W. H. Bayliff

American Institute of Fishery Research Biologists

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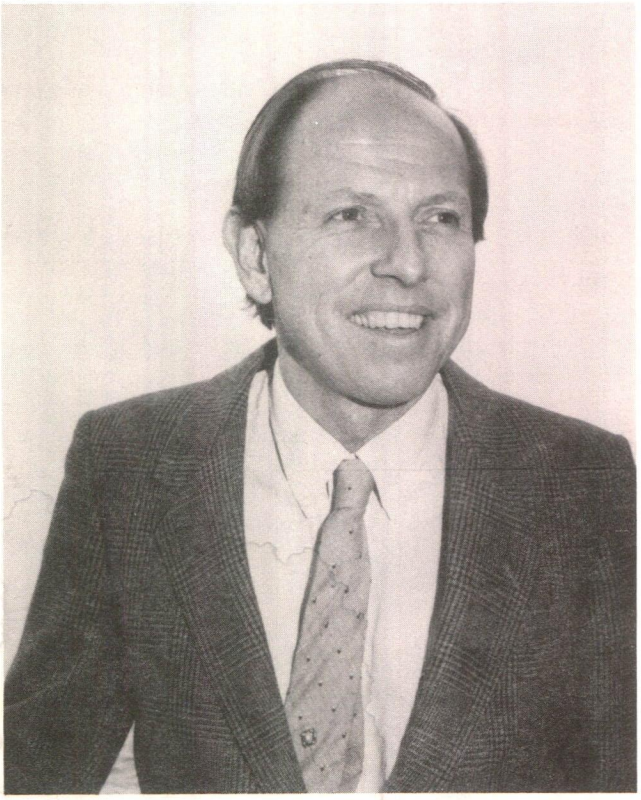
Our President-Elect



The Institute's new President-Elect, Dr. John R. Hunter, is a man of many talents and achievements, and AIFRB is proud to have him as the latest in the long line of distinguished fishery scientists who have served as our leader. John is Supervisory Fishery Biologist (Research) with the National Marine Fisheries Service at La Jolla, California and Adjunct Professor in Scripps Institution of Oceanography, University of California, San Diego.

Born in 1934, Dr. Hunter received a B.A. degree at the University of California at Santa Barbara in 1956, a M.S. degree at the University of Wisconsin in 1958, and a Ph.D. degree in 1962 at the University of Wisconsin. All degrees were in zoology. He became a Fishery Biologist (Research) with NMFS at La Jolla in 1962, and moved upward to his present position in 1975.

His research interests focus on behaviour and physiology of fishes in relation to the ecology and management of marine fish populations, although he has also done considerable research on freshwater fishes. His past studies have included investigations of feeding ecology, predator vulnerability, growth, habits, and schooling of adult fishes; estimation of reproductive parameters required for biomass estimation and reproductive energetics of fishes; swimming energetics, growth conversion efficiencies, and energy budgets of adult and larval fishes; fish attraction devices; and estimation of the effects of UV radiation on marine fish larvae.

John Hunter has received several honors and awards, including the U.S. Department of Commerce Gold Medal for Fishery Research; Scholar in Residence, Rockefeller Foundation Bellaglo Study and Conference Center, Italy; and Two Best-Publication-of-the-Year Awards in *Fishery Bulletin*. In addition to the AIFRB, he is a member of the American Fisheries Society.

Dr. Hunter has given numerous invited lectures in this country, Norway, Taiwan, and the Philippines, and has had service on several committees and panels, including publication and editorial boards. His own technical papers, reports, and book chapters (as author or co-author) number more than 50.

John has been very active in supervising biologists (18 in 1985) and in guiding the work of graduate fishery students as committee chairman.

AIFRB looks forward to having John Hunter become familiar with the detailed workings of the Institute during his indoctrination as President-Elect and having him lead us after he becomes President at the Board of Control meeting in 1986.

Honors for AIFRB People

Hugh MacCrimmon

Our President, Hugh MacCrimmon, is the recipient of a new honour, having been recently elected as a Fellow of the Institute of Fisheries Management. The Institute is an international organization which was created in 1969, and is dedicated to the advancement of fisheries management in all its forms. Like the AIFRB, it recognizes various levels of professional accomplishment. Its activities include training programs, study courses, symposia, and the publication of a Newsletter and the *Journal of Aquaculture and Fisheries Management*. Hugh's award is in recognition of his contributions to fisheries management in the field of research.

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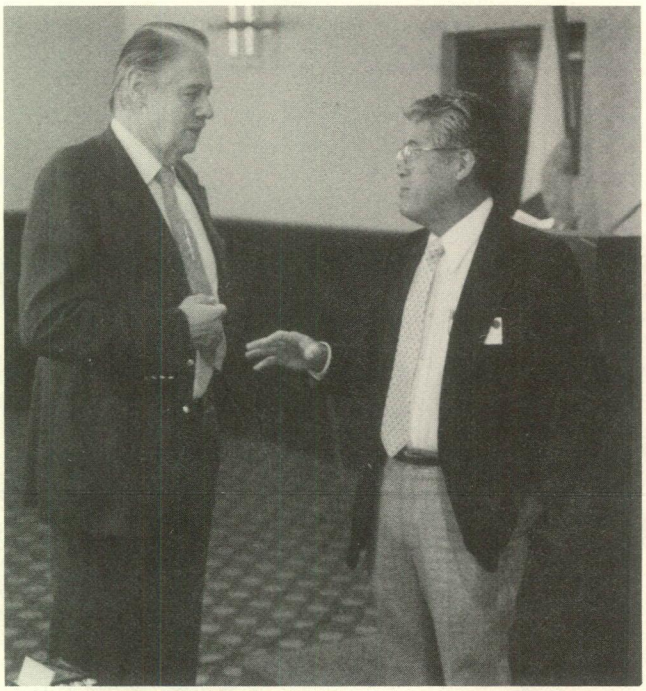
Honors For AIFRB People cont.

James M. Walton

Jim Walton was appointed to the Washington Game Commission last September. He is director of the Fisheries Technology Program at Pennisula College in Port Angeles, Washington and is currently the president of the North Pacific International Chapter of AFS.

Johanna M. Reinhart

Among those elected to membership in AIFRB last month was Johanna Reinhart, current President of the American Fisheries Society.



Hugh MacCrimmon, AIFRB President, and Gene Nakamura, AIFRB Past-President, confer at the Stock Identification Workshop at Panama City Beach, Florida.

Stock Identification Workshop

On November 5-7, 1985, a stock identification workshop was conducted and hosted by the Panama City Laboratory on Panama City Beach, Florida. Support was provided by AIFRB, Florida Sea Grant, Georgia Sea Grant, and the Cooperative Investigations of Marine and Atmospheric Sciences of the University of Miami.

The opening address entitled "Stock Assessment and Stock Identification, An Interactive Process" was given by Bradford Brown. A plenary session of five presentations set the stage. Plenary presentors were: Gary Winans, Northwest and Alaska Fisheries Center, who spoke on "Use of meristic and morphometric data in fishes for stock identification"; Fred Utter, Northwest and Alaska Fisheries Center, presented "Protein electrophoresis and stock identification in fishes"; John Avise, University of Georgia, addressed "The use of mitochondrial DNA in stock identification"; Ron Lundstrom, Northeast Fisheries Center, covered "Stock identification using monoclonal antibodies"; and Saul Saila, University of Rhode Island, concluded the plenary session with "Review and guide to some multivariate methods for stock identification".

The second day consisted of a series of 19 experience papers which covered fishes, both salt- and freshwater, marine mammals, reptiles, and crustaceans in the Indo-Pacific, North Pacific, North Atlantic, South Atlantic, Gulf of Mexico, and North American river systems.

A panel discussion, led by moderator Richard Shomura of the Southwest Fisheries Center, addressed the application problems and costs of the various stock identification approaches. Concluding remarks were given by Eugene Nakamura, Past-President of AIFRB.

The workshop had 86 registered attendees, about 20 of whom were AIFRB members. Of the 5 moderators, 5 panelists, and 34 authors and co-authors, 13 were AIFRB members.

Proceedings of the workshop will be printed and will be available in the last quarter of 1986.

1986 W.F. Thompson Best-Paper Award

In recent years the American Institute of Fishery Research Biologists has presented an award to the student writing the best paper *published* during the past 3-year period. The award is the W. F. Thompson Award and the person receiving it would receive a certificate from AIFRB, as well as a cheque for U.S. $750.

The award committee of AIFRB is now receiving nominations for the 1986 W. F. Thompson Award which will cover *the period 1983-1985*. Papers can have multiple authors, but the student nominated for the award must be the principal author. Peers and professors can be listed as junior authors. When a student receives the award and certificate for a multiple-authored paper, the professor will receive a certificate acknowledging his role in the outstanding paper.

Papers should be concerned with freshwater or marine fisheries topics and problems, and may deal with biology or management problems. The papers are evaluated by the AIFRB award committee on the basis of originality, organization and development, and pertinence to current problems in fisheries. Nominations for papers should be received no later than 31 July 1986. A final decision will be announced by 29 August 1986. Five copies of each paper nominated should be sent to Dr. W. (Tony) Kwain, Chairman, AIFRB W. F. Thompson Award Committee, Ontario Ministry of Natural Resources, Lake Superior Fisheries Research Unit, P.O. Box 130, Sault Ste. Marie, Ontario, Canada P6A 5L5.

