

## New NMFS Scientific Reports Published

The publications listed below may be obtained from either the Superintendent of Documents (address given at end of title paragraph on affected publications) or from D822, User Services Branch, Environmental Science Information Center, NOAA, Rockville, MD 20852. Writing to the agency prior to ordering is advisable to determine availability and price, where appropriate (prices may change and prepayment is required).

NOAA Technical Report NMFS Circular 414. Klein-MacPhee, Grace. **"Synopsis of biological data for the winter flounder, *Pseudopleuronectes americanus* (Walbaum)."** November 1978. 43 p.

### ABSTRACT

This monograph contains a synopsis of selected pertinent papers covering biological and technical data of the winter flounder, *Pseudopleuronectes americanus*, including life history, taxonomy, physiology, disease, ecology, population dynamics, commercial and sports fishery, behavior, environmental effects, and culture. One hundred and fifty-four published reports and 12 unpublished reports are covered. Twenty-one figures are included. Literature up to and including 1976 is covered.

NOAA Technical Report NMFS Circular 415. Chao, Labbish Ning. **"A basis for classifying western Atlantic Sciaenidae (Teleostei: Perciformes)."** September 1978. 64 p.

### ABSTRACT

Sciaenidae of the western Atlantic consist of 21 genera and at least 57 species, and are placed in 11 suprageneric groups: *Cynoscion*, *Larimus*, *Lonchurus*, *Menticirrhus*, *Micropogonias*, *Nebrius*, *Pogonias*, *Sciaena*, *Sciaenops*, *Stellifer*,

and *Umbrina* groups. The phylogenetic relationships of all western Atlantic genera are assessed on the basis of swim bladder, otoliths (sagitta and lapillus), and external morphology. The *Stellifer* group differs from all other western Atlantic sciaenids in having a two-chambered swim bladder and an enlarged lapillus. Phylogenetic and ontogenetic trends of the swim bladder range from a simple carrot-shape, to a more complicated structure with anterior projections and horns, to a very complicated lateral diverticula system. The sagitta is usually oval or elongate in shape. The thickness and the impression of the sulcus on the inner surface of the sagitta are diagnostic among genera. External morphology is adaptive, especially in relation to feeding habits and habitat, but a trend is evident in that closely related genera often have similar body shapes, mouth positions, and other external features. Species of the genus *Stellifer* are exceptions in having diverse mouth positions and feeding habits.

The synopsis section of the paper includes a diagnosis, a primary synonymy, and lists of types of nominal species for each taxonomic category. Four genera and 22 nominal species of New World freshwater sciaenids are also included. Nomenclatural changes in regard to the genus *Micropogon* (to *Micropogonias*) and for the species *Bairdiella chrysura* (to *B. chryssoura*) is given. A tested key to species and genera of all western Atlantic sciaenids is included. The approximate range of distribution and some counts are listed under each species. This paper is designed to serve as a basis for further revision of western Atlantic sciaenids.

NOAA Technical Report NMFS Circular 416. Goulet, Julien R., Jr., and Elizabeth D. Haynes (editors). **"Ocean variability: Effects on U.S. marine fishery resources — 1975."** December 1978. 350 p.

### ABSTRACT

Ocean variability, and its effects on

U.S. marine fishery resources in 1975, is summarized. Also included is a collection of data products and contributed papers focusing on the impacts on fisheries resources of ocean variability. The emphasis is on large scale, both in time and space, environmental processes, the variations of index properties, and the consequent modulations of fisheries responses.

NOAA Technical Report NMFS Circular 417. Cohen, Daniel M., and Jørgen G. Nielsen. **"Guide to the identification of genera of the fish order Ophidiiformes with a tentative classification of the order."** December 1978. 72 p.

### ABSTRACT

Objectives of the paper are to provide dichotomous keys for the identification of ophidiiform genera. For each genus a brief account is presented including synonymy, a short diagnosis, a list of species, distribution, references, when possible comments on relationships, and for most an outline drawing.

