

NMFS Scientific Reports Published

NOAA Technical Report NMFS 47. Sindermann, Carl J. (editor). **"Reproduction, maturation, and seed production of cultured species."** (Proceedings of the Twelfth U.S.-Japan Meeting on Aquaculture, Baton Rouge, Louisiana, October 25-29, 1983, under the U.S.-Japan Cooperative Program in Natural Resources (UJNR).) February 1987, iii + 73 p.

SUMMARY

Included are 13 papers by authorities from Japan and the United States on topics including recent trends in mariculture and seed production, Kuruma prawn maturation, brown algae production in Japan, red sea bream seed production, oyster and seed oyster production, U.S. penaeid shrimp culture, Malaysian prawn larval rearing systems, red swamp crawfish culture, triploid channel catfish production, a bullfrog ovulatory stimuli, and treatment of fish hatchery water to remove solids and turbidity.

NOAA Technical Report NMFS 48. Lenarz, William H., and Donald R. Gunderson (editors). **"Widow rockfish, proceedings of a workshop, Tiburon, California, December 11-12, 1980."** January 1987, iii + 57 p.

SUMMARY

Presented are reports and reviews covering widow rockfish, *Sebastes entomelas*, biology, ecology, ageing and growth, U.S. west coast fisheries, diet, behavior, commercial passenger fishing vessel landings, maturity, plus descriptions of reared larvae of six species of *Sebastes*.

NOAA Technical Report NMFS 49. Harding, Stephen M., and Mark E. Chittenden, Jr. **"Reproduction, movements, and population dynamics of the southern kingfish, *Menticirrhus americanus*, in the northwestern Gulf of**

Mexico." March 1987, iii + 21 p., 10 figs., 8 tables.

ABSTRACT

Menticirrhus americanus in the northwestern Gulf of Mexico mature at 150-220 mm TL and 12-14 months of age, with males maturing when 10-40 mm smaller than females. Spawning occurs within a broad period from February through November with two discrete peaks which coincide with the periodicity of downcoast alongshore currents (towards Mexico) in spring and fall. This species occurs at depths of less than 5 to 27 m, being most abundant at 5 m or shallower. Young-of-the-year recruit primarily at 5-9 m or shallower and gradually expand their bathymetric range. Age determination by length frequency is feasible in *M. americanus* but not as simple as in species that spawn in one major period of the year. Only one or two spawned groups normally predominated at any one time and no more than three co-occurred with few possible exceptions. Observed mean sizes were 138 mm TL at 6 months, and 192 and 272 mm at ages I and II, respectively. Typical maximum size was 296-308 mm and typical maximum age is probably 2-3 years. The largest fish captured were 392 and 455 mm. Observed sex ratio was 1.2 females to 1 male. Weight, girth, and length-length regressions are presented.

NOAA Technical Report NMFS 50. Ropes, John W. **"Preparation of acetate peels of valves from the ocean quahog, *Arctica islandica*, for age determinations."** March 1987, iii + 5 p., 4 figs., 1 table.

ABSTRACT

Techniques are described for preparing acetate peels of sectioned valves of ocean quahogs, *Arctica islandica*, for age determinations. The respective sequence of preparation begins by sectioning left valves oriented to include a single hinge tooth, bleaching to remove the heavy periostracum, embedding the valves in an epoxy resin, grinding and polishing the embed-

ments to a high luster, etching the exposed cut valve surfaces, and applying sheet acetate with acetone. Annuli are clearly defined relative to growth increments in the peel preparations for all sizes and ages of ocean quahogs.

NOAA Technical Report NMFS 51. Croxall, John P., and Roger L. Gentry (editors). **"Status, biology, and ecology of fur seals."** (Proceedings of an international symposium and workshop, Cambridge, England, 23-27 April 1984.) June 1987, v + 212 p.

SUMMARY

Thirty-two papers and reports cover the symposium's goals of reviewing 1) the scope and results of present behavioral, ecological, and physiological research on each fur seal species and the present status, recent population trends, history of exploitation, and rate of recovery from exploitation for each species; and 2) to compare demographic, behavioral, and ecological traits that may be related to recovery for each species; and 3) to identify important needs and opportunities for fur seal research, stressing comparisons and collaborative efforts.

NOAA Technical Report NMFS 52. Huppert, Daniel D. (editor). **"Limited access alternatives for the Pacific groundfish fishery."** May 1987, iii + 45 p.