If there are questions in regard to the award, the Chairman can be reached at (705) 949-1231, extension 274.

Army & NOAA Cooperative Agreement

Robert K. Dawson, Acting Assistant Secretary of the Army (Civil Works) and Anthony J. Calio, Ad-

ministrator of NOAA, announced the signing of a cooperative agreement on October 25, 1985 for a pilot study to investigate the practicality of a national program for restoring and creating fisheries habitat.

The pilot study under the agreement will be conducted over a 3-year period. It will be carried out in two regions of the National Marine Fisheries Service (NWFS) and will involve two or more divisions and districts of the Corps of Engineers. Between one and three fisheries habitat-restoration and -creation sites will be selected for study in each NMFS region. The exact scope of the pilot study will be determined by the field offices of the two agencies working together to locate potential fisheries habitat-restoration and -creation sites in areas of ongoing Corps projects, programs, or studies.

The pilot study will assess the process of identification and selection of restoration and creation sites; planning, design, construction, and maintenance of selected measures; and, as appropriate, the progress of plan implementation accomplished within the study period. The pilot study will also assess the cost effectiveness of the restoration and creation measures as well as the institutional arrangements required with affected Federal, regional, State, and local agencies in the process.

"This new agreement is the result of extensive consultation intended to take advantage of the broad construction capability and experience of the Army Corps of engineers and the expertise of NMFS with marine, estuarine, and anadromous fishery habitats," Dawson said. "This agreement has the potential to improve NOAA/Army coordination and increase the amount of habitat available to the Nation's fish and shellfish," added Calio.

From MRF Highlights, Jan. 1986

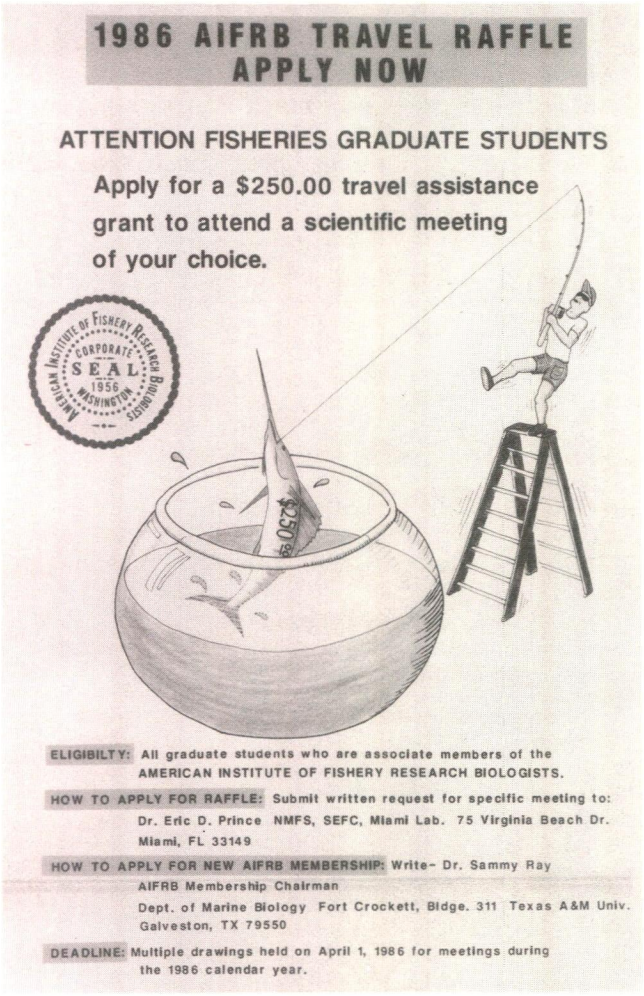
Job Opportunities in Kuwait

The Kuwait Institute for Scientific Research (KISR) is an official institution of the Kuwaiti government carrying out basic and applied research in a variety of scientific fields. KISR's current-year budget totals nearly $70 million dollars, and it employs some one thousand persons, including about 450 scientists, researchers, and technicians from Kuwait and around the world.

KISR is interested in increasing the number of American scientists on its staff. It has requested the U.S. Embassy's help in contacting Americans who might be interested in working on some of KISR's projects. Of the numerous fields in which positions are to be filled, several are related to specialties of AIFRB members. Included are aquaculture, shrimp fisheries biology, population dynamics, fisheries biology, marine pollution, bioengineering, and food technology.

Intersted persons can get in touch with KISR through Mr. Habeeb Al-Sahhaf, Personnel Manager (HA), Kuwait Institute for Scientific Research, P.O. Box 14885 Safat, KUWAIT.

1986 AIFRB Travel Raffle



Eric Prince, Florida District Director and Chairman of the AIFRB Travel Raffle Committee, has distributed copies of the poster shown above. The publicity, aimed at colleges and universities offering degree-granting curricula in fishery science, is being undertaken to give opportunities to as many fishery graduate students as possible in 1986.

The Wallop-Breaux Fund

The initial $137 million Wallop-Breaux allocation reported by the U.S. Treasury was in error. The accurate figure is $122,167,378.14. This amount is now earning interest and will continue doing so until it has all been apportioned and transferred to the States. The interest (estimated at $18 million during FY 86) will be added to the user taxes collected during FY 86 and will be available for apportionment in FY 87. Thus, the FY 87 figure may well show a good increase over FY 86.

The Fish and Wildlife Service will be advising each State of its final FY 86 apportionment in January or February. Meanwhile, to calculate a State's share, simply apply the State's percentage (see Table 1) to $114,837,335, which is the total minus the 6% Federal

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The Wallop-Breaux Fund cont.

share for administering the fund. Coastal states may then use Table 2 to calculate the required freshwater/saltwater split.

NOTE: The State percentage shares indicated in Table I were computed in 1984 and could show a small change in 1986 if there has been a sharp change in numbers of licenses sold.

Table 1
State Percentage Share of Wallop-Breaux Funds

AL-1.7	HI-1.0	MA-1.0	NM-1.8	SD-1.2
AK-5.0	ID-1.7	MI-3.6	NY-2.4	TN-1.8
AZ-2.2	IL-2.3	MN-4.1	NC-1.5	TX-5.0
AR-1.7	IN-1.7	MS-1.3	ND-1.1	UT-1.7
CA-5.0	IA-1.5	MO-2.5	OH-2.6	VT-1.0
CO-2.5	KS-1.5	MT-2.3	OK-2.0	VA-1.5
CT-1.0	KY-1.6	NE-1.3	OR-2.4	WA-2.4
DE-1.0	LA-1.5	NV-1.6	PA-2.5	WV-1.0
FL-2.0	ME-1.0	NH-1.0	RI-1.0	WI-3.5
GA-1.9	MD-1.0	NJ-1.0	SC-1.1	WY-1.6

Table 2
Coastal State Freshwater/Saltwater Percentage Allocation of Wallop-Breaux Funds

	Salt Water	Fresh Water		Salt Water	Fresh Water
AL	15.4	84.6	MS	15.9	84.1
AK	33.2	66.8	NH	30.5	69.5
CA	38.4	61.6	NJ	63.3	36.7
CT	46.9	53.1	NY	41.8	58.2
DE	69.5	30.5	NC	36.4	63.6
FL	52.4	47.6	OR	28.6	71.4
GA	19.2	80.8	RI	60.0	40.0
HI	86.5	13.5	SC	36.8	63.2
LA	25.9	74.1	TX	29.1	70.9
ME	22.3	77.7	VA	44.0	56.0
MD	57.4	42.6	WA	44.4	55.6
MA	53.5	46.5			

From MRF Highlights, Jan. 1986

Larger Striped Bass Size Limits

A committee of the Atlantic States Marine Fisheries Commission (ASMFC) has proposed larger size limits for striped bass.

The NMFS Northeast Fisheries Center participated in a meeting of the ASMFC's Scientific and Statistical Committee on Striped Bass which was held, among other things, to determine what size limits would protect the 1982 and later year-classes until 95 percent of their females had a chance to spawn at least once. The conclusion was 33 inches by fall 1986 and 37 inches by fall 1987. The Commission currently recommends States to have a 24-inch limit in their coastal fisheries.

Dominant year-classes maintain the Atlantic Coast's migratory stock of striped bass. The last such year-class — the largest in 30 years — was the 1970 year-class of the stock's Chesapeake Bay population. The 1986 year-class of the Chesapeake Bay population, although below the long-term average, is nonetheless slightly stronger than other recent year-classes. The ASMFC is trying to protect this and later year-classes to increase the chances for successful spawning.

From MRF Highlights, Jan. 1986

District News

ALASKA **K Koski,** *Director*

The October 1985 meeting of the Alaska District of AIFRB was opened at 8 pm on October 29 by Director Dave Gibbons. Director Gibbons reported briefly on the results of the 1985 District elections. Dr. K Koski will be the new District Director and Norman R. Howse will be the new District Secretary/Treasurer. The current Secretary/Treasurer, Bruce Wing, turned the books and checking account over to Norm Howse. Current balance is $152.57.

