American Institute of Fishery Research Biologists

. . . BRIEFS . . .

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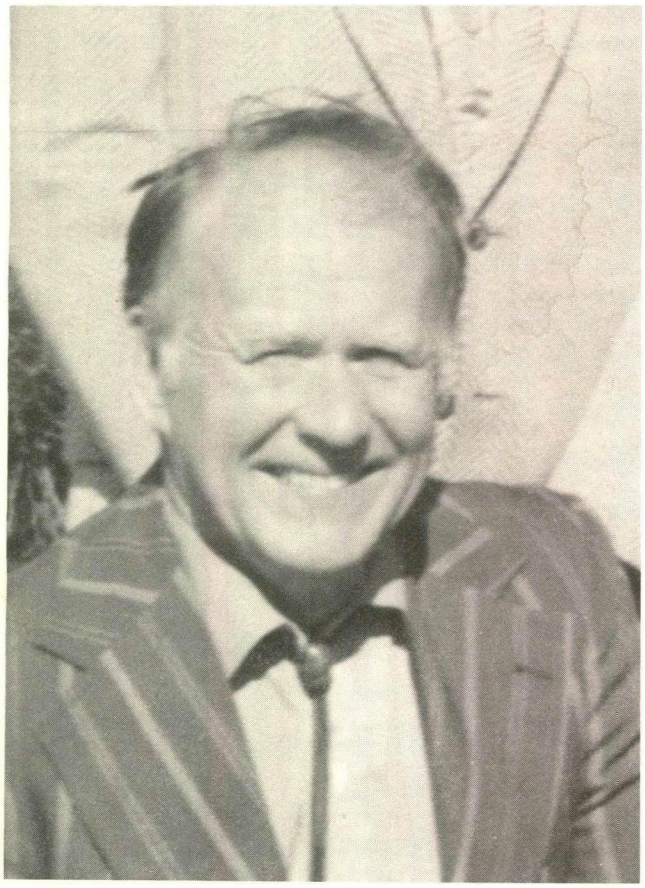
John W. Reintjes

John W. Reintjes, 68, suffered cardiac arrest and died in St. Louis, Missouri on November 15, 1988 during the return to his Morehead City, N.C. home from vacation in Hawaii. John was an active fishery biologist since 1949, a member of the AIFRB since 1959, and a Fellow since 1971. Many AIFRB members knew John only from the return address on BRIEFS and as the contact for publications. Few were cognizant of his Yeoman's ethic: he gave freely and thoughtfully in support of many groups and individuals: AIFRB was but one of several foci for his energy.



Following a brilliant combat career as a Navy pilot (Distinguished Flying Cross with three stars, and Air Medal with six stars) in World War II, John completed his B.S. degree at St. John's University in Minnesota, and received graduate training at the University of Miami and University of Hawaii from which he received an M.S. in 1949. John joined the newly formed Pacific Oceanic Fishery Investigations of the U.S. Fish and Wildlife Service in Honolulu where for 3 years he conducted research on the life histories of Pacific tunas and bait fishes and engaged in extensive cruises.

John returned to the continental U.S. in 1952 with his wife, Vern Maroney, and their first of three children. He joined Fred June in a research survey of the sport and commercial fisheries in the Delaware Bay region, a project that in large part shaped the rest of his career. In that study they realized the magnitude of the Atlantic menhaden catch, the ecological importance of menhaden, and the depth of man's ignorance about the species supporting the Nation's largest fishery. In 1955, John took a 1-year assignment in Portland, Maine, working with the otter trawl ground fishery. But he rejoined the menhaden research program in 1956 at the Beaufort Laboratory and served in various research roles, including overall program leader, until his retirement in January 1981. At the Beaufort Laboratory a yellowed data sheet bears John's penciled words "Sample #1 *B. tyrannus* June 20, 1952", the first contribution to a research program now 36 years old, which has included the measurement of nearly 1 million menhaden in catch sampling and tagging of over 1.7 million fish from Maine to Mexico in attempts to understand the complex movement patterns of the species and the relative importance of different estuaries to menhaden production.

John's personal professional accomplishments are noteworthy: over 40 scientific papers, Fellow of the American Institute of Fishery Research Biologists, President of the North Carolina Academy of Science (1975-76), participant in the International Indian Ocean Expedition, Consultant to the FAO Western Central Atlantic Fishery Project, member of four other scientific societies, etc. In his last decade at the Laboratory, serving as researcher and Laboratory Editor, John bestowed generously his time and help at every level of endeavour to make our writing better and our science more scientific. He had a wealth of pithy practical knowledge on survival in the Federal bureaucracy. And John was an unfailing source of sound advice and generosity in solving personal and family problems.

Retirement from Civil Service allowed a blossoming of John's second career. Community activities that had necessarily been secondary to making a living now received

cont. on page 2

John W. Reintjes cont.

the full force of his energies: President, Friends of the Library; President, Morehead City Lions Club; Board of Directors, Carteret Community Theater; Commander of the Carteret Militia (a Revolutionary period reenactment group serving the Beaufort Historical Association); Private (and benefactor) in the Second North Carolina Regiment of Foot (a regional Revolutionary period reenactment group); Newsletter editor and production editor for the American Institute of Fishery Research Biologists, etc.

To quote one of John's eulogists "... I see John as one with the little tunny, the albacore, that right now are surging through Beaufort Inlet—magnificent animals of 20 pounds that in the pursuit of nourishment and life cause the sea to foam about them, and which in their fervent focus on their target frequently leap four or five feet in the air, and hang gleaming in the sun, having completely escaped the bonds of their everyday environment and far surpassed the accomplishments of lesser beings."

Gene Huntsman

Our People

William A. Dill (AIFRB Fellow 1980) left FAO in August 1972 and returned to California. Bill's last position with FAO was as Chief of the Inland Fishery Branch for the Food and Agricultural Organization. Since his return to his home state, Bill has worked on and off for FAO, UNDP, Resource Associates, AID, and other agencies. He has recently co-authored *The Inland Fisheries of Israel,* and has in press an FAO book which treats the fisheries of 31 European countries, following the same general format as the Israel volume.

John J. Ney (AIFRB Member 1982) of the Department of Fish and Wildlife Science of VPI and SU, Blacksburg, Virginia is President of the Education Section of the American Fisheries Society.

Merriner Volunteers

Dr. John Merriner of the Southeast Fisheries Center of NMFS at Beaufort, NC has volunteered to act as Production Editor for BRIEFS. With the loss of John Reintjes, who had been Production Editor since 1983, the Institute had a real need for someone to do the labeling and mailing of BRIEFS every two months. John Merriner promptly took charge of this activity with the production of the December 1988 issue, so there was no delay in distribution of that issue.

AIFRB is grateful to John and his staff for willingly handling this vital facet of communicating with the membership.

District News

Northern Alaska District **William J. Wilson,** *Director*

The new Northern Alaska District has begun a series of monthly technical seminars during the lunch hour in Anchorage. Called the *Alaska Fishery Research Forum,* the monthly presentations are widely advertised and offer local fishery biologists a continuing opportunity to hear about research programs and to discuss issues of mutual interest with their peers in other organizations. Three seminars were held in 1988:

"Salmon spawning tailrace as mitigation for the Tyee Hydroelectric Project" by Michael D. Kelly, University of Alaska, Anchorage.

"Stock separation of chum salmon populations in the Yukon River drainage" by Dick Wilmot, U.S. Fish & Wildlife Service, Anchorage.

"Precision of age determiniation and the effect on mortality estimation of Pacific herring" by Linda Brannian, Alaska Dept. of Fish & Game, Anchorage.

The January 1989 seminar was:

"Density-dependent growth of age-zero sockeye salmon in Karluk Lake, Kodiak Island" by Bob Olsen, U.S. Fish & Wildlife Service, Anchorage.

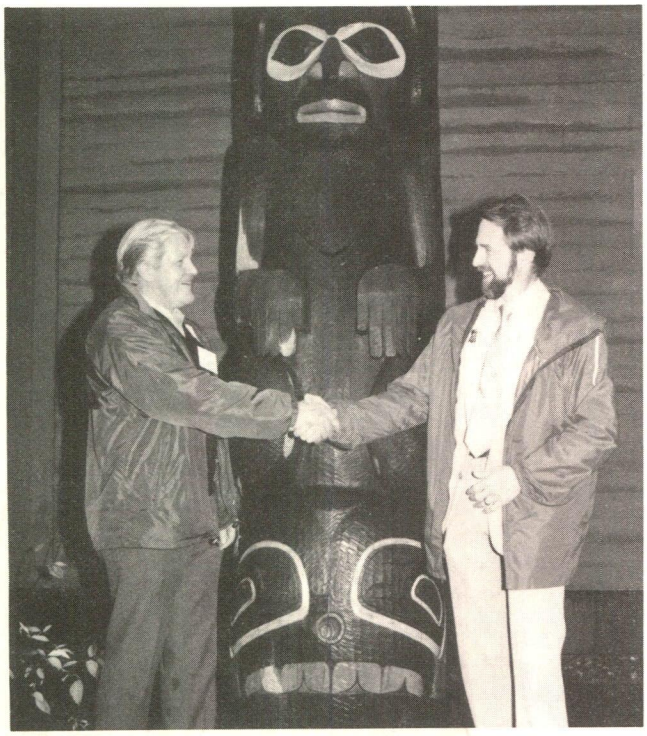
Seminars are scheduled for February through May, 1989. During the summer months, many Alaskan fishery biologists work in the field, so the monthly Alaskan Fishery Research Forum will begin again in September or October.

With the support from both the national treasury of AIFRB and the Alaska Chapter of the American Fisheries Society, the Northern Alaska District has been able to initiate these programs. With a planned collection of a small annual dues payment from members of the District, the group plans a continuing program for the rest of the year.

The District also is working with the AFS Local Arrangements Committee to ensure that the 1989 Board of Control meeting in Anchorage will be successful. Excellent meeting accommodations have been reserved at the Hotel Captain Cook, the headquarters for the 1989 AFS and AIFRB meetings. Contact District Director Bill Wilson if you have questions or suggestions. He can be reached at the North Pacific Fishery Management Council, P.O. Box 103136, Anchorage, AK 99510 (907-271-2809).

Southeastern Alaska District **John F. Karinen,** *Director*

A luncheon was held recently in Juneau to welcome members of the newly organized Northern Alaska District of AIFRB. District Director John F. Karinen welcomed District Director Bill Wilson, members of the Northern Alaska District, and guests to Juneau. A short business meeting followed the luncheon; items of mutual interest were mentioned, and plans for the September 1989 AIFRB/AFS meeting in Anchorage were made, joint District issues and cooperative efforts were discussed, and District meeting agendas were presented.



Southeast Alaska District Director John Karinen and Northern Alaska District Director William Wilson congratulate each other on attainment of their respective offices.

As a result of the joint meeting of the two Districts in Juneau, the members supported two actions:

(1) AIFRB joined AFS in recognizing Dr. Dana C. Schmidt for the Best Paper Award of the AFS meeting. Dr. K Koski, past Director of the former Alaska District, presented $50 and a certificate of achievement to Dr. Schmidt, whose paper was "Kodiak Red King Crab (*Paralithodes camtschatica*) Harvest History and the Implications of Size, Sex, and Season Management". Dr.Schmidt immediately donated the $50 award to the AFS Alaska Chapter.

Several papers were presented by AIFRB members at the meeting, which focused on "The Value of Fisheries to Alaska".

(2) AIFRB members of Alaska agreed to nominate Jim and Mary Lou King of Juneau for the 1989 Chevron Conservation Award for their outstanding contributions to conservation of wetlands in Alaska during the past 20 years.

Washington, NW District **Alan J. Mearns,** *Director*

The solicitation of funds for the District treasury has been very successful. Members contributing $5.00 or more to the activity fund have contributed significant amounts to assist in perpetuating the $50-70 monthly expenditures for printing and mailing the District's attractive and successful newsletter. District Director Mearns has appointed Greg Bargmann as District Treasurer to manage the District funds.

The District has organized a car pool to enable members from Olympia and other localities to attend the monthly meetings in Seattle.

The January meeting of the Northwest Washington District featured Dr. John Armstrong and Catherine Kreuger of the U.S. Environmental Protection Agency, speaking on *Puget Sound Estuary Program: The Health of an Urban Estuary.* The presentation brought out the locations of pollution hot spots, the cleanliness of the rural bays and estuaries, the safety in eating the fish, shellfish, and seaweeds, and the places action is needed.

Hudson River Foundation Fellowships

The Hudson River Foundation announces the third year in a graduate fellowship program to sponsor doctoral research on topics of environmental, ecological, and public health concern to the Hudson River. Our highest research priority is:

Life cycles and Population Biology of Resource Organisms.

Also of interest are:

Base of Hudson River Food Webs.
Source, Disposition, and Role of Toxic Substances.
Hydrodynamics and Sediment Transport.
Education, Public Policy and Decision-Making.

We will also consider proposals outside our priorities, providing the student can demonstrate the importance of the proposed work.

The Fellowships will each provide a stipend of $11,000, plus $1,000 toward supplies. Qualified applicants must be enrolled in an accredited Ph.D. program, must have a thesis advisor and advisory committee, and must have a thesis research plan approved by the student's department. The deadline for applications is March 31, 1989.

Information on how to apply may be obtained by requesting the Foundation's Annual Program Plan from: The Hudson River Foundation, 122 East 42nd Street, Suite 1901, New York, NY 10168.

If you have questions, contact Dr. John Waldman, (212) 949-0028.

University of Iowa Fellowships

Iowa Lakeside Laboratory announces the FOUNDER'S FELLOWSHIP for the summer of 1989 in field biology for pre-doctoral students. The stipend is $2,000, tuition free; fellows pay modest fees for room/board and lab space.

Applicants will be doctoral candidates whose work has a field component for which a summer at our biology station would be especially profitable. Applicants should be at the level of independent investigator.

Lakeside Lab is in northwestern Iowa on recent glacial terrain, with adjacent lakes, wetlands, virgin prairie, prairie rivers, and pockets of forest. The lakes country is continuous to the north and the Great Plains to the west. Our own 55-ha grounds border large and deep West Okoboji Lake, we have forest and manipulable grassland. Conditions: rustic but not primitive, an air of relaxed intensity, food unbelievable. Research labs are relatively new and we have a small library.

Interested applicants should write the director for more about the area and facilities. An application will contain a

cont. on page 4

University of Iowa cont.

cover letter, vitae, and a one or two page synopsis of the proposed project. Specific reasons why our station is so suitable are critical to the application. Two letters are requested, including one from the research sponsor.

Applications will be considered up to April 1st, 1989 by Richard V. Bovbjerg, Director, Professor of Biology, The University of Iowa, Iowa City, IA 52242.

Trout Names

The validity of *Salmo* as a generic name for several western North American trout species has been questioned in recent years. Taxonomists now agree that native *"Salmo"* trouts of northern Pacific Ocean drainages are more closely allied with Pacific salmon *Oncorhynchus* spp. than with Atlantic and Eurasian *Salmo* species (among which are Atlantic salmon *S. salar* and brown trout *S. trutta*). Recent evidence, culminating in new data presented during the June 1988 meeting of the American Society of Ichthyologists and Herpetologists, has persuaded the American Fisheries Society's Committee on Names of Fishes to accept *Oncorhynchus* as the appropriate generic name for all native Pacific-drainage trouts that presently are called *Salmo*. The evidence indicates that species of *Rhabdofario* (fossil trouts), *Parasalmo* (proposed to replace *Salmo* for living Pacific-drainage trouts), and *Oncorhynchus* are not distinctive at the generic level. Of these names, *Oncorhynchus* has historical taxonomic priority for this group of fishes.

A separate problem has concerned the specific name for rainbow trout (and its anadromous form, steelhead), which presently is called *Salmo gairdneri*. Taxonomists now believe that rainbow trout and the "Kamchatkan" trout *Salmo mykiss* of Asia form a single species, for which *mykiss* has nomenclatural priority. The Names of Fishes Committee thus has adopted *Oncorhynchus mykiss* as the scientific name of this species.

The North American species affected by these changes are as follows: Apache trout becomes *Oncorhynchus apache*, cutthroat trout becomes *O. clarki*, Gila trout becomes *O. gilae*, golden trout becomes *O. aguabonita*, Mexican golden trout becomes *O. chrysogaster*, rainbow trout becomes *O. mykiss*. The American Fisheries Society will implement the new names in its 1989 publications. Common names will remain unchanged. A manuscript on this subject will be published in the January-February issues of *Fisheries*.

Reprinted from Fisheries, *13(6):24*

Meeting Announcements and New Publications

Tuna Conference

The *40th Tuna Conference* will be held Monday through Thursday, 22-25 May, 1989, at the University of California's Lake Arrowhead Conference Center, Lake Arrowhead, California, U.S.A.

The Tuna Conference is sponsored annually by the Inter-American Tropical Tuna Commission and the U.S. National Marine Fisheries Service. This rather informal international meeting of scientists, and others interested in tuna and billfish fisheries and research, is convened to provide a forum for presentation and discussion of current topics in tuna and billfish fisheries and research.

The theme for this year's conference is "Pelagic Fisheries Ecology and Biology." Participants are encouraged to submit presentations related to studies of tuna and billfish ecology and biology; however, papers presenting research and methodologies which may prove of interest to those investigating tuna and billfish are also welcome and invited. Thirty minutes will be allowed for each presentation. This format provides about 20 minutes for delivery of the paper and 10 minutes for general discussion.

In addition, some time will be reserved for the presentation of papers on other aspects of tuna and billfish fisheries. These sessions would include, for example, papers on fisheries statistics, management, and other subjects not directly related to the Conference theme, but which are of interest to those working with tuna and billfish fisheries. As in past years, a limited space will be provided for poster presentations.

The Tuna Conference provides a limited number of scholarships to students presenting papers at the Conference. These scholarships are intended to help defray the cost of attending the Conference, but generally do not cover the cost of transportation from the student's home to San Diego. Round trip transportation between San Diego, and Los Angeles, and Lake Arrowhead is available for students.

For further information and registration forms write: Michael G. Hinton, Chairman, 40th Tuna Conference, Inter-American Tropical Tuna Commission, c/o Scripps Institution of Oceanography, La Jolla, California, U.S.A., 92093. Alternate contact means are by telephone: 619-546-7033, and by FAX: 619-546-7133.

Coastal Zone 89

Coastal Zone 89 is the Sixth Symposium on Coastal Zone and Ocean Management. It will be held at the Omni Hotel in Charleston, SC on July 11-14, 1989.

The CZ conference series has evolved into an international, multidisciplinary, in-depth exchange of information and ideas concerning the identification and resolution of coastal- and ocean-related problems. The many sponsors include NOAA, the American Society of Civil Engineers and the Coastal Zone Foundation. Major topic areas include coastal and marine policy, the global environment, public activities and coastal access, developmental, environmental and resource management, and international issues. Professional papers will be presented in conjunction with plenary meetings, poster sessions, exhibitions, training courses and field trips. Over 1500 participants are expected to attend. Registration fees have yet to be set.

For further information contact Delores Clark, NOAA Office of Constituent Affairs, Rockville, MD 20852.

Symposium on Multispecies Models

The International Council for the Exploration of the Sea is organizing a symposium on *Multispecies Models Relevant to Management of Living Resources,* to be held in The Hague, Netherlands on October 2-4, 1989.

The potential importance of biological and technological interactions between living marine resource species and fishing fleets is widely acknowledged. Yet, these interactions have had little influence on management decisions with a few exceptions.

It was the pioneering efforts of two Danish scientists, Ursin and Andersen, that during the early 1970s drew attention to the importance of biological interactions. Their North Sea model demonstrated that potential yield estimates based on single species assessments were optimistic when species interactions were taken into account. While the model was informative, it was too complex for direct application to produce management advice. During the late 1970s, multispecies assessment models have been put forward to bridge the gap between overly simplified single species approaches and the complex North Sea model. In 1979, an ad hoc Working Group on Multispecies Assessment Model Testing designed an international program for collection of the data. The plan was executed in 1981 which became known as the "Year of the Stomach". Since then, ICES has refined multispecies assessments.

Apart from biological interactions, the harvesting technology of many fisheries makes them multispecies. Therefore, the management of one species frequently impacts on one or more interacting species.

Multispecies fishery problems are not unique to the ICES area, but there has been relatively little exchange of ideas and comparison of approaches. Since ICES has been pioneering in the development of multispecies models relevant to management of living resources, it was decided that the Council should convene an international symposium to culminate a decade of focused research under the ICES banner.

The purpose of the Symposium is to encourage quantitative analysis of biological and technological interactions relevant to management of living resources; provide a forum for comparison of approaches applied both within and beyond ICES primary area of interest; and provide a summary of the "State of the Art".

The Symposium, for which there is no registration fee, is open to all interested scientists who announce their participation in advance. Participants are requested to inform the General Secretary by not later than 31 August 1989. Information regarding the venue and arrangements for the Symposium hotel accommodation, etc. in The Hague will be provided by the ICES Secretariat following receipt of such notification.

Contributions to the Symposium are invited on worldwide applications of multispecies models with particular emphasis on recent advances concerning: mechanisms of biological interactions including the role of marine mammals and birds; relationship between biological interactions and recruitment processes; technological interactions in multispecies fisheries; and implications for fishery management.

Scientists wishing to contribute papers or posters to the Symposium are requested to submit the titles together with abstracts to the Co-conveners by not later than 1 December 1988. Authors of papers or posters accepted by the Steering Group for presentation will be notified by not later than 1 March 1989. As it is intended to circulate the papers to participants in advance of the Symposium, it is essential that the required number of copies reach the ICES Secretariat by not later than 1 August 1989. The papers and posters must be in either English or French, and the papers should not be more than 2500 words in length (excluding tables and figures).

Co-conveners:

Dr. M. P. Sissenwine, Northeast Fisheries Center, NMFS/NOAA, Woods Hole, MA 02543, USA.

Dr. N. Daan, Netherlands Institute for Fishery Investigations, Postbus 68, 1970 AB IJmuiden, The Netherlands.

Early Life History Bibliography

A Bibliography of the Early Life History of Fishes, 1988, by Robert D. Hoyt, is an indexed bibliography of early life history stages of fishes featuring egg, embryo, larval, and juvenile literature. The bibliography is comprehensive in scope, including 13,717 works produced from 1842 to July 1987. The two-volume, 980-page set is soft cover and spiral bound for ease of use. Copies may be obtained from Robert D. Hoyt, Department of Biology, Western Kentucky University, Bowling Green, KY 42101. The price is $55.

BLM Wildlife and Fisheries Program

The U.S. Bureau of Land Management in 1988 issued *Status Report-Wildlife and Fisheries Program,* which provides an overview of the status, activities, and examples of accomplishments of the Bureau's wildlife and fisheries program. It provides a baseline from which to measure progress, needs, and accomplishments associated with implementation of *Fish and Wildlife 2000,* the Bureau's plan for the future concerning fish and wildlife resource management on public lands. The two primary purposes of the wildlife and fisheries program have been to provide pertinent data and expertise for land use decision making and management processes, and to develop and protect wildlife and fish habitat pursuant to the management prescriptions specified in Resource Management Plans and Habitat Management Plans or other activity plans such as Allotment Management Plans.

The report treats program objectives, program coordination, budget and staffing, wildlife habitat, fisheries habitat, threatened/endangered species, and examples of actions and partnerships.

cont. on page 6

Meeting Announcements cont.

NAPAP Assessment Plan

The National Acid Precipitation Assessment Program (NAPAP), the Federal interagency research program on acidic deposition, has announced the availability of a public review draft of the NAPAP Assessment Plan. The Plan describes the information to be covered in NAPAP's State of Science and State of Technology reports to be published in 1989, and in NAPAP's 1990 Integrated Assessment report. The Plan also describes the open review process that NAPAP will use in preparing these reports.

NAPAP's reports will provide a comprehensive assessment of the causes and effects of acidic deposition in the United States, combined with analyses of the costs of effectiveness of various emissions-reduction strategies. The reports will provide substantial documentation, guidance, and recommendations on the major issues related to acidic deposition in the United States, based on the full complement of available technical information.

NAPAP's Assessment Plan is one step in a process aimed at providing the best possible scientific and technical information on acidic deposition causes, effects, and control approaches, in order to assist in the development of national policy on these issues.

Copies of the NAPAP Assessment Plan can be requested from the NAPAP Office of the Director, 722 Jackson Place NW, Washington, DC 20503.

Walleye-Sauger Bibliography

Walleye-Sauger Bibliography, by Mark Ebbers, Peter Colby (AIFRB Fellow 1978), and Cheryl Lewis, covers sauger (*Stizostedion canadense*) and walleye (*Stizostedion vitreum vitreum*) and is the result of a joint effort between the Minnesota Department of Natural Resources and Ontario Ministry of Natural Resources. The goal is to update the work by Addison and Ryder and to facilitate the revision of the synopsis of biological data on walleye.