SUMMARY

Included are 8 papers on limited access, reviewing what it is and its application to the Pacific groundfish fishery, along with an appendix presenting elements of a proposal for a groundfish trawl license moratorium by the Fishermen's Marketing Association and Coast Driggers Association.

NOAA Technical Report NMFS 53. Witzell, Wayne N. (convener and editor). **"Ecology of east Florida sea turtles."** (Proceedings of the Cape Canaveral, Florida, Sea Turtle Workshop, Miami, Florida, February 26-27, 1985.) May 1987, iii + 80 p.

SUMMARY

Presented are 11 papers and abstracts on the biology, ecology, and mortality of sea turtles in the Cape Canaveral, Fla., marine ecosystem, along with data on environmental problems, population surveys, landings, and sexing techniques and sex ratios for immature loggerhead sea turtles along the U.S. Atlantic coast.

Healthful Attributes of Fish and Fish Oils

“**Seafoods and Fish Oils in Human Health and Disease**” by John E. Kinsella has been published by Marcel Dekker, Inc., 270 Madison Avenue, New York, NY 10016. The author is with the Institute of Food Science at Cornell University, Ithaca, N.Y., and here he reviews and relates the effects of the omega-3 polyunsaturated fatty acids (PUFA's) found in fish oils to their interactions with the metabolism of the n-6 fatty acids and the effects of the n-3 fatty acids on human health.

The author begins by reviewing the relationship of dietary fats and cardiovascular disease and eicosanoid metabolism. Presented then are longer reviews of the effects of dietary n-3 PUFA consumption learned from both human and animal feeding trials.

Chapter 3 discusses the effects of ingestion of fatty fish, marine oils, or n-3 PUFA's on human plasma and platelet characteristics, production of prostaglandins by vessel walls, levels of urinary prostaglandins metabolites, and on erythrocyte characteristics, etc.

Chapter 4 reviews studies with animals regarding the effects of the n-3 PUFA's on cardiac, plasma, platelet, and other blood characteristics, on aortic tissues, hepatic characteristics, lung and kidney lipids, adipose tissue, and on cerebral and neurological characteristics.

A very short chapter discusses dietary PUFA's and cancer, and another calculates U.S. fish and n-3 PUFA consumption. Other chapters review cholesterol and fat soluble vitamins in fish oils, factors affecting the safety of fish oils, and the status of edible fish oil processing and technology. In addition, the author summarizes the health implications of dietary fish and fish oils and assesses needs for future research. Lastly, he lists the potential sources of fish oil and presents oil content data on the fatty fish in U.S. waters.

The book is indexed (each chapter carries its own bibliography) and provides a good update of recent knowledge on an important topic, and suggests worthy areas for future research. Hardbound, it

is available from the publisher for \$99.75, and will be a handy source of data and reviews for those in the field of food science, either as researchers, dietitians, nutritionists, biologists, etc.

NUTRIENT VALUES OF FINFISH AND SHELLFISH PRODUCTS

Publication of the revised edition of the U.S. Department of Agriculture's Agriculture Handbook No. 8 on fish and fish products has been announced by that agency. It is Agriculture Handbook No. 8-15, “**Composition of Foods: Finfish and Shellfish Products...Raw, Processed, Prepared,**” by the Nutrition Monitoring Division. This is the 15th in the series of publications which update and expand the USDA's widely recognized Agriculture Handbook No. 8, which was last revised in 1963. The newly revised version is being issued section by section, each of which contains a table of nutrient data for a major food group.

The 15th section of the Handbook was prepared to serve as a basic general reference for data on nutrients in finfish and shellfish products and presents values for 174 items. It is published in looseleaf form to facilitate updating. Each page contains the nutrient profile for a single food item, given on the 100 g food basis, in two common measures and in the edible portion of 1 pound as purchased. Values are provided for energy, proximate composition (water, protein, lipid, carbohydrate, and ash), nine mineral elements (calcium, iron, magnesium, phosphorus, potassium, sodium, zinc, copper, and manganese), nine vitamins (ascorbic acid, thiamin, riboflavin, niacin, pantothenic acid, vitamin B-6, folacin, vitamin B-12 and vitamin A), individual fatty acids, total saturated, monounsaturated, and polyunsaturated fatty acids, cholesterol, and 18 amino acids. The standard error of the values on the 100 g basis and the number of samples on which the values are based are included in the tables.

To obtain copies of Agriculture Handbook 8-15, send check or money order

(no cash) to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The price is \$10.00 and the stock number is 001-000-04497-4. A 25 percent discount is allowed on orders of 100 or more to one address.