Director Gibbons reported on the 1985 Board of Control Meeting at Sun Valley, Idaho. Details of the Board meeting will be published in the December issue of "BRIEFS". Of particular interest to Alaskan members will be discussions on the continuing concern of the Board and other members about the differences between AIFRB and AFS, resurrection of proposals for name changes of AIFRB, nominees for the W.F. Thompson and Achievement Awards, and development of an AIFRB Executive Corps of Experts, the latter to be composed of retired Fellows willing to work on special advisory committees. University of Alaska faculty members should also alert their students to the AIFRB travel raffle which can help graduate students attend fisheries-related scientific meetings.

Other items covered were reports on the book distribution of the Old-Growth Forests, Fisheries, and Wildlife Symposium book, with discussions on how to increase sales; the upcoming Alaska Chapter AFS meeting in Kodiak; the Stock Identification meeting to be held in Florida; and last summer's meeting on Scientific Writing held in Anchorage. Dr. Gibbons also reported that the Board of Control was approached by some of the Seattle-based fishing industry to create a new award for excellence in fishery research.

Dr. Gibbons proposed that the District create a position of Deputy District Director and that the 2-year Directorship and Secretary/Treasurer office rotate between the Anchorage and Juneau areas now that the Anchorage membership has grown sufficiently large and active. This proposal, if approved by the Alaska District membership, would be instituted in the fall of 1986 with the election of an Anchorage-area Deputy Director and Secretary/Treasurer. These individuals would become the Alaska District Director and Secretary/Treasurer in the fall of 1987. This would create an overlapping term arrangement between the Deputy Director and Director (see below).

	Deputy Director	Director
1985/86		K Koski #
1986/87	Anchorage *	K Koski #
1987/88	Juneau *	Anchorage #
1988/89	Anchorage *	Juneau #

* = election year/location
\# = attendance at National meeting

The two primary reasons for this change in structure are to facilitate District meetings in Juneau and Anchorage and to have Director representation from across the entire District at the annual National meeting in alternating years.

District Director Gibbons also proposed that the Alaska District join with AFS in sponsoring a hospitality hour at the upcoming AFS meeting in Kodiak. One hundred dollars will be provided.

The membership thanked Dr. Dave Gibbons and Bruce Wing for their Alaska District leadership during the past 2 years.

Incoming District Director K Koski reported recent correspondence sent to Senator Stevens concerning budget cuts to the Forest Sciences Laboratory. Bruce Wing suggested that follow-up letters also be sent to Senator Murkowski and Representative Young. Dr. Koski will also appoint a new Membership Committee and Historian. The Membership Committee will have participants in the Anchorage and Juneau areas.

Finally, Ted Merrell asked for additional suggestions on how to increase sales of the Old-Growth Forest Symposium. Suggestions were to have copies available at the AFS Alaska Chapter meeting in Kodiak, at the Future Effects of Logging Workshop, having the book reviewed by or listed by abstracting services, and reviewed by the Sports Fishing Institute, Alaska Magazine, etc. Rupe Andrews volunteered to find out if it could be promoted through the National Rifle Association publications or meetings.

The meeting concluded with a presentation on the US-Canada Salmon Treaty developments by Dr. James C. Olsen of the Auke Bay Laboratory. Dr. Olsen covered the structure of the various commissions and subcommittees to be established under the new treaty and what the specific concerns of each group will be. Stock identification, stock allocation, and enhancement practices appear to be the major concerns. Habitat protection has not been discussed by the involved committees. Discussion continued until the meeting adjourned at 10:30 pm.

At a follow-up Executive Meeting, the concept of a rotating Director/Deputy Director in Juneau and Anchorage was further discussed and a proposal will be sent to the membership for a vote. A call for 1986 annual dues of $5.00 will also be sent to the membership.

CENTRAL CALIFORNIA **Brian F. Waters,** *Director*

Elections for new 2-year-term District officers were held in November. The new officers for 1986-1987 are: Director — Brian F. Waters, Pacific Gas and Electric Company, San Ramon; Vice Director — Robert N. Tasto, California Department of Fish and Game, Menlo Park; and Secretary-Treasurer — Edward Ueber, National Marine Fisheries Service, Tiburon.

Regular District dinner meetings for members and guests were held in Berkeley in November and January. Additionally, the annual Central California District AIFRB holiday season feast was held as a ten-course dinner at a Chinese restaurant in San Francisco in December. Paul Kubicek of Pacific Gas and Electric Company was the featured speaker at the November meeting, and he gave a slide-illustrated presentation on the "AIFRB/People-to-People Fishery Research Delegation to Japan, China, and Korea", which was the subject of the feature article in the August 1985 issue of BRIEFS. Paul shared the many rewarding experiences, personal as well as technical, that he and his 26 fellow AIFRB members had on that memorable trip, and wholeheartedly recommended his fellow fishery biologists to take advantage of any similar opportunities in the future. Dr. Gordon Robilliard of Entrix, Inc., was the featured speaker at the January meeting, and he gave a presentation on the "History and Natural History of the Antarctic". Gordon showed many intersting underwater slides taken during his three trips to the Antarctic over a 10-year span, and discussed many of the unique and intriguing ecological relationships and environmental adaptations found under the permanent ice cap there.

The Central California District holds dinner meetings on the second Thursday of odd numbered months (except July), and welcomes AIFRB members or guests from outside the District to attend when at all possible.

Announcements and New Publications

Annual Tuna Conference

The 37th Annual Tuna Conference will be held again at the University of California Conference Center, Lake Arrowhead, California, May 18-21, 1986. The Tuna Conference has been an annual event since 1950, providing an opportunity for scientists, fishery managers, government officials, and industry representatives to meet, exchange information, and discuss current research on tuna and tuna-like species. This meeting is sponsored by the National Marine Fisheries Service and the Inter-American Tropical Tuna Commission.

Effective fisheries management requires the successful integration of population biology information, appropriate computer models, economics studies, oceanographic information, and physiological-behavioral research. Through a series of invited speakers, it is the objective of this year's conference to explore recent changes in the tuna industry and recent developments in tuna research, with special emphasis on improving science-government-industry cooperation. As in the past, presentations on topics aside from the conference theme are always welcome. Space will also be provided for poster presentations.

For further information and registration forms, write to Richard W. Brill, National Marine Fisheries Service, Honolulu, Hawaii 96812. Phone (808) 943-1221.

The Marine Mammals of Virginia

The Virginia Sea Grant College Program at the Virginia Institute of Marine Science published in 1985 its VIMS Educational Series No. 35, *The Marine Mammals of Virginia*, by Robert A. Blaylock.

Representatives of all three orders of marine mammals-cetacea (whales, dolphins and porpoises),

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pinnipedia (seals and sea lions) and sirenia (manatees and dugongs) — have been found stranded on Virginia's shorelines. The primary indication of their presence in Virginia waters comes from strandings. In Virginia, the Virginia Institute of Marine Science (VIMS), in cooperation with the Smithsonian Institution and the National Marine Fisheries Service, coordinates the investigation and subsequent disposal of stranded marine mammals.

To aid citizens in identification, this guide describes the natural history of marine mammals. This guide is organized by taxonomic orders and families; within a subfamily, species are listed by their frequency of appearance in Virginia waters. Twenty-one species of dolphins, porpoises, seals, whales, and a manatee are treated, and the book contains notes on identification and natural history, as well as a bibliography.

The volume can be purchased for $1.00 from the Virginia Institute of Marine Science, Gloucester Point, VA 23062.

The Inland Fishes of New York State

C. Lavett Smith, Curator at the American Museum of Natural History, has written *The Inland Fishes of New York State*. Published by the New York State Department of Environmental Conservation, this 523-page hardback book contains detailed descriptions of the morphology, distribution, ecology, and life history of 242 freshwater, diadromous, estuarine, and marine fish species found in New York. The book describes the geology and climate of New York and their influence on the distribution of fishes within the State. Fully illustrated keys to the families and species provide an accurate guide to fish identification. Each of the 242 species accounts includes a State distribution map and record of current and past scientific names. The book is fully referenced, contains a glossary and 20 full color plates, and is indexed by referenced journals, common and scientific names, geographic locations, and general subjects. A book to be enjoyed by the dedicated angler, amateur naturalist, and fisheries professional alike!

The volume sells for $29.95 and can be ordered from N.Y. State Dept. of Conservation, Biological Survey Unit, Room 522, 50 Wolf Road, Albany, NY 12233.

Toxicity of Pesticides to Fish

These volumes by A. S. Murty are the first major attempt to review comprehensively all available information on the toxicity of pesticides to fish. Topics include: reasons for the accumulation of pesticide residues in the aquatic environment, type of residues taken up by fish in different geographical regions, route of uptake and biochemical pathways of detoxification, pesticide-induced biochemical changes in fish, and analytical techniques to distinguish industrial organic chemical residues and pesticide residues. The volumes incorporate over 1700 references published from 1944 to present. Researchers, environmentalists, and those in the pesticide industry will find valuable information in this book.

Volume I: Pesticides in the Environment. Pesticide Residues in Fish. Uptake and Depuration of Pesticide Residues by Fish. Toxicity Test and Test Methodology. Appendix I (Chemical Synonyms). Appendix II (Genus species). 256 pp., 7 x 10, due 1986. Prepub., U.S. $81.00/Outside U.S. $93.00.