References are listed alphabetically by author. Keywords are listed after each reference. A listing of each reference number for each species are also listed by keyword. To order this free publication, write: Mark Ebbers, Minnesota Department of Natural Resources, 500 Lafayette Road, Saint Paul, MN 55155.

Fishes, Shrimps, and Crabs

M. V. Ogburn, D. M. Allen, and W. K. Michener have edited *Fishes, Shrimps, and Crabs of the North Inlet Estuary, SC: A Four-Year Seine and Trawl Survey,* issued by the Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina, Columbia, SC 29208.

The use of estuaries as nursery areas for fishes and macroinvertebrates is widely recognized, but few studies have documented interannual variations in this dynamic process. Four years of biweekly seine and trawl collections from the high salinity tidal creeks of a South Carolina estuary provided information on the occurrence of more than 100 species of finfishes, shrimps, and crabs. The report includes an analysis of the abundance and length frequency data for each species, and graphics depicting monthly, seasonal, or annual trends are presented for the 42 most common taxa. Community-level analyses focus on temporal patterns of abundance, weight, and species richness.

The intent of this book is to provide a first-level analysis of a large and comprehensive data set in a form that would be useful to both fishermen and scientists. Descriptive interpretations of species distributions are supported by tables and graphics which would be useful to scientists interested in exploring the data sets in more detail. The editors encourage the use of this baseline information by investigators interested in developing comparative or collaborative research projects for the future.

To order, send $15.00 to the Institute.

The Inland Fisheries of Israel

William A. Dill (AIFRB Fellow 1980) has joined Adam Ben-Tuvia to write *The Inland Fisheries of Israel.* The paper appeared in 1988 as Volume 40 (3) of the Israeli Journal of Aquaculture-Bamidgeh on pages 75-104.

This is one of the few papers to describe the entire inland fisheries of a country. The contents cover Israel's area; population; geography; climate; hydrography and limnology; land and water use; fish and fisheries; ownership, administration, management, investigation, and agreements; state of the fishery; and references. Seven tables and two figures enhance the paper.

Inland capture fisheries are virtually limited to a thriving commercial fishery on Lake Kinneret and inland sport fishing is minimal. Warmwater fish pond culture is, however, outstanding, maintain itself well despite competition from other land and water uses.

Reprints may be ordered from the editor, Dr. Jaap van Rijn, The Hebrew University of Jerusalem, Jerusalem 91904, Israel.

Basic Fishery Science Programs

S. B. Saila (AIFRB Member 1959), C. W. Recksiek, and M. H. Prager (AIFRB Associate Member 1983) have edited a book, *Basic Fishery Science Programs: A Compendium of Microcomputer Programs and Manual of Operation.* Published by Elsevier Science Publishers as Volume 18 in the *Developments in Aquaculture and Fisheries Science* series, this 1988 volume has about 225 pages and can be ordered for $73.75 prepaid from Elsevier, Box 882, Madison Square Station, New York, NY 10159.

The primary purpose of this book is to provide a range of tested BASIC programs, which are useful for solving some of the problems frequently encountered in fisheries science and related resource assessment disciplines. Taken together, the "package" of programs may be considered to be a system, hence the name Fisheries Science Applications Systems (FSAS) which has been adopted as the title of the package.

In the first chapter, an overview of the FSAS system and its components is presented. The second chapter is a tutorial on data entry, data editing, and the use of a typical application program. The remaining text summarizes each application program, describing the analyses it performs and providing citations to the fisheries literature.

The programs are considered to be of potential value to the practicing fisheries scientist who has access to a personal computer. In addition, they will be of value to fisheries scientists and managers in the developing world, who have access to minimal computing facilities and peripheral equipment.

The programs described in **BASIC Fishery Science Programs** are available on diskette. To order, write to: International Center for Marine Resource Development, c/o ICMRD/FSAS, 126 Woodward Hall, University of Rhode Island, Kingston, RI 02881-0804, U.S.A.

Taxonomic Code

The National Oceanographic Data Center (NODC) announces the availability of the fifth edition of the NODC Taxonomic Code. The Code contains entries giving the scientific names and corresponding numerical codes of worldwide flora and fauna from viruses to mammals. This edition contains 62,175 entries, 35% more than the fourth edition.

The NODC Taxonomic Code is a hierarchical system of numerical codes of up to 12 digits used to represent the scientific names of organisms to the level of subspecies or variety. The bowhead whale (*Balaena mysticetus*), for example, is coded by the 10-digit number 9219030102. The Code links the Linnean system of biological nomenclature to a numerical schema that facilitates computerized data storage and retrieval. It was developed by the NODC to simplify and systematize NODC processing, storage, and retrieval of marine biological data. NODC requires the use of the Code in all marine biological data that it accepts for processing into its marine data files.

To provide necessary flexibility in the numerical schema and to provide more information about code entries, the NODC Taxonomic Code is annotated with a series of terms and symbols. These allow for the listing of synonyms, for information about code changes and corrections, and for cross-referencing between related entries.

The fifth edition of the NODC Taxonomic Code is available only on a single magnetic tape (1600 bpi) at a cost of $98. A descriptive flier giving further details about the code and how to order it is available on request from the NODC. Inquiries should be directed to: National Oceanographic Data Center, User Service Branch, NOAA/NESDIS E/OC21, Washington, DC 20235. Telephone (202) 673-5549. Electronic mail: NODC.WDCA on Telemail/Omnet.

Thesis Abstracts

Seasonal Changes in Sex Steroids of Pacific Halibut *Hippoglossus hippoglossus*

Han Wu Liu, M.S. 1988
University of Washington

Blood samples were collected from captive Pacific halibut, *Hippoglossus hippoglossus*, at intervals of about six weeks from early December, 1986 to late November, 1987. Concentrations of plasma androgen and estradiol in Pacific halibut were determined by radioimmunoassay (RIA).

In mature females, the concentrations of estradiol and androgen began to rise in September and reached peaks averaging 3,451 pg/ml (December) and 2,613 pg/ml (January) for the two respective hormones. Concentrations of steroids fell rapidly about one month before spawning. In a mature male, the androgen began to rise in August, increased between September (338 pg/ml) and November (1,580 pg/ml) and reached a peak of 7,045 pg/ml in early December. One month before spawning the androgen concentration fell to 161 pg/ml. Estradiol concentration in the male varied little during the year. In four females that did not spawn in 1987, both estradiol and androgen concentrations reached about 1,500 pg/ml in January, 1987. From April, 1987 the two steriods started another cycle and reached a high in excess of 2,000 pg/ml; subsequently, all four females released eggs between February and April, 1988. In immature fish neither androgen nor estradiol changed significantly during the year. In one mature female, concentrations of both androgen and estradiol were much lower in the 1988 spawning season than in 1987. This indicates that adult Pacific halibut may not spawn every year following initial maturation.

Comparison of Stream Velocity Simulations for the IFG-4 Model Three-Flow, One-Flow, and No-Velocity Options

Donald J. Bremm, M.S. 1988
Humboldt State University

The Instream Flow Incremental Methodology (IFIM) was developed by the U.S. Fish and Wildlife Service to provide an analytical technique for evaluating flows for a stream that would maintain fisheries habitat. There are several techniques available within the IFIM approach that can be used to predict fisheries habitat. The strengths and weaknesses of each technique are of importance to all model users.

Several technique options of the Instream Flow Group #4 (IFG-4) hydraulic simulation model were tested to simulate stream velocities and weighted usable area (WUA) values of fishery habitat for transects on Big Creek and the Yuba River at different levels of flow. The predicted stream velocities and WUA values were compared to the measured stream velocities and benchmark WUA values for the three-flow technique, three one-flow techniques, and two no-velocity flow techniques. The benchmark values were those

cont. on page 8

Thesis Abstracts cont.

generated by use of the one-flow techniques at their calibration discharges (the discharge at which their velocity information was collected).

Stream velocities and WUA values are most accurately simulated using a combination of the results from the three, one-flow techniques. The three-flow technique was second in prediction capability for both, followed by the single, high flow one-flow and the single, middle-flow one-flow techniques. The two no-velocity flow techniques simulated stream velocities poorly but general trends in the predicted WUA values were quite similar to benchmark values.

Membership Report

PROMOTION TO FELLOW

Dr. Reginal M. Harrell	MD
Dr. Dennis D. Dauble	WA

NEW FELLOW

Dr. Jay R. Stauffer, Jr.	PA

PROMOTED TO MEMBER

Barbara E. Warkentine	NY

NEW MEMBERS

Dr. Andrew E. Jahn	CA
Robert L Wilbur	AK
Dr. Dennis J. Dunning	NY
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BRIEFS, the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

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FIRST CLASS

American Institute of Fishery Research Biologists

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VOL. 18, NO. 2 APRIL 1989

Is It Safe To Eat Fish?

At a Northwest Washington District meeting covering the Puget Sound Estuary Program of EPA, Catherine Kreuger commented on EPA's conclusion that no additional special warnings are needed regarding consumption of seafood from Puget Sound. She described the risk assessment strategy for evaluating carcinogen and non-carcinogen health risks. The approach has admitted uncertainties, but errs on the side of overestimation. In 8 surveys at 22 locations, EPA, DHS, and contractors surveyed fish, shellfish, and seaweeds for toxic chemicals. Of 150 chemicals looked for, 37 were detected. Based on preliminary calculations 5 carcinogens (PCBs, DDT, PAHs, a lindane-related pesticide, and arsenic) and three non-carcinogens (cadmium, lead, and mercury) had any chance of increasing health risk by 1 in one-million (the EPA criteria). The study looked at two types of seafood consumers: "average" (30 meals of fish, 2.7 of shellfish, 0.15 of kelp and 0.1 of nori per year), and "high" (230 meals of fish, 52 of shellfish, 104 of kelp and 70 of nori). For the average consumer the chance of increased cancer risk was 2 in 10,000 and for the high consumer, 4 in 1000. These risks are higher than the EPA goal but comparable to a combined diet of peanut butter and milk while experiencing sunburn. Many other areas in the U.S. produce seafood with similar risk estimates. Since the risks here are comparable to elsewhere and since the risks of alternative (non-seafood) foods is unknown, there was no justification for adding to the existing warnings.

From Northwest Washington News, *Jan. 1989*

Change of Address

AIFRB Treasurer Joseph Rachlin, who is valiantly struggling to keep the membership list current, requests that any members who move their mailing address should notify him of the change of address. Please comply by sending the new address to Dr. Joseph Rachlin, AIFRB Treasurer, Lehman College, Bedford Park Blvd., Bronx, NY 10468.

Eating Fish Containing PCB

Based on recent sampling for PCBs in striped bass and bluefish, the Connecticut Departments of Health Services and Environmental Protection are urging precautions in the consumption and preparation of these popular gamefish.

"Although not all bluefish and striped bass sampled had excessive PCB levels, there is a basis for health concerns for certain individuals at high risk from PCB exposure," said epidemologist Brian Toal of the state health department. But Toal also points out that eating fish has positive effects as a healthy source of protein and as possible protection against the development of heart disease.

The advice issued today is that striped bass and large bluefish taken in coastal Connecticut waters should not be eaten by women who are pregnant. Officials consider a large bluefish as one greater than 25 inches in total length or about 6 pounds. "In addition, women contemplating becoming pregnant in the near future, nursing mothers, or children under fifteen years of age should also not eat these fish, or at most, should limit consumption to a few meals per year. Other avid consumers of these fish, those who eat more than 18 meals per year, should consider limiting their exposure to PCBs from striped bass and large bluefish by limiting the number of meals of those fish, eating smaller rather than larger fish, and using proper preparation and cleaning procedures," said Toal.

The warning, a revision of one that has been in effect for nearly three years for striped bass only, is based on the contamination of striped bass and bluefish by a chemical waste product, polychlorinated biphenyls—or PCBs. Since PCBs accumulate in skin and fatty tissue, removing the skin, "lateral line" area, belly flaps and dark meat portions of the fillet can reduce levels of PCBs prior to cooking by 50% or more in any fish, according to state officials. Broiling fish on a rack so that the fat drips away from the flesh may also be useful in reducing PCB concentrations.

"In addition, since PCBs accumulate over the lifetime of the fish, consumption of smaller or younger fish will also limit PCB exposure. It should be noted that DEP marine fishing regulations only allow the keeping of striped bass greater than 33 inches," said Eric Smith of the Department of Environmental Protection.

PCBs are of concern to state officials because of evidence linking consumption of the chemical to learning disorders

cont. on page 2

Eating Fish Containing PCB cont.

and other developmental abnormalities in children of women who were exposed to high levels of PCBs during pregnancy. Also, some laboratory animals fed high levels of PCBs have developed liver cancers and reproductive abnormalities. PCBs have a tendency to accumulate in fatty tissue in both humans and fish and remain there at elevated levels for long periods of time.

"It should be noted that there is controversy over whether PCBs, when consumed at levels now found in striped bass and large bluefish, actually harm humans. However, the longer one lives, the more PCBs accumulate in the body, so we recommend limiting consumption of fish with elevated PCB levels," said Toal.

It is the possible carcinogenic effects of a lifetime of eating large quantities of fish with elevated levels of PCBs, and the possible reproductive effects, that prompted the original May 1985 warning. Health officials liken today's recommendations to similar ones that caution pregnant women in particular to avoid cigarettes and alcohol.

The advisory is based on findings by the New York Department of Environmental Conservation and Rhode Island Department of Environmental Management that a majority of striped bass taken from the waters of Long Island Sound and Rhode Island had levels of PCBs greater than the tolerance level of two parts per million established by the U.S. Food and Drug Administration.

The recommendations on bluefish are based on a survey of PCBs in Atlantic Coast bluefish conducted by the National Oceanic and Atmospheric Administration which found that 15% of bluefish greater than 25" total length also exceed the FDA tolerance. This study found no concern related to consumption of smaller bluefish.

From the New England Edition of THE FISHERMAN, *Jan. 12-19, 1989*

Where Are They?

AIFRB Treasurer Joseph Rachlin has compiled another list of members whose BRIEFS do not reach them because their addresses in AIFRB files are apparently not current. This is an appeal to the membership to notify Dr. Rachlin at Lehman College, Bedford Park Blvd., Bronx, NY 10468 if the latest addresses of these people are known and the Institute files can be brought up to date.

Missing	Last Address
Thomas P. Calkins	La Jolla, CA
Terry J. Foreman	San Diego, CA
Peter L. Haaker	Long Beach, CA
John H. Hunt	Marathon, FL
Patricia Wolf	Long Beach, CA

AIFRB Tax-Exempt Status

Treasurer Joseph Rachlin reports that, after several months of negotiating with the Federal Internal Revenue Service, our application for Tax Exempt Status under Code 501 (c) (3) has been denied. AIFRB does not meet the appropriate tests, one of which is that the majority of benefits based on our activities must accrue to the public at large and not just to the membership. We do, however, retain our Federal Exempt Status under Code 501 (c) (6).

The consequence of this is that, while we have Federal Tax Exempt Status, we do not carry automatic state and local tax-exempt status. Each state and local government will make its own determination upon appropriate petition for exempt status. Further, the dues and voluntary contributions of the membership can be deducted on Federal Income Tax returns as regular business expenses.

Dolphins and Red Tide

Hundreds of bottlenose dolphins that died off the east coast of the United States during the summer of 1987 and into early 1988 were poisoned by eating fish tainted by a naturally occurring toxin from "red tide" algae, according to the National Oceanic and Atmospheric Administration (NOAA).

The red tide alga, known as *Ptychodiscus brevis,* produces the powerful poison, brevetoxin, which killed some of the dolphins directly, NOAA said, and weakened others making them more susceptible to a host of bacterial and viral infections.

NOAA reported that this is the first known instance of the toxin's being transmitted to a mammal through tainted fish. The toxin itself was confined to the liver and other viscera of the fish. It is not present in the flesh and poses no threat to humans eating fish fillets, NOAA said.

The toxin was carried up the coast by fish—possibly menhaden or Spanish mackerel that had eaten menhaden—that had consumed the algae. Red tides are normally confined to the Gulf of Mexico, although occasionally such algal blooms can be carried around Florida and swept north along the Atlantic coast by the Gulf Stream.

Dead dolphins first began washing ashore in southern New Jersey in late June 1987. In early August, NOAA and the Marine Mammal Commission assembled an investigative team in Virginia Beach, Va., to examine stranded dolphins, collect tissue samples, and begin an analysis that would eventually involve almost 350 dolphins in thousands of separate tests.

The team was headed by Dr. Joseph Geraci, a veterinarian working at the University of Guelph in Ontario, and at one point involved more than 100 volunteer scientists and others at dozens of federal, university, and private agencies and laboratories. The brevetoxin analyses were carried out in the laboratories of Dr. Dan Baden at the University of Miami.

By March of 1988, when the event ended, about 740 dolphins had washed ashore from New Jersey to Florida. NOAA estimates a substantially larger number died and were lost at sea.

From NOAA press release—Feb. 1, 1989

C. W. Watson Award

Nominations are being sought for the 1989 Clarence W. Watson Award. This annual award will be presented at the Southeastern Association of Fish and Wildlife Agencies meeting at St. Louis, Missouri, October 28-November 1, 1989.

The Clarence W. Watson Award is the most prestigious award given in the Southeast and is presented to the career individual who, in the opinion of the Award Committee, has made the greatest contribution to wildlife or fish conservation during the previous year or years. Consideration includes research, administration, law enforcement, I&E, wildlife management, fish management, teachers and students. Preference is given to nominees in the Southeast. The award is a mounted bronze plaque given jointly by the Southern Division of the American Fisheries Society, the Southeastern Section of the Wildlife Society, and the Southeastern Association of Fish and Wildlife Agencies.

All Southeastern fish and wildlife conservationists and other interested persons are encouraged to nominate worthy candidates. Nominations should be submitted in letter form and should include complete information on the candidate's background; i.e. education, training, other noteworthy accomplishments, and particularly, the achievement(s) for which the nomination is being made. The letter should include, but not be limited to, a description of the accomplishment(s), time involved, application in state and region concerned, and the amount of aid received from associates. As much information as possible should be furnished to aid the committee in making the selection. The name of a previously unselected nominee may be resubmitted.

Recipients in previous years, 1964-88 respectively, were: C. W. Watson; Bob Stevens, SC; Price Wilkins, TN; Ted Kistner, GA; John Crumb, VA; Fred Fish, NC; Forrest Kellogg, GA; Chester Phelps, VA; Trusten Holder, AK; Harold Warvel, TN; Vernon Carter, GA; William Turcotte, MS; Carroll Perkins, MS; Earl Frye, Jr., FL; Jack Crockford, GA; Leonard Foote, GA; Frank Hayes, GA; Don Haynes, NC; Chester McConnell, TN; Harold Alexander, AK; Robert Kemp, TX; Dale Arner, MS; Ted Joanen, LA; Larry Gale, MO; and Herman Holbrook, SC.

Letters of endorsement *are not necessary and are discouraged.* Selections will be based on information included in the letter of nomination.

Nominations should be sent to: Chester McConnell, Chairman, Clarence W. Watson Award Committee, S.E. Section - The Wildlife Society, Rt. 6, Box 212, Lawrenceburg, Tennessee 38464.

Nominations should be sent as soon as possible, but *not later than August 31, 1989.*

District News

Washington, NW District **Alan J. Mearns,** *Director*

A highlight of our recent activities was the February 21 lecture by Erik Volk of the Washington Department of Fisheries. He spoke on *Fish Ears, Sea Shells: The Practical Application of Calcified Tissue to Fishery Management Questions,* an overview of the use of animal hard-parts in several fields, including mass marking of juveniles, growth and life history assessment, environmental trends monitoring, and environmental effects on growth and reproduction.

The District Newsletter, *Northwest Washington News,* in January began a new feature—printing biographical profiles of members, associates, and members *emeriti* in the District so everyone could get to know one another better. In the January issue, biographies appeared for five people to give insight into their backgrounds and interests. The March issue contained biographies of three more members.

On March 28, David Kennedy and Jerry Galt of the Hazardous Materials Response Branch of NOAA in Seattle spoke on *SPILL! Response and Effects of the Recent Washington Coast Oil Spill.* They described what actually happened during and following the spill, how marine life, wildlife, and fisheries are affected, and what happens during a major spill response. They also told what happened at the Antarctic and Hawaii spills.

Meeting Announcements and New Publications

Modelling and Analysis Workshop

The *Second Interdisciplinary Conference on Natural Resources Modelling and Analysis* will be held at Florida State University on October 12-13, 1989. Sponsored by Florida Sea Grant; FSU Departments of Biological Sciences, Economics, Mathematics, and Oceanography; FSU Office of Graduate Studies and Research; Resource Modeling Association; Sigma Xi Society; U.S. Geological Survey; and U.S. Office of Naval Research, the conference will focus on recent progress and current issues—biological, economic, social, and technical—in the quantitative modelling and analysis of conserving fisheries, forests, soil, water, wildlife, and other natural resources; and it will foster collaboration across traditional discipline boundaries among biologists, earth scientists, economists, engineers, mathematicians, and resource managers. The registration fees before August 31 are $45 for RMA members, $55 for non-members, and $15 for students and retirees.

For registration materials or further information, contact Michael Mesterton-Gibbons, Department of Mathematics, FSU, Tallahassee, Florida 32306-3027.

Southeastern Association Conference

The 43rd Annual Conference of the Southeastern Association of Fish and Wildlife Agencies will be held at the Sheraton St. Louis Hotel, St. Louis, MO, October 28 through November 1, 1989.

All papers must comply with the manuscript guidelines published as a special supplement at the end of the 1985 *Southeastern Proceedings* (Volume 39). The deadline for submitting technical papers to the appropriate program

cont. on page 4

Meeting Announcements cont.

committee is May 1, 1989. Nontechnical session papers are to be submitted to the program chairperson by the meeting date.

The Fisheries Associate Editor is Dr. William Kelso, School of Forestry, Wildlife and Fisheries, Forestry, Wildlife and Fisheries Building, Louisiana State University, Baton Rouge, LA 70803.

A Special Session at the Conference will cover *Management of Rare or Endangered Species.* Subjects being considered for this session include the alligator snapping turtle and the bald eagle. Send your title and abstract by May 1, 1989 to Tom R. Johnson, Special Session Program Chairman, Missouri Department of Conservation, Box 180, Jefferson City, MO 65102.

Creel Census Symposium

The American Fisheries Society and the Federal Aid Division of the U.S. Fish and Wildlife Service will sponsor an *International Symposium and Workshop on Creel and Angler Surveys in Fisheries Management* in Houston, Texas on March 27-31, 1990. The symposium will be supported by Sport Fish Restoration Act funds.

The Symposium and Workshop on Creel and Angler Surveys will fulfill a pressing need to bring together and synthesize information on survey techniques for fisheries management.

Fishery resource agencies rely heavily on data from creel censuses and angler surveys to formulate management decisions, and they spend tens of millions of dollars annually on such surveys. Once conducted primarily to gather biological and harvest data, surveys have become important ways to learn about the angling public, its needs, and its socioeconomic context. The U.S. angling public is growing (nearly 60 million strong now), diverse, vocal, and increasingly affluent (spending $30 billion in retail purchases yearly, and supporting 600,000 jobs). The dynamics in other countries are similar, though the scales may differ.

Today's fisheries managers must carefully steward the scarce aquatic resources under their control, balancing the often conflicting demands of angling and general publics. If creel and angler surveys are properly designed, implemented, and analyzed, they can provide a wealth of biological, demographic, and societal data that fisheries managers must have to work effectively. Many fishery surveys are flawed, however, and produce information that has limited value and may lead to wrong management decisions.

This symposium and workshop will explore the reasons behind survey shortcomings and emphasize correct survey techniques. Methodological advances and case histories in several disciplines—natural resources, statistics, sociology, economics—will be tapped to highlight proven methods and new developments. The symposium will generate a peer-reviewed proceedings, a techniques manual, and a better understanding of how to obtain viable survey information on recreational fishing.

Information is available from the American Fisheries Society.

Smallmouth Bass Symposium

The *First International Smallmouth Bass Symposium* will be held at the Sheraton Music City Hotel in Nashville, TN on September 24-26, 1989. The meeting will be sponsored by Smallmouth, Inc. in cooperation with the AFS Southern Division Warmwater Streams Committee and the Department of Wildlife and Fisheries, Mississippi State University. Coverage will include management of smallmouth bass in a variety of waters. Tom Rodgers, President of Smallmouth, Inc., Box 670, Edgefield, SC 29824 can furnish more information.

Sonar Systems for Fisheries Research

BioSonics, Inc. has published *Sonar for Fisheries Research: An Introductory Guide to Hydroacoustics.* The 26-page booklet, which includes a glossary, describes how hydroacoustics provides accurate and reliable information on fish abundance, location, behavior and size.

