New NMFS Scientific Reports Published

Some publications listed below may be sold by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Copies of all are sold by the National Technical Information Service, Springfield, VA 22151. Writing to either agency prior to ordering is advisable to determine availability and price (prices may change and prepayment is required).

NOAA Technical Report NMFS 39.

Swan, George A., Tommy G. Withrow, and Donn L. Park. **"Survey of fish protective facilities at water withdrawal sites on the Snake and Columbia Rivers."** April 1986, iii + 34 p., 26 figs., 6 tables, 1 appendix.

ABSTRACT

Proliferation of water withdrawals and new pump intake and screen designs has occurred with the growth of irrigated agriculture along the Columbia and Snake Rivers. Concern for the protection of anadromous and resident fish populations resulted in formulation of a survey of the water withdrawal systems. The survey included distribution studies of juvenile fish near pump sites and field inspection of those sites to determine adequacy of screening for protection of fish. A total of 225 sites were inspected in 1979 and 1980, with a follow-up inspection of 95 sites in 1982. Results indicated a definite trend toward lack of concern for the condition of fish protective facilities. Only 4 out of 22 sites not meeting criteria in 1979 had been upgraded to acceptable conditions. Of more concern, 13 of the sites meeting criteria in 1979 were below criteria when reinspected in 1982. Some of the discrepancies included lack of protective screens, poorly maintained screens, and screens permitting excessive velocity that could result in impingement of larvae or small fish. A conclusion from these surveys is that if adequate protection for fish is to exist, screens for water withdrawals need to be properly installed, inspected, and maintained.

NOAA Technical Report NMFS 40.

Fisheries Management and Large Marine Ecosystems

Large Marine Ecosystems (LME's) are extensive areas whose fishery resources are linked via continuity and similarity of the region's bottom configuration, oceanic currents, temperature ranges, and other specific environmental and biological conditions, and scientists have been moving toward management of such ecosystems slowly for many years. Those close to land masses are beset by increased stress from pollution, as well as exploitation which must be measured and accounted for in management schemes.

Marine fisheries studies have progressed from single species and their yields to a more holistic approach, focussing on entire ecosystems and the multispecies assemblages and interactions which influence annual production of fisheries. Thus, **"Variability and Management of Large Marine Ecosystems",** edited by Kenneth Sherman and Lewis M. Alexander is a timely review of the state-of-the-art in measuring changes in fish populations and productivity in LME's, LME physical-chemical environments, and management options available to governmental agencies for the LME's.

The volume represents the first symposium on the "Variability and Management of Large Marine Ecosystems" which was convened at the 1984 Annual Meeting of the American Association for the Advancement of Science. It was published as AAAS Selected Symposium 99 by Westview Press, 5500 Central Avenue, Boulder, CO 80301.

The contents are presented in three parts, with part one contributions examining the impact of perturbations on the productivity of renewable resources in large marine ecosystems. Part two contains articles on ways of measuring variability in large marine ecosystems, and part three contributions discuss the institutional frameworks—political, economic, legal, etc.—for managing LME's.

In sum, the authors and editors have done a fine job in drawing together and synthesizing current knowledge on LME problems, resources, and resource management, and the book should be of value to a wide range of marine students, scientists, and resource managers. Indexed, the 319-page paperbound volume is available for $31.95.

A Guide for Prospective Salmon Shark Fishermen

Publication of the **"Salmon Shark Manual,"** by Brian Paust and Ronald Smith and edited by T. Frady, has been announced by the Alaska Sea Grant College Program, 590 University Avenue, Suite 102, Fairbanks, AK 99709-1046. It is subtitled "The development of a commercial salmon shark, *Lamna ditropis*, fishery in the North Pacific," but it includes reviews of shark fishing gears and techniques, shark preservation and marketing, shark food products and by-products, and much more. In trying to target a select group of Alaskan fishermen, processors, and managers deemed "early adopters" of new technology or fishing strategies, the authors have provided extensive and very detailed information that will be useful to anyone interested in the development of shark fisheries far outside Alaska.