Tropical, Subtropical Fisheries Conference Proceedings Available

Publication of the “**Proceedings of the Eleventh Annual Tropical and Subtropical Fisheries Conference of the Americas**”, compiled by Donn R. Ward and Barbara A. Smith, has been announced by the Texas Agricultural Extension Service's Marine Advisory Service Program, Texas A&M University, College Station, TX 77843.

Several of the contributions deal with market development for various fishes, including underutilized species. Two are on crawfish product economics and markets and on crawfish market development. Warren Rathjen discusses potential fish species for promotion and impediments to their adoption by consumers. Other papers cover salting and drying of cannonball jellyfish and of selected underutilized southeastern U.S. finfishes for the international market. And J. A. Gooch and M. B. Hale describe the edibility characteristics and instrumental texture and color parameters for 40 southeastern U.S. finfishes.

Other papers discuss screening of sodium bisulfite on shrimp (a modified Monier-Williams approach), influence of washing and cooking on sulfite residuals on treated shrimp, an evaluation of alternatives to sulfiting agents as melanosis inhibitors in raw shrimp, fluctuations in calico scallop production, soft-shelled blue crab production research, processing menhaden for conventional food products, minced intermediates, and surimi, and more.

In addition, five papers on seafoods and human health are presented, including three on fish oils and human health studies, and one each on larval ascaridoid nematodes in seafood products, and transfer of a *Gambierdiscus toxicus* toxin

to black sea bass tissues. The 304-page paperbound volume is available from the publisher for \$10.

The "**Proceedings of the Tenth Annual Tropical and Subtropical Fisheries Conference of the Americas**," compiled by Ward and Granvil D. Treece, was dedicated to the late Melvin Waters, longtime NMFS technologist. The volume includes very useful author and subject indexes to the first 10 volumes.

Presented are eight contributions on shrimp, including a look at processing costs and value added in Gulf shrimp in 1982, economic factors determining shrimp prices, three models for forecasting U.S. shrimp prices, SO₂ levels in iced and frozen shrimp, methods for determining SO₂ levels, and others. Articles on crawfish include processing time effects on the meat, evaluation of differences between red swamp and white river crawfish meat, holding temperature and body condition of Finland crawfish, and brine freezing of crawfish. Other articles include thermal process studies of alligator meat, on-board handling to improve the shelflife of fish, quality changes in thawed lobster tails, demand for major reef fishes in the U.S. southeast, dried kingfish as a potential for export, and others. The 307-page paperbound volume is available for \$15 from the publisher.

Care and Handling of High Quality Fishes

"**Quality Handling of Hook-Caught Rockfish**" by Brian Paust and John Svensson, published by the Alaska Sea Grant College Program, 590 University of Alaska, Suite 102, Fairbanks, AK 99701, is a small but very good handbook that relates tested methods for proper handling of rockfishes (genera *Sebastes* and *Sebastes*) to maintain the highest quality and thereby earn top dollar for them. The methods are aimed at those fishing for rockfish on small- to medium-sized fishing vessels. Soak times of 2-4 hours are recommended by the authors and, if gaffing is necessary, gaff only in the head, they say. Bleeding, very important, is thoroughly discussed

and illustrated with diagrams of veins and arteries and photos of the proper procedures. Also covered are washing, dressing, holding, filleting, packing, shipping, and sanitation. Printed on a tough, water resistant paper, the handbook is Marine Advisory Bulletin 20 (price not listed).

The University's Marine Advisory Bulletin No. 28 is the "**White Fish Processing Manual**" by Chuck Jensen which was developed as a supplemental handbook for a course in white fish processing technology. Quality control is the entire thrust of this manual and it is a good one, discussing programs to maintain high quality, starting with delivery, bleeding fish, onboard storage, keeping quality control records, clean-up and sanitation, importance of employee attitude toward sanitation, detergents and sanitizing or sterilizing agents, chlorine compounds, hypochlorites, cleaning schedules, personal hygiene for workers, product examination records, fillet quality and defects, packaging, suggested quality inspection forms, and more. Then, chapter II reviews Alaskan, Federal and industry regulations affecting processors, and chapter III surveys the raw materials themselves—types of white fish, catch methods, etc. Chapters IV, V and VI review considerations for plant siting, layout, and design and type of cutting operation. Chapter VII then reviews employee incentive programs; chapter VII, financial considerations; and IX, tools of the trade. Chapter X then reviews selection of markets and market strategies briefly, followed by Appendix A—the NMFS fishery products inspection manual. Appendix B lists material specifications, shipping requirements, warranty, and other technical data on fish blocks, odor, color, size uniformity, and more. Paperbound, the 75-page manual is a fine, succinct guide to producing high quality fish product; price not listed.

