New NMFS Scientific and Technical Reports Published

Most of the publications listed here may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (if listed as a sales item). Readers are advised to write that agency prior to ordering to determine price and availability. Prices may change and prepayment is required. Information on the availability of other NOAA publications can be obtained from the Environmental Science Information Center (D822), Environmental Data and Information Service, NOAA, 6009 Executive Boulevard, Rockville, MD 20852. When out of print, copies of the reports (either paper or microfiche) can be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151.

NOAA Technical Report NMFS Circular 434. Tyler, James C. **"Osteology, phylogeny, and higher classification of the fishes of the Order Plectognathi (Tetraodontiformes)."** October 1980. 422 p.

Abstract

The osteology of over 160 species of fossil and Recent plectognath or tetraodontiform fishes is described and illustrated in relation to the supposed phylogeny and proposed higher classification (subfamilial to ordinal levels) of this group of approximately 320 Recent species of primarily tropical and temperate forms of the Atlantic, Pacific, and Indian oceans. The history of the classification and of the previous work on the osteology of the order is reviewed, while one new species (†*Acanthopleurus collettei,* Oligocene of Canton Glarus, Switzerland) and one new genus (†*Eotetraodon,* Eocene of Monte Bolca, Italy) are described. Comparative inclusive and exclusive definitions are given for all higher categories based on both external and internal anatomical features. The Order Plectognathi (Tetraodontiformes) is divided into two suborders, the Sclerodermi or Balistoidei and the Gymnodontes or Tetraodontoidei, with a variety of other infraordinal and superfamilial categories, and 10 families, with subfamilial groupings in 4 of the latter.

NOAA Technical Report NMFS SSRF-741. Dickinson, John J., Roland L. Wigley, Richard D. Brodeur, and Susan Brown-Leger. **"Distribution of gammaridean Amphipoda (Crustacea) in the Middle Atlantic Bight region."** October 1980. 46 p.

Abstract

The distribution and abundance of 101 species of marine benthic gammaridan amphipods are described for

Fourth Annual Tropical, Subtropical Fisheries Tech Conference Papers

"Proceedings of the Fourth Annual Tropical and Subtropical Fisheries Technological Conference of the Americas," compiled by Ranzell Nickelson II (individual authors edited their own papers), presents 29 contributions ranging from an assessment of the international fisheries scene by David James of FAO's Fish Utilization and Marketing Service to a review of the Louisiana cholera outbreak by M. W. Moody of Louisiana Cooperative Extension Service, and E. Spencer Garrett of the NMFS National Seafood Quality and Inspection Laboratory in Pascagoula, Miss.

A review of the product quality and safety research activities of the NMFS is given by Thomas J. Billy and E. Spencer Garrett. Other papers discuss shrimp boat sanitation, free liquid content of oysters, a "dip stick" method for monitoring fecal coliform levels, the potential of *Planococcus citreus* for shrimp spoilage, fluid separation of fish by shape, economic freezing of fish in a plate freezer, a centrifumatic crab machine, solar drying of mullet roe, brining mullet, extension of flounder shelf life by poly (PHMB), freezer storage of blue crabs for picking plants, deboned flesh from nontraditional Gulf of Mexico fishes, nutritive values of seafoods, fish flakes, microwave shrimp cookery, queen conch fisheries and biology, and more.

The 254-page paperbound volume is available from the Marine Information Service, Sea Grant College Program, Texas A&M University, College Station, TX 77843 for $10.00.

Dangerous Marine Species Identified

Publication of the second edition of **"Dangerous Marine Animals"** by Bruce W. Halstead has been announced by Cornell Maritime Press, P.O. Box 456, Centreville, MD 21617. The well-illustrated (16 pages of 4-color photos or drawings), 256-page volume provides a detailed and ready source of information regarding the identification, geographical distribution, habits, and noxious characteristics of marine species from around the world. All organisms discussed are identified by common and scientific name and are illustrated. The means by which they come in contact with humans and thereby inflict injury, and how one copes with such situations, is discussed. Practical first aid measures and medical treatments are described.

While research scientists may miss technical discussions of the chemical and pharmacological properties of the poisonous substances, the volume remains of considerable value to most others involved in the marine environment. The 208-page volume is indexed

the Middle Atlantic Bight region. This report is based on 669 quantitative grab samples from 563 stations on the continental shelf and upper continental slope between Cape Cod, Mass., and Cape Hatteras, N.C. The amphipod fauna from the open shelf is most completely represented, but deep-sea and estuarine species are also included. The abundance of each species is reported in terms of its numerical density. Geographic and bathymetric distributions, and sediment relationships are also reported for each species.

NOAA Technical Report NMFS SSFR-742. Husby, D. M., and G. R. Seckel. **"Water structure at Ocean Weather Station V, northwestern Pacific Ocean, 1966-71."** October 1980. 56 p.