The booklet is a basic introduction to hydroacoustics, which is the scientific use of underwater sound. Readers will learn how hydroacoustic systems work, the type of data they produce and how they are operated. The booklet is easy to read, yet provides enough technical data to be an authoriative reference.

Beginning with a discussion and comparison of the various fisheries techniques available for getting information on fish populations or behavior in the wild, the booklet then goes on to explain how hydroacoustics compares to other techniques and outlines its capabilities and limitations.

Several applications for fisheries hydroacoustics are discussed, including monitoring fish passage through dams and power plants, surveying populations of fish in freshwater and marine environments, and determining fish abundance in aquaculture pens.

Readers will discover that, as a fisheries assessment technique, hydroacoustics is cost-effective and complements other sampling techniques. They will also find out who uses hydroacoustics for fisheries research and management, a list which includes Fish & Game Departments, public and private power utilities, research organizations, and governments worldwide.

BioSonics is the world leader in the design and application of hydroacoustic systems for fisheries research, and manufactures a complete line of hydroacoustic equipment. The company also provides consultation and training, including a one-week course in "Fisheries Hydroacoustic Assessment Techniques."

Sonar for Fisheries Research: An Introductory Guide to Hydroacoustics is available from BioSonics, Inc. The booklet costs $3.50, plus shipping and handling. Also available, at no charge, is a paper entitled "Important Steps to Ensure the Dependability of Hydroacoustic Data." To receive an order form for both publications, call or write Lisa Gonnason at BioSonics, Inc., 4520 Union Bay Place Northeast, Seattle, Washington 98105, U.S.A., (206) 527-0905.

Fish Life History Summaries

The following sections of Volume 3 of the *Handbook of Freshwater Fishery Biology,* by Dr. Kenneth Carlander (AIFRB Fellow 1956) are available to persons who need data before the volume is published (probably in 1991); *Morone americana* ($2.00), *Morone chrysops* ($2.75), *Morone mississippiensis* ($2.00), *Morone saxatilis* ($2.50), *Morone hybrids* ($1.00), Etheostominae the darters ($3.00), and *Stizostedion vitreum* ($8.00).

These sections were up to date when they were compiled, but will be updated and edited prior to final publications. The material covered is similar to that in the earlier volumes. To order, write, with payment, to Dr. Kenneth D. Carlander, 2200 Hamilton Drive, #701, Ames, Iowa 50010.

Fishing and Stock Fluctuations

Taivo Laevastu (AIFRB Fellow 1982) and Felix Favorite (AIFRB Emeritus 1980) have authored *Fishing and Stock Fluctuations,* a 240-page, hard-cover book published by Fishing News Books Ltd.

Fisheries literature can leave the impression that changes in fish stocks are mainly caused by intensive fishing. Only a few publications analyze the environmental, fish behavioural, and gear-dependent factors which affect catches, and the multitude of causes of stock fluctuations have been little ventilated in the past.

This book summarizes the present state of knowledge of the effects of fishing on the fluctuations in abundance of fish stocks and evaluates whether intensive fishing can be the main cause of diminishing catches from some fish stocks, as is often assumed. Because fish stocks are known to fluctuate even when they are subject to little or no fishing, other factors such as environmental anomalies are discussed. Whether and how much the fish stocks fluctuate must be determined with different stock-assessment methods. Thus also reviewed are the reliability and validity of stock-assessment methods.

The review of the effects of fishing is complemented by a brief survey of problems in fisheries management, as the latter is usually designed to control the effects of fishing on stocks. The influence of catches on the age composition of the exploitable parts of the stocks is explained with quantitative examples, and it is shown that the influence of heavy fishing on stocks is in many cases smaller than previous theories suggest. The effects of fishing are compared to natural influences on stock sizes. The quantitative knowledge of the effects of fishing will help to promote better fisheries management and will permit those who are affected by management to influence events.

The basic factors determining the effects of fishing on stocks are the existing stock size and recruitment. The book summarizes and evaluates the conventional methods for fishery resource assessment and factors affecting recruitment fluctuations, and reviews past approaches and their possible effects. Also dealt with are the effects of ocean environmental factors and the behaviour of fish in relation to catching gear, as this latter can lead to improvement of gear as well as tactical approaches in fishing. The question, how much can we take from a given stock without lowering the exploitable part of it below the level of profitability or affecting considerably future recruitment, is presented in a new light considering the interactions between senescent and fishing mortalities.

The final chapters describe the problems associated with the full utilization of marine fishery resources, other outlooks in resource utilization, gear improvements, and changes in marine fisheries practices.

Order from Fishing News Books Ltd., 1 Long Garden Walk, Farnham, Surrey, GU9 7HX, England. The price is 25 pounds.

Remote Sensing and Marine Fisheries

FAO has issued *The Application of Remote Sensing Technology to Marine Fisheries: An Introductory Manual,* by M.J.A. Butler, M.C. Mouchot, V. Borale, and C. LeBlanc. The book of 165 pages is FAO Fisheries Technical paper 295, and costs $18.00 from Unipub, 4611-F Assembly Drive, Lanham, MD 20706.

The manual introduces some of the fundamental concepts of remote sensing and its application to fisheries. It reviews the history, terminology, physics of electromagnetic radiation, sensor platforms and types, environmental satellites, applications of sensing technology, and case studies.

Aquatic Invertebrate Names

American Fisheries Society Special Publications 16 is entitled *Common and Scientific Names of Aquatic Invertebrates from the United States and Canada: Mollusks.* The 277-page book was written by D.D. Turgeon, A.E. Bogan, E.V. Coan, W.K. Emerson, W.G. Lyons, W.L. Pratt, C.F.E. Roper, A. Scheltema, F.G. Thompson, and J.D. Williams. The price is $19.00 for AFS members, and $24.00 for non-members.

This publication is a sequel to AFS Special Publication 12 on fishes, and is a checklist of species taxonomically arranged with recommended common names for North American mollusks. This volume may become the authoritative reference used by all malacologists and aquatic biologists.

Order from the American Fisheries Society.

Contamination in Lakes

Norbert W. Schmidtke has edited *Toxic Contamination in Large Lakes,* a four-volume set representing the Proceedings of the 1986 Conference on Large Lakes on Mackinac Island, Michigan. Volume I is *Chronic Effects of Toxic Contamination in Large Lakes,* 364 pages; Volume II is *Impact of Toxic Contaminations on Fisheries Management,* 330 pages; Volume III is *Sources, Fate and Controls of Toxic Contaminants,* 440 pages; and Volume IV is *Prevention of Toxic Contamination in Large Lakes,* 321 pages.

Authors are from academia, government, and industry; they share the latest research, management, and political strategies for remedying toxic problems in lakes. Volume II includes papers on the Great Lakes; lakes in Israel, Egypt,

cont. on page 6

Meeting Announcements cont.

Italy, Japan, Sweden, and Britain; tropical lakes; and fisheries topics such as effects on fishery yields, productivity, and indexes for assessing biomass and yield.

The book was published by Lewis Publishers, Inc. of Chelsea, Michigan at a price of $49.95, but is available from the American Fisheries Society at a 5% discount.

Dissertation and Thesis Abstracts

Compatibility and Complementarity of Alewife *(Alosa pseudoharengus)* and Gizzard Shad *(Dorosoma cepedianum)* as Forage Fish in Smith Mountain Lake, Virginia

Mark Steven Tisa, Ph.D. 1988
Virginia Polytechnic Institute

The attributes of alewife and gizzard shad as coexistent forage fish for striped bass *(Morone saxatilis)*, walleye *(Stizostedion vitreum vitreum)*, and largemouth bass *(Micropterus salmoides)* were evaluated in Smith Mountain Lake, an 8,337-ha hydroelectric impoundment in south-central Virginia. Alewife and gizzard shad larvae exhibited strong spatial segregation which minimized the potential for direct trophic competition and increased feeding opportunities for piscivores. Gizzard shad spawning peaked in June while alewife spawning peaked in July. Daily growth rate of age-0 gizzard shad was 37% greater than for age-0 alewives. Later spawning and slower growth enhanced temporal and morphological availability of alewives to piscivores and reduced the potential for exploitative competition between the clupeids.

Distributional analysis indicated that gizzard shad were primarily uplake and littoral while alewives were mostly downlake and pelagic. Alewives co-occurred with striped bass and walleye during the growing season and were crucial in providing forage for these piscivores. Largemouth bass shared a common distribution with gizzard shad and were more trophically dependent than other piscivores on them.

Prey supply and predator demand were 1 year out of phase; gizzard shad and alewife production peaked in the first year of life while their predators' cohort production peaked in the second year. Cohort production analysis indicated that, over their lifespan, striped bass prey demand (per 1000 fish) would exceed that of walleye and largemouth bass by 17% and 166%, respectively. Lifespan cohort production patterns and ingestibility limitations on prey assured that most predation pressure in Smith Mountain Lake came from piscivores ages 0-2 and was constrained to alewives ages 0 and 1 and young-of-the-year gizzard shad. Prediction of patterns of consumption of alewife and gizzard by piscivores was derived from analyses of morphological and distributional availabilities; these agreed closely with actual diets for most predator-prey location, season, and age combinations. The alewife appears to be both compatible with, and complementary to, the gizzard shad as a forage species in Smith Mountain Lake. Suitability of alewives for introductions into other reservoirs will vary with the morphometry and management objectives for those waters.

Habitat Use and Movement Patterns of Copper, Quillback, and Brown Rockfishes in Puget Sound, Washington

Kathleen Ryan Matthews, Ph.D. 1988
University of Washington

This dissertation compared the habitat use and movement patterns of copper, quillback, and brown rockfishes on high-relief rocky reefs, low-relief rocky reefs, high-relief artificial reefs, and sand/eelgrass through monthly SCUBA surveys, underwater tag-resighting, and ultrasonic tracking. Monthly surveys conducted from December 1986 through February 1988 on two representatives of each habitat type revealed significant seasonal changes in rockfish densities: densities on artificial reefs declined during the summer and densities on low-relief reefs and sand/eelgrass increased during the summer coincident with peak plant cover, whereas consistent monthly densities were observed on the two high-relief rocky reefs. An underwater tag-resighting study conducted from July 1986 through June 1988 (512 tagged rockfishes and 726 resightings) indicated that home ranges, movements from reefs, and tendency to return from experimental displacement (up to 8.0 km) were dependent upon habitat association.

The habitat types were ranked in order (from highest to lowest) of suitability for copper, quillback, and brown rockfishes based on the tendency to return from experimental displacements and natural movement onto and away from habitats: 1) high relief rocky reefs in all seasons; 2) high-relief artificial reefs during fall, winter, and spring; 3) low-relief rocky reefs during the summer; 4) high-relief artificial reefs during the summer; and 5) low-relief rocky reefs during the fall, winter, and spring. Ultrasonic tracking was used to investigate the home ranges of 11 copper and quillback rockfishes on a diel basis, during strong current, and to determine their return routes when displaced 500 m from a high-relief rocky reef to a low-relief rocky reef. Copper and quillback rockfishes remained sedentary at night and during strong current (7.4 km/hr.). Home range sizes were larger on the low-relief reef than on the high-relief reef, similar to the results of the underwater tag-resighting study. The homing routes suggested that neither compass orientation nor random search were utilized as a mechanism to relocate their home site and rockfishes may be using navigation or olfactory cues.

Diet and Growth of First-Year Flathead Sole *(Hippoglossoides elassodon)* in Auke Bay, Alaska

John D. Watts, M.S. 1987
University of Alaska-Southeast

Flathead sole *(Hippoglossoides elassodon)* are synchronous spawners co-occurring with the spring zooplankton increase. Their larvae appear in the water column between May and

July with peak densities occurring in late May. The diets of the larvae for 1985 and 1986 were predominantly copepods of the genera *Acartia, Pseudocalanus, Oithona, Calanus,* and *Candacia.* The larvae tend to be size-selective, feeding on progressively larger prey items (copopod eggs - adults) as they grow. Differences in density, diet, and growth rates occurred between the two years. Densities of flathead sole were higher in 1986 than in 1985, with peak densities at 3.6/m^2 and 0.85/m^2, respectively. In 1986 larvae consumed more copepodites and copepods than in 1985, when no adult copepods were consumed. The 1986 larvae also consumed fewer copepod nauplii than in 1985. A growth rate (GR) was calculated for 1986 using daily otolith increments (GR=0.29 mm per day), and estimated for 1985 using length-frequency data (GR=0.27 mm per day). The differences in growth rate between years were related to differences in prey fields. In 1985 there was a shift in timing for some of the prey species and densities were lower than in 1986.

The diet of 0-age juveniles consisted mainly of the calanoid copepod *Gaetanus* sp., mysids, amphipods, and clam siphons. Growth rate of juveniles was 6.8 mm per month. Growth stopped when juveniles switched to clam siphons in April and May. It appears that the copepod *Gaetanus* sp. and mysids are better utilized than clam siphons.

Age and Growth of Arctic Char in the Wood River System, Alaska

Timothy Todd Baker, M.S. 1987
University of Alaska-Southeast

I conducted a comprehensive age and growth analysis of stocks of Arctic char in the Wood River System, Alaska, using both mark-recapture and age-length data. The major objective of this study was to identify possible stocks of Arctic char within the Wood River System from age and growth characteristics. From 1975 to 1979, approximately 57,000 Arctic char were captured and marked, and/or recaptured producing an extensive mark-recapture data base. In 1985, age-length data were determined for about 525 Arctic char that were sacrificed for otolith removal.

Arctic char utilized in this study ranged in fork length from 300 to 720mm, and ranged in age from 5 to 16 years. Based upon mark-recapture data, median growth in 1 year ranged from 10 to 85mm and median growth for 2 years ranged from 20 to 125mm. Growth was found to be highly dependent upon length of the fish at the time of marking.

I estimated Arctic char growth curve parameters from Schnute's generalized growth model using age-length data. I then modified Schnute's generalized growth model to estimate growth parameters using mark-recapture data. Growth parameter estimates were compared between both data sets. Growth parameters from mark-recapture data were smaller than estimates from age-length data indicating the age of older Arctic char may have been underestimated.

Based upon differential length composition, age composition, growth, and growth curve parameters, a discrete stock of Arctic char exists in Lynx Lake (a small isolated lake in the Wood River System). There is evidence that other stocks exist within the main part of the Wood River System. These stocks appear to be separate feeding forms rather than reproductively isolated stocks.

In Memoriam

Zell E. Parkhurst
Member 1960; Emeritus 1967
1988

Zell Parkhurst passed away on October 11, 1988. During his last 2 years, Zell lived with his sister and brother-in-law (Cliff Millenbach). Zell and Cliff, both well-known West-Coast fishery personalities for many years, had a lot in common and had many mutual friends.

Zell fought valiantly after surgery for cancer, but succumbed after 2 years. His many, many friends, in and out of AIFRB, miss him.

Messages can be sent to Cliff Millenbach's address, 4520 John Luhr Rd. N.E., Olympia, Washington 98506.

Membership Report

PROMOTION TO FELLOW

Dr. Larry A. Nielsen	VA
Dr. S. Marshall Adams	TN

NEW MEMBERS

Dr. Gordon H Kruse	AK
Gary Shigenaka	WA

NEW ASSOCIATE

Dan L. Ayres	WA

EMERITUS

W. Percy Wickett	BC
James E. Sykes	NC

Sammy M. Ray, *Membership Chairman*
Texas A&M University at Galveston
Building 3311, Fort Crockett
Galveston, Texas 77551

Direct membership inquires to Membership Chairperson

BRIEFS, the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

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American Institute of Fishery Research Biologists

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American Institute of Fishery Research Biologists

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VOL. 18, NO. 3 JUNE 1989

1988 Travel Assistance Awards

Dr. Joseph Rachlin, Travel Awards Program Chair, announces that selections have been made for awards to three associate members of AIFRB to help the recipients present papers at national meetings. $850 will be distributed among the winners. The selectees, their affiliations, and abstracts of their papers are presented here:

Mr. Donald L. Pereira, a Ph.D. student of Dr. George Spangler, University of Minnesota, will be presenting a paper on aspects of his thesis work at the annual AFS meeting in Anchorage, Alaska, September 1989.

THE APPLICATION OF MULTIVARIATE TIME SERIES ANALYSIS FOR FORECASTING YIELD AND ESTABLISHING SPECIES INTERACTIONS IN PERCID COMMUNITIES.

The Red Lakes in Minnesota have provided a lucrative commercial fishery since the turn of the century. Recent changes in the fish community included reductions in the catch of desirable species such as walleye (*Stizostedion vitreum vitreum*), and an increase in freshwater drum (*Aplodinotus grunniens*), a species with low market value. Data from this commercial fishery were arranged into monthly time series of catch for several major species from June 1938 through November 1987, with effort available for the years 1958 to present. Multivariate time series models were fit to these data and were evaluated for their utility in forecasting as well as for an initial investigation of potential species interactions. In addition, analyses were performed in the frequency domain. Specifically, the cross spectral density function was applied to assess the significance of temperature as a driving variable of the fish community.

Ms. Haejung An, a Ph.D. student of Dr. Cheng-i Wei, University of Florida, will present three papers on aspects of her thesis research at the June 1989 Annual Meeting of the Institute of Food Technologists in Chicago, Illinois.

USE OF A MODIFIED UREA GEL ISOELECTRIC FOCUSING TECHNIQUE FOR SHRIMP SPECIES IDENTIFICATION.

Use of an ampholyte mixture containing 80% pH 4-6.5 and 20% pH 3-10 ampholytes in an isoelectric focusing polyacrylamide gel greatly improved the effectiveness of the technique to identify pink, white, and rock shrimp species. Raw shrimp showed excellent banding patterns useful for distinguishing each shrimp species by species-specific protein bands. Cooked shrimp showed species-specific protein banding patterns. However, except for rock shrimp detection of shrimp species in a mixture was difficult.

DEVELOPMENT OF MONOCLONAL ANTIBODIES SPECIFIC FOR ROCK SHRIMP.

Monoclonal antibodies (McAb) specific for rock shrimp were produced by the hybridoma technique. Mice were immunized with protein "C" purified from SDS-PAGE gels and shown, in the previous studies, to be specific for rock shrimp when compared with pink or white shrimp. One McAb (4H2-10D3), studied in detail, was specific for an antigenic determinant found on protein "C" and in crude rock shrimp extracts. The specificity of the antibody was confirmed by testing against the 12 common species of shrimp and lobsters.

ELECTROPHORETIC IDENTIFICATION OF FISH SPECIES IN SURIMI

Both sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) and urea gel isoelectric focusing (IEF) were used to identify species-specific protein bands of raw and cooked fish and surimi samples from Alaska pollock (*Theragra chalcogramma*) and red hake (*Urophycis chuss*). In raw samples, species-specific bands were found in the water extracts, while in cooked samples 1% SDA and 8M urea extracts were more effective for species identification in both fish and surimi.

Mr. Patrick J. Harris, a graduate student working under the direction of Dr. Roger A. Rulifson of East Carolina University, will be presenting a paper on aspects of his thesis research at the 1989 meeting of the Northeast Fish and Wildlife Conference, in Ellenville, New York.

CHARACTERIZATION OF THE STRIPED BASS SPORT FISHERY ON THE ANNAPOLIS RIVER, NOVA SCOTIA.

One of the best known sport fisheries for striped bass in the Canadian Maritimes is located on the Annapolis River in Nova Scotia. In the mid 1970's, this population exhibited a decline in numbers. Creel and spawning surveys suggest recruitment failure as one cause for this decline. Since the last creel survey conducted in 1978, a tidally-driven electrical generating station was constructed in the Annapolis River estuary.

cont. on page 2

Awards cont.

The study was conducted between 1 June and 22 October 1987. During the creel survey 937 hours were sampled, for a total of 898 fishermen and 60 fish encounters. Angler number was only 36.6% of that in 1978. Fishing effort was lower compared to 1978, but fishing success was 60% higher (19.8h/fish). Only 5% were residents of other Canadian provinces or the USA, indicating a decline in non-local and tourist participation from that reported in 1978.

A total of 223 striped bass were sampled. Of these, 60.1% were caught on rod and reel and the remainder by gill net. All fish were aged, the length-weight relationships were calculated, and food habits investigated. The data collected suggested that the recruitment failure reported in the 1970's has ended. Tag returns from this and previous studies, combined with the biological data from this study, suggest that the Annapolis River striped bass population is composed of a mixture of migratory and resident fish.

The creel survey was an effective method of sampling the population to monitor the effects of the tidal power station on the population. Further study is required to identify the nursery area for striped bass spawned in the Annapolis River, and to determine what percentage of the population is migratory.

The FWRS

The U.S. Fish and Wildlife Service has provided Federal grant funds to State fish and wildlife agencies to assist in their fish and wildlife conservation efforts since 1938. Under the grant program, the State agencies conduct a variety of activities, among the most important of which is broadly defined as information gathering or research. Because the Service is responsible for the effectiveness of the State efforts under the grant program, it is vital that the results of their research be made known and available to researchers in other States and to other public and private agencies. This need was recognized and in 1965, acted upon.

HISTORY

In 1965, the International Association of Fish, Game, and Conservation Commissioners requested that the Service develop a system for collecting, indexing, and providing copies of research reports. Initial efforts were shared by the Natural Resources Library of the Department of the Interior and the Denver Public Library. At that time, 35,000 research reports were available. The Denver Public Library developed a computerized system, one of the earliest at that time, and several years later the entire responsibility for the operation of the Fish and Wildlife Reference Service (FWRS) was shifted to them. In 1983, the Reference Service was contracted to Informatics General Corporation and moved to Rockville, Maryland. The Reference Service is now located in a permanent facility at the Renewable Natural Resources Center in Bethesda, Maryland and is operated by the MAXIMA Corporation. This unique service, which disseminates largely obscure, often difficult-to-obtain reports, is now well established.

SERVICES

The goal of the Fish and Wildlife Reference Service is to accumulate, evaluate, index, store, and make available the research reports developed by State fish and wildlife agencies, Cooperative Fishery and Wildlife Units, and Endangered Species Recovery Teams. The FWRS serves two groups, Cooperators and Clients. Cooperators are employees of State or Federal agencies with an interest in natural resources. Clients are all other persons who have a need for or interest in Fish and Wildlife Reference Service material.

The Fish and Wildlife Reference Service is made up of a repository and a distribution center. The repository is supported by all functions involving collection maintenance, document acquisition, indexing and rating reports, and database development. The distribution center encompasses all of the activities that provide for direct information dissemination to the users.

Reports received by the FWRS are rated for their relevance to the FWRS database. After rating, these reports are indexed and citations are added to the database. The paper copies and microfiche are filed in the repository collection.

The FWRS receives materials from Federal, State, and private sources for technical processing in the following categories:

Federal Aid in Fish and Wildlife
  Restoration documents
Anadromous Sport Fish Conservation Program Documents
Endangered Species Grants
  Program recovery plan
Cooperative Fish and Wildlife Units
  theses and reports
State Game and Fish Agency reports
Division of Federal Aid annual reports, CFAR
  reports, and general surveys
Boating access articles and other materials
Education materials developed by State and
  Federal agencies regarding fish and wildlife

All documents received from these sources will be evaluated for possible inclusion in the database. Results of the evaluation or rating process dictates the placement of the documents into one of two collections; main collection or database and inventory collection. Documents rated as "1" or "2" (research reports and final reports) are incorporated into the database. Those documents rated "3" (surveys, information pamphlets) are incorporated into the inventory collection.

After a document is selected for inclusion into the database, it is next reviewed to capture bibliographic information such as accession number or MIN number, project title, author, project number, and geographic location. Descriptors that represent the scope of the document are selected from the *FWRS Thesaurus*. All significant concepts appearing in a report are entered as descriptor codes.

The Reference Service conducts literature searches of the FWRS database, producing bibliographies for requesters.

Computer literature searches provide a list of documents or projects that deal with a specific technical problem or biological question. The FWRS database includes approximately 20,000 records of reports, published papers, technical publications, theses, and recovery plans.

Literature searches may be requested by mail or via the toll-free number 800-582-3421. The FWRS searcher interviews the requester in an effort to compile a search strategy. When key words have been selected, the search is typed into Personal Librarian PC software where the database is housed. Results are then printed and sent to the requester via first class mail.

The FWRS distribution center serves approximately 8,700 users, both cooperators and clients. The distribution center fills document requests in either photocopy or microfiche format. Requests come to the Reference Service by mail and by phone. The maximum turnaround time for information is 5 days. The Reference Service is also open to the public.

Requests are filled using copies made from original documents or microfiche masters. All copies of documents are clearly identified as being provided by FWRS.

Dissemination of information available from the FWRS is key to reduction of duplicate research and extension of the awareness of the research results. The Newsletter is a six-page publication mailed quarterly to about 8,700 users included on the FWRS mailing list. The Newsletter lists 50 new publications available from the Reference Service in each issue and provides an order form for the listed documents.