The authors begin with a review of the Southeast Alaska Salmon Shark Project (SEASP), which stimulated the volume, discuss the edibility of sharks, review the sharks and skates found in Alaskan waters (and taxonomy of Alaskan sharks). Then they comprehensively

Myers, Edward A., Donald E. Hoss, Walter M. Matsumoto, David S. Peters, Michael P. Seki, Richard N. Uchida, John D. Ditmars, and Robert A. Paddock. **"The potential impact of Ocean Thermal Energy Conversion (OTEC) on fisheries."** June 1986, iii + 33 p., 11 figs., 8 tables.

ABSTRACT

The commercial development of ocean thermal energy conversion (OTEC) operations will involve some environmental perturbations for which there is no precedent experience. The pumping of very large volumes of warm surface water and cold deep water and its subsequent discharge will result in the impingement, entrainment, and redistribution of biota. Additional stresses to biota will be caused by biocide usage and temperature depressions. However, the artificial upwelling of nutrients associated with the pumping of cold deep water, and the artificial reef created by an OTEC plant may have positive effects on the local environment.

Although more detailed information is needed to assess the net effect of an OTEC operation on fisheries, certain assumptions and calculations are made supporting the conclusion that the potential risk to fisheries is not significant enough to deter the early development of OTEC. It will be necessary to monitor a commercial-scale plant in order to remove many of the remaining uncertainties.

NOAA Technical Report NMFS 41. Bohnsack, James A., and Scott P. Bannerot. **"A stationary visual census technique for quantitatively assessing community structure of coral reef fishes."** July 1986, iii + 15 p., 13 figs., 3 tables.

ABSTRACT

A new method is described and evaluated for visually sampling reef fish community structure in environments with highly diverse and abundant reef fish populations. The method is based on censuses of reef fishes taken within a cylinder of 7.5 m radius by a diver at randomly selected, stationary points. The method provides quantitative data on frequency of occurrence, fish length, abundance, and community composition, and is simple, fast, objective, and repeatable. Species are accumulated rapidly for listing purposes, and large numbers of samples are easily obtained for statistical treatment. The method provides an alternative to traditional visual sampling methods. Observations showed that there were no significant differences in total numbers of species or individuals censused when visibility ranged between 8 and 30 m. The reefs and habitats sampled were significant sources of variation in number of species and individuals censused, but the diver was not a significant influence. Community similarity indices were influenced significantly by the specific sampling site and the reef sampled, but were not significantly affected by the habitat or diver.

review the salmon shark's distribution, feeding behavior, and prey relationships. Also reviewed is the functional biology and the physiology of lamnid sharks, shark reproduction strategies and growth, salmon shark research and harvest in Japan, and problems of elasmobranch fisheries management.

Following a lengthy review of North American and European shark fishing methods and gear, the authors discuss development of a sport fishery for salmon shark in Alaska, list commercial shark fishing strategies applicable to the species, and review contemporary shark food products and commercial byproducts. Then follow reviews of the characteristics and preparation of shark meat, shark quality control standards for harvesters and processors, methods for handling shark on small fishing vessels, processing and marketing of shark fins, hides, jaw sets, and teeth, and processing and marketing shark byproducts (i.e., blood serum, cartilage, livers, etc.). Also discussed at length is the economic background of various world shark fisheries with reference to development of salmon shark fisheries of the North Pacific.

Several appendices then review initial processing of shark fins, potential purchasers of trimmed shark fins, future research opportunities involving development of salmon shark fisheries, a potential fishery for the mud shark, *Hexanchus griseus*, in southeastern Alaska, and potential purchasers of shark meat, oils, hides, and other byproducts.

All in all, the volume is a very comprehensive review of the literature and information on the salmon shark, shark fishing techniques, and the utilization, handling, and marketing of sharks. Paperbound, the large-format 430-page volume, report AK-SG-86-01, is available from the publisher for $9.00.

A Useful Guidebook to West Coast Marine Life

If the value of a book can be gauged by the number of editions printed, then **"Between Pacific Tides"** by Edward F. Ricketts, Jack Calvin, and Joel W. Hedgpeth, with the fifth edition revised by David W. Phillips, is a classic. The original edition was written in 1939, and the volume has become an excellent reference for U.S. Pacific coast students and professionals alike. In short, this newly revised volume reviews the animals and habitats of the bays, estuaries, rocky shores, and tidal pools of the U.S. Pacific Coast. It is particularly well written and also is very well illustrated with many photographs and drawings, all in black and white. The species are all grouped according to their most characteristic habitat (i.e., rocky shore, sandy beach, eelgrass flat, mud flat, wharf piling, etc.), and the species' life history, physiology, and interrelationships are discussed.