Abstract

The oceanographic station data obtained at Ocean Weather Station V from 1966 to 1972 by the U.S. Coast Guard have been analyzed and are presented in a form suitable for water structure studies. Temperatures, salinities, and depths are given as a function of density (sigma-*t*). We used harmonic analysis as a curve-fitting technique, to obtain parameters for these properties as a function of time. The harmonic coefficients and interpolated values at the first of each month for the 6-year series are tabulated in an appendix.

We describe the temporal distributions of salinity and depth in terms of the oceanographic setting. At depths greater than sigma-*t* 26, temperature-salinity relationships remain relatively constant in time. Depth variations at these levels are attributed primarily to meanders of the Kuroshio Extension. The surface divergence, as reflected by changes in the depth of sigma-*t* 26, has no annual periodicity. The 6-year record shows that large baroclinic variability occurs at time scales of more than 55 days with largest variability occurring at the interannual scale.

Heat budget estimates show that the effects of local ocean-atmosphere exchange processes are obscured by advected properties. For example, the heat content of the layer above sigma-*t* 26 is primarily determined by the divergence of this layer and anomalies in the mean temperature are produced by heat advection rather than heat exchange across the sea surface.

NOAA Technical Report NMFS SSRF-743. Low, Loh-Lee, and Ikuo Ikeda. **"Average density index for walleye pollock, *Theragra chalcogramma,* in the Bering Sea."** November 1980. 11 p.

Abstract

The data base and an average density index (ADI) procedure for assessing walleye pollock, *Theragra chalcogramma,* abundance in the eastern Bering Sea were evaluated. The data base consisted of daily catch-effort records of individual fishing vessels in the Japanese groundfish fishery from 1964 to 1976. Variances about the annual mean catch, effort, and catch per unit effort (CPUE) data were low. Coefficient of variation of annual CPUE data was in the 1-2% range for the data base after 1969 but higher in earlier years when the number of fishing records was lower. An ADI procedure is described which takes into consideration different types of vessels used in the fishery, species mix in the catch, distribution of pollock, and fishing pattern of the fleet. Data from five vessel class-gear types that fished mainly for pollock were selected to compute ADIs in four area-time cells. An overall ADI within these cells was determined, summarizing the results by vessel class-gear types and area-time cells. From 1964 to the early 1970s, overall ADI and CPUE trends increased as a result of increased pollock abundance and fishing power of vessels. For 2-3 years during the early 1970s, abundances of pollock were at peak levels. Beginning in 1972, abundance declined but stabilized during 1975-78 at an intermediate level when 1.1 million metric tons of walleye pollock were harvested annually.

and a list of references is provided. Cost is $15.00.

FAO, UNESCO Fisheries Publications Available

The availability of several FAO and UNESCO fisheries publications has been announced by UNIPUB, 345 Park Ave. South, New York, NY 10010. Among them are the following items.

"Proceedings of the workshop on the Phenomenon Known as 'El Nino'", a UNESCO publication ($22.50) forms part of the Proceedings of the Workshop held at Guayaquil, Ecuador, 4-12 December 1974. This volume contains translations of 10 papers contributed in Spanish by marine scientists from the region, and which were presented or distributed at the workshop in their original version. Papers discuss physiological and biological aspects of the 1972-73 "El Nino" phenomenon, water masses and primary production in the northern and central Chilean zones, physical and biological aspects of the Peru current system, a summary of the biology of the anchoveta, projected Peruvian research on the species, and more.

"Engineering Applications: 1, Installation and Maintenance of Engines in Small Fishing Vessels", FAO Fisheries Technical Paper 196, by FAO consultant Brian Mutton, is a basic handbook intended primarily to aid small boatyards, boat owners, and fishermen in developing countries, still it has a lot of sound information useful to anyone involved in working with fishing vessels.

It covers principles and installation details for various engines; stern gear; cooling, exhaust, fuel, electrical, and starting systems; controls and instruments, bilge pump and bilge systems, power take-off, etc. Finally, it discusses engine selection, obtaining parts and tools, and care and maintenance. The 127-page volume costs $7.25.

The **"Handbook of Utilization of Aquatic Plants,"** by E. C. S. Little (FAO Fisheries Technical Paper 187), is a completely revised and updated version of the author's 1968 handbook, "Utilization of Aquatic Plants" and provides an extensive review of the world literature, with an annotated listing of more than 250 books, papers, etc. on aquatic plant uses. The largest section concerns the chemical composition and productivity of various species and a large number of analytical results are quoted. Sections are included on harvesting and protein extraction.

Other sections deal with harvesting methods; use for human, livestock, fish, and aquatic animal foods; use for fertilizer, compost, mulch, etc.; and such miscellaneous uses as fuel, paper, building materials, medicines,

and more. The 176-page paperbound volume costs $9.75.