NEW ACTIVITIES

The Reference Service is planning several new and updated promotional materials to inform users of available services. Such materials include an updated brochure and a slide program that will be shown in display areas at technical meetings and other professional gatherings. A slide-tape program will be available for showing to small groups. The presentation will provide information on how to access FWRS services. Rolodex cards will be distributed at meetings and to users to allow better access to FWRS.

To further enhance the full-text aspect of the Reference Service, investigations of full-text software are underway. We will be looking at several full-text alternatives, including full-text on-line software, CD-ROM, and others as we become aware of them. Electronic bulletin board services are also being contemplated.

From *Fish and Wildlife Reference Service Newsletter*, Fall/Winter 1988-89

Great Lakes Invasions

Yet another foreign organism has been discovered in the Great Lakes, and international efforts are underway to find ways to close the door for future invasions.

A small striped mollusc, the zebra clam is native to the Caspian Sea. It appeared in western Lake Erie last summer, and has since been discovered in the Detroit River and Lake St. Clair.

Ron Griffiths, an ecologist with Environment Ontario, said, "Anyplace you can find a beach with sand, you'll find them. They're everywhere." The clams, he said, "appear to have found a niche in the Lakes' ecosystem; there are few such space-limited species to compete with them, and no natural predators."

Joe Leach, a research scientist with the provincial Ministry of Natural Resources' Great Lakes Fisheries Research Station, said the zebra clams reproduce and grow in waters at a temperature of about 15 degrees centigrade, and can survive in colder waters. In the larval stage, "they can spread very well," Griffiths said, though they "may have trouble moving upstream, and Lake Superior is probably too cold."

The zebra clam's rapid reproduction may cost utility companies and boaters millions of dollars to clean them off fishnets, boats, and intake pipes, Leach said. "We think we're looking at a major economic impact," he said.

William Kovalak, biological systems scientist for Detroit Edison, said, "We expect it to be" a problem, especially in the summer, when the clams spawn.

"We have discovered them at our Monroe (Michigan) intake" for the utility's coal-fired Monroe Power Plant, Kovalak said, in densities of up to 50 per square foot.

"The problem is that they attach themselves to any solid surface," he explained. "If they get into the (power plant) system, they'll start plugging up nozzles and so forth."

Rick Turnbull, an Environment Ontario researcher, said his department has found the clams on "every drinking water intake we've inspected" along western Lake Erie, the Detroit River, and Lake St. Clair.

Leach noted that the reasons for repeated ecological invasion of the Great Lakes are not completely understood, but said it is clear that "man has made it easier for them to get in."

In 1988 alone, the river ruffe, a European perch-like fish, was discovered in Duluth Harbor on Lake Superior, and a macroorganism known colloquially as the "spiny water flea" has spread throughout the Lakes system. Previous invaders have included the notorious sea lamprey and alewife, the asian clam, and several plant species. "There are probably others out there, and probably others coming," Leach said.

The Great Lakes Fishery Commission has taken the lead role in efforts to stem the tide of invaders. Margaret Dochoda, a fishery biologist with the Commission, explained that the binational agency has focused its efforts on a prime suspect in such invasions: ships' ballast.

"The Commission was established, in part, to handle exotics," Dochoda said, noting also that the 1987 amendments to the U.S.-Canada Great Lakes Water Quality Agreement give responsibility for studying organism transport to the two national coast guards.

Canada's Coast Guard had already written, in 1980, a report documenting the transport of organisms in ships' ballast entering the St. Lawrence Seaway, Dochoda said. "We think ballast and private aquaculture are the worst for this," Dochoda said. The grass carp and at least one

cont. on page 4

Great Lakes Invasions cont.

fish disease have been introduced into the Lakes as a result of private fish stocking and breeding.

Last year, the Fishery Commission lobbied the coast guards and federal governments of Canada and the U.S. to restrict or eliminate the dumping of ballast from other continents in the Lakes, efforts supported by federal, state and provincial fishery agencies.

As a result, Canada's Coast Guard has agreed to ask the captains of ships entering the St. Lawrence to exchange freshwater ballast from other ecosystems for salt water. Saltwater organisms, Dochoda explained, are far less likely to survive in the Lakes than those from other lakes or rivers. Tom Fleck, chief of pollution prevention for the Coast Guard, called such exchanging "the simplest way to address the problem at this time."

In addition, Fleck said, the (Canadian) St. Lawrence Seaway Authority is considering a Coast Guard request to spotcheck the logs of ships entering the system, in order to check where the vessels picked up their ballast water. Foreign shippers which use the St. Lawrence have endorsed the steps, Fleck said.

The Fishery Commission, Dochoda said, has also begun work on convincing the various governments on the Lakes to tighten and rationalize regulation of aquaculture. The Commission is also "considering doing a comprehensive inventory of all exotic organisms in the Lakes, and working on a policy for all agencies to consider to protect healthy fish communities from invasion," Dochoda said.

Totally eliminating existing invaders is impractical, Dochoda said, short of poisoning the entire Lakes ecosystem. "You can't eradicate them," she said. "You can nudge them, reduce them; but the best answer is prevention, so we're focusing on that."

From *The Great Lakes Reporter*, March/April 1989

Our People

Two AIFRB members are candidates for Second Vice-President of the American Fisheries Society. **Carlos M. Fetterolf, Jr.** (Fellow 1973) and **Delano R. Graff** (Member 1973) are prominent fishery personalities who will run for election in June 1989. Carlos is Executive Secretary of the Great Lakes Fishery Commission, and Delano is Director of the Bureau of Fisheries, Pennsylvania Fish Commission. Detailed accounts of the backgrounds and objectives of these two candidates appeared in the March-April issue of *Fisheries*.

Richard W. Gregory (Member 1972), currently Second Vice-President of the American Fisheries Society, has been selected as Chief of the Fish and Wildlife Service's Office of Information Transfer in Fort Collins, Colorado.

Gene Huntsman (Member 1975) has assumed the presidency of the Southern Division of the American Fisheries Society.

Douglas B. Jester, Jr. (Member 1975), a member of the staff of the Michigan Department of Natural Resources, recently became Editor of the *North American Journal of Fisheries Management.*

Douglas J. Martin (Member 1988) has joined with several other fishery biologists in the Pacific Northwest to form a new consulting organization, *Pacific Environmental Technologies, Inc.*

News from the Districts

OREGON-WASHINGTON, SW **Richard Craven,** *Director*

District officers elected in 1988 are Richard Craven, Director; Dr. Robert Ellis, Vice-Director; and Wayne Burck, Secretary.

Twenty-two members, spouses, and guests gathered for a dinner meeting in Tigard, Oregon, on 14 March 1989 and heard a status and progress report from Eldon Hout, Program Manager for the Ocean Resources Management Program of the State of Oregon. This program, which was created by the 1987 Oregon Legislature, directs several state agencies, ocean user groups, local governments, and public representatives to work together to design a management plan for Oregon's ocean resources. Mr. Hout coordinates activities of a task force that is developing the plan.

The need for a management plan to provide consideration for the renewable, living resources is driven by interest in development of nonrenewable natural resources, including nearshore hard minerals and offshore gas and oil. Concentrations of "black sand," which contain minerals such as chromium and titanium, have been identified along most of the Oregon coast. The entire Oregon-Washington offshore area is included in the proposed final 1987-1992 outer continental shelf oil and gas leasing schedule of the Department of Interior's Minerals Management Service.

The task force is scheduled to produce a draft plan in September 1989 and a final plan in June 1990. The plan will include recommendations and will discuss the question, Should there be development in Oregon's territorial sea?

NORTHWEST WASHINGTON **Alan J. Mearns,** *Director*

On April 25, Dr. Robert Gray, Chief, Environmental Monitoring, Battelle Pacific Northwest Laboratories, presented a lecture on *Hanford: Forty-Five Years of Environmental Monitoring.* In this, he separated fact from fiction about conditions at and around the infamous Hanford facility, discussing such topics as how aquatic and terrestrial ecosystems and fisheries in the Columbia basin are faring after 45 years of nuclear operations and monitoring at Hanford, to what extent food chains are contaminated with radionuclides, biological damage, and whether conditions are getting better or worse.

Plans were discussed for the upcoming annual banquet, which promises to be another very special evening of friends, food, and festivities planned by Ken Chew and Roy Nakatani.

The scheduled March program on oil spills was handled ably by Dr. Bill Lehr, who filled in for Dr. Jerry Galt and Mr. Dave Kennedy because the scheduled speakers rushed to Prince William Sound to help advise the Coast Guard on

the Exxon-Valdez spill. Bill discussed short- and long-term processes that determine the fate of spilled oil and the ability to forecast trajectories and impacts, and reviewed mechanisms of spreading, evaporation, dissolution and dispersal and appropriate techniques of containment and cleanup, including use of chemicals, skimmers, and sorbents.

The District newsletter, *Northwest Washington News,* ran detailed biographies of two more members, Dick Burge and Doug Martin.

Announcements and New Publications

Acidic Deposition Conference

Acidic Deposition: State of Science and Technology will be an international conference to examine the 10 years of research sponsored by the U.S. National Acid Precipitation Assessment Program. The conference will be held on February 11-16, 1990 at the Hyatt Regency Hilton Head Oceanfront at Palmetto Dunes, Hilton Head, South Carolina.

Two concurrent sessions will be held. Session A will cover emissions and controls, atmospheric processes, deposition and air quality, effects on visibility, and economic analyses, while Session B will deal with aquatic effects, terrestrial effects, effects on materials, and effects on human health.

A limited number of contributed papers within the programmatic areas listed for Sessions A and B will be accepted for presentation at the conference. These papers will include critical reviews of the NAPAP SOS/T Reports, alternative interpretations of work covered in NAPAP SOS/T Reports, or important additional information not yet included in the SOS/T Reports. Outlines of the SOS/T Reports are currently available from NAPAP. Papers on studies performed outside the United States are welcome.

Authors should submit a one-page abstract to the address below. The deadline for receipt of abstracts is August 1, 1989. Acceptance of Contributed Papers will be determined by the NAPAP Conference Committee, and authors will be notified by September 15, 1989.

A discussion session will follow each group of related SOS/T Reports, Review Papers, and Contributed Papers. NAPAP will publish a summary of issues developed during the conference, including agreements and disagreements.

To facilitate critical review and discussion, drafts of the State of Science/State of Technology Reports to be presented at the conference will be available to conference registrants two to three months in advance of the conference.

Further information is available from NAPAP 1990 International Conference, c/o National Acid Precipitation Assessment Program, 722 Jackson Place, NW, Washington, DC 20503.

Floodplain Rivers Symposium

The first announcement has been issued for the *Symposium on Floodplain Rivers,* to be held at the Hilton Hotel, Baton Rouge, Louisiana, 70803 on April 9-11, 1990. Sponsored by the Louisiana Cooperative Fish and Wildlife Research Unit; the Warmwater Streams Committeee of the Southern Division, American Fisheries Society; and the U.S.A.E. Waterways Experiment Station, the symposium will have a plenary session featuring physical processes in floodplain river formations, floodplains and deltas, geochemistry of floodplain rivers, river use and water law, an ecological overview of floodplain rivers, and adaptations of fishes to floodplain rivers. Technical sessions will cover floodplain nurseries for fishes, fisheries resources in regulated and non-regulated floodplain rivers, management of aquatic habitats in the river floodplain, integration and exchange of materials and energy during flood events, riparian rights in river floodplains, primary production in floodplain rivers, secondary production in floodplain rivers, and food webs and energy flow in floodplain rivers.

Abstracts of papers are due August 1, 1989.

Registration fees are: Attendees—$100; Guest—$50, Students—$40.

Further information is available from the Louisiana Cooperative Fish and Wildlife Research Unit, 124 For., Wildl., and Fish Bldg., Louisiana State University, Baton Rouge, LA 70803-6202.

International Environmental Affairs

International Environmental Affairs, a journal for research and policy, is a new quarterly journal that seeks to improve knowledge of environmental policy and management at the international level.

Over the past decade, environmental management has joined security issues and economic and trade matters as one of the three major areas of global policy concern. While the importance of international security and trade issues has been widely recognized for some time, the growing significance of international environmental policy remains to be fully appreciated.

At the moment, the urgency of the environmental issues and a frequent lack of clear precedents for solutions have inevitably meant that a need to act has taken priority over a need to understand. Nevertheless, an international management system, understandably imperfect, has begun to form. This common effort in seeking solutions urgently needs a forum in which to exchange information, report findings, explore hypotheses, and establish consensus. Until now, the lack of a major, widely recognized journal on foreign environmental affairs has been an obstacle to broader understanding of the many underlying issues. The stimulating new International Environmental Affairs will enable policy and research to keep better pace with events as they occur and to contribute to a management system built on true knowledge.

International Environmental Affairs will address all environmental and conservation issues, including but not limited to global climate change, stratospheric ozone depletion, conservation and species diversity, management of the oceans and their resources, Antarctica, international aspects of desertification, deforestation, toxic chemicals control,

cont. on page 6

atmospheric pollution, and transfrontier management of natural resources. It will also deal with energy and resources policy as they relate to broader environmental or conservation concerns. Particular attention will be paid to international issues of the North American continent.

This journal is published for Dartmouth College by University Press of New England. Subscriptions are $65 for libraries/institutions and $45 for individuals, and can be ordered from University Press of New England, 17½ Lebanon Street, Hanover, NH 03744.

Dictionary of Marine Science

The Facts on File Dictionary of Marine Science is a useful reference for marine science. It provides definitions for geologic and physical terms; for various taxa of animals from abalone to Zooxanthellae; for geographic locations such as Hudson Canyon (which is in Hudson Bay); for persons such as Saint Brendan, an Irish monk supposed to be the first European to cross the Atlantic; and miscellaneous marine topics such as fishing, FLIP (floating instrument platform), and schooner.

The book is available from Facts on File, Inc., 460 Park Avenue South, New York, NY 10016, clothbound, for $19.95.

Congressional Directory: Environment

A new, 600-page, library-strength hardbound *Congressional Directory: Environment* (with free 90-date update lists of Members and their personal environment aides) developed specifically for *those who are concerned about environment legislation,* has just been published. Unlike generic directories on Congress now available, this directory is focused on the key *environment* decision makers (Members of Congress, environment legislative aides, key staff on environment legislation committee/subcommittees).

The *Congressional Directory: Environment* will be useful for voluntary environment organizations, state and local environment officials, attorneys, corporate leaders and legal staff, libraries, research and development companies, environment educators, media reporting on the environment, and Members of Congress and their environment legislative aides.

It contains: *All 79 committees/subcommittees* dealing with the environment (Members, environment jurisdictions, staffers); *Environment aides* for all 535 Members; *Environment interests* of many Members included in comprehensive biographies; *Over 400 biographies* of committee and Members' staffers working on environment issues; *Three key word indexes* listing nearly 500 environment issues, referenced to committee/subcommittee jurisdictions.

This directory *also* contains the best elements of the most popular three generic congressional directories now available: *Each Member of Congress listing* has name, address, phone number, full biographic information, photo, environment aide, appointment secretary, and district/state office personnel (2,300 aides listed) with addresses and phone numbers; *Congressional Staff Delegations,* with full page congressional district maps; full listing of delegations; *Five Indexes* give immediate reference to committees/subcommittees having jurisdiction, Members and staff.

Also available are three new products for those who want to contact Congress: Mailing lists of Members and environment aides; Computer diskette for personalized letters to individual Members and environment legislative aides; Computer diskette for personalized letters to committee members and committee staff handling environment legislation.

For further information, contact: Betty Farley, Environment Communications, 6410 Rockledge Drive, Suite 203, Bethesda, Maryland 20817 (301) 571-9791 (FAX: (301) 530-8910). The price is $87.50.

University of Washington Press Books

The Washington Sea Grant Program has published two new books which are being distributed by the University of Washington Press, P.O. Box 50096, Seattle, WA 98145.

Marine Populations by Michael Sinclair (AIFRB Member 1982) is an essay on population regulation and speciation.

How do physical conditions in the oceans affect fishery yields? Theory has long predicted that the abundance of fish stocks is determined mainly by environmental conditions in early life history stages, when young fish are recruited to the adult population. Now strong evidence is emerging to support that theory.

In *Marine Populations: An Essay on Population Regulation and Speciation,* Michael Sinclair reviews historical progress toward understanding factors believed to regulate animal populations, and finds the field at an impasse. He attempts to break that impasse with a new look at marine fisheries data. Using Atlantic herring as a point of departure, he divides marine animal species into geographic stocks and examines how their abundance and variability respond to localized physical processes. In his conclusion, he speculates on the implications his observations bear for ecological and evolutionary theory in general.

Dr. Sinclair, director of the Biological Sciences Branch at the Halifax (Nova Scotia) Fisheries Research Laboratory, develops and defends the member/vagrant hypothesis, which emphasizes the role of geography (and, for species with a planktonic stage, water movement) in regulating the population pattern, richness, and absolute abundance of sexually reproductive marine species. Membership in a population, states the hypothesis, requires being in the right place at the right time during the life cycle. Energetics processes such as predation, disease, and food availability may be important but are not essential to population regulation.

Marine Populations is the first in a new series, Books in Recruitment Fishery Oceanography, published by Washington Sea Grant to disseminate current thinking on the effects of environmental variability on populations of marine organisms, especially those of commercial importance.

This 1988 book has 251 pages and costs $15 in paper and $25 in cloth.

Population Genetics and Fishery Management, edited by Nils Ryman and Fred Utter (AIFRB Member 1969 and Fellow 1983) is in its second printing.

Advances in technology, welcome as they are, pose new problems for the managers of fishery programs. Modern fleets have the capability to reduce substantially, even extinguish, large stocks of demersal and pelagic fishes. The availability of highly efficient hatchery and enhancement technology enables, even pressures, fishery managers to implement programs that realize short-term benefits but that eventually work to the detriment of fish populations by reducing genetic variation.

Population genetics is a scientific field that clearly has importance for fishery management, yet it remains largely outside fishery management programs. *Population Genetics & Fishery Management* seeks to introduce genetic theory and applications into the education and training of fishery managers.

Nils Ryman from Stockholm University and Fred Utter of the U.S. National Marine Fisheries Service have edited contributions from twenty-four experts into this useful volume, which one reviewer (*TAFS* 117, 1988) calls "the most complete work to date on the linkage between population genetics and the management of natural fish populations."

This volume contains 418 pages, with figures, tables, references, and a species index. It sells for $17.50 in paper and $35 in cloth.

New Wiley Books

John Wiley & Sons, Dept. 063, One Wiley Drive, Somerset, NJ 08875-9977 has recently issued two books of interest to AIFRB members.

Marine Invertebrate Fisheries: Their Assessment and Management is edited by John F. Caddy.

In one comprehensive source, you now have the breadth of experience gained in the research and management of commerically exploited marine invertebrates. This book contains over thirty different studies illustrating the theoretical knowledge and the practical experience to be gained for the effective management and yield of such fisheries.

Case studies focus on crustacean fisheries for krill, lobster, crab and shrimps, and fisheries for molluscan resources such as clams, scallops, squid and octopus. Later chapters deal with echinoderms, precious corals, and rare shell harvests. Examples are drawn from tropical temperate seas, and from arctic and antarctic ecosystems. 752 pp. 1989. $74.95.

Fish Population Dynamics, 2nd Edition, is edited by J. A. Gulland.

Incorporates a decade of new research in the quantitative impacts of fishing on fish stocks. The new edition continues the philosophy of the earlier, well received edition, combining theoretical methods with practical experience to enhance management techniques of the stocks of fish, crustaceans, and marine mammals in all parts of the world.

Specialists give more attention to experience outside the north Atlantic in this revised edition as well as more coverage to the problems of the interaction between several exploited species. Dr. Gulland concludes the book with discussion of the degree to which stock assessment scientists have been able to provide advice which is useful to managers and suggests ways in which performance might be improved in the future. 330 pp. 1988. $49.95.

Van Nostrand Aquaculture Books

Van Nostrand Reinhold, Box 668, Florence, Kentucky 41022 has some new books dealing with aquaculture.

Aquaculture Management by James W. Meade is the first and only comprehensive reference on the modern principles of aquaculture management. This decision-making tool for aquaculture managers explains how to successfully combine aquaculture science with marketing and management principles to make your operation more successful.

Aquaculture Management covers such critical concepts as business and people management, microeconomics, efficiency, and productivity. You'll also find incisive discussions on the current state of the aquaculture industry, the relationship of aquatic animal life cycles to production strategies, water quality and aquatic animal health management, ethics and professionalism, and economics, record keeping, and production capacity assessment.

This book emphasizes the component nature of culture systems, showing how each system is composed of several enterprises that can be studied, managed, and mixed to increase productivity and maximize returns for your available resources.

Finally, extensive reference lists direct you to important literature on new developments, techniques, and applications.

The price for this 220-page book is $49.95.

Nutrition and Feeding of Fish by Tom Lovell presents practical feeding information on commercially-important fishes from diverse culture systems, including coldwater fish, warmwater fish, crustaceans, pond cultures, and highly artificial cultures.

This practical book covers fish nutrition and metabolism, fish feeding strategies, and feed formulation and preparation. It also explains how to process commercial feeds and details vital nutrition requirements and deficiency effects. Chapters by expert contributors cover the practical feeding of channel catfish, tilapias, salmon, trout, panaeid shrimps, eels, and crawfish.

Two convenient appendices provide helpful information on the composition of feed ingredients and the common and scientific names of fish.

This book has 260 pages and costs $46.95.

Membership Report

Inquiries regarding membership should be addressed to the Membership Chairperson, Dr. Sammy Ray, Texas A & M University at Galveston, Building 311, Fort Crockett, Galveston, Texas 77551.

BRIEFS, the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

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VOL. 18, NO. 4 AUGUST 1989

1989 Annual Meeting

President Charles F. Cole announces that the 1989 annual meeting of the Board of Control of AIFRB will be held at the Captain Cook Hotel in Anchorage, Alaska on September 2 and 3, 1989, beginning at 8:30 a.m. on Saturday. All Associate Members, Members, Fellows, and Emeritus Members of AIFRB are welcome to attend the meeting. Annual meetings of the American Fishery Society and the International Association of Fish and Wildlife Agencies will also convene in Anchorage, from September 4 to 8.

Agenda

Call to Order:
- Adoption of Agenda
- Introductions
- Determination of Quorum Present

1. Approval of Minutes of 1988 Annual Meeting and Secretary's Report
2. President's Report
3. Treasurer's Report
   - Motion to authorize business transactions
4. Reports on Publications
   - A. Report of BRIEFS Editor
   - B. Report of Production Editor
5. Membership Committee Report
6. Reports on Awards
   - A. Travel Assistance Awards
   - B. W. F. Thompson Best Paper Award
   - C. Outstanding Achievement Award
   - D. Best Paper Award at Local Meetings
7. Reports from Districts
8. Other Business
9. New Business
   - A. Nomination for President-Elect
   - B.
   - C.
   - D.
   - E.
   - F.
10. Announcements
    - Arrangements for Next Meeting
11. Adjournment

COASTWATCH

NOAA COASTWATCH: A Real-Time Mechanism for Coastal Environmental Phenomena and Remote-Sensing Applications is a predictive tool that takes advantage of NOAA's observing capabilities in the National Marine Fisheries Service, National Weather Service, National Ocean Service, and the National Environmental Satellite, Data, and Information Service. Using focused products, NOAA can apply information to address immediate coastal management needs.

Data Products

NOAA has recently been producing near real-time data products using its environmental satellites along with oceanographic and weather data for the Southeast Coast through a program known as COASTWATCH. Weekly summaries of sea surface temperature, wind drift, Ekman transport, and other information is distributed to a network of scientists and state and Federal agencies concerned about outbreaks of red tide. The patterns of ocean circulation provided by COASTWATCH helped scientists piece together the cause of recent dolphin die-offs along the Atlantic Coast—the same red tide responsible for the closure of North Carolina shellfisheries poisoned the dolphins. Monitoring the conditions of the Atlantic from Florida to Cape Hatteras will enable NOAA to provide advance warnings of a red tide reoccurrence.

Pilot COASTWATCH

A pilot COASTWATCH for the Chesapeake Bay was conducted between March and May 1989, in conjunction with the multi-state/Federal agency Chesapeake Bay Program, to improve spatial and temporal resolution of chlorophyll during the spring algal bloom period. This information will improve estimates to total spring algal biomass, thought to be closely linked to the Bay's oxygen depletion problems. NOAA is working closely with the U.S. Environmental Protection Agency and the participating states to develop the most appropriate data products, to determine the frequency of reports, and the best means of disseminating interpreted satellite and aircraft data.