Besides those chapters, others review intertidal zonation, principles of intertidal ecology, and an extensive section of reference matter is presented, including an outline of the major taxa, an annotated systematic index, a general bibliography, and a general index. This latest edition has been enlarged about 20 percent, with many changes and additions, and the systematic index and bibliography has been greatly updated and expanded (almost 2,300 entries). It also includes the interesting Prefaces to the earlier editions, as well as John Steinbeck's Foreword to the 1948 edition.

The references are unique in that the

general bibliography is divided into four areas: 1) essential general references related to seashore life, 2) other useful texts and general references, 3) selected papers on marine ecology and related topics, and 4) books and papers on geology, paleontology, and zoogeography. Other references dealing primarily with specific animals or groups are listed in the Annotated Systematic Index. Most of the works listed were published after 1967.

The 652-page hardbound volume is an excellent reference to a rich and diverse coastal region and is available from the Stanford University Press, Stanford, CA 94305 for $29.50.

An International Marine Reference Guide

"Maritime Affairs—A World Handbook," subtitled "A reference guide to maritime organizations, conventions and disputes and to the international politics of the sea" has been published by Longman Group Limited, Longman House, Burnt Mill, Harlow, Essex, U.K. CM20 2JE, and is distributed in the United States by Gale Research Co., Book Tower, Detroit, MI 48226.

As the title and subtitle imply, the volume is a wide ranging reference to marine-related laws, transportation, resources, communications, scientific research, boundary disputes, and military matters. Several chapters are of interest to those involved with marine living resources.

Chapter 1 provides data on the Law of the Sea—historical development of maritime law, UN conferences and Conventions on the LOS, and territorial claims by coastal states. Chapters 2 and 3 (international organizations and shipping) have little data on fisheries. However, Chapter 4 presents data (for 1983) on fish harvests and trade, coastal state EEZ claims, descriptions of major conventions and agreements, national legislation on fisheries, and a listing of international organizations concerned with marine resources. Chapter 5, "Environmental and Scientific Interest in the Sea," provides data on dimensions of the marine pollution problems; conventions, agreements, and legislation on marine pollution; aspects of scientific research related to the sea; and international bodies involved in ocean research. Chapter 6 is on maritime boundary disputes and Chapter 7 is on military uses of the sea. Also published is the full text of the UN Convention of the Law of the Sea, as well as an extensive listing of maritime journals. Indexed, the hardbound 412-page volume is available for $90.00 from Gale Research Co.

Research, Management, and Life History of the Dungeness Crab

Number three in the University of Alaska's Lowell Wakefield Fisheries Symposia Series is **"Proceedings of the Symposium on Dungeness Crab Biology and Management,"** B. R. Melteff, Symposium Coordinator. It was published as Alaska Sea Grant Report 85-3 by the Alaska Sea Grant College Program, University of Alaska, Fairbanks, AK 99701.

The symposium and volume were divided into five sessions, with Session I presenting reviews of the Dungeness crab fisheries of California, Oregon, Washington, British Columbia, and several areas of coastal Alaska. Session II on life history includes papers on the ecology, growth, and population dynamics of juvenile Dungeness crabs in Grays Harbor, Wash.; sampling design and methodology for juvenile Dungeness crab surveys; the role of estuaries in the crab's early life history; young-of-the-year abundance and growth in the nearshore environment; age and growth of male Dungeness crabs in northern California; and molt increments, annual molting probabilities, fecundity, and survival rates of adult female crabs in northern California.

Session III on mortality presents a review of Dungeness crab diseases, a paper on Dungeness crab predation by sea otters in Prince William Sound, and two studies on problems of Dungeness crabs exposed to bark debris at marine log transfer facilities. Session IV includes four papers on Dungeness crab population dynamics, and Session V includes five contributions including biases in crab tag recovery data, oceanography of Cook Inlet in relation to crab distribution, a review of the effects of Sevin on crab, oyster, and other estuarine species; and a review of crab feeding behavior—a review of the general evolutionary and ecological factors which characterize crabs of the genus *Cancer*, then placing the eight species studied into two major feeding or life-history specialization groupings and exploring the implications of this for management of the species and suggest management implications.

