcatus* in Kuwait are made by K. H. Mohamed, M. El-Musa, and A.-R. Abdul-Ghaffar while Farmer and M. H. Al-Attar report results of shrimp marking programs in Kuwait. The development of the Kuwait shrimp fishery and its present status are presented by N. P. van Zalinge, and M. El-Musa and A.-R. Abdul-Ghaffar.

Session II, Shrimp Releasing, contains H. Kurata's review of shrimp fry releasing techniques in Japan (with special reference to artificial tideland) and a report on large-scale production of shrimp for releasing in Japan and the United States and the results of the releasing program at Panama City, Fla., by J. Kittaka.

Session III, Shrimp Tagging, provides reviews of crustacean marking methods (Farmer), the NMFS shrimp research program in the Gulf of Mexico (E. F. Klima), shrimp marking trials in Japan (K. Ishioka), mark-recapture and recruitment studies on Australian penaeid shrimp (J. W. Penn), mathematical models for use with mark-recapture studies (R. Jones), and a design for a simplified releasing cage for marked shrimp or fish (Farmer and Al-Attar).

Session IV, Shrimp Fisheries Management, includes papers on estimates of mortality rate and population size

for shrimp in Kuwait waters (Jones and N. P. van Zalinge), population dynamics and management of the shrimp fishery in the Seto Inland Sea (T. Doi), prediction of shrimp landings from investigations on the abundance of post-larval shrimp (J. Y. Christmas and T. N. Van Devender), factors affecting shrimp recruitment (F. Sander), and a review of the North American penaeid fisheries, with particular reference to Mexico (C. P. Mathews).

A short concluding session presents the workshop group's statement of findings and recommendations. Group discussions following each paper are also published following each paper.

Further information on the availability of the report can be obtained from the Mariculture and Fisheries Department, Kuwait Institute for Scientific Research, P.O. Box 1638, Salmiya, State of Kuwait. Paperbound, 415 pages, the publication is very well edited and produced and will likely be of interest to many shrimp researchers and managers.

## **A Zooplankton Atlas of the SW Atlantic Ocean**

The "Atlas of the Zooplankton of the Southwestern Atlantic and Methods in Marine Zooplankton Research," edited by Demetrio Boltovskoy, has been published as a Special Publication by INIDEP, the Instituto Nacional de Investigacion y Desarrollo Pesquero, Casilla de Correo 175, Playa Grande, 7600 Mar del Plata, Argentina. Cost of the 939 page paperbound volume is \$40.00.

Entirely in Spanish, the contents are arranged in three parts: Research methods, physical and biological features of the southwestern Atlantic, and zooplankton of the southwestern Atlantic. Part I includes material on sample collection (nets; automatic, continuous, and high-speed samplers; pump sampling; bottle sampling; miscellaneous methods; and industrial-scale collection. Other problems described include sampler efficiency and handling, shape of sampler, the gauze, avoidance of samplers (dodging), esti-

mation of water volume filtered, depth of tow, towing speed, and sampling design. Also discussed is sample treatment, marine zooplankton cultivation, and general handling of data, literature, and material.

Part II describes the physical features, water masses, and biological features of the southwestern Atlantic while Part III examines the region's zooplankton. Here, each chapter includes a brief account of the biology, reproduction, general distribution, importance and applications, trophic relationships, and methods of research of the particular group. Detailed information is given on the distribution in the southwestern Atlantic (0°-60°S and 70°-25°W), including critical analysis of the previous records of each species in the area of study. The last section of each chapter of Part III is devoted to the identification of the species known to occur in the region, including descriptions, keys, and illustrations of all the taxa. Included is data on radiolaria, foraminifera, tinnina Siphonophorae, Hydromedusae, Polychaeta, Pteropoda, Cladocera, Ostracoda, Copepoda, Euphausiacea, Decapoda larvae, Chaetognatha, Thaliacea: Salpidae, Appendicularia, and Ichthyoplankton.

The volume contains about 3,000 bibliographic references and 270 figures with 80 plates with species illustrations. Sponsors, in addition to INIDEP, include Argentina's Consejo Nacional de Investigaciones Cientificas y Technicas and the Comision de Investigaciones Cientificas de la Provincia de Buenos Aires and UNESCO.

## **Tuna Processing Handbook Available**

The New Zealand Ministry of Agriculture and Fisheries has prepared a 36-page report entitled "A Handbook on Processing Southern Bluefin Tuna for the Fresh Chilled Sashimi Market in Japan." The report is composed of five sections. The introduction gives a brief background of the fishery — the Zealand-claimed waters. The main section explains processing techniques

and discusses problems which often arise. There are also sections dealing with proper handling and storage of fish in ice, freezing chilled fish, and packing large fish for export by air in accordance with International Air Transportation Association guidelines. The manual is the result of research carried out on Japanese longliners operating off New Zealand, research conducted at various sashimi markets in Japan, and the practical experience of New Zealand fishermen.

A copy of the report may be requested by title from Michael A. Carney, (F/IA-1), Division of Foreign Fisheries Analysis, NMFS, NOAA, Washington, DC 20235. Please enclose a 9" x 12" self-addressed envelope with \$0.80 postage.

## **Uruguayan Fisheries Report Available**

Uruguay has a small fishing industry, but the government's fisheries development program has been successful. The fisheries catch has increased from only 17,500 metric tons (t) in 1973 to about 120,000 t in 1980, or nearly 6 times. Government officials had projected a 1981 catch of 140,000 tons. Most of the catch is exported and the fishing industry is rapidly becoming an important source of foreign exchange earnings. Fishery exports exceeded \$50.0 million in 1981, of which \$15.5 million was shipped to the United States.

The National Marine Fisheries Service and the U.S. Embassy in Montevideo prepared a 19-page report entitled "The Fishing Industry of Uruguay, 1975," describing the country's fishing industry and fisheries development program in 1975 (DIB-77-08-040). The U.S. Embassy in Montevideo has prepared a 34-page update entitled "The Fishing Industry in Uruguay, 1980" (ITA-82-01-007). Either of the two reports can be ordered from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. The 1975 report costs \$5.00 and the 1980 report costs \$6.50. (Source: IFR-82/32R.)