Volume II: Toxicity of Individual Compounds, Safe Concentrations, and Toxicity to Different Age Groups. Influence of Environmental Conditions on the Toxicity of Pesticides to Fish. Toxicity of Formulations, Isomers, and Degradation Products. Joint Action of Pesticide Mixture. Insecticide Resistance in Fish. Polychlorinated Biphenyls and Related Compounds. Environmental Hazard Evaluation and Prediction. Appendix I (Chemical Synonyms). Appendix II (Genus Species). 192 pp., 7 x 10, due 1986. Prepub., U.S. $62.00/Outside U.S. $71.00.

Order from CRC Press, 2000 Corporate Blvd., N.W., Boca Raton, Florida 33431.

Aquatic Toxicology and Hazard Assessment

This is the eighth in a series of ASTM publications on Aquatic Toxicology and Hazard Assessment. Based on the papers presented at the Eighth Symposium on Aquatic Toxicology, this volume emphasizes the use of aquatic testing in legislation, regulation, industry, research, and decision-making.

Numerous test methodology papers are presented among the 36 peer-reviewed papers. Also included are discussions of on-going research that addresses various targeted knowledge gaps. Ths papers are divided into seven sections:

1. Keynote Addresses
2. The Use of Scientific Data by Specific Legislative Mandates
3. Protection: Single Species, Populations, or Ecosystems — A Debate
4. Research needs in Environmental Science — Panel Discussion
5. Correlations of Laboratory and Field Data
6. Aquatic Toxicology Concepts, Including Time/Toxicity Concentration Prediction Techniques
7. Dioxins: Environmental Significance, Fate, Mobility, and Aquatic Toxicity

Toxicologists, environmental scientists, ecologists, biologists, chemists, and regulatory agencies will be particularly interested in adding this to their working libraries.

This book, STP 891, has 488 pages and 76 illustrations, and costs $41.60 to ASTM members and $52.00 to others. Order from ASTM, 1916 Race Street, Philadelphia, PA 19103.

Thesis and Dissertation Abstracts

Technical Innovation in the Pacific Coast Commercial Trawling and Salmon Trolling Fisheries

Christopher M. Dewees, Ph.D. 1985
University of California, Davis

The adoption/non-adoption of technical innovations was examined in two important Pacific Coast commer-

cial fisheries. The purposes of the study were to gain insight into the innovation process in commercial fisheries and to test a new model of innovation adoption/non-adoption. The model was based on recent conceptual issues raised in the innovation diffusion literature and a working knowledge of the fishing industry. Included in the model were variables measuring each fisherman's personal characteristics and situation, attitudes about fishing, and perceptions of each innovation's attributes. Innovations examined included both fish catching technology and safety equipment.

Personal interviews were conducted with 83 randomly selected trawlers located between Newport, Oregon, and Santa Barbara, California, February through April, 1984. Questionnaires were mailed to a random sample of 1,500 licensed California salmon trollers in April 1984, with a 33 percent return rate (494 useable responses). Logistic regression was the primary statistical method used to analyze the survey data.

The findings generally support recent conceptual issues raised by Downs and Mohr (1976) and other innovation researchers. A different subset of independent variables explained the adoption of each innovation. This appears to be due to the innovation-by-innovation differences in the match between the potential adopter and the innovation. The effect of variables on adoption/non-adoption varied across innovations. This instability can be explained primarily by idiosyncrasies of each innovation. Both the characteristics of potential adopters and the characteristics of the innovations, as perceived by the potential adopter, were important determinants of adoption/non-adoption.

The trawl and salmon troll fleets were in a period of extreme difficulty in 1984. Many fishermen were trying to lessen or end their financial commitment to fishing. The findings of this study have important policy implications for the fishing industry, fishery management agencies, and extension and development programs.

Effects of Food Ration Size on Bioaccumulation of Kepone by Spot *(Leiostomus xanthurus)* and Grass Shrimp *(Palaemonetes pugio)*

Daniel J. Fisher, Ph.D., 1985
The College of William and Mary in Virginia

Long-term bioaccumulation studies were conducted using ^{14}C-Kepone and unlabeled Kepone to determine the significance of dietary accumulation to final Kepone body burdens in spot *(Leiostomus xanthurus)* and grass shrimp *(Palaemonetes pugio)*. Both food (grass shrimp) and consumer organisms were exposed to aqueous Kepone concentrations of 0.04 μg/l at 23°C for 16-19 days, followed by a 21-28 day clearance phase. Dietary and aqueous sources of Kepone were shown to be additive for both species. Dietary contributions of Kepone represented 9, 18, and 38% of the total Kepone body burden in spot fed contaminated food rations of 4, 8, and 20% mean body weight, respectively. At rations of 4 and 8%, dietary Kepone contributions to final shrimp body burdens were 24 and 33%, respectively. There were no significant differences in organism size or lipid content among treatments for either species.

Ration size had no effect in either organism on the uptake and clearance rate constants estimated for dietary accumulation and bioconcentration by a first-order pharmacokinetic model. Shrimp had a slower clearance rate of Kepone than spot and, hence, a greater bioaccumulation potential. Kepone derived from aqueous exposures to both species appeared to be cleared more slowly than residues derived from dietary exposure. Kepone assimilation efficiencies for spot and shrimp were 15% and 21%, respectively, for the finely ground food source used in this study. These values are low compared to literature data for other lipophilic chlorinated hydrocarbons. This indicates that grinding of the food reduced Kepone availability to the consumer organisms. Even at these low assimilation efficiencies, Kepone from the diet contributed significantly to final Kepone body burdens in spot and shrimp.

An accelerated test methodology was adequate to describe spot bioaccumulation kinetics, especially at the larger food ration size tested. Uptake of Kepone from contaminated artificial food was similar to uptake from contaminated natural food.

A Bioeconomic Model of the Middle Atlantic Surf Clam *(Spisula solidissima)* Fishery

Thomas Marshall Armitage, Ph.D., 1985
The College of William and Mary in Virginia

A bioeconomic simulation model of the middle Atlantic surf clam *(Spisula solidissima)* fishery has been developed from a survey of biological and econometric relationships. While identifying the biological input parameters available in the literature, the economic submodel of the fishery has been developed with price and landings time-series data, and with data obtained through the use of survey questionnaires and interviews with surf clam fishermen and processors. Alternative management scenarios in the fishery have been evaluated from industry costs in both the harvesting and processing sectors and analysis of the demand for raw product confronting surf clam fishermen.

Multiple regression analysis of time-series data indicates that surf clam ex-vessel prices may be negatively related to surf clam landings whereas hard clam prices are positively related to ex-vessel ocean quahog prices and ex-vessel oyster prices. The strength of this relationship confirms the status of ocean quahogs as very close substitutes for surf clams.

The results of case studies using the model suggest that the Mid-Atlantic Fishery Management Council has followed a prudent course of action in managing the surf clam fishery. The model also projects that, 1) larger yield quotas may be possible in the immediate future without jeopardizing surf clam population stability, 2) overcapitalization in the fishery appears to remain a problem, and 3) the economic outlook for the operators of small vessels remains relatively bleak.

Abundance, Seasonality, and Community Structure of Fishes on the Mid-Atlantic Bight Continental Shelf

James Alden Colvocoresses, Ph.D., 1985
The College of William and Mary in Virginia

Cluster analyses of seasonal (spring and fall) National Marine Fisheries Service Groundfish Survey bottom trawl catches on the Middle Atlantic Bight (Cape Hat-

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Thesis and Dissertation Abstracts cont.

teras to Cape Cod) continental shelf revealed consistent species associations and faunal zones over a 9-year period. Boundaries between faunal zones tended to follow isotherms on the inner and middle portions of the shelf and isobaths along the outer shelf.

During the late winter/early spring, four faunal zones were identified: a northern inner and middle shelf zone extending from Cape Cod southward to about Delaware Bay, a northern middle and outer shelf zone offshore of the first zone, a southern middle and outer shelf zone, and a fourth zone on the shelf break and upper slope. The southern inner shelf was a transition zone between the first and third zones. Five species groups were identified: a small cryophilic group restricted to the first zone, a cold-water boreal group found in the first two zones, a ubiquitous boreal/resident group containing the major dominants, a warm-temperate group confined to the warmer southern and outer shelf waters, and a group of slope residents confined to the deepest zone.

During the fall, five faunal zones were identified: a southern inner and middle shelf zone, a northern inner shelf zone, a northern mid-shelf zone, an outer shelf zone and a shelf break/upper slope zone. The five species associations recognized were largely analogous to those in the spring, with the following exceptions: the cryophilic group was absent, the ubiquitous group contained mixed boreal and warm-temperate elements, and a second outer shelf group was recognized. The most notable change in the distribution of groups from the spring was a general northward shift in the distributions of the boreal species and a sharply defined inshore movement of the warm temperate group.

Analyses of a single summer cruise showed patterns of distribution intermediate to those seen during the spring and fall. Absolute abundances, both of individual species and the total fish community, were highly variable between areas, seasons, and years. Species diversity and its components appear to be of little utility in describing the fish communities of the open continental shelves.

Membership Report

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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 $15 a year to Institutions and Non-Members.

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American Institute of Fishery Research Biologists

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The Royce Report

Included in the October 1985 issue of BRIEFS was a questionnaire designed by Fellow William F. Royce to learn of the opinions of the AIFRB membership concerning AIFRB and our profession and our relationships to the American Fisheries Society. Here is Bill Royce's first report on the results of the questionnaire; he gives us a statistical analysis, an interpretation of the elaborations of the opinions, and a commentary on historic trends. Ed.