The Dungeness crab, *Cancer magister*, is fished commercially from mid-California to Alaska. But while the Alaskan fishery has grown in recent years, the more southerly fisheries have declined. Thus, this symposium presents a fine review of the species' biology, management, and population dynamics, and discusses management issues especially applicable to Alaska.

Manual for Research and Conservation of Marine Turtles

The second edition of the **"Manual of Sea Turtle Research and Conservation Techniques",** edited by Karen A. Bjorndal and George H. Balazs has been published and is distributed by the Center for Environmental Education, 624 9th Street, N.W., Room 500, Washington, DC 20001. The manual was prepared for the 1983 Western Atlantic Turtle Symposium (WATS), sponsored by IOCARIBE, and its authors include Peter C. H. Pritchard, Peter H. Bacon, Fredrick H. Berry, Archie F. Carr, John Fletemeyer, Robert M. Gallagher, Sally R. Hopkins, Robert R. Lankford, Rene Marquez M., Larry H. Ogren, William G. Pringle, Jr., Henry A. Reichart, and Ross Witham.

The manual, in either English or Spanish, was prepared to aid in planning and research for the WATS 1982 and 1983 field research programs. The tech-

niques presented are considered "recommended" or "preferred", but are followed, where appropriate, by "alternatives", along with draft outlines of successful sea turtle survey data recording forms. The manual covers the six sea turtle species of the western Atlantic as well as the flatback turtle of Australia and Papua New Guinea and the black turtle of the eastern Pacific.

Requirements for a sea turtle conservation program, are given, followed by a lengthy section on survey techniques, which includes an identification guide to species, aerial and ground truth beach surveys, survey charts, pelagic and other aerial surveys, vessel surveys, nesting beach surveys, market surveys, turtle measurement and tagging, determination of hatching success, and more.

The section on management and conservation covers beach and nest protection from wild, domestic, and human predators; protection of turtles from beach erosion and later nesting turtles; egg handling and relocation, and release of hatchlings. Also covered is the incidental catch of turtles and its avoidance and the resuscitation of apparently drowned turtles. Data is given on protective legislation and enforcement, as well as on care of sea turtles in captivity—culture requirements and techniques for conservation or population restoration. Also included is a glossary of terms, extensive list of references, and an appendix of 40 color plates of the various species (at different ages) and their color variations. The 126-page paperbound volume is a fine manual for sea turtle researchers and costs $10.00.

Also distributed by the Center for Environmental Education are volumes 1-3 of the **"Proceedings of the First Western Atlantic Turtle Symposium,"** edited by Peter Bacon, Fred Berry, Karen Bjorndal, Harold Hirth, and Larry Ogren. Following the inaugural addresses and a history of the WATS, six panel sessions present an overview of the biology of the six western Atlantic sea turtles: the green, loggerhead, Kemp's ridley, olive ridley, hawksbill, and leatherback turtles. Additional panel sessions discuss research techniques and planning, habitat alteration impacts, utilization of turtles, their conservation, aquaculture, enforcement and regulations, status of the species, and management options. Another session dealt with future actions to conserve sea turtles, along with a symposium summarization. Also included are the first five appendices: A glossary of terms, abstracts of posters, an announcement of the manual of research and conservation techniques, list of registered participants, and a report on eastern Pacific sea turtle research.