"Fish Feed Technology," published by the United Nations Development Program, contains lectures presented at the FAO/UNDP Training Course in Fish Feed Technology at the University of Washington's College of Fisheries in Seattle in late 1978.

The lecturers discussed fish digestion physiology and anatomy, nutritional bioenergetics in fish, nutritional biochemistry, the feedstuffs (components, antioxidants, toxins, unconventional ingredients, storage problems, and stability), formulating feeds, manufacturing technology, practical and novel fish diets, and quality control. The 395-page volume costs $21.50.

A Basic Textbook for Commercial Fishermen

The **"Fishermen's Handbook"**, edited by Captain W. H. Perry has been published by Fishing News Books Ltd., 1 Long Garden Walk, Farnham, Surrey, England. In four parts, the volume covers practical seamanship, safety and survival, navigation and watchkeeping and ship-handling.

Part I deals with bends and hitches, knots and splices, tackles, slings and spans, anchors and cables, and care of fish. Fishing with bottom trawl gear and seine net and bottom trawling techniques are briefly discussed. Part II includes chapters on distress and rescue procedures, visual signals, inflatable rafts, fire prevention and fighting, and emergencies at sea.

Part III discusses navigational instruments, coastal navigation, astronomical navigation, and electronic navigational aids and equipment. Part IV covers ship handling, elements of vessel stability, meteorology, international rules to prevent collisions, etc.

This is a good basic text for British commercial fishermen and others, of course, would also find much useful information in it. The 344-page book is available from the publisher for £9.75 plus £1.00 postage and handling.

Japanese Eel Culture Book Is Translated

"Theory and Practice of Eel Culture," [Yōmanho nō riron to jissai], by Isao Matsui, has been translated from the Japanese and published for the National Marine Fisheries Service and the National Science Foundation by Amerind Publishing Co., New Delhi, India. It is available (price not listed) from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

The 133-page volume includes a wide range of information on eels and their culture that makes it useful to beginners, scientists, and eel culturists. Chapters discuss the position of eel culture in Japan, types and distribution of eels in Japan, life cycle of eels, elvers and their collection, feeding the eels, the proper environment, diseases and prophylaxis, pond management and culture techniques, marketing, and eel management.

Squid Fishing Areas and Trawl Obstruction Sites Listed for Atlantic Coast

The Virginia Institute of Marine Science, Gloucester Point, VA 23062, has published **"Location of Foreign Fishing Vessels Harvesting Squid in the Mid-Atlantic Region of the United States: 1970-1976"** by James Zaborski (SRAMSOE No. 235) to help U.S. fishermen locate squid resources within the Mid-Atlantic U.S. Fishery Conservation Zone. It is a summary of foreign squid fishing activities in this area, summarized from NMFS, Coast Guard, and ICNAF data. The charts show, on a monthly basis, areas where foreign vessels were engaged or were believed engaged in squid fishing, by frequency of use of the areas. Data for both *Illex illecebrosus* and *Loligo pealei* are given. While abundance and seasonal location of squid are likely to change as a result of environmental fluctuations and changes in stock size, the data remain a good tool to determine areas and times for squid fishing.

VIMS also has copies of the "Fishermen's Hang Log of the Atlantic Coast of the United States", an expanded version of a 1975 collection of data from trawler captains who charted objects or ocean bottom items that would hang or snag trawling gear and nets. The log provides as many Loran A cross bearings as possible and, when possible, converts them to Loran C. Depth (in fathoms) is given where possible.

Marine, Freshwater Fisheries in the PRC

Availability of **"Aquaculture Development in China,"** a report on an FAO/UNDP Aquaculture Study Tour to the People's Republic of China, 2 May-1 June 1978, has been announced by UNIPUB, 345 Park Avenue South, New York, NY 10010. Covered are aspects of Chinese aquaculture development, planning, and management; financing and credit; fish culture practices; integrated farming of fish, crop, and livestock; fish cultivation in natural lakes, reservoirs, and rivers; marine aquaculture; marketing; education and training; and fisheries research. Cost is $6.00 for the 65-page volume.

Also available from UNIPUB is **"Fisheries and Aquaculture in the People's Republic of China"** by G. I. Pritchard. This small pamphlet (about 22 full pages of text, 7 photographs) provides a glimpse of Chinese fish culture activities, fisheries priorities and achievements, and the Chinese perspective on fisheries science and development.

In general, marine fisheries science and development has lagged while freshwater fish culture has grown. However, the author predicts a good outlook for fisheries science and culture, particularly if coupled with the broad base of western science and technology. He also reports on Chinese studies on the production and feeding of seals and progress in artificial propagation of eels. About 60 citations of Chinese fisheries literature are listed. Published by the International Development Research Center in Canada, this booklet costs $3.50.