Soft-Shelled Blue Crab Research

The "**Proceedings of the National Symposium on the Soft-Shelled Blue Crab Fishery**," edited by Harriet M. Perry and Ronald F. Malone, has been

published by the Gulf Coast Research Laboratory, Biloxi, Miss. The symposium was sponsored by the Southeast Marine Advisory Service Network and the Sea Grant Mid-Atlantic Advisory Service Network, and was hosted by the Louisiana and the Mississippi-Alabama Sea Grant institutions.

The soft-shelled blue crab industry has grown considerably in recent years and the symposium presents much of the advancements in research and development that have been attained. Contributions range from a thorough review of the physiology of the blue crab during a molt by Charlotte P. Mangum et al., to shorter state-by-state reviews of blue crab developments. In addition, Phyllis T. Johnson discusses blue crab viruses and the diseases they cause, while Ronald Sizemore relates the involvement of *Vibrios* in soft crab mortalities. Another article by W. S. Otwell and J. A. Koburger presents new data on the microbial and nutritional attributes of soft-shelled crabs. Other presentations provide data on the soft-shelled crab fisheries, blue crab shedding systems, aquaculture system design considerations, profitability components in closed shedding systems in the Gulf of Mexico, development of a Japanese export market, and more. Short working group reports are also presented, as are the discussions in the Open Forum. Paperbound, the 128-page volume (MASGP-86-017) is available from the Mississippi-Alabama Sea Grant Consortium, P. O. Box 7000, Ocean Springs, MS 39564-7000 at \$7.00 per copy.

Commercially Important Shellfish and Seaweeds of the Pacific Northwest

Publication of "**Shellfish & Seaweed Harvests of Puget Sound**" by Daniel P. Cheney and Thomas F. Mumford, Jr., has been announced by the University of Washington Press, P.O. Box C-50096, Seattle, WA 98145-0096. The volume is another in the U.W. Sea Grant Program's excellent "Puget Sound Books" series and is a thorough and well illustrated review of the region's important shellfish and seaweed species and their harvests and culture.

Outside the region, chapter 7 will be of considerable interest for its review of several seaweed species, their uses and harvesting methods, and the development of seaweed culture. Washington has over 500 species of seaweeds, and culture studies of *Iridaea* and *Gigartina* have been tried and dropped; nori culture has continued and other species are also harvested. In addition, Appendix C lists actual or potential uses for nearly 100 species of seaweeds.

Following an introductory overview, the authors discuss the resources and fisheries (and culture, where applicable) for oysters (Pacific and Olympic) and clams (six species), clam industry economics and future, blue and California mussel, *Octopus dofleini*, squid, scallops, and abalone. Another chapter reviews the Sound's Dungeness crab resources, harvests, and management. Shrimp, sea urchin, and sea cucumber resources, harvests, management, and market development are also presented. The book reflects the many changes that have occurred in the shellfish and seaweed industries, and the authors say that Puget Sound offers many more opportunities for development of many of these fisheries.

Other Appendices review the physical and biological characteristics of Puget Sound, the physical and environmental features of commercially harvested pandalid shrimp in Puget Sound, and pertinent State regulations. Indexed, the 164-page paperbound volume is available from the publisher for \$8.95.

Tunas and Development in the Pacific Islands

The Pacific Islands Development Program of the East-West Center in Hawaii has conducted considerable research on tuna development in the emerging nations of the Pacific Islands region, from which several interesting publications have resulted. One of these is "**Tuna Issues and Perspectives in the Pacific Islands Region**," edited by David J. Douman, which carries a wide variety of papers on the tuna resource of that region and the factors that impinge on its development. An introductory section presents papers on tuna fisheries manage-

ment in the region, the impact of the LOS on tuna resources, and biological perspectives on development of industrial tuna fisheries. Other sections deal with distant-water tuna fisheries of Japan and the United States and the purse seine and longline tuna fisheries. Four papers review artisanal tuna fisheries in the region and three others deal with the history and role of the Forum Fisheries Agency, fisheries cooperation in the Nauru Group, and a look at global tuna markets. Douman sums it up then with a look at prospects and directions for the region's tuna fishery. Paperbound, the 314-page book is available from the Publications Office, East-West Center, 1777 East-West Road, Honolulu, HI 96848 (price not listed).