Appendix 6 is volume 2, the **"Annotated Bibliography of Sea Turtle Research in the Western Atlantic,"** by Peter R. Bacon. This was compiled as a WATS background document and presents references (up to May 1983) to sea turtle research, populations, and socioeconomics. It totals 954 annotated citations from scientific journals (604), books (56), theses (12), newsletters (36), government reports (116), and miscellaneous sources (130), i.e., conference proceedings, manuscript reports, reports to international agencies, etc. References are relevant only to the Western Central Atlantic Region, excluding references to the southern parts of Brazil and the United States north of the Carolinas. *Chelonia mydas* has the most references (332), followed by *Caretta caretta* (254), *Dermochelys coriacea* (187), *Eretmochelys imbricata* (134), *Lepidochelys kempi* (124), and *Lepidochelys olivacea* (61). Most of the publications (624) were published between 1970 and 1973; less than 80 were published before 1940. Most of the geographical citations referenced U.S. research (260), trailed by Mexico (85), Costa Rica (66), Suriname (47), Cayman Islands (34), French Guiana (33), Nicaragua (31), Venezuela (31), and all other nations less than 30. The 318-page volume is paperbound; price not listed.

Appendix 7, or volume 3, contains **"The National Reports,"** edited by Peter Bacon, Fred Berry, Karen Bjorndal, Harold Hirth, Larry Ogren, and Michael Weber. Included are 40 reports for the WATS region's 38 nations; two reports were submitted by Mexico and Netherlands Antilles to facilitate subregional analyses. They are either official "National Reports," Draft National Reports, Ad Hoc Data Reports and some include a Supplemental Data Report. Report format, compiled by Harvey R. Bullis, Jr., presents tabular data on such items as geographic inventory, shoreline and bottom type habitat inventories, nesting beach inventory, nesting census, aerial beach survey, nesting female population assessments, foraging areas inventory and turtles present on foraging areas, nonforaging turtles at sea, natural mortality, various turtle harvest data, turtle culture operations, sanctuaries and refuges, national research projects, and more. The 514-page volume is paperbound; price not listed. Together, the volumes present an immense amount of data on the region's sea turtles, their biology, status, and management and outlook and will be a very useful reference.

Mooring and Anchoring and Marine Navigation

Publication of **"The Complete Book of Anchoring and Mooring"** by Earl Hinz has been announced by the Cornell Maritime Press, Inc., P.O. Box 456, Centreville, MD 21617. Basically, the author addresses anchoring systems and techniques and permanent moorings for all recreational and working vessels from 12 to 80 feet long.

The book is divided into three parts. Part I, "The Technology of Ground Tackle," employs a systems approach to determine loads at anchor and translate them into ground tackle design criteria. Topics include loads at anchor, deck gear for anchors, the anchor windlass, anchor rodes, anchor options, and anchor and rode selection.

Part II, "The Art of Anchoring," includes chapters on the human and safety factors in anchoring, techniques and tricks of anchoring, rights and responsibilities, and storm anchoring. And Part III, "The Mechanics of Anchoring," reviews permanent moorings, including mushroom anchor single point mooring, multiple anchor single point mooring, fore and aft buoyed and pile moorings, mooring maintenance, and rights to moorings. Indexed, the 309-page hardbound volume costs $22.50 and should be a useful reference for vessel users.

Also recently published by CMP is the 6th edition of **"How To Navigate Today"** by Leonard Gray, based on the original handbook by M. R. Hart. This handy pocket-sized guide to celestial navigation reviews in several concise chapters the basics of celestial navigation; star, sun, moon, and planet sights; the navigator's daily routine, other sight-reduction methods, sextant use, and use of the star finder. Also included is a list of references, a glossary, and excerpts from the "Nautical Almanac" and H.O. 249. The small 116-page handbook is paperbound, costs $5.50, and is a handy field guide for beginning navigators.

Far more comprehensive and aimed at advanced seafarers is CMP's **"Celestial for the Cruising Navigator"** by Merle B. Turner. This volume presents a comprehensive treatment of celestial navigation based upon the essential foundations of nautical astronomy and spherical trigonometry. The author begins with a discussion of position and time and proceeds systematically to show how sextant observations, coupled with time, provide indispensable checks and data on course, distance, and position. He emphasizes computational rather than tabular solutions to sight reduction problems and, while basic trigonometric fomulae are developed, all computation can be done with an inexpensive hand calculator. Two appendices provide some computational formulae and a glossary of terms. Indexed, the 222-page paperbound volume is available from CMP for $14.95.