Returns

A total of 128 returns had been received by mid-January 1986. This is 11.4% of the January 1984 membership total of 1,126.

The rate of return by States and regions was reasonably consistent. The five States that accounted for 54% of the membership (WA-217, CA-118, FL-112, AK-84, and OR-73) provided 52% of the returns (WA-20, CA-12, FL-11, AK-11, and OR-11).

The response according to employers was Academic-26, Government-68, and Private-15. (In this and in the remaining statistics, the totals will seldom add to the total number of returns because of omitted answers.)

About 88% were members of the American Fisheries Society (91-yes, 13-no).

Statistical Analysis of Answers

QUESTION 1. How important for a person seeking employment will be professional recognition in addition to the university and employment record (on a scale of very, 1, to slight, 5) in academe, in government, and in the private sector?

Overall total count

Scale	A	G	P
1	44	17	18
2	24	28	35
3	19	47	28
4	14	18	18
5	14	12	16

Responses from academics

Scale	A	G	P
1	7	2	0
2	7	4	9
3	3	11	7
4	3	6	4
5	6	2	6

Responses from private employees

Scale	A	G	P
1	6	0	1
2	2	6	5
3	2	4	3
4	3	2	3
5	1	2	2

QUESTION 2. Will recognition as an associate member of AIFRB be more or less desirable than certification as an associate fishery scientist by AFS in academe, in government, in the private sector?

Overall total count

	A	G	P
Less	30	44	33
Same	51	65	64
More	34	13	16

Responses from academics

	A	G	P
Less	7	11	8
Same	11	11	13
More	6	0	1

Responses from private employees

	A	G	P
Less	5	7	6
Same	9	7	8
More	0	0	0

QUESTION 4. Will it be desirable to recognize separately fishery research scientists and fishery scientists?

Overall response: Yes-51, No-67.
Academic employees: Yes-10, No-14.
Private employees: Yes-4, No-8.

QUESTION 5. Will it be desirable to recognize separately the numerous research specialities that are now important in fishery science?

Overall response: Yes-48, No-67.
Academic employees: Yes-10, No-13.
Private employees: Yes-1, No-11.

Comment on the Statistics

The low rate of return is a concern because the answers may not be representative of the approximately 1,126 members. One of our colleagues, who has had experience with opinion surveys, reminds me that the U.S. Office of Management and Budget considers surveys

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with a response of less than 80% as likely to be biased.

My guess is that many members, with a sense of deja vu, probably felt that this was another shot at problems which have long been under discussion without definitive action.

On the other hand, a large proportion of those who did reply took pains to elaborate at length their views of the problems addressed by the questionnaire. Many of them who signed their questionnaire are leaders whose lengthy comments provide an extraordinary perspective on our organization.

It is not possible, therefore, to arrive at a completely objective summary of opinions within the membership of AIFRB on the basis of this questionnaire. Nor is it possible to give adequate credit to the opinions of the people who commented at length. The following discussion will be my interpretation based on the responses and on my sense of the historical development of fishery science.

The overall distribution of responses to Questions 1,2,4, and 5 reveals an extraordinary diversity of opinions on all of them. This needs to be judged in relation to Article I of the Bylaws, Membership and Activities. According to this Article, election to membership is *the major activity* of AIFRB by which it achieves the Purposes of Article IV of the Articles of Incorporation. These purposes are:

"1. To advance the theory, practice and application of the science of fishery research biology; and thereby to promote the conservation and proper utilization of fishery resources.
2. To maintain high professional standards in fishery reserach biology, by recognition of achievement and by adherence to a code to be known as "Principles of Professional Conduct for Fishery Biologists."
3. To do everything necessary, suitable and proper for the accomplishment of any of the foregoing purposes; provided it be consistent with the provisions expressed herein and with the laws under which this Institute is incorporated.
4. In pursuing these purposes, the primary role of the Institute shall be concerned with the professional development and performance of its members, and the recognition of their competence and achievement."

The overall responses to Question 1 indicated a moderately high value of election to membership, especially among academics. In the responses from academic and private employees, few felt that election was important outside academia. In addition, the value to academics appears to have been reinforced by impressions about academic employment among government employees (62% of responses) and private employees (14% of responses). Overall, about one-fourth indicated a slight or only a little more importance to membership.

The comparison of AIFRB and AFS in Question 2 of the value of election for associate level scientists indicated a large majority that felt AIFRB recognition was less desirable or only equal to AFS recognition. In particular, none of the private employees who responded felt that recognition by AIFRB was more important.

The reasons were elaborated by many respondents in answer to Question 3. The most common reason was that AFS is better known, with a much larger membership, and with an extensive outreach through its several publications. Many pointed out, however, that a comparison was difficult because neither organization was known to a major proportion of government and university employers.

Several respondees were apparently not aware of the two-tier certification program of AFS that was adopted in 1984, so perhaps their response to Question 2 was influenced in favor of AIFRB.

Several also felt that the AFS program was not as rigorous as that of AIFRB. This was disputed in a personal communication to me during the 1985 meetings from Dr. B. L. (Bud) Griswold who has been closely involved with the programs of both organizations. He asserts that the AFS program is now more rigorous.

Several respondees thought the AIFRB had a special emphasis on research and thereby a more scientific image. Others pointed out that research competence was demonstrated by publications which had been reviewed by peers and a special recognition was unnecessary. A person in private business noted that input to or review of environmental impact statements was not a qualifying experience for AFS whereas such work might be as demanding as any applied research at the PhD level. Further, that such documents were not subject to normal peer review. Other comments were: AIFRB should focus on biological research as its name indicates, AIFRB people are mostly concerned with stock assessment—an applied research area, AFS is a broadly based federation open to nonscientists, and AIFRB is elite.

One clear-cut use of certification or election was suggested by a few respondees who have been involved in court cases; a document to show qualifications for service as an expert witness.

The answers to both Questions 1 and 2 appear to reflect a large amount of idealism in addition to the practical matter of having a certificate of competence. This reflects value judgments by members of both organizations which are impossible to quantify.

Questions 4 and 5 asked about separate recognition of research specialties and the many activities that are grouped under fishery management and development. The answers to both were preponderantly NO. Those in favor pointed to the many research specialties, the rapid expansion of scientific work in fisheries, new specialties related to aquaculture and to environmental management, and noted a jack-of-all-trades mentality. Those opposed noted the frequent changes in duties, especially in smaller organizations or in local offices where many kinds of problems were encountered. Others commented on the added complexity, the numerous intergrades among specialties, the possible inequities, the danger of limiting assignments after experience had been gained without recognition, and the possibility of

identifying "interest areas" rather than certified areas.

Another senior fishery biologist employed by a non-fishery agency points out that the certificate is essentially worthless whereas licensed professionals (engineers, attorneys, and accountants) are given special consideration.

A Comment on the History of AIFRB

The 26 leaders of fishery biology who incorporated the AIFRB in 1956 were on the crest of a wave of support for the application of science to the conservation of the fisheries. They were familiar with, and disgusted by, the shabby politicking that had characterized fishery management in the preceding decades.

The 1950's were years when the application of biology to conservation of fish through the regulation of fishing progressed more than before or since. The creed of conservation of an environment for all to enjoy was widely accepted. In the U.S., the Federal Aid in Sportfish Recreation Act of 1950 (Dingell-Johnson) provided major support for research on freshwater fisheries. The Fish and Wildlife Act of 1956 added the Bureau of Commercial Fisheries to the Fish and Wildlife Service, especially for research on marine fisheries.

Canada and the U.S. were taking the lead in conventions for the regulation of fishing based on use of science. The Halibut Convention, on which negotiations had started in 1918, and which had gone through tentative versions in 1924 and 1937, had finally provided full authority to the Commission in 1953. The Fraser River Salmon Convention, which had been negotiated in 1930, blocked by politicking in Washington until 1937, and renegotiated to provide for removal of the blockage in the River in 1944, had finally allowed the Commission to regulate the fishing for both sockeye and pinks in 1956. The Great Lakes Convention had been signed in 1954.

In addition to these bilaterals, multilateral conventions had been added, among them the Northwest Atlantic and Inter-American Tropical Tuna in 1949, North Pacific in 1952, and revised North Pacific fur seal in 1957.

Then the United Nations meetings on the Law of Sea in 1955 and 1958 set the framework for the fishery management consensus of the mid-1970's and the Convention of 1982. Conservation of the ocean fisheries was defined as the measures taken to obtain the optimum sustainable yield and the measures were to be based on scientific findings.

These were heady years for fishery biologists, including the founders of AIFRB. Their science had been recognized in law and they were trusted to recommend major policies on the basis of their findings. The fact that they maintained that trust is to their everlasting credit.

AIFRB was not a scientific island after the 1950's. The American Fisheries Society, which listed 939 active members in 1950, has doubled in size in each of the three following decades and provided increasingly better professional service to its members.

AIFRB members have periodically raised the issue of affiliating in some way with AFS. An exchange of views in 1979 brought out arguments in favor of affiliation that noted the AFS certification program, the broader array of AFS people with interests in fish resources, the valuable AFS publication program, and the large proportion of dual memberships. Those opposed still feared the prewar attitude of politics as usual and a loss of identity were AIFRB to join AFS. They also listed 24 accomplisments, including resolutions on working conditions of fishery scientists, publication of scientific symposia, and briefs on public issues.