The genera are organized into an hierarchical classification which divides them into two suborders, Ophidioidei, which contains oviparous fishes with a high anterior nostril, and Bythitoidei which contains viviparous fishes with a low anterior nostril.

Ophidioidei is divided into two families. Carapidae, with a vexillifer larval stage, has two subfamilies: Pyramodontinae with two genera and Carapinae with four. Ophidiidae has four subfamilies: Brotulinae, with a single genus: Brotulotaeniinae (new family) with a single genus; Ophidiinae, the cust eels, with eight genera in two tribes; and Neobythitinae, with 38 genera (*Epetriodus* and *Spottobrotula* are new genera based on new species from the Indian Ocean) in two tribes.

Bythitoidei contains two families, one of which, Aphyonidae has five genera characterized by many neotenic features. Bythitidae is divided into the free-tailed Bromphycinae with 13 genera in two tribes and Bythitinae with 15 genera.

NOAA Technical Report NMFS Circular 418. Manooch, Charles S., III, Eugene L. Nakamura, and Ann Bowman Hall. **"Annotated bibliography of four Atlantic scombrids: *Scomberomorus brasiliensis*, *S. cavalla*, *S. maculatus*, and *S. regalis*."** December 1978. 166 p.

## ABSTRACT

Annotated references are presented on 570 papers published from 1793 to 1977 on *Scomberomorus brasiliensis*, serra Spanish mackerel; *S. cavalla*, king mackerel; *S. maculatus*, Spanish mackerel; and *S. regalis*, cero. A subject index is included for each species and covers a variety of topics ranging from taxonomy to commercial and recreational fishing.

NOAA Technical Report NMFS Circular 419. Bovee, Eugene C., and Thomas K. Sawyer. "Marine flora and fauna of the northeastern United States. Protozoa: Sarcodina: Amoebae." January 1979. 56 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

## ABSTRACT

This manual contains a key to 15 families of freshwater and marine amoebae, of which only one, the Echinamoebidae, does not contain a known marine species. Diagnostic features for 49 genera, of which 34 include marine species, also are given. Descriptions and illustrations for 76 species of marine amoebae and an annotated systematic list are provided. The basic key is designed to assist the user in the identification of recognized species of marine amoebae that have been described from waters of the northeastern United States. However, certain well-known families and genera of freshwater forms are included to assist in their identification should they be discovered in seawater in future investigations. Information also is provided which includes comments on the general biology of the Amoebida, and techniques for microscopic observations and laboratory

cultivation of many species. Most of the amoebae described in the key are free living, but a few are parasitic and known to be of considerable economic importance. One new free-living species, *Vexillifera minutissima*, was discovered in Chincoteague Bay, Va., and is described herein for the first time.

NOAA Technical Report NMFS Circular 420. Morrow, James E. "Preliminary keys to otoliths of some adult fishes of the Gulf of Alaska, Bering Sea, and Beaufort Sea." February 1979. 32 p.

## ABSTRACT

Keys and outline drawings are provided for the identification of the otoliths of 142 species of marine fishes from the Gulf of Alaska, Bering Sea, and Beaufort Sea.

NOAA Technical Report NMFS Circular 421. Lang, William H. "Larval development of shallow water barnacles of the Carolinas (Cirripedia: Thoracica) with keys to naupliar stages." February 1979. 39 p.

## ABSTRACT

The report includes an introduction to structure, descriptions, and illustrated keys to the barnacle larvae of Georgetown, S.C. Descriptions of 13 species are based on both laboratory reared and field specimens. The complete naupliar development of *Chelonibia patula*, *Chthamalus fragilis*, *Balanus venustus*, *Balanus subalbidus*, *Octolasmis forrestii*, and an unknown species, "nauplius SC," is described for the first time.