Also recently published by CMP is the second edition of **"Star Sight Reduction Tables for 42 Stars"** by Thomas D. Davies, retired Rear Admiral of the U.S. Navy. It covers the years 1986-92, and the stars tabulated are of sufficient brightness to be readily sighted during evening or morning twilight. The tables cover lat. 60°N through 45°S. Thus, the user can shoot "stars of opportunity" when bad weather obscures some or many stars, eliminating the need for precomputation and the resultant frustration when cloud cover obscures the desired star. The author briefly explains how his method is to be used, provides examples of actual sights and a filled-in form showing how the work is done. The 440-page paperbound volume is available from the publisher for $28.50.

Crustacean Culture, Fisheries, Economics, Behavior, and Ecology

Volume 10 in the series "The Biology of Crustacea" is **"Economic Aspects: Fisheries and Culture,"** edited by Anthony J. Provenzano, Jr., and published by Academic Press, Inc., Orlando, FL 32887. The first three chapters provide broad reviews of the biology and exploitation of 1) shrimps and shrimp-like animals by Richard A. Neal and Robert C. Maris, 2) crabs by Paul A. Haefner, Jr., and 3) lobsters and crayfishes by J. Stanley Cobb and Denis Wang.

Data on the fisheries biology of shrimps are given for the penaeid and caridean shrimps and for stomatopod and zooplankton fisheries. For the major species in each group, information is given on their life cycles, habitat, population dynamics, behavior and migrations, ecological importance, and their management. Additional data covers fishing gears and methods, handling and preservation at sea and on shore, waste utilization, as well as perspectives on future demand and supply, fishery trends, new products, and research needs. The same general outline of information is provided for important species of crabs, lobsters, and crayfishes.

Provenzano then reviews in Chapter 4 the basics of crustacean culture—culture systems and their management, criteria for species cultured, seed supplies, and growout. In chapter 5 he provides more detailed information on the large-scale culture of shrimps and prawns, anomurans, crabs, and the lobsters and crayfishes. Each chapter provides extensive references and the volume is indexed by subject and taxonomic indexes. While single volumes have been devoted to individual species or fisheries, this book, in synthesizing data for many of the important crustaceans, was an ambitious project. Overall, it is a fine and useful review of and reference on an important segment of the world's fisheries. Hardbound, the 331-page volume is available from the publisher for $65.00 or £56.50.

Volume 7 in the same crustacean biology series is **"Behavior and Ecology,"** edited by F. John Vernberg and Winona B. Vernberg. The book is divided into six chapters in which various authors review information on 1) communication, 2) movement patterns and orientation, 3) biological timing, 4) symbiotic relationships, 5) pelagic larval ecology and development, and 6) biotic assemblages—populations and communities.

Both interspecific and intraspecific communication by crustaceans is dealt with by Michael Salmon and Gary W. Hyatt. They present an overview of communication in an ecological setting, as well as reviewing communication in terms of quantitative measurement, functions and mechanisms, and evolution, and suggest areas for future research. William F. Herrnkind then discusses orientation within various biotypes and over a long distance and patterns of movement of crustaceans in chapter 2.

In chapter 3, Patricia J. DeCoursey reviews the cyclic nature and timing of various crustacean biological functions, including matching of biological rhythms and environmental cycles and basic concepts of regulation of biological rhythms. She also surveys biological rhythms (organismic and cellular and physiological) in crustacea, and provides a perspective of the adaptive value of environmentally entrained clocks. D. M. Ross summarizes information on a variety of crustacean symbiotic relationships with both crustacean and noncrustacean hosts, and recommends additional research to analyze and better understand those relationships. A. N. Sastry then reviews work on larval ecology—how larval stages interact with the various biotic and abiotic factors in their environment, including egg incubation and hatching, larval development, adaptation to the environment, dispersal and recruitment, and the role of pelagic larvae in live histories. Finally Coull and Bell provide an overview of the complex interactions associated with biotic assemblages, using as examples three habitats where crustaceans are impor-

tant members (marine sandy bottom habitats, hard substrates—rocky shores and reefs, and marine and freshwater plankton assemblages). Each of the authors provides extensive references for their chapters and suggest fruitful areas for future research, and the volume provides a handy overview of crustacean behavior and ecology. The hardbound 338-page volume includes systematic and subject indexes and costs $51.50 or £43.00.