Changes in the Profession

Since the 1950's, the confidence in fishery scientists has continued even though we have been asked to advise on much more diverse fishery and aquatic environmental issues. Employment in Canada and the United States has quadrupled.

But the issues are changing even more rapidly. Regulation for conservation of the market fisheries is producing social disasters around the world as oceanic production is topping out. The need for biological studies in order to manage for conservation is recognized but the dominant issues have become economic, social, legal, and institutional. Conservation of such fisheries open to all fishers can be achieved only with increasing difficulty and frequently at an unacceptable public cost.

Regulation for conservation of recreational fisheries, on the other hand, is still remarkably successful. The sustainable yield can be divided among all who want to fish for fun with minimal effects on the overall economic or social values. The angling fraternity remains dedicated to conservation as a primary objective and characteristically supports biological research.

In addition to regulation of fishing, many of the fishery scientists in government agencies and the private sector are concerned with, perhaps overwhelmed by, environmental issues. These issues always involve complex biological, economic, social, legal, and institutional matters. Even the biology may extend beyond the waters to forests and other terrestrial areas. In this field the fish biologist will be working with scientists from several other disciplines in order to reach broadly acceptable courses of action.

Public aquaculture has become firmly established in northern America for the purpose of enhancing or mitigating damage to the recreational fisheries and also to market fisheries for salmonids. Private aquaculture (really fish farming) has burgeoned in the past decade until now the production in the U.S. is about 20 times as great as the production from the public system. In both fields, the role of fishery biologists has become clearly established and is much less involved with public policy than their role in fishery management.

On the Contributions of AIFRB

As I look back over the history of AIFRB, I see the early role of the founders as establishing trust in each other through the election program. This, in turn, led to a remarkable degree of public trust in our ability to advise on public conservation policies that have grown so

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The Royce Report cont.

effectively during the past three decades.

Now the public issues in market fishing and environmental protection require coordinated professional inputs from biologists along with several other scientific specialties. The inputs must be presented in an appropriate combination if they are to take precedence over political horse-trading. In other words, if research biologists do not provide solutions to the issues as they are perceived by the public, the biologists will lose some of the public trust. Research biologists will, of course, continue to have a vital role in advancing our basic understanding of the ever-more-complex aquatic ecology and biology, but the immediate research findings will seldom be understood by the concerned public.

AIFRB also has had an important role distinct from that of AFS in fostering small district or sub-district groups that can meet frequently. These provide an opportunity for senior and junior fishery scientists to get acquainted, to discuss local issues, and perhaps to make local public policy recommendations. Such groups are smaller with more frequent meetings than the regional or chapter meetings of AFS; therefore they can take action at a more appropriate time.

In my judgment the great diversity of views among AIFRB members about the value of their election program the relatively static membership in most districts, the rapidly evolving field of fishery science, and the broad appreciation of nonbiological matters now required of so many fishery scientists indicate that AIFRB must consider a modified role for its future. It has much to build on and much to do. Let us take a long-range look ahead.

William F. Royce
21 February 1986

District Officers

District elections and an appointment in AIFRB Districts have resulted in a new roster of District Directors. With respect to elections, Secretary Lawler urges the Districts to observe the following practices in processing results:

1. All ballots are to be sent directly to the AIFRB Secretary for tallying.
2. Insure that the Secretary is notified beforehand of all District elections by providing a copy of the ballot, the date ballots are sent out, and the deadline for receipt of ballots.
3. Make certain of the correct address of the Secretary. G. "Herb" Lawler's address is: 501 University Crescent, Winnipeg, Montreal, Canada R3T 2N6.

The following list shows the names of the current District Directors:

Alaska ..... **Dave Gibbons**
California, Central ..... **Brian Waters**
California, Southern ..... **Peter Haaker**
Carolina ..... **John Merriner**
Florida ..... **Eric Prince**
Great Lakes, S. Central ..... **Howard Tanner**
Gulf of Mexico, NE ..... **Charles Roithmayr**
New York-New Jersey ..... **Joseph Rachlin**
Oregon, Washington, SW ..... **Howard Horton**
Texas ..... **Andre Landry**
Washington, DC, Metro ..... **Ronald Rinaldo**
Washington, NW ..... **Ed Best**

Symposium Sponsorship—Should We, and What?

The American Fisheries Society has approached AIFRB with an invitation to stage a 1- or 2-day symposium or workshop in conjunction with the AFS annual meeting to be held at Toronto, Canada in 1988. The last time AIFRB held a symposium under these circumstances was in 1981 at Albuquerque—the affair was highly successful and gave a good professional image of AIFRB.

There appear to be two points to be considered before the AIFRB Board of Control can respond to Rudolph Rosen, the Program Chairman for the AFS meeting. First, the question of whether AIFRB should sponsor a symposium or workshop. Second, if we decide to go ahead with a symposium or workshop we must select a topic on which to build a first-rate program that will be a credit to AIFRB. AIFRB's leadership solicits suggestions on answers to both these questions.

Our District Directors are aware of our need for input regarding a symposium or workshop, but it is felt that our membership at large should be in a position to contribute valuable suggestions for a theme for a general or specialized program of interest to the fisheries community. So, this is a call for action by our members—give this some thought, and *participate.* Members with ideas should transmit their contributions to their District Directors or directly to President Hugh MacCrimmon. Remember—we all have a duty to promote AIFRB and its standing in the fishery circle, so here's a chance for each member to do his part.

The Board of Control is waiting!

Geomagnetic Navigation

Although marine animals such as turtles, fish, and whales are known to migrate across thousands of miles of the open sea, how they find their way or navigate remains a mystery. Many of the clues available to terrestrial or aerial migrators are unusable or unavailable to animals migrating in the sea. Two of the geopotential fields (gravitational and geomagnetic) are particularly stable with respect to the oceanic floor, and these are almost totally independent of fluctuations produced by more transient features like oceanic currents. The geomagnetic field, in particular, can provide a surprising wealth of information.

In the past 15 years, behavioral experiments on migratory and homing animals have revealed that many of them possess the ability to detect the earth's magnetic field. Among these are skipjack tuna *(Katsuwonus pelamis)* and kawakawa *(Euthynnus affinis)*, which can be conditioned to respond to changes in earth-strength fields (Walker, M.M. 1984. J.Comp.Phys.A. 155:673-679). A candidate magnetic sense organ has

also been proposed in the yellowfin tuna *(Thunnus albacares)* (Walker, M.M. et al. 1984. Science 224:751-753). From these experiments and others, two discrete geomagnetic sensory abilities are suggested, one which involves using the field like a simple compass, and the other in which animals apparently use small geomagnetic anomalies as local reference marks.

Recent work has shown that many species of dolphins and whales tend to strand at coastal locations where negative magnetic anomalies intersect the coastline (Kirschvink, J.L. et al. in press. J.exp.Biol.), and that migrating fin whales *(Balaenoptera physalus)* sighted at sea in the Atlantic Ocean are similarly associated with low magnetic field gradients like those which occur at the bottoms of magnetic minima (manuscript in review). These results suggest that migratory marine animals use magnetic anomalies as at least one component in their navigational 'map.'

Andrew E. Dizon
NMFS, La Jolla, CA

International Commission for the Conservation of Atlantic Tunas Plans Yellowfin Year Program

During the last decade the fishing effort in the east tropical Atlantic has increased considerably with little or no increase in yellowfin catch. Stock assessments show that the stocks were at or above the expected maximum sustained yields up to 1983. Starting in 1983, the overall effort in the east tropical Atlantic declined sharply due to the departure of purse seiners to the Indian Ocean. The Commission noted that this large perturbation to the equilibrium situation provides an excellent opportunity to test the application of existing models to handle dis-equilibrium situations and to develop new approaches. To accomplish this, the Commission approved and funded the Yellowfin Year Program to gather and analyze detailed data. The research is to be carried out by volunteer scientists from member countries.

Activities planned to meet the goal include special sampling of catch and effort statistics for fleets and fisheries with usually poor statistics, detailed or super sampling of entire schools of yellowfin to estimate biases associated with normal sampling procedures, and placement of observers on commercial vessels to measure school sighting frequency and operations data for comparison to similar data taken before the effort reduction. Also planned is an ambitious tagging program using a combination of dedicated vessel time and opportunistic tagging. Operational plans for each of the activities have been made and projects will begin in the spring of this year. Data compilation will be done by participating laboratories and countries. Data analysis is planned to begin in mid-1987 and extend through mid-1988. Results are to be presented at a special workshop in mid-1988.

Norm Bartoo
NMFS, La Jolla, CA

NOAA Ship Hosts Scientists on Research Cruise off California

Cruising in unseasonably calm seas off the California coast this past December, the 171-ft NOAA research vessel, *David Starr Jordan,* carried an unusual group of scientists. Aboard were National Marine Fisheries Service (NMFS) biologists seeking information on deep-sea fishes, an endocrinologist from the Univ. of California, Berkeley who collects fish tails, aquarists from the Monterey Bay Aquarium adding to their collections, ornithologists from the Point Reyes Bird Observatory who are studying sea birds, a researcher from the Scripps Insitution interested in the sex habits of deep-sea fishes, and several others with special reasons for participating in the cruise as guest-scientists of the Fisheries Service.