NOAA Technical Report NMFS Circular 422. Springer, Stewart. "A revision of the catsharks, Family Scyliorhinidae." April 1979. 152 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

## ABSTRACT

The family includes 86 species in 17 genera. Species are characterized and most of them are illustrated. Summaries of biological studies pertinent to classification are included. Keys to genera and species are provided. Six new species and one new subspecies are described: *Parmaturus manis* of the western North Atlantic; *P. stenseni* of the Pacific continental slope off Panama; *P. campechiensis* from the Gulf of Mexico; *Galeus schultzi* from Philippine seas; *G. arae antillensis* from the West Indies; and two species of *Apristurus* from the western Atlantic, *A. canutus* Springer and Heemstra and *A. parvipinnis* Springer and Heemstra. Two populations close to *Galeus arae* and one population close to *G. melastomus* are treated here as subspecies; they are *G. a. antillensis* (new subspecies) and *G. a. cadenati* of the Caribbean region and *G. m. murinus* of northeastern Atlantic island slopes. Treatment emphasizes descriptive accounts thought to be useful for species identification.

NOAA Technical Report NMFS Circular 423. Watling, Les. "Marine flora and fauna of the northeastern United States. Crustacea: Cumacea." April 1979. 23 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

## ABSTRACT

This manual includes an introduction on the external and internal morphology, development, life history, ecology and distribution, an illustrated key, an annotated systematic list, a selected bibliography, and an index to the 34 species of cumacean peracarid crustaceans occurring in waters shallower than 200 m from Nova Scotia to Chesapeake Bay.

NOAA Technical Report NMFS Circular 425. Zullo, Victor A. "Marine flora and fauna of the northeastern United States. Arthropoda:

## The Acidification of Aquatic Ecosystems

"Sulfur Oxides," by the National Council's Committee on Sulfur Oxides, has been published by the National Academy of Sciences, Washington, D.C.

Chapter 5, "Effects of sulfur oxides on aquatic ecosystems," reviews and discusses the acidification of oligotrophic lakes and streams. The alterations to these aquatic ecosystems that occur as a result of the deposition of

energy-related pollutants are briefly outlined and a selection of current literature is cited. Specific examples are listed and the effects of human society—health, aesthetic, and recreational—are outlined. The 250-page paper-bound volume is available at \$9.00 per copy from the Office of Publications, National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, DC 20418.

**Cirripedia.** April 1979. 29 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

#### ABSTRACT

This manual treats the estuarine and coastal marine barnacles of the northeastern Atlantic from the Gulf of St. Lawrence to Cape Hatteras, N.C. The introduction includes a review of the general biology, classification, and diagnostic features of the five orders of Cirripedia, and an annotated species list covers those cirripeds reported from the region. The bulk of the manual is devoted to aids in the identification of barnacles (Order Thoracia), and includes an illustrated systematic key to species augmented by a discussion and glossary of morphologic terms, and a guide to study methods.

NOAA Technical Report NMFS SSRF-726. Pawlowski, Robert J. **"The Gulf of Maine temperature structure between Bar Harbor, Maine, and Yarmouth, Nova Scotia, June 1975-November 1976."** December 1978. 10 p.

#### ABSTRACT

Monitoring of the temperature structure on a vertical section between Bar Harbor, Maine, and Yarmouth, Nova Scotia, has permitted observation of the seasonal warming and cooling trends in the northern Gulf of Maine.

Data have revealed a rise in both temperature and salinity from 1975 to 1976.

NOAA Technical Report NMFS SSRF-727. Cook, Steven K., Barclay P. Collins, and Christine S. Carty. **"Expendable bathythermograph observations from the NMFS/MARAD Ship of Opportunity Program for 1975."** January 1979. 93 p.

#### ABSTRACT

This report is designed to show the results of the fifth year of operation of the NMFS/MARAD Ship of Opportunity Program (SOOP). The data are presented in the form of vertical distributions of temperature and horizontal distributions of sea surface temperature and salinity. Operational and data management procedures are discussed, and a descriptive analysis of the most dynamic transects showing the Yucatan, Loop, Florida, and Gulf Stream current systems is presented. The annual development and subsequent degradation of the cold cell off the Middle Atlantic Bight is also discussed.