Remote Sensing

While information on potential red tide outbreaks is required on a daily or weekly basis, information on spring algal biomass in Chesapeake Bay is only needed on a weekly to

cont. on page 2

COASTWATCH cont.

seasonal time frame. There is still another COASTWATCH component—monitoring the losses or gains in coastal wetlands—with time requirements of several years. The coastal habitat mapping project is designed to use remote sensing imagery to account for changes in wetlands acreage every three to five years, beginning with the Chesapeake Bay region in Fiscal Year 1990, and extending to all coasts of the U.S. over the following four years.

Other Regions

COASTWATCH provides an opportunity to improve our understanding of the marine environment and unusual environmental event effects. COASTWATCH programs for other regions of the U.S., such as the Gulf of Mexico, the Pacific, or in the Northeast are envisioned for the future.

For further information contact Kent H. Hughes, NOAA/NESDIS, (202) 673-5596.

Emergency Striped Bass Research Study

The Secretary of Commerce and the Secretary of the Interior recently submitted a joint annual report to Congress on the status of Striped Bass *(Morone saxatilis)* stocks along the Atlantic Coast. The Executive summary of this report is printed below. Further information may be obtained from National Marine Fisheries Service, SSMB1, Room 8208, F/CM3, Silver Spring, MD 20910, Attn: David G. Deuel.

Unprecedented declines in striped bass harvests coupled with poor juvenile production during the 1970s led to legislation which authorized comprehensive studies on Atlantic Coast striped bass populations (The Emergency Striped Bass Research Study [ESBS]). The purpose of this report is to summarize the results of those and related investigations to date. This report focuses on (1) the status of striped bass juvenile and adult stocks, (2) research conducted to identify causes of the decline, and (3) management measures implemented to rebuild the stocks. Since the ESBS began in 1980, much has been learned, not only about striped bass biology, but also its management. Information gathered by the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the States has laid a solid basis for the restoration of striped bass. Restoration, however, will be a slow process, given the depressed state of the stock and the relatively high age at first spawning.

Harvest Decrease

Harvest of anadromous stocks of striped bass on the Atlantic Coast declined precipitously during the late 1970s and early 1980s. Reductions in harvest levels can be attributed principally to a decline in production of juveniles by the Chesapeake Bay stock. Present low levels of harvest are due in part to increasingly restrictive management measures designed to preserve the remaining adult stocks and to ensure the maturation of pre-reproductive fish.

Juvenile Production

Declines in juvenile production could have resulted from (1) long term increases in fishing mortality which reduced the average lifetime egg production per female, (2) long-term decreases in the survival rate from egg to juvenile life stages, or (3) a combination of (1) and (2). Increased demand for striped bass in response to the high abundance of the early 1970s along with degradation of spawning and nursery habitats are thought to be underlying causes of the decline.

Maryland vs. Virginia

Juvenile production in Maryland's tributaries to Chesapeake Bay has remained extremely low during the early to mid-1980s. Females of the 1982 year-class began to appear on the spawning grounds in Maryland in increased numbers in 1987; however, their abundance was lower than expected. This could have occurred if females mature more slowly than was previously believed, in contrast to the poor reproductive success observed in Maryland waters in 1987, Virginia's juvenile index was very high. Difference in spawning stock abundance and environmental conditions may have contributed to the discrepancy in juvenile production between the two areas.

Fishing Analyses

Analyses of the effects of fishing on the stock demonstrate that striped bass have historically been subjected to growth overfishing, a condition in which fish are harvested before achieving their maximum potential for growth. Furthermore, the stock was fished at a level which reduced the average number of recruits per year (recruitment overfishing) during the years prior to recent restrictive management actions. Continuation of adult tagging, fishery-independent sampling, and mathematical modeling efforts during 1986 should provide further insights on the effects of exploitation on the stocks.

Toxics

Four years of in-situ and on-site toxicity tests have identified water quality problems in some rivers in some years. Striped bass eggs and larvae are extremely sensitive to pH levels below 7.0. Some rivers are poorly buffered and experience episodic depressions in pH with major rainfall events. Such events, coupled with high ambient levels of aluminum and other inorganic toxicants can result in highly toxic conditions. Whether these events reduce year-class strength depends on the spatial and temporal extent of the toxic conditions and how extensively they overlap with the period of spawning and larval development. Analyses of historical data on pH levels in major striped bass spawning areas along the Atlantic Coast have revealed no systematic difference in either the frequency or magnitude of low pH events before and after 1970. However, simulations indicate that the historical monitoring programs would have been capable only of detecting major changes in the frequency or magnitude of such events.

Predation

The roles of predation, competition, lack of appropriate food sources, disease, and eutrophication have been invest-

tigated as possible causes of the decline in striped bass; however, none of these appear to have been significant. The role of the Chesapeake and Delaware Canal, however, remains uncertain. Measurements indicate a net flow from Chesapeake Bay to Delaware Bay; thus, eggs and larvae may be transported into the Canal from within the Elk River complex.

Overfishing

Our ability to distinguish whether overfishing or habitat degradation was more instrumental in causing the decline will depend on the response of the populations in the next few years. Regardless of whether water quality has changed, it is clear that the level of fishing mortality during the population's decline (early to late 1970s), was far too high to allow the population to sustain itself. Current reports of large numbers of fish of the protected 1982 year-class provide evidence of previously excessive fishing pressure. The 1982 juvenile index in Chesapeake Bay was only about average, but reduction of fishing mortality has produced large numbers of survivors from this year-class. If these survivors, which have not yet achieved full maturity, fail to produce a strong year-class in the next few years, this will provide support for the water quality hypothesis, particularly if water quality conditions on the spawning grounds are adverse. It is clear, however, that this hypothesis cannot be tested without an adequate spawning stock. Further, the inherent variability in early life stage survival requires that water quality monitoring be continued for several years along with the juvenile monitoring to adequately test the hypothesis. Information from population monitoring will also measure the effectiveness of current management measures and aid management in the future as the stock recovers.

Fingerling Stocking

The U.S. Fish and Wildlife Service, in cooperation with Maryland and Virginia, began to stock fingerling striped bass in Chesapeake Bay in 1985. To date, over 1.5 million hatchery-reared striped bass have been stocked. Most of these fish have been tagged with coded wire tags and some have also been marked with internal anchor tags. The tags will provide information on the movements and mortality of hatchery striped bass and will help determine their contribution to the natural stocks. This stocking program will be terminated when natural production increases to historical levels.

Management Measures

Management measures imposed by the states on the striped bass fisheries are intended to substantially reduce fishing mortality, particularly on the 1982 and subsequent year-classes of the Chesapeake stock. Nearly total protection of these year-classes has been accomplished since 1985 by increasing minimum-size limits incrementally over time. This protection has apparently resulted in improved survival and consequent high abundance of these year-classes. Recovery of the stock depends on successful reproduction by these year-classes and on adequate survival of their progeny.

Interstate Action

The Atlantic Striped Bass Conservation Act was passed by Congress to support and encourage the development, implementation, and enforcement of effective interstate action regarding the conservation of striped bass. The Act has been effective in encouraging the States to implement, in a timely manner, regulatory measures to comply with Amendment 3 of the Interstate Fisheries Management Plan for the Striped Bass. Many of the management actions have been guided by research conducted under the ESBS. Conversely, management needs have provided direction for selected research activities.

From Estuarine Research Federation Newsletter 15 (2), June 1989

Our People

John Carr (Member 1972) has retired from the National Marine Fisheries Service after 29 years of federal fisheries research. For the past 11 years, John has been Deputy Director of the Southwest Fisheries Center in La Jolla, California. During his career in fishery work, he was a fishery biologist with the Bureau of Commercial Fisheries Laboratory at Ann Arbor, Michigan, studying cold water fish stocks and lake eutrophication. John became Assistant Laboratory Director at Ann Arbor in 1970, and later became Great Lakes Liaison Officer for the NMFS.

John Carr lives near San Diego with is family and his dogs, and plans to spend time in northern Michigan with Claire and her family, and to visit his native Smoky Mountains in spring.

Meeting Announcements and New Publications

Continuing Education—Oceanography

The Continuing Engineering Education Program of The George Washington University in Washington, D.C. will offer a course on *New Applications of Oceanography* in Washington, D.C. on August 21-23, 1989.

Completion of this course should enable participants to understand the basic principles of physical oceanography; use these principles to solve practical problems of marine pollution, resource utilization, transportation, and military operations; and better understand, monitor, and communicate with the ocean science community.

Scientists, engineers, program managers, and policy analysts who need basic understanding of physical oceanography and its applications; military officers, members of the intelligence community, oil industry executives, congressional staff, government program managers, private consultants, members of the ocean technology community, and others who need to make informed decisions about ocean science issues; attorneys, public affairs officers, technical editors, budget experts, librarians, and other professionals should also benefit from this course.

The course covers the basic principles, techniques, and technology of physical oceanography, emphasizing their practical application. It describes a unique systems framework within which the perspectives of oceanography, ecology, economics, and government policy can be brought together to solve a wide range of problems, from pollution to ocean mining and management of marine resources. State-of-the-art concepts in oil-spill modeling

cont. on page 4

Announcements cont.

and risk assessment, pollution modeling, resource management, energy extraction, ocean mining, ship routing, search and rescue tactics, military applications of ocean science, and remote sensing are presented.

For information on time and place, housing and meals, payment, and registration, write to Continuing Engineering Education Program, the George Washington University, Washington, D.C. 20052.

Symposium on Operational Fisheries Oceanography

An *International Symposium on Operational Fisheries Oceanography* will take place on October 23-27, 1989 at the Radisson Plaza Hotel in St. John's, Newfoundland, Canada. The principal themes for the conference will be the scientific basis of operational fisheries oceanography, environmental influences, real-time data acquisition, marine data communications, operational data products, experiments and services, and fleet deployment strategies. Abstracts are due on June 30, 1989.

Information is available from Mr. L. W. Davidson, Seaconsult Ltd., Suite 301, Victoria Hall, 187 Gower Street, St. John's, Newfoundland, Canada A1C 1R2.

American Fisheries Society Meetings

The Annual Meeting of the Southern Division of AFS will be held at the Sheraton Hotel, St. Louis, Missouri on October 28-November 1, 1989. Information is available from Stan Michaelson, MO Department of Conservation, Box 180, Jefferson City, MO 65102.

The Annual Meeting of the North Central Division of AFS will be held at the Hilton Hotel and the Ramada Renaissance Hotel, Springfield, Illinois on December 3-6, 1989. Information is available from Dale Burkett, IL Division of Fisheries, 600 N. Grand West, Springfield, IL 62706.

The 120th Annual Meeting of the American Fisheries Society will be held at the Pittsburg Hilton, Pittsburg, Pennslyvania on August 27-31, 1990.

Hudson River Power Plants

The American Fisheries Society has published AFS Monograph 4, *Science, Law, and Hudson River Power Plants: A Case Study in Environmental Impact Assessment.* This 359-page book was edited by Lawrence A. Barnthouse, Ronald J. Klauda (AIFRB Member 1980), Douglas S. Vaughan (AIFRB Member 1979), and Robert L. Kendall.

The Hudson River Power Plant Case was one of the most celebrated environmental issues in the USA from mid-1960 to 1980. The case centered on the development of electric power generation along the Hudson and the effects that cooling water diversions would have on the fish populations of this tidal riverine estuary. Most aspects of the case were unprecedented: its duration, the magnitude of new generating capactiy it entailed, the amount of field research it provoked, the biological and hydrological modeling efforts it required, the length and futility of the legal hearings, and the cost of the final out-of-court, negotiated settlement. The total cost of the exercise was in the hundreds of millions of dollars.

Although many parties were involved, the case in its final form pitted the utilities against the U.S. Environmental Protection Agency. The issue was whether or not closed-cycle cooling towers costing nearly 2 billion dollars should be built to prevent mortality of larval and juvenile fishes that would otherwise be impinged or entrained at the power plants. Evaluation of this issue required a great deal of new research into the biological and hydrological dynamics of the river.

Both sides, the utilities and EPA, relied on consultants for data collection, analysis, and modeling. The two consulting groups were adversaries through the legal hearings. When the hearings broke down and negotiations proceeded out of court, opponents were forced to find areas of common ground. By the time settlement was reached, the consultants had acquired some degree of amity, and they resolved to distill their long and difficult experiences for the scientific community at large. AFS Monograph 4 is the expression of that resolve.

This peer-reviewed book summarizes the voluminous data and analyses generated during the power plant case, but it is relevant well beyond the Hudson Valley. It has much to say about the inadequacies of ecological and fisheries theory for long-term environmental impact prediction, about the kinds of environmental modeling that work and do not work, about the conduct of "adversarial science," and about the interactions of science and the legal system in the resolution of public issues. Though disagreements about key issues are stated more civilly in the book than they were in court, they have not been suppressed. The emergent lessons about large-scale environmental impact assessment are highlighted throughout, and should be of value to anyone involved with applied science.

Science, Law, and Hudson River Power Plants is available from the American Fisheries Society. Its price is US $33.00 ($35 for orders from outside the USA), which includes shipping and handling.

Sea of Cortez Marine Invertebrates

Alex Kerstitch is the author of *Sea of Cortez Marine Invertebrates—A Guide for the Pacific Coast, Mexico to Ecuador,* a publication of Sea Challengers, 4 Somerset Rise, Monterey, CA 93940. Major contributors are Hans Bertsch (nudibranch molluscs), L. Yvonne Maluf (echinoderms), and Ron H. McPeak (cniderians), and a number of other eminent specialists contributed through specimen identification and systematic review of controversial and difficult groups.

This 120-page, 7″ x 9″, paperback book is the first and only all-color field guide to the subtidal marine invertebrates of the Sea of Cortez (Gulf of California) region. The 283 color plates are superb, and are among the best ever seen by this reviewer: the plates have very faithful color reproduction and are detailed enough for accurate identification for most groups.

The volume has a pictorial key to phyla, and treats 283 species, including 8 sponges, 37 corals, anemones, and their relatives, 11 worms, 109 snails, clams, nudibranchs, and octopi, 35 starfish, urchins, and cucumbers, and 77 crabs, shrimps, and lobsters. Each species is covered by a description, life history, habitat features, zoological and common names, and remarks. The book contains an extensive glossary, index, and bibliography.

Sea of Cortez Invertebrates can be ordered from the publisher for $21.50 + $2.35 shipping, a bargain for all who appreciate fine photographs of marine invertebrates in any part of the world.

Age and Growth of Istiophoridae and Xiphiidae

Dennis W. Lee (AIFRB Member 1981) has authored *Annotated List of Selected References on Age and Growth Studies of Istiophoridae and Xiphiidae,* issued as NOAA Technical Memorandum NMFS-SEFC-224. This 39-page report, published in 1989, is a bibliography containing 83 annotated references with specific emphasis on ageing, ageing methods, growth rates, and regression and growth equation parameters that have been published on these two families of billfishes. A subject index follows the annotations, which cover eight species.

Persons wishing a free copy should write the author at the Miami Laboratory, 75 Virginia Beach Drive, Miami, FL 33149.

Oil Dispersants: New Ecological Approaches

ASTM has issued *Oil Dispersants: New Ecological Approaches,* edited by L. Michael Flaherty. This book is hard cover, has 310 pages with 105 illustrations, and has a list price of $62. This volume, STP 1018, contains chapters on Effects of Chemical Dispersant Agents on the Behavior and Retention of Spilled Crude Oil in a Simulated Streambed Channel, Dispersant Use Guidelines for Freshwater and Other Island Environments, Dispersants in the Freshwater Environment, Economic Evaluation of Dispersants to Combat Oil Spills, The Use of Chemical Dispersants to Control Oil Spills in Shallow Nearshore Waters, Field Experience with Dispersants for Oil Spills on Land, The Effect of Elastomers on the Efficiency of Oil Spill Dispersants, Use of Computerized Spill Response Tool for Emergency Response, Personnel Training, and Contingency Planning, The Crisis in Response Training, A Computer-Assisted Planning System for Oil Spill Response Chemical Applications, Approaches to Planning for Dispersant Use in Oil Spill Response, Planning for Dispersant Use, Dispersant Use Considerations, Oil Dispersant Guidelines: Alaska, Letters of Agreement for the Use of Dispersants, Field Measurement of Effectiveness: Historical Review and Examination of Analytical Methods, A New Pair of Eyes II. Looking at Dispersants from a Different Point of View, Measurements on Natural Dispersion, Laboratory Stuides on Oil Spill Dispersants, Design and Evaluation of a Large Boat-Mounted Dispersant Spraying System and Its Integration with Other Application Equipment, Tropical Oil Pollution

Investigations in Coastal Systems (Tropics): The Effects of Untreated and Chemically Dispersed Prudhoe Bay Crude Oil on Mangroves, Seagrasses, and Corals in Panama, Dispersed Oil Effects on Tropical Nearshore Ecosystems, and The Behavior of Disperse and Nondispersed Fuels in a Sewer System.

This book can be ordered from ASTM, Customer Service Department, 1916 Race St., Philadelphia, PA 19103.

Recent NOAA Publications

Federal Marine Pollution Plan

The National Ocean Pollution Policy Board, has released the "Federal Plan for Ocean Pollution, Research, Development, and Monitoring, Fiscal Years 1988-1992." The Plan was prepared by NOAA's National Ocean Pollution Program Office in cooperation with other Federal agencies and departments. The Plan establishes ocean pollution research priorities for addressing six major goals of the National Marine Pollution Program, which is a composite of all marine pollution research, development, and monitoring programs sponsored by the Federal government. These goals relate to understanding pollution problems concerning toxic materials, nutrients, biological agents, habitat loss and modification, conditions and trends in marine ecosystems, and human health. Copies of the Plan can be obtained by calling or writing NOAA's National Ocean Pollution Program Office, 11400 Rockville Pike, Room 610, Rockville, MD 20852, telephone (301) 443-8823.

Sea Grant—In the Gulf of Mexico

Just released is a publication entitled *Sea Grant—A Directory of Research and Marine Advisory Projects in the Gulf of Mexico.* Published by the Mississippi-Alabama Sea Grant Program, the 21-page report reviews the scope and range of activities presently being undertaken by Sea Grant programs from Florida to Texas. Over 80% of the activities listed relate to environmental studies. The publication (MASGP-889-09) may be obtained from the Mississippi-Alabama Sea Grant Consortium, P.O. Box 7000, Ocean Springs, MS 39564-7000.

The Quality of Shellfish Growing Waters on the East Coast of the United States

This publication is the second in a series of shellfish reports developed by the Strategic Assessment Branch of the National Oceanic and Atmospheric Administration that examine the quality of shellfish growing waters in estuaries of the United States. Information is presented for 14 East Coast states on administration of state shellfish programs, status and trends in classification of shellfishing waters, and sources of pollution affecting harvest-limited waters. Data is collected by site visit to each shellfish-producing state, through interviews with state personnel, and by reference to written materials. The 42 estuaries included in this report extend from Passamaquoddy Bay in Maine to the Indian River in Florida. For further information contact Ms. Dorothy Leonard on (301) 443-8843.

Fish for Tomorrow

The University of Washington School of Fisheries has published *Fish for Tomorrow* as part of its *Publications in Fisheries* series. The 162-page illustrated book is authored by the late DeWitt Gilbert, the authoritative writer/editor who was editor of *Pacific Fisherman,* consulting editor of *National Fisherman,* contributor to several international fishing journals, member of the Industrial Advisory Commitee of the International North Pacific Fisheries Commission, and member and Chairman of the Pacific Salmon Fisheries Commission.

The book is a historical treasure, written in an informal style. It examines the early history of fishery management in the U.S. and, in particular, the development of the fishery commissions from their inception in the 1950s.

Negotiations in the early 1900s about fisheries in Lake Champlain, the Great Lakes, and the Pacific Northwest were consistent failures as politicians tried to resolve economic issues that plainly were due to lack of conservation. Acceptance of fisheries conservation by commercial fishermen and others needed more than political compromise; it needed a basis in science on which to build agreements. This came after scientific studies on halibut and the Fraser River salmon by W. F. Thompson and his associates, who worked closely with fishermen and the fishery agencies of Canada and the U.S. Science plus public support overcame the political obstacles, and a growing awareness of thinking fishermen contributed to the change.

This volume is arranged chronologically, covering events and actions leading to the first treaties and commissions. Chapters cover the halibut treaties, the sockeye salmon treaties, the U.S.-Mexican Treaty, interstate commissions and treaties, modern technology and politics, the post-war treaties, key movers and makers, and the politics of the treaties.

One of the fascinating features of this history is the wealth of references to individual fisheries personalities, from Atkinson to Van Cleave. In today's fishery community, we still have many colleagues and students of the leaders who participated in the research leading to the scientific bases for changed conservation policies and to the treaties themselves. *Fish for Tomorrow* gives insight into the thinking and the personalities of these fishery leaders, and furnishes delightful reading for those who knew these pioneers and for those who did not know them.

Copies of this book will be mailed, as a token of appreciation, to those who contribute to the University of Washington School of Fisheries Endowment Fund, which will provide financial support for students. A contribution of $20 or more is suggested. Order from Publications in Fisheries, School of Fisheries WH-10, University of Washington, Seattle, WA 98195.

Marine Aquarium Reference

A new book by Martin A. Moe, Jr., *The Marine Aquarium Reference: Systems and Invertebrates,* has just been announced by Green Turtle Publications. This is a comprehensive reference for marine aquarists, marine scientists, and school and marine science libraries. There are 510 pages of text, 9 tables, 49 figures, and over 130 drawings that explain and illustrate the theory, techniques, and technology behind the structure and husbandry of modern marine aquarium systems. Many new techniques have been developed over the last few years that allow marine aquarists to maintain and grow algae and invertebrates that were previously very difficult or impossible to keep in small marine aquarium systems. Some of these technical advances are in hardware, such as trickle filters, gas reactors, high intensity lighting and denitrifying filters; and some are simply a better understanding and testing of chemical factors such as carbonate hardness and redox potential. Moe's book clearly and simply explains and integrates the new technology with old, established techniques. The result is an extensive and greatly needed up-to-date reference to the science and technology of modern, small marine aquarium systems. Both novice and advanced marine aquarists will gain in knowledge of the function and maintenance of marine systems.

The marine aquarist is no longer limited to a simple aquarium setup designed to maintain and display tropical marine fish and a few large invertebrates. There are many types of small marine systems described in *The Marine Aquarium Reference:* coral reef displays (reef systems), miniature marine systems (desk top tanks), algae based systems, deep water systems, night display systems, and many other specialized types of marine aquaria, including systems designed to rear the larvae of marine fish and invertebrates. Moe's book provides a wealth of ideas and information for the progressive marine aquarist.

Marine invertebrates such as sponges, corals, crustaceans, and echinoderms, as well as ornamental green, brown, and red algae can now be maintained and grown in small systems. A detailed chapter on the foods and feeding of marine invertebrates includes a section on propagation of phytoplankton and zooplankton, important foods for many marine invertebrates and most larval forms of marine creatures.

The book is available for $21.95 from Green Turtle Publications, P.O. Box 17925, Plantation, FL 33318.

Law of Water Rights and Resources

Law of Water Rights and Resources by A. Dan Tarlock is a 1988 looseleaf volume published by Clark Boardman Company, 435 Hudson St., New York, NY 10014. It will be updated periodically, and there is no charge for revisions issued within 3 months of purchase.

Written by one of the nation's foremost authorities on water law, this book conveys all the basic knowledge of water law doctrines and underlying

cont. on page 6

Announcements cont.

principles; is national in scope, covering both the common law of riparian rights and the western doctrine of prior appropriation; and emphasizes changing water allocation patterns and increasing intervention by the states and the federal government in crucial water allocation decisions. The book covers organization and scope, hydrological cycle, common law of riparian rights, law of groundwater allocation, prior appropriation doctrine, appropriation of groundwater, adjudication of water rights, public water use rights, federal allocation and regulation of water, and interstate allocation.

This volume can be ordered from the publisher for $95, with a 10% discount for prepayment.

New Wiley Books

John Wiley & Sons, Inc. has published the following 1989 books, which can be ordered from their Dept. 0-6298, P. O. Box 6792, Somerset, NJ 08875-9976.

Henderson's Dictionary of Biological Terms, Tenth Edition, by I.F. Henderson and Eleanor Lawrence, has 400 pages and costs $49.95.

The tenth edition of this classic reference has been totally revised to give new emphasis to modern molecular and cellular biology, genetics, virology, neurobiology, and ethology. Many new terms have been added, and definitions have been completely rewritten to acknowledge new research and developments in the field. It covers all major fields, including biochemistry, botany, cell biology, genetics, immunology, and zoology. A new feature is a selection of structural formulae of important biochemical compounds. Over 22,000 entries give clear, concise definitions. Acronyms appear at the beginning of each letter section. There are separate sections on abbreviations, units and conversions, SI prefixes, common Greek and Latin noun endings, and the Greek alphabet. *Henderson's Dictionary of Biological Terms* will prove invaluable to students as well as to established workers and teachers in biology.