This cruise was organized and led by biologists from the NMFS Southwest Fisheries Center Laboratory in Tiburon, CA who are studying the valuable groundfishes off the West Coast. The scientists were invited by NMFS to participate in the cruise to ensure maximum use of the research capibilities of the ship. They helped NMFS scientific staff to conduct their research and, in turn, shared some of the vessel's time and facilities for carrying out their own work. This cruise began in San Diego and ended in Sausalito with brief stops at Monterey, San Francisco Bay, and Bodega Bay to take on and drop off passengers.

The main purposes of the NMFS scientists during the first leg of the cruise were to determine the whereabouts and abundance of a deepwater fish called the Pacific grenadier and to study the reproductive habits and flesh quality of Dover sole. According to Susumu Kato, Chief Scientist on the first leg of the cruise, the potential market value of the grenadier is being investigated and the breeding biology of the Dover sole, already an important food fish on the west coast, is the object of study by scientists at the Southwest Fisheries Central in La Jolla, California. Good numbers of both species were collected during the cruise. Kato reported that the meat of the grenadier has a delicate flavor, a protein content of around 15% and a very low fat content of 0.5%. Curiously, researchers Eric Lynn and Roger Leong of the La Jolla facility found that in certain deeper waters the Dover soles taken were almost exclusively females.

Tetsuo Matsui, a researcher with the Marine Life Research Group at the Scripps Institution, collected specimens for the Scripps aquarium in La Jolla and gathered data on the sexual maturity of several species of deepwater fishes. Richard Nishioka, an endocrinologist from the Univ. of California, Berkeley, is studying a gland found in the tails of fishes. During this cruise he collected 850 tail sections from nine species of fish. One of the hormones found in this gland is known to lower blood pressure in mammals and affect the secretion patterns of steroids in mammals as well as in fishes.

In addition, collectors from the Monterey Bay Aquarium kept several species of fishes and invertebrates alive for study and display at the Aquarium.

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NOAA Ship Hosts Scientists cont.

Joe Pennisi, a commercial fish processor and fisherman from Monterey, also joined the cruise to observe the special vertical longline technique which is used by NMFS scientists to catch fish at great depths. The line, which has 50 baited hooks, is equipped with a magnesium wire link which dissolves 9 hours after being set, permitting the line to break free of the anchor and float to the surface. Kato commented that this system allows fishing in extremely deep waters without the need for thousands of feet of fishing line.

The second leg of the cruise was led by Tiburon Laboratory fish physiologist Michael Bowers, who coordinated round-the-clock sampling by scientists from NMFS, the Environmental Protection Agency, and the Point Reyes Bird Observatory. Bowers' objectives were to assess the general health and reproductive condition of certain economically-important rockfishes and obtain tissue samples for later analyses. He also wanted to collect live rockfish for study of reproductive processes in the laboratory. He obtained a number of yellowtail rockfish which were transferred to the Univ. California's Marine Laboratory at Bodega Bay. Another goal was to survey the winter distribution of krill, a shrimp-like invertebrate which is an important food for many fishes.

When not sampling rockfish or krill, the researchers trawled for bottom fishes and took core samples of the sea floor for radionuclide analyses. These samples were taken from depths of 1,650 to 5,000 feet near known dump sites for radioactive wastes.

NMFS SW Fisheries Center
La Jolla, CA

AIFRB People in the News

Shelby D. Gerking

AIFRB Emeritus Member Shelby D. Gerking will assume the presidency of the American Fisheries Society at the AFS annual meeting at Providence, RI in September 1986. Before taking Emeritus status, Shelby was a long-time Fellow in our Institute. For many years he has occupied a conspicuous place in freshwater fishery research and teaching.

Bernard E. Skud

Bernie Skud, immediate past-president of AIFRB, life member of the American Fisheries Society, and Affiliate Professor of Oceanography at the University of Rhode Island, has accepted a position as Executive Director of the International North Pacific Fisheries Commission. Bernie has been a special scientific assistant to the Northeast Fisheries Center of the National Marine Fisheries Service at Narragansett, RI for the past 6 years.

Skud was directly involved in commission discussions during the 1970s while serving as director of investigations for the International Pacific Halibut Commission.

The INPFC, based in Vancouver, British Columbia, was established by convention between Canada, Japan and the United States for the conservation of fisheries resources in the North Pacific.

Bernie expected to begin his new duties around April 1.

Announcements and New Publications

Conference—Aquatic Plants for Water Treatment and Resource Recovery

Fifteen natural resource agencies will sponsor a conference on *Research and Application of Aquatic Plants for Water Treatment and Resource Recovery* at the Americana Dutch Resort Hotel, Lake Buena Vista, FL on July 20-24, 1986. The program will have plenary, concurrent, and poster sessions for scientists and engineers involved in research in this topical area and for those interested in application of the technology.

Sessions will address an overview of issues, model systems, international experience, critical processes in aquatic plant treatment systems, aquatic plant management and utilization, and systems evaluation, and there will be a panel discussion on R & D needs identification.

Registration for the conference is through Aquatic Plants/Water Treatment Resource Recovery Conference, Director of Conferences, IFAS, 1041 McCarty Hall, University of Florida, Gainesville, FL 32611 ($85 before June 1), and arrangements for lodging through the hotel at 1850 Hotel Plaza Blvd., Lake Buena Vista, FL 32830.

Field Guide to Atlantic Coast Fishes

C. Richard Robins (AIFRB Fellow) and G. Carleton Ray have authored *A Field Guide to Atlantic Coast Fishes,* an addition to the Peterson Field Guide series. The book includes every saltwater fish found along the Atlantic Coast, from the Arctic reaches of eastern Canada to the Florida Keys and around the Gulf of Mexico to southern Texas. It features: over 1100 species—every fish found to a depth of 650 feet. Over three times as many species as any other field guide; over 1100 illustrations—400 in color—with concise species descriptions on the facing pages; detailed, readable descriptions of each species in the text; and the Peterson Identification System to pinpoint the key features that distinguish one fish from another.

This first comprehensive, 512-page pocket guide to the saltwater fishes of the Atlantic Coast can be ordered from the Special Sales Dept. Fish, Houghton Mifflin Co., 2 Park Street, Boston, MA 02108 for $20.95 hardcover or $14.95 softcover or from the American Fisheries Society at a 5% discount.

Dangerous Marine Animals of the Pacific Coast

Christina Parsons has written this 96-page handbook about the dangerous Pacific Coast invertebrates, fishes, sea snakes, and mammals. The book identifies, describes and details the hazards, lists symptoms, and gives sound advice on prevention. It is also a handy compedium of information on the latest first aid procedures recommended by medical specialists.

Copies may be ordered from Sea Challengers, 4 Sommerset Rise/Skyline Forest, Monterey, CA 93940 for $4.95 + $1.65 for handling.

Coastal Wetlands

Here is a book by Harold H. Prince and Frank M. D'Itri, who bring together the *Proceedings of the First Great Lakes Wetlands Colloquium* of November 1984. This new book presents a well rounded overview of coastal wetlands, mainly focusing on the unique Great Lakes ecosystem, but valuable as well in other areas of the world. Seven chapters deal with current work that contributes to the state of knowledge of the processes and management of coastal wetlands. Nine of the 16 chapters spell out priorities for research to provide needed future information—these nine chapters each include programmed discussion.

The volume, of special value to fishery and wildlife biologists, ecologists, limnologists, aquatic research managers and planners, and environmental scientists, has 270 pages and 39 figures. It is available for $39.95 from Lewis Publishers, 121 South Main St., Chelsea, MI 48118.

Crustacean and Mollusk Aquaculture in the U.S.

This volume, edited by Jay V. Huner and E. Evan Brown, is a 476-page reference book on the current status of viable culture systems for the production of crustaceans and mollusks in America. In general, topics for each organism include culture, biology, environmental requirements, diseases, predators, and other factors affecting economical commercial production.

This useful book provides information for researchers in universities and private enterprise, growers, and anyone involved in the culture of crustaceans and mollusks.

The animals covered in the 10 chapters are crayfish (4 chapters), other crustaceans, oysters, clams, mussels, abalone, and brine shrimp. Other chapters deal with the development of commercial cultivation in the U.S. and water quality.

The book is available from The AVI Publishing Co., 250 Post Rd. E, Westport, CT 06881 for $65 and from the American Fisheries Society at a 5% discount.

Dissertation Abstract

Community Structure of Demersal Fishes on the Inshore U.S. Atlantic Continental Shelf: Cape Ann, MA to Cape Fear, NC

William C. Phoel, Ph.D., 1985
The College of William and Mary in Virginia

Numerical classification analyses (clustering) of spring, summer, and fall National Marine Fisheries Service bottom trawl catches on the inshore continental shelf between Cape Ann, Ma. and Cape Fear, N.C., showed consistent species associations and faunal zones over a 3-year period. Analysis of a data set created by combining all nine survey cruises also produced consistent species associations; however, sites clustered by seasons as well as by geographic area.

The three faunal provinces of the U.S. East Coast (Gulf of Maine, Middle Atlantic Bight, and South Atlantic Bight) were represented in the study area, as were the seasonal faunal barriers at Nantucket Shoals and Cape Hatteras. Generally, the faunal zones correlated well with the thermal regimes of each province and respected the faunal barriers when strong thermal gradients were present. Only south of Cape Hatteras did depth appear to define a boundary between faunal zones.