NOAA Technical Report NMFS SSRF-728. Saur, J. F. T., L. E. Eber, D. R. McLain, and C. E. Dorman. **"Vertical sections of semimonthly mean temperature on the San Francisco-Honolulu route: from**

**expendable bathythermograph observations, June 1966-December 1974."** January 1979. 35 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

#### ABSTRACT

Frequently repeated sections of expendable bathythermograph observations between San Francisco and Honolulu, taken by merchant vessels during the period June 1966 through December 1974, were analyzed to obtain mean seasonal cycles. Results are depicted in a set of semimonthly vertical sections of mean temperatures to 500 m and in a set of corresponding sections of 30-day mean temperature changes to 200 m. In addition, seasonal cycles at selected depths are included along with mean monthly vertical profiles for seven typical locations along the route.

The analyses reveals geographic and temporal facets of the mean thermal structure, including: 1) depth of the surface mixed layers in winter, 2) growth and decay of the seasonal thermocline, 3) decrease in depth of the permanent thermocline from Oahu to the California coast, 4) a region of temperature inversions or very weak vertical temperature gradients that develops between 50 and 100 m during the spring in the Transition Zone, and 5) the location and movement of warming and cooling regions during the year.

Vertical mixing appears to be the dominant process along most of the route for transmitting the annual surface warming and cooling cycle downwards to depths of 100 to 150 m. However,

## The Management of Tuna and Tuna-like Fishes

**"International Management of Tuna, Porpoise, and Billfish,"** subtitled "Biological, Legal and Political Aspects," has been published by the University of Washington Press. Authors are James Joseph, Director of Investigations of the Inter-American Tropical Tuna Commission, and Joseph W. Greenough, IATTC Senior Scientist.

Management of the highly-migratory tuna demands an international management approach, rather than a nation-by-nation approach, according to the authors, who, in response to a request from the eight IATTC nations, have analyzed the problems and

possible solutions to the management of tuna and tuna-like fishes. The authors address four major problem areas: 1) Collection and analysis of data needed to determine and regulate catches; 2) distribution of the catch among potential harvesters; 3) the economics and control of fleet carrying capacity; and 4) the enforcement of regulations.

The authors then consider six management approaches: 1) Control to 200 miles by individual coastal nations; 2) extension of the present IATTC management system; 3) open-access management with a partially allocated overall quota; 4) various types of

regional coalitions of nations; 5) total resource allocation schemes; and 6) resource allocation by competitive bidding.

The book also reviews the present status of world tuna resources and the fisheries for them, the tuna-porpoise problem in the eastern Pacific, and existing international arrangements for tuna management, and present possibilities for tuna conservation in which the authors stress their belief in the need for a coordinated global tuna management system.

The 270-page volume is available from the University of Washington Press, Seattle, WA 98105, for \$20.00.

advective processes are active in the California Current.

Tables of semimonthly mean temperatures are given in an Appendix.

NOAA Technical Report NMFS SSRF-732. Anderson, Emory D. "Assessment of the northwest Atlantic mackerel, *Scomber scombrus*, stock." April 1979. 13 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

#### ABSTRACT

The status of the Atlantic mackerel, *Scomber scombrus*, stock in the International Commission for the Northwest Atlantic Fisheries (ICNAF) convention area is analyzed in this paper. Total catch declined from a high of 431,606 t in 1972 to an estimated 92,000 t in 1977. The U.S. spring bottom trawl survey has shown a continuous decrease in Atlantic mackerel abundance since 1968. Fishing mortality ( $F$ ) in 1977 was estimated at 0.39, nearly one-half of the 1976 level and the lowest since 1972. The 1974 year class appears to be the strongest since 1969, whereas the 1975 and 1976 year classes appear to be very weak. Spawning stock biomass decreased from 1.8 million t in 1970-72 to an estimated 402,500 t at the beginning of 1978, which is slightly below the 1962-67 level when catches averaged only about 25,000 t. A zero catch in 1978 would increase the 1979 spawning stock by 6 percent; a catch of 23,500 t ( $F=0.07$ ) would maintain the spawning stock at the 1978 level.