Estuarine Ecology, by John W. Day, Jr., Charles A. S. Hall, W. Michael Kemp, and Alejandro Yanez-Arancibia, has 576 pages and costs $54.95.

Here is a straightforward synthesis of the information available on the structure and function of estuaries, important ecosystems critical for the life cycles of fish and other aquatic animals. Marine biologists, ecologists, fishery scientists, and environmental scientists will find *Estuarine Ecology* both clear and comprehensive, and highly valuable as a text and reference. It integrates large amounts of new research not covered in other books into its discussion of physical and chemical aspects of estuarine ecology, the biology and ecology of key organisms, the flow of reduced carbon through estuaries, and human impact on estuarine systems and fisheries.

CONTENTS:

Estuarine Geomorphology and Physical Oceanography. Estuarine Chemistry. Estuarine Phytoplankton and Other Algae. Intertidal Wetlands: Salt Marshes and Mangrove Swamps. Estuarine Seagrasses. Microbial Ecology and Organic Detritus in Estuaries. Zooplankton, the Drifing Consumers. The Estuarine Bottom and Benthic Subsystem. Nekton, the Free-Swimming Consumers. The Role of Wildlife in Estuarine Ecosystems. Estuarine Fisheries. Human Impact in Estuaries. Index.

In Memoriam

Ivan J. Donaldson
Member 1960; Emeritus 1976
1989

Fred E. J. Fry
Fellow 1958; Emeritus 1989
May 22, 1989

Dr. Fred E. J. Fry passed away on May 22, 1989. A giant among fish biologists and ecologists, Fred Fry served as a most effective President of AIFRB in 1973 and 1974 and as President of the American Fisheries Society in 1966 and 1967. In his long teaching and research careers at the University of Toronto and a 5-year stint with the Royal Canadian Air Force, Dr. Fry received many awards and honors, including the M.B.E., one of the most prestigious awards within the British Commonwealth.

Fred Fry was among the numerous fisheries luminaries at the University of Toronto in the 1930's and 1940's, and, along with J. R. Dymond, W. J. K. Harkness, and A. G. Huntsman, helped in the creation of new ecological approaches for describing the environmental parameters of aquatic ecosystems. Fry spawned the concept of *Categories of Effect* which provided a novel and invaluable approach to a quantified description and better understanding of the behavioral/physiological relationships of aquatic organisms and communities with their aquatic environment. His contributions to scientific thought in the areas of limnology, fish biology, and fisheries science are immense. His 1947 paper, *Effects of the Environment on Animal Activity*, is the outstanding primary reference for all which has followed, and his contributions to Brown's *The Physiology of Fishes* and Hoar and Randall's *Fish Physiology, Volume VI* are monumental.

Dr. Fry's contributions to the scientific community were effectively served by his unique combination of intellect, energy, kindness, and humility.

In Memoriam

Edwin L. Niska
Member 1972
May 18, 1989

Edwin L. Niska passed away on May 18 in Astoria, Oregon. Ed was born in 1915 in Butte, Montana, graduated from Astoria High School, and received a bachelor's degree in fisheries from the University of Washington in 1940. In his long fisheries career Ed Niska worked on the Stanford campus on the California sardine fishery, for the National Marine Fisheries Service in Hawaii, for the Oregon Fish Commission on troll salmon, for Bumble Bee Seafoods in Astoria, for Astoria Seafoods in product development, and back with the Oregon Fish Commission on groundfish investigations. He retired from Oregon Fish Commission.

During World War II, Niska's knowledge of Finnish, Russian, German, and English served him well as an interpreter for the U.S. Army in relocating refugees along the Danube River. After the war, he attended the University of St. Gaellen in Austria for 2 years before returning to fishery work in the U.S.

Ed Niska was very active in community affairs, especially with the United Finnish Kaleva Brotherhood and Sisterhood Lodge. He was a member of the Astoria Elks Lodge, the Finnish West Coast Singers, the Community Concert Association, the Clatsop Care and Rehabilitation Center, and the restoration of the Lindgren House at Cullaby Lake. Niska was host of the Scandinavian Hour on radio station KMUN, a contributor to the Clatsop County Historical Society's publication, and wrote articles about Astoria's history for other periodicals.

Ed Niska was a strong and proud supporter of AIFRB, and we all miss him.

Ernest O. Salo
Member 1958; Fellow 1968
July 3, 1989

Dr. Ernest O. Salo, Professor Emeritus, University of Washington School of Fisheries, and a Fellow of AIFRB since 1968, passed away on July 3 at his home in Seattle at age 69 after a several-month illness. Ernie was internationally reknowned as one of the foremost authorities on salmonid biology and forestry-fisheries interactions as well as a dedicated teacher and distinguished fisheries scientist.

Ernie obtained a B.S. in Zoology and a Ph.D. in Fisheries at the University of Washington, the latter while serving as a biologist for the Washington Department of Fisheries and assistant supervisor of Washington State Salmon Hatcheries. Upon completion of his Ph.D. in 1955 he accepted a faculty position at California State University at Humboldt, and continued there as Chairman, Division of Natural Resources, 1961-1965. He then returned to the University of Washington in 1965 as a faculty member of the Fisheries Research Institute, continuing as Professor Emeritus, School of Fisheries, after semi-retirement in 1985. He served as Director, Big Beef Creek Research Station, 1965-1985, and as first Director, Center for Streamside Studies, University of Washington, in 1987-1988.

Ernie will be remembered in particular for his innovative leadership of a wide variety of comprehensive studies concerned with salmonid ecology and for his rational approach to effective resolution of environmental conflicts. His research emphases included effects of logging on fish resources, aquaculture of salmonids, estuarine studies, and salmon ecology.

Through his understanding of salmon ecology, he saw the challenges to salmonids created by man's encroachment on the environment, and he sought to overcome these challenges through an unfailing dedication to the education process. He was truly devoted to working with and guiding his many graduate students, encouraging them, finding funding for their support and research, recognizing their attributes, and always being sympathetic and helpful to their individual personal problems. Ernie was held in high esteem by his peers and students because of his leadership, intelligence, breadth of view, fairness, kindness, integrity, complete honesty, and gentle sense of humor.

Dr. Salo was active in several scientific societies and authored over 70 research publications, including major reports and symposium contributions. He was active in over 30 consultancies with universities, private industry, state and federal agencies, and port authorities. He had a great interest and pride in his Finnish roots, visited his ancestral homeland several times, lectured, and developed professional contact with Finnish fisheries scientists. He also assisted the Chilean government in initial phases of establishing salmon culture in South American waters.

Ernie's colleagues and students will long cherish the memory of him personally as a caring friend and mentor and professionally as a truly outstanding leader in the fisheries community. A scholarship fund is being set up at the School of Fisheries, University of Washington, in his memory.

Ronald E. Westley
Member 1963
July 19, 1989

Membership Report

PROMOTION TO FELLOW

Dr. Bruce S. Miller	WA
Dr. Harold M. Tyus	UT

PROMOTION TO MEMBER

Phyllis W. Scannell	AK

NEW MEMBERS

Dr. Behzad Mahmoudi	FL
George H. Burgess, Jr.	FL
Dr. Gary C. Matlock	TX
Dr. Robert L. Shipp	AL

ASSOCIATES

Kevan A. F. Urquhart	CA
Brian Bigler	WA
Jon S. Chen	FL
David Bushek	TX
George D. Dennis III	P.R.
Gregory A. DeBrosse	NJ
Laurieann R. Phalen	NC
Paul S. Phalen	NC
Robert A. McConnaughey	WA

EMERITUS

Randall P. Cheek	NC
Dr. Norman G. Benson	CO
Donald D. Worlund	WA
Dr. Harold Berkson	MD
Grant I. Fiscus	WA

Sammy M. Ray, *Membership Chairman*
Texas A&M University at Galveston
Building 3311, Fort Crockett
Galveston, Texas 77551

Direct membership inquiries to Membership Chairman

BRIEFS, the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

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American Institute of Fishery Research Biologists

. . . BRIEFS . . .

VOL. 18, NO. 5 OCTOBER 1989

1989 Board of Control Meeting

The 1989 AIFRB Board of Control meeting was called to order by President Charles F. Cole at 8:30 a.m., September 2, 1989, at the Hotel Captain Cook in Anchorage, Alaska. Officers and members present at the meeting were: Charles F. Cole, President; Roy E. Nakatani, Secretary; Joseph W. Rachlin, AIFRB Treasurer and New York-New Jersey District Director; Sammy M. Ray, AIFRB Membership Chairman and Texas District Director; Oliver B. Cope, BRIEFS Editor; Bernard E. Skud, Past-President; William J. Wilson, Director, Northern Alaska District; John F. Karinen, Director, Southeastern Alaska District; Ed Irby, Director, Florida District; Donald A. McCaughran, Director-Elect, Washington, Northwest District; Robert Gray, Washington NW District; and Charles P. Meacham, Alaska District. It was determined that a quorum was present, and the meeting proceeded.

The minutes of the 1988 Board of Control meeting were approved.

President's Report

The President's Report will appear in a future issue of BRIEFS.

Treasurer's Report

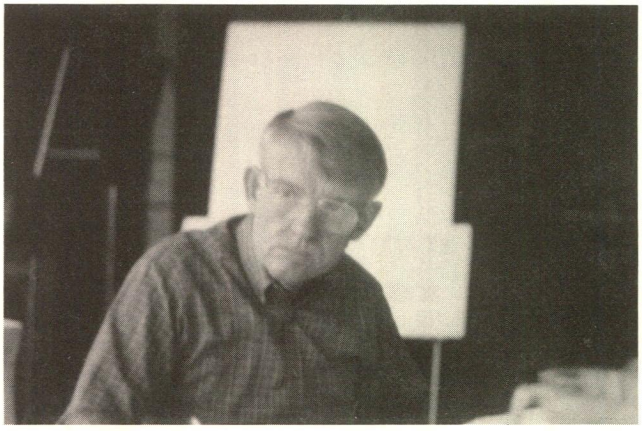
Dr. Rachlin reported on fiscal activities of the Institute during the past year. His financial report appears as a separate item in this issue of BRIEFS.

An audit of AIFRB checkbooks was conducted by officers and members at the meeting, and the records were found to be in order and were approved.

Dr. Rachlin described the investment program of AIFRB and set forth the rationale for investment changes for the future. He also discussed the AIFRB filing system and the preparation and distribution of mailing labels for BRIEFS and other mailings.

The treasurer reported on the state of delinquency in membership dues and furnished information on those who have not paid dues for three years and have been notified three times. A motion was made to eliminate 55 delinquent members by September 30, 1989; the motion carried.

A motion to authorize certain officers to transact business on behalf of AIFRB was approved.



President Pete Cole ponders a point at the 1989 Board of Control meeting in Anchorage.

Publications

BRIEFS Editor Cope reported on the six issues of BRIEFS published during the past year—Vol. 17, Nos. 5-6 and Vol. 18, Nos. 1-4. In these six issues of eight pages each, two half-tones were printed. More figures would have been desirable, but the membership shows little interest in forwarding illustrations for publication in BRIEFS. The content of BRIEFS this year was similar to that of previous volumes, with items featuring AIFRB activities, items of general interest to the fishery research community, notices of upcoming symposia and workshops, announcements of recent publications, membership reports, information on awards, items regarding recent news of our AIFRB people, a few dissertation and thesis abstracts, reports of activities of four AIFRB Districts, and obituaries of nine AIFRB members who had recently passed away.

Sources of material for publication in BRIEFS were similar to those of past years. From the New England area, 22 items were received; 44 came from the Mid-Atlantic area; 19 were from the South; 26 were received from the Mid-West; the West contributed 23; 2 were submitted from Canada; and 1 came from China. Six colleges and universities forwarded 32 thesis and dissertation abstracts. Forty items were received from AFIRB officers and leaders. About 33% of the items received were published, either intact or after various degrees of editing.

cont. on page 2

Publications cont.

The 1988 death of John Reintjes, former BRIEFS Editor and Production Editor from 1983 to 1988, caused some concern because of the loss of a friend and colleague and because of the threat of delay in distribution of BRIEFS. However, John Merriner immediately accepted the task of labeling, stamping, and mailing of BRIEFS, and AIFRB sustained absolutely no delay in the distribution to the membership.

Production Editor John Merriner submitted a report on production activities, including a financial summary of printing and mailing costs. Each of the six issues of BRIEFS printed and mailed during the year consisted of 1,200 copies for the membership and with file copies for the Editor, President, Membership Chairman and Production. Postage rates for domestic first class $.25, Canada $.30 and foreign $.90 were in effect. Printing costs for the year were $3,830.10, and mailing costs were $2,337.76

The major achievement of this year was the distribution of the entire stock of our old-growth symposium volume. We shipped the last individual copy on August 23, 1989. The NOAA/NMFS Beaufort Laboratory graciously continued storage facilities and postage for the several orders that trickled in over the year. The volume's availability was also listed in the North West Regional Forestry Newsletter; that managed to move several case lots to west coast forestry offices for local employee distribution.

Our major windfall was an international symposium sponsored by the US Forest Service held March 29-31 in Portland, Oregon and titled "Old-growth Douglas Fir Forests: Wildlife Communities and Habitat Relationships". I arranged for distribution so that meeting registrants were able to obtain gratis copies of our volume—the prior treatise on the topic. NOAA-NMFS provided for shipping of 35 cases to the symposium organizers. On my first contact they did not indicate familiarity with our symposium publication. After inspection of a copy, they were very appreciative of our offer and complimentary of the scientific quality of the document.

John Merriner assumed duties of the production office late last fall in an unfortunate manner, the passing of John Reintjes. However, with the continuation of the BRIEFS production team we will endeavor to continue in John's footsteps. The present arrangement is efficient and cost-effective compared to alternate mailing mechanisms presented in John's 1988 report.

Revision of the AIFRB brochure was discussed, but action will be deferred until discussions are held with individuals who have been working on improvements to the current version.

Membership

Sammy Ray submitted the report from the AIFRB Membership Committee, showing that the Committee processed 26 new applications for membership; all were approved. Of these, 12 were accepted as Associates, 13 as Members, and 1 as a Fellow. The new membership was recruited by: 15 were nominated by the membership, 1 was sent application forms with initial correspondence, 7 sent curricula vitae with initial correspondence, 1 sent a letter of inquiry initially, and 2 were reinstatements.

The Membership Committee considered promotions for 8 persons; 5 were granted, 2 were denied, and 1 was sent to the Board of Control for a decision. The Board granted the promotion.

Emeritus status was granted to 15 persons.

The membership of AIFRB stood at 1,136 as of September 1, 1989.

Awards

No awards were made this year.

District Reports

Northern Alaska District

At the 1987 Board of Control meeting in Winston-Salem, the Board approved the creation of a Northern Alaska District. The District was formed by splitting the Alaska District into the Northern Alaska and Southeast Alaska Districts. Bill Wilson, the first director of the new district, started developing activities for the district the following spring, and represented the new District at the Toronto Board of Control meeting in September 1988.

Our District membership is small—approximately 25 members—but the District encompasses a large geographic region. It includes the majority of Alaska excluding the southeast panhandle. Since most Northern Alaska District members live in or near the Municipality of Anchorage, the focus for activities has been the Anchorage area.

A recruiting drive was started in earnest during fall and winter of 1988-89. Many invitations were sent out, primarily to the several hundred AFS members living in the Anchorage area, and many fishery biologists from this area were nominated for membership. Few, unfortunately, took the time to submit applications. Some new members were gained, however.

Our District has continued a close relationship with the Southeast Alaska District. Together we sponsored the best paper award at the Alaska Chapter, American Fisheries Society meeting in Juneau in November 1988. Currently the two districts are cooperating to produce a white paper analyzing the technical and scientific issues, including the short- and long-term biological implications, of salmon mariculture (net pen farming) in Alaskan waters. A paper on genetic issues in salmon ranching was prepared by the Alaska District in 1975 and subsequently proved very influential in setting State genetic policies on salmon aquaculture; this new effort, we hope, will be as useful and constructive. Members from both Alaskan districts are writing sections of the paper.

We instituted a dues program early in 1989. While small, these individual dues help to offset postage costs involved with various mailings. Some financial support was volunteered from the Alaska Chapter of AFS at its November 1988 annual meeting; the Chapter felt the District was a constructive organization, and they wanted to acknowledge the past cooperative programs between the District and the Chapter by contributing funds to help meet operating

expenses. The District also has obtained start-up funds from the treasury of the national AIFRB organization.

A major activity of this District has been a series of monthly luncheon presentations of fishery research mini papers. These presentations were part of our "Alaska Fishery Research Forum" and were scheduled at a local restaurant for part of the year and were brown-bag affairs the rest of the year. The talks were publicized in two local newpapers, and posters and flyers were sent to all members and to an expanded mailing list totalling about 55-60 individuals. While not extremely well attended, the series provided an opportunity for local fishery biologists and others interested in the topic at hand to get together for discussion and to get to know each other better. The topics for this year's papers were:

The Response of Migratory Adult Pink Salmon to a Simulated Oil Spill

Salmonid Colonization of New Streams in Glacier Bay National Park

Density-Dependent Growth of Age Zero Sockeye Salmon in Karluk Luke, Kodiak Island

Precision of Age Determination and the Effect on Mortality Estimation of Pacific Herring

Stock Separation of Chum Salmon Populations in the Yukon River Drainage

Salmon Spawning Tailrace as Mitigation for the Tyee Hydroelectric Project

Other papers in this series will be scheduled for later in the fall of 1989 after the field season has wound down and biologists are again free to attend and participate.

I trust that the accommodations and amenities at this Board of Control meeting in the Hotel Captain Cook are satisfactory. The Northern Alaska District has been heavily involved with preparations for the Board meeting and with the national AFS meeting in Anchorage. An AIFRB display is part of the Trade Show/Poster Session/Display Area in the Egan Convention Center; this traveling display, however, appears to be getting a bit "ragged" and may need to be replaced in the near future—say, before the next Board meeting.

I have had very little success in motivating members—and non-members also—to become involved with AIFRB in this District. I don't know if this is due to apathy, everyone being extremely busy with higher priority activities, satisfaction with AFS as their primary professional involvement, or a combination of these or other factors. Nonetheless, I continue to try and hope that we can find the right formula to involve many others in the activities of this District.

A nominating committee will be appointed soon to enlist a group of individuals willing to serve as leaders of the Northern Alaska District for 1990 and beyond.

William J. Wilson, *Director*

Southeast Alaska

Diversion and Dilution of Fisheries Research and Issues

The Exxon Valdez oil spill in Prince William Sound on March 24, 1989 has had more than biological and physical impacts on the fisheries of Alaska. Over the past 5 months the fisheries research community of Alaska has been diverted, stretched, and taxed to near the limits of endurance to meet the data-collection needs for evaluating the impacts of the spill. Much ongoing research has been put on hold because of these needs. Over the long term much of the research effort in Alaska is likely to be directed to various aspects of the spill. The fisheries issues outlined in the 1988 report to AIFRB are still of concern, and hopefully research efforts in Alaska over the next few years will address these problems as well as meet the needs of the management organizations in responding to this catastrophic spill in PWS and the Gulf of Alaska. Activities of the Southeast District have been curtailed by the spill, as well; e.g. cancelled meetings and social events, work on specific fishery issues, and involvement of officers in AIFRB activities.

AIFRB Activities in 1988-89

The Southeast Alaska District held approximately one evening meeting every 6 weeks from October to April. Each meeting had a guest speaker who spoke to a specific fisheries issue, or reported on research or fisheries-related travel. Speakers included:

John F. Karinen—NOAA Fisheries, Auke Bay Laboratory.
Video of Behavior of Rockfish and Sablefish at 1000 ft.

Michael Kaill—Alaska Department of Fish and Game, Juneau.
Mariculture In Alaska.

Linc Freese—NOAA Fisheries, Auke Bay Laboratory.
Fish Resources of the Red Sea, a Divers View.

Michael Kaill—Alaska Department of Fish and Game, Juneau.
Mariculture In Alaska—recent developments, role of AIFRB.

Theodore R. Meyers—Alaska Department of Fish and Game, Juneau.
Viral Hemorrhagic Septicemia (VHS), recent outbreak concerns Alaska.

Attendance at evening meetings ranged from 6 to 15 members.

Two luncheon meetings were held during the year. The first was an Executive Committee meeting on October 12, 1988 and the second was an impromptu gathering of the Southeast and Northern Alaska Districts held during the Alaska Chapter's American Fisheries Society Meeting, November 14-17 at the Juneau Centennial Hall. About 24 members of the two Districts, and several guests, attended.

The Northern and Southeast Districts joined the Alaska Chapter of AFS to present a Best Paper Award for the above meeting to Dr. Dana C. Schmidt of the Alaska Department of Fish and Game. Dr. K Koski, Past Director of the Alaska District, made the presentation.

The two Alaska Districts also joined in nominating Jim and Mary Lou King, residents of Juneau, for the Chevron Conservation Award for their joint efforts in conserving

cont. on page 4

AIFRB Activities cont.

wetlands in Alaska, conservation education, development of beach parks and trail systems to natural areas, providing refuge and treatment for injured and sick birds, conserving and protecting endangered waterfowl, development of waterfowl refuges throughout Alaska, and encouraging others to carry on conservation efforts over the past 20 years. AIFRB enthusiastically initiated and supported this nomination because of the vital link between productivity of wetlands and adjacent fish habitat. The Kings were among the 21 individuals and five organizations across the United States that were honored by Chevron to receive the Chevron Conservation Award. The Kings traveled to Washington D.C. in May to receive their award and their accomplishments were noted in major articles in the Juneau Empire on July 19 and 24, 1989.

Major communications were contributions to BRIEFS, letters to Congressional members regarding U.S. Forestry Science Laboratory budgets for Southeast Alaska, letters to the membership chairman, a letter of condolence to the John W. Reintjes family, and announcements to members.

Jesse D. (Doug) Jones, Alaska Department of Fish and Game, was appointed Chairman of the Membership Committee for a two year term. As of March 24, 1989 eight fisheries personnel in Juneau had been nominated for membership in AIFRB. Two had applied for membership and one was accepted for membership. Dr. William A. Smoker was granted EMERITUS status.

Secretary/Treasurer Tamra Faris reported that the balance in account was $236.03 as of 2/2/89. Expenditures balanced assets received during the year. A $5.00 dues assessment was voted at mid-year but a concerted effort to collect from non-participating members has not been made. Most members participating in the meetings have paid this assessment.

Just prior to the Exxon Valdez oil spill the District passed a motion that the S.E. District accept as a project the preparation of a white paper outlining the guide lines for non-finfish mariculture in Alaska, with special emphasis on protection of existing resources and habitat. Sponsorship of a scientific symposium on the subject was also discussed but not voted. Nothing further has been accomplished in this regard because of pre-occupation with the spill. Members of the Northern Alaska District have expressed interest in participating in the project.

Two members of the Southeast Alaska District died, Robert T. Baade of Petersburg and Richard Marriott of Juneau. We note their passing with remorse.

Activities in 1989-90 will be centered around the mariculture issue in Alaska, especially with regard to genetic and disease problems. We may be required to have a special election in the near future as I have received informal notification from Director-elect Dr. Doug Eggers that he will be unable to take the responsibilities of the Director for 1989-90.

John F. Karinen, *Director*

Carolina District

Correspondence with District members in late 1988 and early 1989 yielded low populous interest in a meeting and absence of a focal issue to galvanize the group to action. Plans are now underway for a meeting November 29th and 30th in Charleston, SC.

Ballots for election of a Vice-District Director have been distributed to eligible members with a response due by 25 September 1989. Dr. John M. Dean of the University of South Carolina will assume the office of District Director.

A membership drive in the District has netted several new members, now a total of 39. Recruitment attempts within state and federal facilities have been marginally successful and we have encouraged university faculty to actively recruit from their student population and associated faculty. We remain a constituency of diverse interests and geographic dispersion.

John V. Merriner, *Director*

Florida District

Ed Irby reported that the principal activity in the Florida District at the present time is the search for a new District Director.

New York-New Jersey District

District Director Joseph Rachlin reported that the District has two new members. Dr. Rachlin has been re-elected as District Director for the coming year.

Northwest Washington District

Our District had a very active year, with eight meetings. These included seven monthly evening seminars or workshops and another exciting and well-attended banquet in May 1989. We continued to host open, and advertised, meetings on current topical issues including Wetlands; Climate Change Effects in the Northwest (panel); Marine Debris; Puget Sound Water Quality (panel); Growth Records in Otoliths; Oil Spills (Washington and Alaska—real time!); and Hanford. At the banquet, members and guests were treated to a tour of the Antarctic. Evening meeting attendance averaged 25 members and guests but, more importantly, over the course of time, the number of different people attending one or more District meetings continued to grow. Since Ms. Kate Myers and I took over in September 1988, a cumulative total of over 200 members and guests have attended a District function.