Ocean Variability and Salmon Production

"The Influence of Ocean Conditions on the Production of Salmonids in the North Pacific," edited by William G. Percy and published by the Oregon State University Sea Grant College Program in Corvallis, presents papers and comments on them from a workshop held just after the devastating 1982-83 El Niño when ocean catches of coho and chinook salmon off Oregon and Washington were lowest in recent history.

The first part of the workshop presents review papers on salmonid biology and oceanography, with each followed by a commentary providing often a somewhat different viewpoint or approach to the topic. Later, attendees broke into working groups on hatcheries, inlets and estuaries, the coastal ocean, and the open ocean. They identified problems and hypotheses that needed further research to improve our knowledge of the relationships between the ocean environment and salmonid stocks, and those reports are also contained in the publication.

Some of the the topics reviewed are: Factors associated with mortality of coho salmon from saltwater release facilities in Oregon, marine influences on the interannual variation in abundance of salmon, biology of juvenile coho salmon off Oregon and Washington, trends in abundance of northeast Pacific salmon stocks, oceanographic factors influencing the distribution, migration, and survival of salmonids in the northeast Pacific, and limitations on the ability to enhance Pacific salmon stocks.

Others include the variability of marine survival of Pacific salmon, interaction among sockeye salmon in the Gulf of Alaska, population dynamics of Bristol Bay sockeye salmon from 1956 to 1983, environmental factors and the abundance of Kodiak archipelago pink salmon, and more.

Overall, the workshop and publication presents a good review of the status of knowledge of the effects of the ocean environment on salmonid production in the northeast Pacific as of the early 1980's and should be a useful reference. (The publication is also a companion to a volume on nonsalmonid species entitled "From Year to Year: Interannual Variability of the Environment and Fisheries of the Gulf of Alaska and Bering Sea," edited by Warren S. Wooster and published by the University of Washington Sea Grant Program in Seattle.) Paperbound, the 327-page volume is available as Report ORESU-W-83-001 from Sea Grant Communications, Oregon State University, AdS A418, Corvallis, OR 97331 (price not listed).

Fish Oils and the Human Diet

"Omega-3, The Fish Oil Factors" by G. G. Pique has been published by Omega-3 Project, Inc., Suite 347, 10615-G Tierrasanta Blvd., San Diego, CA 92124. The author briefly reviews research into the role of fish oils and their omega-3 (n-3) fatty acids in the human diet in a somewhat popularized, yet still fairly technical, style of writing in an effort to promote greater use of omega-3-rich foods, particularly fatty fishes. Besides the effects on the cardiovascular system, the author also reports on perceived benefits of a fish-oriented diet for some who suffer from rheumatoid arthritis, phlebitis, colitis, and other inflammatory problems. And he questions the value of the widely used polyunsaturated vegetable oils in the diet.

Because the writing is partly technical and partly evangelical in tone, the book is difficult to categorize. References to "a true magic bullet" (EPA) and a "miracle food" (fish) may make some readers uncomfortable. Pique also discusses natural animal and vegetable sources of the omega-3 fatty acids and champions a diet based on one devised about 30 years ago by the late Averly Nelson, a Seattle, Wash., cardiovascular specialist who used a special fish-rich diet in the 1950's with heart patients and reported positive results. The author advises readers to consult with their physician and warns about the possibilities of vitamin toxicity in certain cases. A postprinting Appendix discusses the effects of omega-3 oils on atherosclerosis.

The small paperbound 163-page volume is available from the publisher for $9.95. Purchasers will also receive periodic updates (upon return of a coupon).

Hatching and Culturing the Rainbow Trout

An updated fourth edition of S. D. Sedgwick's 1973 **"Trout Farming Handbook"** has been published by Fishing News Books Ltd., 1 Long Garden Walk, Farnham, Surrey, England GU9 7HX. The original book has been much revised and additional chapters have been added. It includes a discussion of trout farming in floating cages in both freshwater and saltwater as well as treatment of trout farm effluent. Advice is also given on how to design and construct a modern trout farm, and data is included on the recognition and treatment of common trout diseases, trout hygiene, foods and feeding, egg sources and fry production, broodstock, trout processing and markets, profits, and prevention of losses. Well illustrated with photos and diagrams, the 160-page paperbound volume is available from the publisher for £10.00.