Available from the same office also is "**The Development of the Tuna Industry in the Pacific Islands Region: An Analysis of Options**," (cost is \$10.00), also edited by Douman. Here is a thorough overview of the region's domestic tuna industries, distant-water fleet operations, and regional fisheries cooperation. Also reviewed are the important U.S., Japanese, Canadian, European, and Middle East tuna markets, especially from the view of accessibility for the Pacific Island nations.

Likewise, important competitors for those markets, such as Mexico, the Philippines, and Thailand, are reviewed, compared, and analyzed. Also discussed and summarized are the international business operations in the global tuna market. And, finally, a section on development options and issues presents papers on financing a tuna project, public investment and taxation, packaging tuna projects, development and financing of fishery-related infrastructure, and social and environmental aspects and impacts of tuna projects.

Two other PIDP papers also available are "**Development of the Australian Tuna Industry**" by Greg Crough and "**The U.S. Tuna Market: A Pacific Island Perspective**" by Dennis M. King. The former discusses two main aspects of the development of the Australian tuna industry—first, its history from small-scale origins in the 1930's through its full development. The second aspect relates the involvement of corporations, particu-

larly transnational ones, in the development of the industry. Cost is \$20.00.

King's report examines the large U.S. tuna market and makes suggestions on how the Pacific island nations, by controlling 40 percent of the global tuna supply, could have a major impact on all world markets and develop strategies to gain more market control and negotiate more effectively with the large U.S. tuna companies. Cost also is \$20.00.

Global Harvest and Trade in Salmon

Publication of "**Salmon: Economics and Marketing**" by Susan A. Shaw and James F. Muir has been announced by Timber Press 9999 S.W. Wilshire, Portland, OR 97225. The authors are senior lecturers with the University of Stirling in Scotland. Salmon and salmon products from both northern and southern hemispheres compete in marketplaces worldwide, and the authors have produced a thorough review of the economics of this resource that should be of interest to those involved in salmon harvests and regulation, marketing, and aquaculture. Introductory material describes the various salmon species and their life cycles (along with their different production characteristics and positions in the marketplace), fishing methods, artificial enhancement and ranching, salmon farming, and handling and processing techniques used.

Chapter 2 then outlines the primary patterns of salmon supply and trading patterns for salmon and salmon products, while chapters 3-5 provide a closer look at the supply side of the equation, exploring such issues as salmon management, farming and ranching, and the implications for production costs and the availability of supplies. Chapter 6 details the various methods and amounts of salmon processing, while chapter 7 looks at the distribution channels and the marketing of salmon. Finally, chapter 8 discusses the workings of the salmon markets and the demand for salmon and offers a look at salmon markets in the 1990's. The authors expect salmon supplies to increase in the next decade, with a doubling for some like the Atlantic salmon, and thus conclude on an opti-

mistic note. The 270-page hardbound volume is indexed, includes a glossary, and is available from the publisher for \$34.95 plus \$3 postage and handling.

The Future of Marine Fisheries

"Fisheries Development: 2000 A.D.," edited by K. K. Trivedi, and published by A. A. Balkema, Rotterdam, constitutes the proceedings of a sequel conference to the FAO World Fisheries Conference held in 1984 and presents wide-ranging and detailed discussions of EEZ management, aquaculture prospects, and international trends in the marketing of marine fisheries products which will be of interest to those involved in future fisheries development.

Organized by the Association of Indian Fishery Industries, the meeting and volume are slanted toward Indian fisheries development, but most of the presentations also provide useful insights into the question of how to develop and manage the world's fisheries to meet the growing need for those products. Besides the "green revolution," or production of more cereal grains, Indian officials are also seeking a "blue revolution" to spur greater production of fish and fishery products, and that is the thrust of this publication.

Following a review of the World Fisheries Conference and its assessments and recommendations, papers include a review of the worldwide effect on fishing of creation of EEZ's by Peter Hjul; the EEZ creation and development of India's marine fisheries by P. V. Dehadrai; management and development of the Australian fishing zone by R. Bain; and then a discussion on management of EEZ's.

The session on fisheries development strategies included papers on marine fisheries development to the year 2000 by W. Philip Appleyard; India's strategy for marine resource development by N. P. Singh; and development of deep-sea fishing by J. V. H. Dixitulu. T. V. R. Pilay then presents an international perspective on aquaculture while Jaques Perrot reviews French achievements in fish culture. Prospects for and perspectives on aquaculture over the next 15 years is then related by S. N. Dwivedi.