The expanded District Newsletter resulted in many compliments, including (and especially) from outlying members who can rarely get to meetings. For many regional members this is one of their few links of communication outside home (retirees) or office. Especially rewarding has been the "vitae" about new members, researched and prepared by Mike Fredin. This activity also aided our nominations search and election. Many of the reports carried right on through to BRIEFS, such that we were major contributors to national news.

A result of this expanded communication is that the District incurred expenses ranging from $50 to $100 per month. Requests for contributions mid-season resulted in a rapid response to the extent of several hundred dollars, with most contributing $5, but some as much as $50. A checking account was established and Mr. Greg Bargmann appointed as Treasurer.

The tasks of programs and newsletters consumed most of the officers' available extra time. We conducted less explicit action on awards, membership, and professionalism. However, membership and meritorious certificates were awarded during evening meetings on several occasions and, as a result of open meetings and advertising, many new people were exposed to us, resulting in a low but continuing increase in actual membership.

Especially rewarding has been the help continuously, and for many years, provided by Mr. Doug Weber (NMFS, Mukilteo) for refreshments and behind-the-scenes help at meetings. He deserves an award or similar recognition. We hope Mike Fredin will continue to provide his expertise via interviews of new members. I appreciate the encouragement offered by Past Director Ron Westley. I believe we have now achieved the "revitalization" he hoped for and urge anyone seeking to "revitalize" to read the report by the 1986 Revitalization Committee chaired by the late Jon Isakson. I am absolutely delighted with the enthusiasm of Director, Vice-Director, Treasurer elect Don McCaughran, Paul Dinnel, and Greg Bargmann (and their expanded team of committee members) to continue and expand on our efforts.

My greatest desire now is that the AIFRB National Committee support our active District via a return of funds sufficient to ensure continuation of the newsletter and related costs. The *true* cost of running an active District, involving one quarter of the entire AIFRB membership, is $750 to $1000. Recognizing and supporting this from the national level will allow current officers to focus squarely on good and professional activities and programs.

Alan J. Mearns, *Director*

New Business

A motion was made to authorize the payment of $200 from the AIFRB treasury to each District on an annual basis. To receive the funds, each District would be required to request the $200 annually. The motion carried.

Nominations were made for candidates for AIFRB officers to take office in 1990. Nominees for the office of President-Elect are Jack Helle of the Southeast Alaska District and Clark Hubbs of the Texas District.

1990 Meeting

The 1990 meeting of the AIFRB Board of Control will be held on August 25-26 at the Pittsburgh Hilton, Pittsburgh, Pennsylvania.

Adjournment

President Charles F. Cole adjourned the Board of Control meeting at 11:40 a.m. on September 3.

Financial Report

The condition of AIFRB's finances was reported by Treasurer Joseph Rachlin at the Board of Control meeting at Anchorage, Alaska on September 2, 1989. A synopsis of the report is presented here.

AIFRB
Treasurer's Report, Fiscal 1989
as of 22 August 1989

CREDITS:		
Dues Receipts		$17,529.35
Balance Carryover from Fiscal 1988		6,218.12
Miscellaneous, Deposit/Cover Withdrawal		10.00
Deposits for Dr. Fry's Dinner, Toronto		85.74
Rental of Mailing List		490.00
	Total Credits	**$24,333.21**
DEBITS:		
Treasurer's Expenses:		
Assistant		$ 1,426.50
Insurance Bond		100.00
IRS Fee for Exempt Status Determination		300.00
Computer Supplies, Mailing Labels		87.13
Representative to NY/AFS-Recruitment		50.00
Treasurer's Stationary Stock		350.15
Dues Notice Postage		360.10
Bank Charges-Canadian Exchange Costs		80.00
Bank Charges-Members Bounced Checks		50.00
Miscellaneous		10.00
	Subtotal	**$ 2,813.88**
BRIEFS:		
Production and Postage		$ 2,337.76
Coastal Press, Printing		3,830.10
Editor's Costs		34.22
	Subtotal	**$ 6,202.08**
Awards:		
Associate Member Travel Award Program		$ 850.00
W.F. Thompson Award-Kathleen S. Mayer		750.00
	Subtotal	**$ 1,600.00**
Other:		
AIFRB-Letterheads, Coastal Press		$ 101.85
Travel to 1988 AIFRB Board Meeting		1,475.69
Dr. Fry Banquet and Gift		188.31
Travel Adv. to 1988 AIFRB Board Meeting		600.00
Membership, 300 Certificates, Dr. S. Ray		842.13
	Subtotal	**$ 3,207.98**
	Total Debits	**$13,823.94**
ASSETS:		
I-Liquid:		
Prudential-Bache Money Market		$ 2,810.00
Prudential-Bache Cash Account		33.98
Checkbook Balance		10,509.27
II-Asset Funds:		
Blackstone Income Trust Inc. 360.00 sh.		$ 3,285.00
*P-B. Municipal Ser Fund NJ 663.444 sh.		7,025.87
P-B. Equity Fund 611.896 sh.		7,036.80
P-B. Govt. Sec. Int. Trust 696.123 sh.		7,016.92
P-B. Utility Fund 267.386 sh.		4,853.06
CD Gibraltar Sav FSLIC 5 at $1000 each		5,000.00
*Result of Sale of P-B Incomevertible on 13 June '89		
	Total All Assets	**$47,570.90**

1989 Candidates for AIFRB President-Elect

John H. (Jack) Helle

Jack Helle is a Fishery Research Biologist at the Auke Bay Biological Laboratory of the National Marine Fisheries Service at Auke Bay, Alaska, where he has been involved in coastwide salmon studies. Since 1982, he has had major responsibilities in U.S./Canada salmon interception research, including responsibility for coordinating the enumeration of major sockeye spawning populations in Southeast Alaska; responsibility for coordinating cooperative studies on separation of sockeye by scale methods, electrophoretic techniques, and parasite marker analysis; preparation of technical documents for treaty negotiations; planning and coordinating large-scale marking programs to determine interception rates; and coordination of radio telemetry studies on salmon in transboundary rivers. Helle also serves on the Northern Boundary Technical Committee of the Pacific Salmon Commission and is a Technical Advisor to the Pacific Salmon Commission, Northern Panel, U.S. Section.

Jack Helle was born on April 26, 1935 in Williston, S.D. He received B.S. and M.S. degrees in fishery management at the University of Idaho. In 1964-65, Jack studied at the University of Aberdeen in Scotland and was named Honorary Research Fellow, working on osmotic relations of developing Atlantic salmon eggs. In 1979, he received the Ph.D. degree in fisheries science from Oregon State University.

After gaining experience in positions with the U.S. Forest Service and the U.S. Bureau of Commercial Fisheries from 1953 to 1960, Jack began his permanent employment career as a Fishery Research Biologist with the Bureau of Commercial Fisheries in the Auke Bay Biological Laboratory to learn what factors limit the abundance of pink and chum salmon that spawn in stream intertidal zones. From 1965 to 1972, his work emphasized evaluation of the effects of the Alaska Earthquake on production of pink and chum salmon, and the main objective of his research from 1972 to 1981 was to describe the environmental and hereditary relationships that influence marine growth, survival, and age at maturity of chum salmon.

Jack Helle has authored more than 40 papers and reports, delivered over 30 papers at meetings and symposia, and given more than 30 lectures at seminars. He became a member of the Amercian Fisheries Society in 1959 and is a Certified Fishery Scientist of AFS. He is a member of Xi Sigma Pi, Pacific Fishery Biologists, and AAAS. He has been a member of AIFRB since 1958 and a Fellow since 1985, and was Director of the Alaska District in 1981-83. Helle's consulting activities have focused on providing outside agencies and private organizations with age analysis of various chum salmon runs and furnishing information concerning genetic considerations in planning for management strategies of wild and cultured stocks of salmon. He has been an Affiliate Associate Professor in the School of Fisheries and Science at the University of Alaska since 1983.

Clark Hubbs

Clark Hubbs is Clark Hubbs Regents Professor in the Department of Zoology of the University of Texas at Austin. In this capacity he has teaching and research responsibilities; the research he supervises is designed to answer questions regarding the reasons fishes are able to live in their environments and how they became adapted to succeed there.

Clark was born on March 15, 1921 in Ann Arbor, Michigan and received the A.B. degree from the University of Michigan in 1942. After 3½ years in the U.S. Army in World War II, he returned to academia and received the Ph.D. degree from Stanford University in 1951.

Hubbs' extensive teaching career began at Hopkins Marine Station in 1948 and includes ranks from Instructor to Professor at the University of Texas; Visiting Professor, University of Oklahoma; Member of the Graduate Faculty, Texas A&M University; Chairman, Division of Biological Sciences, University of Texas; Chairman, Department of Zoology, University of Texas; Curator of Ichthyology, Texas Memorial Museum; and his present position.

Clark's society memberships include the American Institute of Biological Science; American Society of Ichthyologists and Herpetologists (President, 1987); American Fisheries Society (Chairman, Environmental Quality Committee, 1970-72; Chairman, Endangered Species Committee, 1970-72; Chairman, Exotic Species Committee, 1975-76); Society of Systematic Zoologists; National Audubon Society; Texas Academy of Science (President, 1972-73); Southwestern Association of Naturalists (President, 1966-67); Ecological Society of America; American Society of Naturalists; American Society of Zoologists; Desert Fishes Council (Chairman, Chihuahua Desert, 1974-76); Southeastern Fishes Council; Ichthyology Society of Japan; AIFRB; International Society of Ecology; Texas Organization of Endangered Species (President, 1978-79); and American Elasmobranch Society.

Clark Hubbs' professional activities and honors have included: Managing Editor of Copeia, 1971-84; Editor of the Texas Journal of Science, 1957-61; Award of Excellence, American Fisheries Society, 1988; Advisory Committee, Fish, Wildlife, & Parks, U.S. Department of the Interior, 1975-77; Fish Advisory Committee, Union Internationale pour la Conservation de la Nature, 1976-; Leader, Rio Grande Fishes Recovery Team, U.S. Department of the Interior, 1978-; Consultant, Pan American Health Organization, 1981-82; U.S. Representative, European Ichthyological Congress, 1985-88; Director, Sea World Research Institute, 1985-; Biology Advisor, Board of Higher Education, State of Mississippi, 1983; Biology Consultant, Board of Higher Education, State of Arkansas, 1987; Trustee, Texas Nature Conservancy, 1988-.

Clark has an extensive list of publications dealing with ichthyology, fishery biology, and ecology.

Clark Hubbs joined AIFRB in 1970 as a Fellow.

In Memoriam

Colin Keith Harris

Member 1984

August 2, 1989

On August 2, 1989, Dr. Colin Keith Harris died of AIDS. Colin was one of the foremost biologists in the study of oceanic distributions of Pacific salmon stocks, and of the Japanese fisheries targeted on them.

Born in 1949, Colin received his BS from the University of Washington College of Fisheries in 1971. He joined AFS in his senior year and became the first student intern at the Society's Executive Office in Washington, D.C. Renowned conservationist Henry Clepper directed Colin in writing and editorial assignments, and the skills Colin developed became one of his trademarks later in his career.

He obtained his MS in 1973 from the University of Michigan on diurnal onshore/offshore movements of the fish community of western Lake Erie, and returned to the University of Washington to enter a doctoral program. He completed a survey of the habitat and distribution of the Olympic mudminnow, made major contributions to the book *Inland Fishes of Washington*, and served as project leader of the OCSEAP Kodiak estuary survey of nearshore fish communities.

The majority of Colin's career was spent as project leader of the UW Fisheries Research Institute's (FRI) high seas salmonid program dealing with US interests in the Japanese salmon driftnet fisheries in the North Pacific. In this capacity he directed major high seas salmon tagging cruises for the US, and US participation in cooperative USSR-US tagging cruises. He oversaw a series of scale pattern analyses designed to identify distribution of North American and Asian sockeye, coho, and chinook salmon in the North Pacific. A paper derived from this work was judged the most significant paper in the *North American Journal of Fisheries Management* in 1987. He was a mainstay at meetings of the Salmon Sub-Committee of the International North Pacific Fisheries Commission (INPFC), where he instituted several changes that streamlined the work of the Sub-Committee and the production of its report. Weeks before his death, Colin completed his Ph.D. dissertation, a major study of the effects of changes in the USSR-Japan and North Pacific fishing treaties on the Japanese high seas salmon fisheries.

His colleagues at FRI and INPFC sorely miss his comprehensive knowledge of high seas salmon fisheries, his phenomenal memory, his boundless energy, his merciless editorial pen, and his warm and giving personal friendship.

Richard A. Marriott

Member 1970

1989

AIFRB, and especially the Southeast and Northern Alaska District members, note with remorse the death of Richard A. Marriott early this spring. Dick was an enthusiastic and active member of AIFRB, and his contributions to fisheries in Alaska and AIFRB will be sorely missed.

He was born in 1936 in Mission City, B.C. and graduated in 1960 from the University of Washington with a B.S. degree in fisheries science. Before and after graduation, he worked for the University of Washington on sockeye salmon research in Bristol Bay.

From 1962 until his retirement in 1982, Dick worked for the Alaska Department of Fish and Game, first on sockeye research at Afognak Island, then for 5 years in Kodiak as the sport fish area management biologist for Western Alaska. He had lived in Douglas since 1969, working as the coho research project leader for Southeast Alaska and the sport fish area management biologist for the Juneau-Yakutat area.

In addition to membership in AIFRB, Dick Marriott was a member of the American Fisheries Society and the Pacific Fishery Biologists.

Our People

Carlos Fetterolf (Fellow 1973) has been elected second vice-president of the American Fisheries Society and took office in September at the Society's annual business meeting in Anchorage, Alaska. Mr. Fetterolf will serve as an officer of the Society for the next 3 years before assuming the presidency in 1992.

Since 1975 Mr. Fetterolf has been executive secretary of the Great Lakes Fishery Commission. He earned his B.S. in wildlife management/zoology at the University of Connecticut and his M.S. in fisheries biology from Michigan State University. The first 5 years of his career were spent with the Tennessee Game and Fish Commission. In 1958 he joined the Michigan Water Resources Commission. After special assignment to the National Academy of Sciences, he became chief environmental scientist for the Michigan Department of Natural Resources in 1972.

An AFS member since 1951, Mr. Fetterolf has served as president of the Southern Division and the Water Quality Section, been active in the Michigan Chapter, and served on several AFS committees.

In addition to his activities with AFS, he has served as president of the North American Benthological Society and the International Association for Great Lakes Research. In 1986, he received Michigan State University's Distinguished Service Award for his career contributions to natural resources.

Also taking office were first vice-president **Richard W. Gregory** (Member 1972) and president-elect **Larry A. Nielson** (Fellow 1989).

Dr. Richard Frie (AIFRB Associate Member 1953) has been named assistant professor of fisheries at the University of Wisconsin.

Dr. Larry A. Nielsen (AIFRB Fellow 1982), president-elect of the American Fisheries Society, has received the 1989 Certificate of Teaching Excellence of the College of Agriculture and Life Sciences at Virginia Tech. He is a professor of fisheries and wildlife sciences at Virginia Tech where he has been a member of the faculty since 1977.

Dr. Donald Orth (AIFRB Associate Member 1982) has received the School of Forestry and Wildlife Resources' Outstanding Faculty Award at Virginia Tech. Don is associate professor in the Department of Fish and Wildlife Sciences. The award is based on evaluations by students and faculty colleagues, and is presented in recognition of dynamic teaching ability, professional attitude toward teaching, and outstanding relationships with students.

Dr. James D. Hall (AIFRB Member 1971), **Dr. Fred H. Everest** (AIFRB Member 1972), and **Donald A. Duff** (AIFRB Member 1979) spent last June in Ireland as part of a scientific and technical exchange program in which they studied the long-term cumulative effects of deforestation and grazing on riparian zones and the physical structure of habitat for anadromous salmonids in Ireland and the western U.S.

BRIEFS, the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

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American Institute of Fishery Research Biologists

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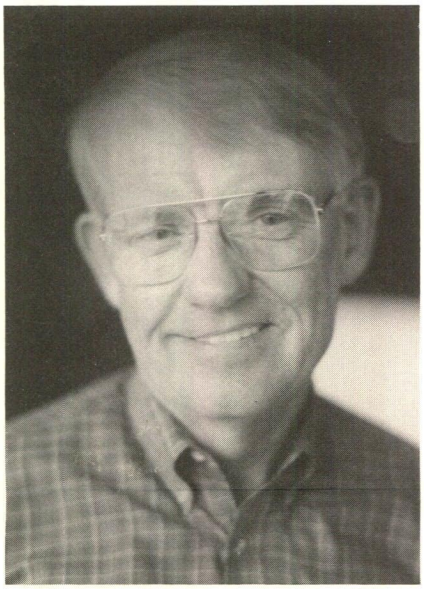
FIRST CLASS

American Institute of Fishery Research Biologists

. . . BRIEFS . . .

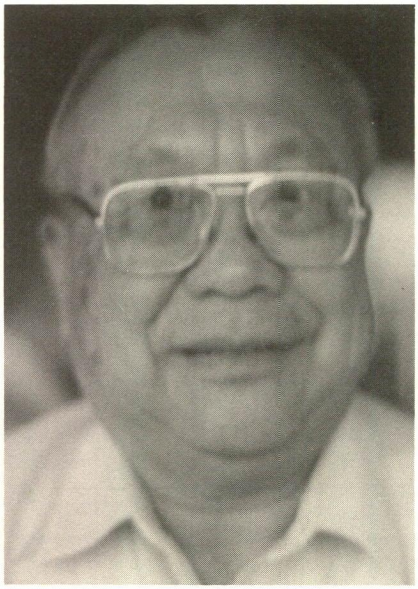
VOL. 18, NO. 6 DECEMBER 1989

AIFRB Officers — 1989-1990

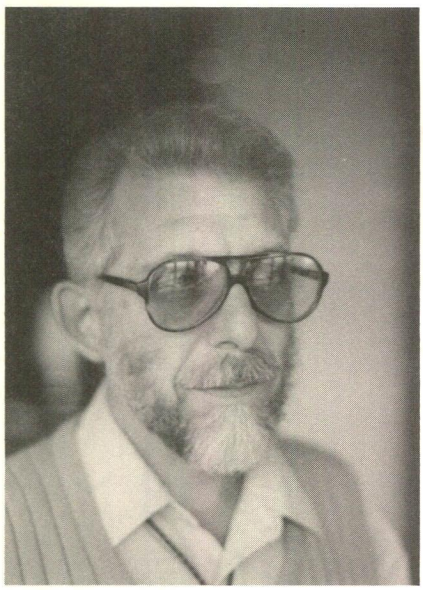


Charles F. Cole
President

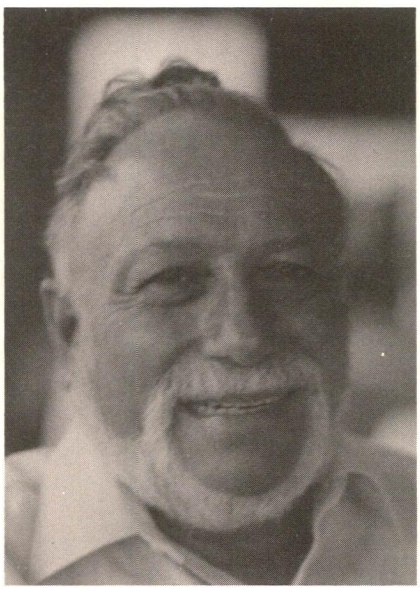
John R. Hunter
Past President



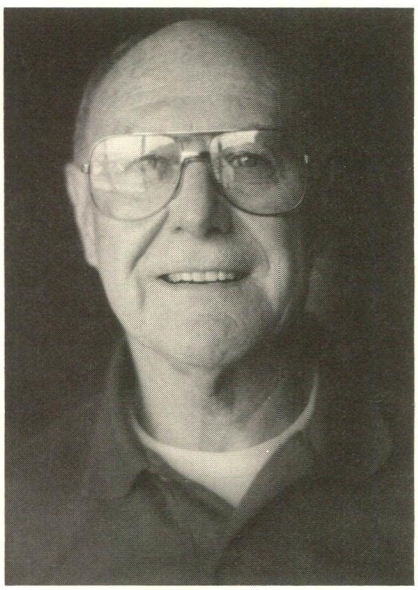
Roy E. Nakatani
Secretary



Joseph W. Rachlin
Treasurer



Sammy M. Ray
Membership Chairman



Oliver B. Cope
BRIEFS Editor

AIFRB Travel Assistance Program

Purpose:

To provide travel assistance for qualified graduate students and other associate members so that they may present a paper at a scientific meeting of their choice.

Eligibility:

All Associate Members of AIFRB

Application:

Submit written request, letter of support from your research mentor or supervisor, copy of abstract of paper, and notification of paper's acceptance for a specific meeting to:

Dr. Joseph W. Rachlin
Department of Biological Sciences
Lehman College of C.U.N.Y.
Bedford Park Boulevard West
Bronx, New York 10468-1589

Deadline:

April 1st of each year for meeting during that calendar year.

Note:

Recipients of Travel Assistance Awards will have their name and abstract published in BRIEFS.

1989 Recipients

Ms. Haejung An	University of Florida
Mr. Patrick J. Harris	East Carolina University
Mr. Donald L. Pereira	University of Minnesota

Southeast Alaska District Nominates Winners

The Southeast Alaska District saw their efforts bear fruit with the announcement last May that Jim and Mary Lou King of Juneau had been given a Chevron Conservation Award. The Kings were among only 21 individuals and 4 organizations from across the U.S. that were honored.

The District compiled an inch-thick folder detailing the successes of Jim and Mary Lou in promoting conservation activities in the Juneau area. Among their accomplishments during the past 25 years have been: helping to win designation of 3,764 acres of Mendenhall wetlands as a state game refuge; protecting Juneau's public lands and making them more accessible; and introducing a whole generation of school children to the area's rich marine environment through the Sea Week program.

Sea Week was developed as a series of field trips, a different trip for each grade level. Mary Lou helped put the field trips together and led many of them. Jim wrote the student booklet on birds for the 4th grade—this tied into the wetlands walk. The program spread from Auke Bay School throughout the Juneau public school system and Southeast Alaska and finally into a statewide program now known as Alaska Sea/River Week. Now, over 19,000 children in 150 schools participate in Sea or River Week studies; Sea Week was selected as one of the ten best environmental education programs in the nation in the 1985 National Science Teachers Search for Excellence in Environmental Education. Mary Lou King's booklet, *90 Short Walks Around Juneau,* tells of perhaps the most exciting trail system in America, a system where we can explore some of the world's richest intertidal sea beaches, virgin spruce-hemlock rain forests, glaciers, ice fields, alpine meadows, and spectacular mountains rising from the sea.

The Southeast Alaska District is to be congratulated for the success of their project to promote the bestowal of this award. Perhaps other Districts can follow the lead of the Southeast Alaska District and secure recognition for outstanding conservationists in their areas.

Fox Named NMFS Director

Dr. William W. Fox, Jr. (AIFRB Fellow 1984) has been appointed Director of the National Marine Fisheries Service. Bill leaves the University of Miami's Rosenstiel School of Marine and Atmospheric Science (RSMAS) where he is a professor of biology and living resources. At RSMAS he conducted research on the population dynamics of tropical fishery resources and developed stock assessment methodology. He also taught a graduate-level course in fishery management science, directed the Cooperative Institute of Marine and Atmospheric Studies, and served as the University's campus coordinator of the Florida Sea Grant Program. In addition to his university responsibilities, Bill has served as one of seven members on the State of Florida Marine Fisheries Commission since 1983 and as a Commissioner of the U.S. Marine Mammal Commission since 1987. He was appointed chairman of the Marine Mammal Commission by President Reagan in 1988. Prior to joining the faculty at the University of Miami, Bill spent twelve years with the National Marine Fisheries Service and its predecessor agency, the Bureau of Commercial Fisheries. He has served as the scientific advisor on U.S. delegations to the Inter-American Tropical Tuna Commission, the International Commission for the Conservation of Atlantic Tunas.

Mercury Reduction Technology

New equipment and a new process are helping reduce the discharge of mercury into Minnesota's St. Louis River Area of Concern.

The Western Lake Superior Sanitary District sewage treatment plant has been identified by state officials as a major source of mercury contamination in the river. Under the U.S. federal Clean Water Act, the facility must reduce its mercury discharges by 40% by 1992.

In the new process, developed with assistance from the University of Minnesota's Sea Grant Extension program, a coagulant is added to wastewater entering the plant. Small particles in the water begin sticking together, and binding the mercury particles, before sinking to the bottom of the plant's settling ponds.

The sludge from the ponds is then removed and disposed of.