NOAA Technical Report NMFS SSRF-733. Ellis, Robert J., and William J. McNeil. "Possible management procedures for increasing production of sockeye salmon smolts in the Naknek River system, Bristol Bay, Alaska." April 1979. 9 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

#### ABSTRACT

About 35 percent of the Naknek River system is greatly underutilized by juvenile sockeye salmon, *Oncorhynchus nerka*. In two basins the cause seems to be a lack of spawning grounds, and in a third basin the cause may be too few spawners or poor quality spawning grounds. The annual yield of adult sockeye salmon to the fishery could probably be increased by

about 200,000 to 300,000 fish by increasing the production of smolts. Artificial production of fry, along with improving or increasing the spawning environments, is recommended. The numbers of adult females, eggs, and fry required to fully seed the three underutilized basins are discussed. Attempts to increase the production of sockeye salmon in the Naknek River system must be accompanied by detailed biological studies to determine optimum seeding levels and establish cause-and-effect relations.

### Whales and the Whaling Industry off Alaska

"Alaska Whales and Whaling" has been published by the Alaska Geographic Society, Anchorage. Written mostly in a popular style, it still has several items of some interest to whale specialists. The book is superbly illustrated with many early photographs of whaling activities as well as art by Richard Ellis and Donald Sineti and color photographs by scientists and whale enthusiasts, including the rare photographic record of bowhead whale reproductive activity by NMFS biologist Bruce Krogman. Color plates from *Zoologica*, 3 April 1935, are reprinted showing worldwide capture points of right, bowhead, and humpback whales, as indicated by logbook records of whaling ships on voyages between the late 1700's and early 1900's.

The introduction, "Alaska's Whales," is by well-known scientist Victor B. Scheffer. Another chapter, "Alaska's Whales, A Closer Look," outlines the distribution, behavior, and physical characteristics of 15 whale species: Narwhal, beluga, minke, blue, fin, right, bowhead, sperm, sei, gray, humpback, killer whale, giant bottlenose or Baird's beaked whale, goose-beaked or Cuvier's beaked whale, and the Bering Sea beaked whale. Popular accounts of early and modern Eskimo whaling and whale studies are presented by staff writer Lael Morgan. Charles and Virginia Jurasz give an account of their humpback whale studies in Southeastern Alaska and John Bockstoce, Curator of Ethnology, New Bedford, Mass., Whaling Museum contributed

a "History of Commercial Whaling in Arctic Alaska."

The paperbound 144-page volume, one issue, 5(4), of the quarterly *Alaska Geographic*, costs \$9.95 and is available from the Alaska Geographic Society, Box 4-EEE, Anchorage, AK 99509. Previous numbers also dealing with aspects of marine fisheries include: "Fisheries of the North Pacific: History, Species, Gear and Processes," 1(4) and "The Silver Years of the Alaska Canned Salmon Industry: An Album of Historical Photos," 3(4), both \$7.95; and "Bristol Bay Basin," 5(3), \$9.95.

### Oil Pollution and the Amoco Cadiz

The wreck of the *Amoco Cadiz* off the coast of France in March 1978 spawned many studies. Now, a special issue of Pergamon Press' *Marine Pollution Bulletin*, 9(11), titled "Amoco Cadiz Oil Spill," published early this year under guest editor Molly F. Spooner, presents nine papers, notes, or progress reports on some of those studies. A brief list of earlier related reports is included.

Spooner begins with an overview of the spill, its effects on the marine environment and shore fauna, the cleanup and costs, and lessons learned. Formal paper topics include: Lines of study and early observations, Lucien Laubier; summary observations by U.S. scientists, Douglas A. Wolfe; sediment penetration of the oil, potential for future release, and toxicity, J. H. Vandermeulen et al.; petroleum hydrocarbon analyses, R. J. Law; early samples of oil in water and some analyses of zooplankton, P. R. Mackie et al.; and ecological impact on and near shores, C. Chasse. Shorter notes discuss conditions of intertidal sands in September 1978, sea bed pollution and disturbance of sublittoral communities in Northern Brittany, and oiled birds.

Copies of the 30-page paperbound issue of the *Marine Pollution Bulletin* are available at \$6.00 each from Pergamon Press, Fairview Park, Elmsford, NY 10523.