Wolfgang Krone reviews trends in the international markets for fisheries products, while D. P. Verboon relates the marketing of fishery products in Australia, and S. G. Sundaram discusses the problems and prospects for exporting marine products from India. Final presentations summarize the conference papers and provide a list of sound recommendations for those involved in the development and marketing of fisheries and fish products, especially those connected with the less developed nations. Hardbound, the 263-page volume is available from International Publishers Service, Inc., c/o Mercedes Distribution Center, Inc., 160 Imlay St., Brooklyn, NY 11231 for \$43.50.

Rockfishes of the Northeast Pacific

Publication of a **"Guide to Northeast Pacific Rockfishes, Genera *Sebastes* and *Sebastolobus*"** by Donald E. Kramer and Victoria M. O'Connell has been announced by the Alaska Sea Grant College Program, 590 University Ave., Room 102, Fairbanks, AK 99709-1046. The handbook, Marine Advisory Bulletin 25, was compiled and published to simplify the identification of the rockfishes found along the Alaska coast, and is intended for those who do not have the experience or time to use a key for rockfish identification. It should accomplish its purpose handily, for the drawings and photographs are large and very well done. Indeed, the color photos may well be the most important part of the book, for some species, such as *Sebastes nebulosus*, can be identified by color alone. Many species, though are very similar to others and the user will have to employ the full diagrams and descriptions to be sure what species is in hand.

The book will also be very useful and of interest well south of Alaska, too, as the authors have included all rockfish species found off British Columbia, and most of the species in Washington and Oregon waters. Rather than grouping species by color or characteristics, they are listed alphabetically by scientific name. Thus, the users will have to leaf through the guide and check all the possibilities and characteristics to determine

what species he has. For some, that may be a minor annoyance, but for the average angler or commercial fisherman it is probably just as fast; 37 species are included in the volume. Also included are indexes to scientific and common names and a list of selected references. The book is spiral bound, printed on extra-heavy, coated paper for long use, and is available from the publisher (price not listed).

Locating Fisheries Data and Related Information

The Aquatic Sciences and Fisheries Information System (ASFIS) is an international information system for the science, technology, and management of marine and freshwater environments which is maintained jointly by the FAO, IOC, UN OETB, along with the assistance of the various national ASFIS partners. The ASFIS information outputs include the computer searchable Aquatic Sciences and Fisheries Abstracts (ASFS) database and its printed abstracts, contents tables, meetings register, and serial titles list. And it now includes an updated **"Aquatic Sciences and Fisheries Thesaurus,"** subtitled "Descriptors Used in the Aquatic Sciences and Fisheries Information System," compiled by E. Fagetti, D. W. Privett, and J. R. L. Sears and published for the FAO by Cambridge Scientific Abstracts, 5161 River Road, Bethesda, MD 20816 as ASFIS Reference Series No. 6 Revision 1.

The new thesaurus was conceived to correspond to the objectives of the ASFIS system and permits the subject indexing and retrieval of information on all aspects of aquatic sciences and technology, exploitation of living and nonliving resources, related policy, social and economic aspects; processing and marketing of aquatic products, as recorded and stored in the ASFA database. It supercedes the old FAO Fisheries Circular 344, "Thesaurus of Terms for Aquatic Sciences and Fisheries" published in 1976. Clearly, the volume will be a great help to those who want to locate appropriate materials in the hundreds of thousands of records compiled during 1971-85. The Thesaurus covers only subject index terms and should be used in con-

junction with the ASFIS Guidelines for Subject Categorization and Indexing and the other ASFIS indexing tools—i.e., the geographic authority list and the NODC Taxonomic Code. (Price not listed.)

Seaweed Ecology, Herring Parasites, Siphonophores, and Antarctic Fish Study

“Advances in Marine Biology,” volumes 23 and 24, edited by J. H. S. Blaxter and A. J. Southward and published by Academic Press, Inc., 1250 Sixth Avenue, San Diego, CA 92101, present several very interesting reviews ranging from population and community ecology of seaweeds to the ecology of deep-sea hydrothermal vent communities, biology of Pycnogonida and Siphonophores, herring and their parasites, physiology of Antarctic fishes, and more.

Volume 23 begins with “Population and Community Ecology of Seaweeds,” by A. R. O. Chapman of Canada’s Dalhousie University, in which he provides an extensive synthesis of the several score recent studies on ecology seaweed, including related ecophysiological studies. J. Le Fèvre then presents a paper entitled “Aspects of the Biology of Frontal Systems,” especially with regard to frontal structures in northwest European waters and their influence on pelagic ecosystems. The author provides an overview of shelf-sea tidal fronts and discusses models, frontal circulation patterns, bottom water near tidal fronts, internal waves, and estuarine and coastal fronts. In addition, an overview of fronts and plankton is provided, including the annual phytoplankton cycle, high seas fronts, red tides and fronts, and the accumulation biotype.