The sources of the mercury entering the plant are not clear, according to Sea Grant scientist Dianne Dorland. Nickel-cadmium batteries, for example, are one source, but cannot account for the 91 pounds of mercury the plant has been discharging each year into air and water, Dorland said.

From *The Great Lakes Reporter* Sept./Oct. 1989

FLAGSHIP

The University of Washington School of Fisheries has published another superb book as part of its *Publication in Fisheries* series. In BRIEFS (Vol. 18, No. 4, August 1989), we described *Fish for Tomorrow*, a volume concerning the early history of fishery management in the U.S., with emphasis on the development of fishery commissions. The latest in the series is *FLAGSHIP, A History of Fisheries at the University of Washington*, by Dr. Robert R. Stickney (AIFRB Fellow 1983; Director, School of Fisheries at the University of Washington.)

The writing of this history began when Dr. Richard Van Cleve, Director of the School and Dean of the College of Fisheries from 1948 to 1971, began, sometime before 1981, a manuscript chronicling the extensive history of fishery instruction and research at the University of Washington. Dr. Van Cleve passed away in 1984, the manuscript not completed and its status in question. Bob Stickney entered the picture after he began his work as Director in 1985, and, using the Van Cleve manuscript as a point of departure, dove into the archives of the Fisheries Research Institute and the University. He interviewed many of the people who contributed in various ways to the colorful history of the School of Fisheries; some of those interviewed traced their association with the program back to the 1920s. Stickney also enlisted the services of Marcus Duke, Editor for the School of Fisheries, for copy and production editing. The result is an enlightening story of the evolution of the fisheries program centered in Seattle. The book is being used to generate funds for student scholarships.

The idea for a fisheries school was born in 1913, when Hugh M. Smith, Commissioner of the U.S. Bureau of Fisheries, indicated to the American Fisheries Society that professional training in fisheries was available in Ireland, France, and Japan, but not in the U.S. The President of the American Fisheries Society appointed a committee to discuss the idea of an institution to train fisheries professionals, and, from this beginning, the first school of fisheries in the U.S. was launched at the University of Washington. After considerable correspondence among University officials, government leaders, and the editor of *Pacific Fisherman*, the College of Fisheries was established in 1919, with John N. Cobb as Director and a faculty consisting of George C. Embody and Clarence L. Anderson, and an autumn quarter enrollment of 32 men and 1 woman.

In the early years, there were several changes in faculty and curriculum, and, by 1929, the faculty numbered 6, enrollment surpassed 100, the number of courses was 29, research programs were under way, and laboratories, fish collections, and buildings had been developed. Time went by and new problems were encountered and solved. Through it all, the program grew, the faculty was enlarged, the facilities expanded, the curriculum strengthened, and the enrollment grew. There were many changes in organizational structure, changes in direction, new relationships with other fishery organizations (International Fisheries Commission, federal agencies, state agencies, International Pacific Salmon Commission), and expansion of geographic interestes (Alaska salmon, South Pacific radiation).

The Fisheries Research Institute of the University of Washington was established in 1947 to study Alaska salmon problems, with Dr. W. F. Thompson as Director of the Institute and research professor in the School of Fisheries. Each of the staff members of the Institute had affiliations with the School of Fisheries and the Alaska Salmon Industry financed the work of the Institute and maintained liaison with the Institute. The Fisheries Research Institute has contributed significantly to research on salmon, has expanded its activities to include studies on oyster pathology, shellfish toxicity, and the biology of Puget Sound fishes, and continues its operations today.

Fame has come to the fisheries program at the University of Washington through the development of the Donaldson trout, the Applied Fisheries Laboratory and its research on radioactivity and the marine environment, the Fern Lake Mineral Metabolism Program, and research on chinooks and cohos.

A succession of eminent fisheries administrators and educators who served as Director or Dean of the College, Department, or School of Fisheries (depending on the current title of the top administrator and the current name of the institution) built the academic programs leading to today's superb operation. John N. Cobb emphasized training in fishing and food processing technology. W. F. Thompson reorganized the Department, stressed the incorporation of fundamental subjects and specialized studies in fishery biology, and added new faculty members. Wilbert M. Chapman overhauled the curriculum and made a plan for acquiring new faculty. Richard Van Cleve saw the completion of the Fisheries Center, improvement of hatchery facilities, acquisition of fishery vessels, redevelopment of the fishery technology program, rebirth of the College of Fisheries, the beginning of new growth of curriculum and faculty, and subdivision of the College. Douglas G. Chapman strengthened the quantitative approaches to fisheries management. Donald Bevan oversaw growth in the School of Fisheries—in 1982, 150 projects were being conducted by 59 faculty members, and the School had 273 on the support staff and a budget of $6,222,000 (over $4,800,000 from grants and contracts). Robert R. Stickney became Director in 1985, and, as he says, the rest is history and should be written by others; those in the School of Fisheries are living it.

This book is not only for those with affiliations with the University. It is for all who have an interest in the history of fishery training and research, and for those who can appreciate the tribulations connected with management of a unit within a large university.

cont. on page 4

FLAGSHIP cont.

FLAGSHIP can be ordered from the Director's Office, School of Fisheries WH-10, University of Washington, Seattle, Washington 98185. Be sure to include a donation of $20 or more.

Our People

AIFRB people were well represented when awards were handed out at the American Fisheries Society banquet in September at Anchorage, Alaska. **Reeve Bailey** (AIFRB Fellow 1972) received the AFS Meritorious Service Award; **Howard L. Raymond** (AIFRB Member 1969) was given the award for Best Paper in the North American Journal of Fisheries Management; and **Saul Saila** (AIFRB Fellow 1984) received the Award for Excellence in Fisheries Education.

Witold L. Klawe (AIFRB Member 1962), Senior Scientist with the Inter-American Tropical Tuna Commission (IATTC) and internationally-renowned expert on tunas, was awarded the Gold Insignia of the Order of Merit of the Polish People's Republic at a ceremony held at the Sea Fisheries Institute in Gdynia, Poland, on August 31, 1989. This honor was conferred in recognition of Mr. Klawe's many contributions to the field of fisheries research, in Poland and elsewhere, and of his close ties with researchers in Poland.

Klawe, who was born in Poland, is the author of more than 50 papers and books, most of them dealing with tuna biology, particularly their early life history, and the global utilization of tunas, billfish, and other related species. His most recent publication, "Tuna and Billfish—Fish Without a Country," written in conjunction with Dr. James Joseph, Director of the IATTC, has been a popular favorite, widely read and quoted.

Since 1955, Klawe has worked for the IATTC, an international organization headquartered on the campus of the Scripps Institution of Oceanography in La Jolla, California, and dedicated to the study and conservation of the tunas of the eastern Pacific Ocean. He has travelled extensively, lecturing on tunas and tuna fisheries, and serving as a consultant to the Food and Agriculture Organization of the United Nations and the South Pacific Commission. He became a U.S. citizen in 1961.

The Order of Merit was established by the Polish government in 1974 to honor citizens of other countries for contributions which strengthen international cooperation and friendship with Poland. Dr. Zbigniew Karnicki, Director of the Sea Fisheries Research Institute, conferred the award at a ceremony attended by scientists and dignitaries from both Poland and the United States.

Robert T. Lackey (AIFRB Member 1973) has been named Deputy Director of EPA's Environmental Research Laboratory in Corvallis, Oregon. Lackey had served as Chief of the Terrestrial Branch in the same Laboratory. Prior to EPA, Lackey was with the U.S. Fish and Wildlife Service in Washington, D.C. and was a professor at Virginia Polytechnic Institute and State University.

The Corvallis Laboratory employs 350 scientists and supporting staff and has an annual budget of $28 million. Laboratory scientists conduct a nationwide program of ecological research on such diverse problems as biotechnology, acid rain, global climate change, wildlife toxicology, wetlands loss, biodiversity, air toxics, pesticide effects, stratospheric ozone loss, air pollution, and hazardous waste disposal.

District News

CAROLINA

John M. Dean, *Director*

The Carolina District has elected new officers to serve from August 1989 to August 1991. The District Director is Dr. John M. Dean of the University of South Carolina, Columbia, SC, and the District Vice-Director is Dr. Douglas S. Vaughan of the NMFS Laboratory, Beaufort, NC.

A District meeting was held on November 30 at the Town and Country Inn in Charleston, SC. Features of the meeting were the installation of officers, a business session, and a program by Dr. David S. Peters, who spoke on *Overview of NMFS Habitat Research in the Southeast.*

NORTHWEST WASHINGTON

Donald A. McCaughran, *Director*

The Northwest Washington District has elected new officers. Donald A. McCaughran of the International Pacific Halibut Commission is the Director, Paul A. Dinnel of the Fisheries Research Institute is the Vice-Director, and Gregory G. Bargmann of the Washington Department of Fisheries is the Treasurer. Alan J. Mearns becomes the outgoing Director, Doug Weber will handle arrangements and refreshments, and Kate Myers and Mike Fredin will produce the District newsletter.

On October 26, the first District meeting of the year took place in Seattle. A panel of experts, Don McCaughran of the Halibut Commission, Craig Bowhay of the Northwest Indian Fisheries Commission, and Mark Pedersen of the Washington Department of Fisheries, presented *Halibut: Competition for a Limited Resource/Halibut Allocation for the Northwest Coast.*

Meeting Announcements and New Publications

Sturgeon Workshop

The University of Wisconsin Sea Grant Institute, the John G. Shedd Aquarium, and Sturgeon for Tomorrow will sponsor a *North American Lake Sturgeon Workshop* in Milwaukee, Wisconsin on February 4-7, 1990.

Lake sturgeon once ranged extensively throughout central North America. This fish still thrives today in some areas, but isolated groups of sturgeon are struggling for survival. Damming, dredging, water flow manipulations and myriad other human influences continue to sabotage the preservation of this species.

In some areas, the fish is doing well and is only under "watch" status for protection, while in other areas the species struggles to hang on and is considered "endangered." This varied approach to protection—coupled with different levels of abundance and interest—has made it difficult to obtain funds for lake sturgeon research.

The lake sturgeon has long been considered a relict—impossible to bring back to past levels of abundance. While some landlocked populations, managed for a fishery, are showing signs of decline, other free-ranging groups seem to be making a comeback. This workshop is designed to bring everyone working on lake sturgeon in North America together to exchange information, make new contacts and open new lines of communication.

The agenda will cover distribution, life history, rehabilitation techniques, population dynamics, taxonomy and genetics, research equipment and methodology, and management.

Information is available from Thomas F. Thuemler, Wisconsin Dept. of Natural Resources, Box 16, Industrial Parkway, Marinette, WI 54143.

Symposium on Catch-Effort Sampling

The Humberside International Fisheries Institute at the University of Hull, in cooperation with the European Inland Fisheries Advisory Commission, the Institute of Fisheries Management, the Fisheries Society of the British Isles, and the American Fisheries Society, will hold an *International Symposium on Catch-Effort Sampling Techniques* on April 2-6, 1990 in Hull, England.

The symposium will review the main applications, strategies, and developments of catch-effort sampling techniques in the management of inland fisheries; examine the factors that limit the value of catch-effort data as a tool in management; examine catch data from commercial fisheries and the application and success of using these data to develop strategies to maintain the fisheries; examine different creel census techniques; examine "put-and-take" fisheries, the nature of the data collected and how these data are used; and give anglers, angling clubs, and commercial fishermen the opportunity to share practical information with fisheries biologists.

For information, contact Dr. I. G. Cowx, Humberside International Fisheries Institute, University of Hull, Cottingham Road, Hull HU6 7RX, United Kingdom.

Floodplain River Symposium

The Louisiana Cooperative Fish and Wildlife Research Unit, the Warmwater Streams Committee of the Southern Division of the American Fisheries Society, and the U.S. Army Engineers Waterways Experiment Station will sponsor a symposium of floodplain rivers at the Hilton Hotel, Baton Rouge, Louisiana on April 9-11, 1990.

The symposium will feature theoretical and applied research reports on floodplain habitats for fishes, fisheries resources in regulated and non-regulated floodplain rivers, management of aquatic habitats in the river floodplain, riparian rights in river floodplains, primary and secondary production in floodplain rivers, and food webs and energy flow in floodplain rivers.

For information on registration and fees, write C. F. Bryant, Louisiana Cooperative Fish and Wildlife Research Unit, 124 Forestry, Wildlife and Fisheries Bldg., Louisiana State University, Baton Rouge, LA 70803-6202.

Great Lakes Fish Parasites

The Great Lakes Fishery Commission has issued its Technical Report No. 51, entitled *Parasites of Fishes in the Canadian Waters of the Great Lakes.* Edited by Stephen J. Nepasy (AIFRB Member 1980), this book contains a series of four papers on the parasitic fauna of fishes in the Ontario Great Lakes—Superior, Huron, Erie, and Ontario. The authors have attempted to provide a catalogue of the parasites found in extended surveys by the Ontario Ministry of Natural Resources since 1960. Information is presented on the prevalence of parasites, site of infection, intensity of infection, life cycle stages of parasites, and the relative importance of the parasites as fish pathogens. Relationships between parasite fauna and the degrees of euthrophication of lake habitats are discussed. The papers also contain references to parasites not encountered in these surveys, but reported in the scientific literature by other authors.

The reports will provide baseline data for biologists who are concerned with research and management of the Great Lake ecosystems. By recording the parasites extant at the particular time period for each lake it is hoped that more rigorous comparisons of the parasite fauna of fishes between lakes and between time periods for individual lakes will be possible in the future.

The papers in Technical Report No. 51 are:

Survey of the Parasite Fauna of Lake Superior Fishes, 1969 to 1975, by A. O. Dechtiar and A. H. Lawrie.

Survey of the Parasite Fauna of Lake Huron Fishes, 1961 to 1971, by A. O. Dechtiar, J. J. Collins, and J. A. Reckahn.

Survey of the Parasite Fauna of Selected Fish Species from Lake Erie, by A. O. Dechtiar and S. J. Nepszy.

Survey of the Parasite Fauna of Lake Ontario Fishes, 1961 to 1971, by A. O. Dechtiar and W. J. Christie.

This 100-page book is available *gratis* from the Great Lakes Fishery Commission, 1451 Green Road, Ann Arbor, Michigan 48105-2898.

Marine Populations

Marine Populations: An Essay on Population Regulation and Speciation has been authored by Dr. Michael Sinclair. How do physical conditions in the oceans affect fishery yields? Theory has long predicted that the abundance of fish stocks is determined mainly by environmental conditions in early life history stages, when young fish are recruited to the adult population. Now strong evidence is emerging to support that theory.

In *Marine Populations: An Essay on Population Regulation and Speciation,* Michael Sinclair reviews historical progress toward understanding factors believed to regulate animal populations, and finds the field at an impasse.

cont. on page 6

He attempts to break that impasse with a new look at marine fisheries data. Using Atlantic herring as a point of departure, he divides marine animal species into geographic stocks and examines how their aboundance and variability respond to localized physical processes. In his conclusion, he speculates on the implications his observations bear for ecological and evolutionary theory in general.

Dr. Sinclair, Director of the Biological Sciences Branch at the Halifax (Nova Scotia) Fisheries Research Laboratory, developed and defends the member/vagrant hypothesis, which emphasizes the role of geography (and, for species with a planktonic stage, water movement) in regulating the population pattern, richness, and absolute abundance of sexually reproductive marine species. Membership in a population, states the hypothesis, requires being in the right place at the right time during the life cycle.

The cost of the book is $15.00 (paperback) or $25.00 (bound). Add $2.00 for postage and handling. Washington state residents, add 8.1% sales tax. To order, contact: University of Washington Press, P.O. Box 50096, Seattle, Washington 98145. To order by phone, call 1-800-441-4115.

Sanctuary Currents

The Center for Marine Conservation (formerly the Center for Environmental Education) has issued its first *Sanctuary Currents,* an attempt to focus public attention on the National Marine Sanctuary Program, the sanctuaries, and the sites being considered as sanctuaries.

This newsletter will be published quarterly and will not only give the reader a current and comprehensive overview of the marine sanctuary program but also will let the reader know how to participate in different areas.

This Fall 1989 issue contains articles on Cordell Bank, Flower Garden Banks, Monterey Bay, Washington Outer Coast, Northern Puget Sound, Stellwagen Bank, and the Florida Keys.

The Center for Marine Conservation is a private non-profit organization dedicated to protection of our nation's ocean and coastal wildlife and habitat and is located at 1725 DeSales St., NW, Washington, D.C. 20036.

New FAO Fishery Publications

UNIPUB, 4611-F Assembly Drive, Lanham, MD 20706-4391, distributes publications of the Food and Agriculture Organization of the United Nations. The following recent FAO fishery books are available from UNIPUB.

The Fisheries Forecasting System in Japan for Coastal Pelagic Fish (FAO Technical Paper No. 301). Yamanaka, I, *et al.*

Prepared as part of FAO's regular program activities, first, to introduce the fisheries forecasting system employed in fishing for coastal pelagic fish around Japan, and second, to provide technical information on global and specific requirements for both the infrastructure and technical backstopping for fisheries forecasting to facilitate the examination of the applicability of such a system in other Member Countries.

1988, 72 pages, $9.00. Order No. F571X.

Contributions to Tropical Fisheries Biology (FAO Fisheries Report No. 389) Venema, S. *et al.*

Papers from the FAO/DANIDA Follow-up Training Course on Fish Stock Assessment in the Tropics, Manila, Philippines, January 12-February 6, 1986 and Hirtshals, Denmark, May 5-30, 1986. Includes papers on the dynamics of tropical invertebrates, demersal, and pelagic fishes and on biological and technical interactions in tropical multispecies stocks and fisheries.

1988, 519 pages, $50.00. Order No. F7072.

International Introductions of Inland Aquatic Species (FAO Fisheries Technical Paper No. 294). Welcomme, R. (compiler).

A register of all known introductions of fish species into inland areas outside of their native range, drawn from questionnaires sent to over 300 correspondents and from a survey of the scientific literature. Summarizes trends, motives, and risks and discusses risk reduction methods. Entries in the register are listed in alphabetical order by genus name and are supplemented by subject and species indices.

1988, 318 pages, $15.00. Order No. F3246.

Synopsis of Biological Data on the Northern Pike, Esox lucius *Linneaus, 1758* (FAO Fisheries Synopsis No. 30, Rev. 2) Raat, A.

A consolidation of all available published data on the biology, growth, migration, and population dynamics of the northern pike, *Esox lucius*. This report, last updated in 1969, is based on a survey of literature found in the Aquatic Sciences Fisheries Abstracts, the Sport Fisheries Abstracts, and the Landwirtschaftliche Zeitschrift. Includes taxonomy and distribution, bionomics and life history, population, exploitation and management, and northern pike culture.

1988, 178 pages, $18.00. Order No. F3248.

The Application of Remote Sensing Technology to Marine Fisheries: An Introductory Manual (FAO Fisheries Technical Paper No. 295). Butler, M. *et al.*

Introduces the science and technology of remote sensing in terms of its history, concepts, and language, and its application to the exploitation and management of marine fisheries. Designed for personnel who are responsible for the development and management of marine resources. Recommended reference material, a glossary of terms and acronyms, sources of oceanographic satellite data, and a selected list of training institutions conclude this manual.

1988, 165 pages, $18.00

Taxonomic Authority List: Aquatic Sciences and Fisheries Information System (FAO Reference Series No. 8). de Luca, F.

The Aquatic Science and Fisheries Information System (ASFIS) is an international information system for the science, technology and management of marine and freshwater environments, including their socioeconomic and legal aspects.

1989, 465 pages, $43.00. Order No. F7722.

Tuna and Billfish Book

The Inter-American Tropical Tuna Commission announces the publication of a much enlarged and extensively revised edition of its highly acclaimed book, *Tuna and Billfish—Fish Without a Country.* This fourth edition has text by James Joseph, Witold Klawe (AIFRB Member 1962), and Pat Murphy, introduction by Roger Revelle, and paintings by George Mattson.

The book is a concise, comprehensive, and authoritative reference for all 61 species of tunas, billfishes, and their relatives. It is written in clear, non-technical language, and covers the life history, migrations, and geographic ranges of these magnificent fish, as well as fishing methods and techniques commercial and recreational fisheries, and resource conservation. Also included are a bibliography and a list of all-tackle records of sport catches. The book is printed on high-quality paper, and is profusely illustrated with photographs, color plates, and maps, plus line drawings of each of the 61 species. Among the 28 full-page color plates are 23 reproductions of outstanding watercolor paintings of fish.

This treasure trove of information for fishermen, marine buffs, armchair adventurers, nature lovers, biologists, and anyone who appreciates things of beauty, is available from Tuna and Billfish Book, Box 271, La Jolla, CA 92038 for $15.75.

Thesis Abstracts

Erythrocythic Inclusion Body Syndrome: A Viral Disease of Salmonid Fish

Stephen Carl Piacentini, M.S. 1989
Oregon State University

Erythrocytic inclusion body syndrome (EIBS), a viral disease of salmon, was investigated. Reliable artifical infections were established in coho salmon *(Oncorhynchus kisutch)* via intraperitoneal injection of homogenized kidney, spleen, and blood from naturally infected animals. By examining the exposed fish periodically for viral inclusion bodies and hematocrits, the disease progression for EIBS was determined. Erythrocytic inclusion body syndrome has four stages, which are incubation, inclusion body formation, lysis, and recovery. After an incubation period, circulating erythrocytes developed cytoplasmic inclusions and the numbers of infected cells increased to a maximum. The lysis stage followed and was characterized by lysis of erythrocytes with inclusions, lower hematocrits, and an accompanying anemia. When hematocrits were lowest, no cells with inclusions were observed. Following the anemia, the fish began to recover, as indicated by an increase in circulating lymphocytes and immature erythrocytes. When the fish had recovered, their hematocrits were normal, serum was protective in passive immunization experiments, the fish showed resistance to reinfection, and tissues from the recovered fish were no longer infectious.

The four states of EIBS were discerned in infected fish held at temperatures of 6, 9, 12, 15, and 18 °C but as the temperature increased, the incubation time, time to maximum inclusions, duration of the inclusion stage, and the time to recovery decreased. Numbers of inclusions were highest in fish held at 6 and 9 °C. In histological analysis, cells of the liver, anterior kidney, and spleen from infected fish were not necrotic indicating the virus was specific for the erythroid cell. Hemosiderin, a protein-iron pigment, accumulated in the spleen following cell lysis. Utilizing the artificial infection, rainbow *(Oncorhynchus mykiss)* and cutthroat *(Oncorhynchus clarki)* trout were determined to be susceptible, but the disease was much less severe in these species than in chinook *(Oncorhynchus tshawytscha)* and coho salmon, the natural hosts of the virus. Additional results indicated EIBS is transmitted horizontally and that infected fish may be immunosuppressed. Staining of blood smears with acridine orange has indicated the genome of the virus is single stranded nucleic acid.

Thermodynamic Relationships Between Trophic Levels in a Small Lacustrine Ecosystem in the Canadian Arctic

Peter Vanriel, M.S. 1989
University of Manitoba

Theory indicates that within an ecosystem energy density (energy per unit biomass) increases with ascending trophic levels. This appears to be one of the requirements for ecosystem stability; others are increase in life span and increase in size. Together these factors increase "action" (energy density x biomass x time). Stability is most apparent in autonomous ecosystems. The present investigation was designed to test the thesis that the steady state or climax represents a condition of minimum energy dissipation (least value of the P/B ratio); to attain this condition energy density increases along the food chain. It was postulated that a highly autonomous ecosystem should display such an increase. For this reason Keyhole Lake, Victoria Island, N.W.T., was selected as the study site. Samples of benthic bacteria and detritus, benthic algae, phytoplankton, benthic invertebrates, zooplankton, and Arctic char *(Salvelinus alpinus)* were collected for energy density determination. Stratified random sampling was selected for biomass estimation of most trophic levels. Arctic char were captured mainly with multi-mesh gillnets; biomass was estimated by decline in catch per unit of effort. Physical and chemical limnological surveys were conducted. Energy density was determined using microbomb calorimetry on all trophic levels. Taxa within trophic levels were treated individually where separation was possible. Ages of Arctic char were determined from otoliths. Total energy contained in each trophic level or taxon was calculated.

The results verify the hypothesis: energy density increases with each succeeding link along the food chain. It appears that energy density is a major determinant of the direction of energy flow in an ecosystem. Trophic level pyramids of energy density and biomass displayed an inverse relation-

cont. on page 8

Thesis Abstracts cont.

ship. Obscure relationships were disclosed: energy densities of the links along the food chain were highly correlated with the logarithm of biomass and biomass energy. The Arctic char population recovered in a well-damped manner after a severe depletion. Illumination of the role of energy density contributes to a unified theory of energy relations in ecosystems. These findings support a theory of ecosystem structure and behaviour based on thermodynamic principles.

Membership Report

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