Finally, J. Frederick Grassle of the Woods Hole Oceanographic Institution discusses the ecology of deep-sea hydrothermal vent communities, beginning with a brief history of their discovery, and reviewing their physical characteristics (distribution, age, chemical components of hydrothermal fluids), the various organisms common (and uncommon or absent) at the vents. He then discusses faunal distribution and density, zoogeog-

raphy and ecology (i.e., feeding relationships, metal tolerance, geologic history, and metabolic rates of the deep-sea communities). The volume has subject and taxonomic indexes and provides a cumulative list of titles and authors in the series. It is available in the U.S. at \$76.00 or from Academic Press, Inc. (London) Limited, 24-28 Oval Road, London NW1 7DX at £42.00.

Volume 24 presents five reviews, beginning with F. Arnaud and R. N. Bamber on “The Biology of Pycnogonida,” or sea spiders, exclusively marine invertebrates with about 1,000 species in 84 genera. This paper collates and summarizes the current knowledge on pycnogonid biology for marine biologists. Topics reviewed include zoological characteristics, physiology and function, life cycles, interrelationships with other organisms, zoogeography, and palaeontology and systematic affinities.

“Siphonophore Biology” by G. O. Mackie et al. is an up-to-date treatment of the group, stressing the ecological and physiological aspects. Discussed is body form (development and coloniality), systematics and evolution, distribution and migration, physiology and behavior, and nutrition, ecology, and ecological importance. K. MacKenzie then discusses relationships between the herring, *Clupea harengus* L., and its parasites, reviewing the protozoan and metazoan parasites reported from that species, host range and specificity, life cycles and zoogeography of the parasites, sexual differences in herring to parasitic infection, parasites as biological tags, and the contribution of parasitic disease to natural mortality.

The chapter on comparative physiology of Antarctic fishes by J. A. Macdonald et al. presents a fine summary of the progress in the field made over the last 25 years and suggests potential areas for further study. Most of the work reviewed was done on fishes of McMurdo Sound area, though work from areas like the Scotia Sea and other areas is included, too. Following brief introductory discussion of the evolution of Antarctic fishes, the kinds of fish there and their capture, and the usefulness of their study, the authors discuss adaptive radiation and buoyancy, stenothermy and temperature

selection, cryoprotective agents or “antifreeze,” metabolism and growth, blood and the transport of oxygen, enzymes and other proteins, and Nototheniid neurobiology. The final chapter by N. J. P. Owens reviews natural variations in ^{15}N in the marine environment, presenting methods and calculations, isotope effects and fractionation, variations in ^{15}N in nature, source studies, and food chain dynamics. Hardbound, the 473-page volume is available from the publisher for £48.00

Predation Effects in Aquatic Communities

Publication of “Predation, Direct and Indirect Impacts on Aquatic Communities,” edited by Charles Kerfoot and Andrew Sih, has been announced by the University Press of New England, 3 Lebanon Street, Hanover, NH 03775. The volume is an outgrowth of a symposium sponsored by the Ecological Society of America on “Competition, Predator Avoidance, and the Traits and Distribution of Aquatic Organisms” held in Ft. Collins, Colo., in 1984. However, those reports have been considerably augmented with another 18 solicited papers.

The editors have arranged the contributions in three main subject areas: 1) Direct and indirect influences of top predators on food web dynamics; 2) chemically mediated interactions between predators and prey; and 3) research on the ways that predators modify prey behavior, life styles, and morphology. The contributions are broad in scope, ranging from stability analysis to natural fluctuations in systems, and studies of response time ranging from minutes to days, months, and even million of years.

The volume’s central theme is that the mere presence of a predator can alter the relationship between two or more competitors in various and important ways and the 24 essays treat a variety of important topics on organisms in both freshwater and marine environments. This book is divided into sections on direct interactions, types of indirect interactions, food web dynamics (cascading

trophic responses and influences along indirect pathways), behavioral and morphological responses, evolutionary responses mediated by chemicals, ecological adjustments in time and space, and local and regional extinctions. The contributions provide a handy and useful synthesis of recent findings and should be a fine introduction to a developing field. In addition, they indicate potentially fruitful directions for future research in this field. Hardbound, the 386-page volume is indexed and each chapter carries its own literature citations. It is available from the publisher for \$60.00.

Experiences in Limited Entry

“Fishery Access Control Programs Worldwide,” edited by Nina Mollett, and published by the Alaska Sea Grant Program as Report 86-4 constitutes the “Proceedings of the Workshop on Management Options for the North Pacific Longline Fisheries.” Included are 20 wide-ranging presentations which provide considerable insight into the problems and progress in this aspect of fisheries management. The impetus for the workshop was an Alaska Sea Grant project to reopen the dialogue on management alternatives for that state’s longline fisheries, and one of the first steps was to try to learn what the worldwide experience had been with the various limited access programs—what had shown success and which ones had failed and why. In introductory papers, R. Bruce Rettig provides an overview of other national experiences with limited entry and Hugh Richards and Abby H. Gorham review the complex controversy that surrounded the U.S. halibut fishery moratorium.

Other papers discuss regulation of Norwegian fishing fleet capacity, limiting Norway’s purse seine fleet capacity, management of Iceland’s demersal fisheries, Japan’s vessel reduction program in the tuna and skipjack fisheries, implementation of an ITQ-based (property rights) fisheries management system in New Zealand, developments and alterna-

tive strategies in Australian fisheries, and individual transferable quotas in the Australian southern bluefin tuna fishery.

Also reviewed are various management schemes for selected Canadian fisheries, surf clam management under the Magnuson Act, California’s limited entry programs, Washington’s limited entry experiences, efficiency and distributional aspects of Alaska’s limited entry program, and a review of management schemes in developing countries. Paperbound, the 366-page volume is available from the Alaska Sea Grant College Program, 590 University Ave. Suite 102, Fairbanks, AK 99701-1046 (price not listed).

Some Notes on Mariculture

“World Salmon Farming: An Overview with Emphasis on Possibilities and Problems in Alaska” by Curt Kerns has been published by the University of Alaska’s Sea Grant College Program, 590 University Ave., Suite 102, Fairbanks, AK 99709-1046 as Marine Advisory Bulletin #26. Written primarily for an Alaskan audience, this bulletin provides a handy overview of the beginning and, more recently, the explosive growth in salmonid culture, particularly in Scandinavia. The author also looks at current and potential markets and relates opportunities for increased salmon farming. He also outlines the culture methods and reviews the present status of salmon farming around the globe, needs in research and training, and assesses the potential for Alaska, its salmon culture competitors, the benefits and potential disadvantages for the state, and makes some projections for future production and salmon markets. Paperbound, the 43-page report costs \$2.00.

Also from Alaska Sea Grant Program is Aquaculture Note #11, “Where to Get More Information on Farming Marine Algae in High Latitude Waters” by Curt Kerns. The bulk of the note is an extensive listing of nearly 400 books, articles, and reports, given alphabetically by au-

thor, of titles relating to the farming of marine algae. In addition, the author provides notes on Alaskan culture regulations, research assistance available, aquaculture organizations involved, periodicals that carry articles on seaweed culture, and addresses of organizations working with seaweeds. Also included are subject and systematic indexes and a geographical index. It would be a useful reference for anyone contemplating the culture of seaweeds; cost is \$1.00.

Likewise, Aquaculture Note #9, also by Kerns, tells “Where to Get More Information on Small-Scale Aquaculture,” by providing related bibliographical data on general technical manuals and manuals devoted specifically to salmon, trout, and shellfish. Again, data is provided on pertinent aquaculture organizations and periodicals; cost is \$2.00.

Cataloging the Humpback Whales

University of Alaska Sea Grant Report 87-1, edited by T. Frady, is **“Workshop on Humpback Whale Photo Identification: A Summary of Proceedings,”** which relates the discussions in Seattle in April 1986 of humpback whale researchers regarding a computerized humpback whale photo-identification catalog system being developed by the NMFS National Marine Mammal Laboratory (NMML). At the time, no formal data sharing existed among Pacific humpback whale researchers, many of whom had private whale photo collections ranging from <100 to >2,000 collected over 5-25 years.

This publication presents a summary of the discussions and lists variables for NMML photo identification system, Pacific humpback whale photo-ID catalog areas and subareas, research goals, and illustrates fluke patterns used, along with a fluke section map and additional details on the program. The 12-page paperbound report is available from the Alaska Sea Grant College Program, University of Alaska, 590 University Avenue, Suite 102, Fairbanks, AK 99709-1046 (price \$4.00).