During the spring, when bottom water temperatures were lowest, four species associations and three faunal zones were identified. The species associations consisted of a cold water boreal group (affiliated only with the faunal zone between Cape Ann and Cape May, N.J.), a less cryophilic boreal group, a eurythermal warm temperate group, and a warm temperate group which was restricted to waters south of Cape Hatteras. With vernal warming, a northerly and onshore migration of warm temperate species increased to five the number of species associations in summer. Beside the four groups found in spring a more thermophilic association was identified. Separations between the northern three summer faunal zones occured at Nantucket Shoals and northern New Jersey. The other two summer zones were restricted to south of Cape Hatteras and were separated longitudinally (inshore and offshore). In fall, when bottom temperatures were highest, a sixth species group of primarily southern species was identified. This group appeared restricted to the inshore faunal zone south of Cape Hatteras. The five faunal zones recognized in summer were also identified in fall; however, the cold-water zone was restricted to north of Cape Cod and the other two groups north of Cape Hatteras extended further to the north than they did in summer.

Membership

Inquiries regarding membership should be directed to Dr. Sammy M. Ray, Membership Chairperson, Texas A & M University at Galveston, Building 311, Fort Crockett, Galveston, Texas 77550.

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 $15 a year to Institutions and Non-Members.

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FIRST CLASS

W. H. Bayliff

American Institute of Fishery Research Biologists

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VOL. 15, NO. 4 AUGUST 1986

W. F. Thompson Award

Katherine W. Myers, recipient of the 1985 W. F. Thompson Best Paper Award, receives congratulations from Dr. Roy E. Nakatani (Fellow '72, AIFRB), Associate Director of Fisheries Reserach Institute, and a check for $750 and a Certificate from AIFRB. The award, named in memory of a founding member and the first president of AIFRB, recognizes the year's outstanding student research in a fisheries publication. The winning paper was co-authored with Prof. Howard F. Horton. Kate Myers is a fisheries biologist at Fisheries Research Institute.

1986 Annual Meeting

The 1986 annual meeting of the Board of Control of the American Institute of Fishery Research Biologists will be held at Providence, Rhode Island on September 12 and 13. All Associate Members, Members, Fellows, and Emeritus Members and Emeritus Fellows of AIFRB are welcome to attend the meeting. Annual meetings of the American Fisheries Society and the International Association of Fish and Wildlife Agencies will take place at the same locality from September 12 to 18.

The basic agenda to be followed at the AIFRB Board of Control meeting is:

1. Call to Order
2. Minutes of the 1985 Meeting
3. Report of President
4. Reports of District Directors
5. Reports of Ex-Officio Officers
   - (i) Secretary
   - (ii) Treasurer
   - (iii) Membership
   - (iv) Publications
6. Reports of Award Committees
   - (i) Travel Raffle
   - (ii) W. F. Thompson Best Student Paper 1986
   - (iii) Outstanding Achievement Award 1986
   - (iv) Group Award of Excellence
7. Bylaw Considerations
8. Other Business
   - (i) Unfinished Business
   - (ii) New Business
9. Approval of 1986-7 Budget
10. Installation of New President
11. Adjournment

The 1986 Travel Raffle

Nancy Anderson assists Bill Fox (AIFRB Fellow) in the drawing of names for the 1986 Travel Raffle.

cont. on page 2

The 1986 Travel Raffle cont.

Eric Prince, Florida District Director and chairman of AIFRB's committee on the Third Annual Travel Raffle, announces the names of the winners for this year. A drawing was held in Miami, FL in June, and AIFRB checks for $250 have been issued to the lucky young fishery biologists.

The winners, and the meetings for which the funds have been or will be used, are:

Jerald S. Ault, FL AFS Annual Meeting
Gary D. Marty, IA AFS Fish Health Section Meeting
Barbara E. Warkentine, NY Northeast Fish and Wildlife Conference

AIFRB congratulates the winners and trusts that these awards will contribute to the advancement of the professional careers of these three budding fishery people.

The 1987 U.S. Federal Budget for Natural Resource Agencies

The administration's proposed 1987 budget, sent to Congress on February 5, contains relatively few surprises for conservationists and natural resource agencies. As in previous years, the president proposes to make the government "leaner" and allegedly more efficient, thereby shaving billions of dollars off the annual federal deficit. In the natural resources field, the administration proposes to accomplish these goals by restriciting land acquisition and new construction activity for several agencies in 1987, imposing heavier user fees on park users and beneficiaries of Corps of Engineers water projects, and terminating "nonessential" federal programs ranging from state coastal zone management grants to technical assistance to farmers for certain soil and water conservation activities.

President Reagan is also once again calling for the "privatization" of many government functions, although this time the prime targets of the privatization effort are not public lands agencies, but rather the Bonneville Power Administration, the Naval Petroleum Reserves in Elk Hills, California, and Teapot Dome, Wyoming; and portions of the federal government's loan portfolio. The proposed 1987 budget makes sizeable reductions in fish and wildlife programs, decreases federal efforts to protect endangered species, and calls for some politically controversial changes in the formulas under which federal timber, mineral and grazing receipts are shared with local units of government. However, as House Democrats have begun to comment, the budget proposal does not extend the administration's "user fee" philosophy consistently to all beneficiaries of public lands: Bureau of Land Management grazing fees would be frozen under the proposal.

Budgets and programs for the Fish and Wildlife Service and the National Oceanic and Atmospheric Administration are highlighted here. The FY 1986 estimated budget figures used include the Gramm-Rudman cuts of 4.3 percent, which took effect this spring.

Fish and Wildlife Service

The proposed budget of $581 million for FWS is about the same as that in FY 1986, but represents a $50 million (8%) decrease from the FY 1986 level. In contrast, the total decrease for the entire Interior Department from 1986 to 1987 is 3 percent. Generally, FWS operating accounts for resource management are about the same as in 1986. Significant 1987 cuts include elimination of endangered species and anadromous fish grants to states and drastic cutbacks in land acquisition and construction. Also, FWS has cut 361 FTE's from its 1986 staff level, including 195 in the Animal Damage Control Program transferred to USDA; 52 from the Federal Aid Program; 42 from construction; and 50 from refuge maintenance.

FISH AND WILDLIFE SERVICE

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Base	FY 1987 Proposed
Total Budget (millions of dollars)	585.5	630.5	574.5	581.4
Selected Accounts:				
Habitat Resources	49.5	45.7	47.1	49.1
Wildlife Resources	147.5	129.2	133.2	128.2
Fishery Resources	46.5	48.4	49.6	48.0
Endangered Species	27.1	29.0	29.9	23.2
Construction and Anadromous Fish Grants	28.3	21.3	1.4	3.1
Land Acquisition (LWCF)	70.2	40.4*	0	1.5
Migratory Bird Acquisition (Advance)	21.3	14.3	0	0
Migratory Bird Acquisition (Duck Stamp)	14.5	14.4	14.4	16.5
Pittman-Robertson	85.9	120.8	120.8	95.0
Dingell-Johnson	38.1	122.2	122.2	161.5

*Does not include a proposed recision of $4.9 million.

Habitat Resources—New activities in FY 1987 include an increase in comprehensive field surveys for suspected industrial and agricultural contaminants (+$696,000); additional research to pinpoint contaminant discharges affecting fish and wildlife (+$257,000); expansion of research on contaminants in estuarine sediments (+$320,000); and purchase of laboratory equipment (+$900,000). The major cutback is −$500,000 for studying the biological effects of acidification of waters.

Fishery Resources—FWS proposes to close or transfer to states six hatcheries and one field station (-$2.1 million). These facilities are: Pvt. John Allen, MS; Natchitoches, LA; Frankfort, KY; Warm Springs, GA; Mammoth Spring, AR; Carbon Hill, AL; and Bears Bluff, SC.

Endangered Species—The major change is the elimination (-$4.4 million) of grants to states under Section 6 of ESA. There is also a cutback (-$754,000) in recovery activities of lower priority.

Construction/Anadromous Fish—FWS has deferred any new capital construction or major repairs. (FWS is spending over $15 million on construction in 1986). Only dam safety work will be done (+$2.7 million) and some advance planning. Grants to states under the Anadromous Fish Conservation Act are terminated. Such grants totaled $4 million in 1985 and $1.9 million in 1986. FWS wants states to take care of their anadromous fish needs with grants provided under the Dingell-Johnson Act which have increased 324 percent from the 1985 level.

Land Acquisition—The Reagan administration is again attempting to defer land acquisition under its Land and Water Conservation Act authority, a decrease of $38.9 million from 1986.

Pittman-Robertson Funds—FWS estimates that state grant funds for wildlife restoration will decline $25.8 million (−21%) from 1986 because of accounting and reporting adjustments. The $95-million estimate for 1987 is based on historical levels of receipts. Twenty-six FTE's are eliminated (a 50% reduction) from the federal aid staff. FWS hasn't determined exactly where to make the FTE cuts, but many regional staff spots are likely to be axed.

Dingell-Johnson Funds—Because of 1984 legislation that expanded revenue sources for the Dingell-Johnson Fund, receipts in 1987 are estimated at $161 million, 324 percent higher than the $38 million collected in 1985. FWS also is slashing its federal aid program staff another 26 FTE's that currently supervise Dingell-Johnson grants.

National Oceanic and Atmospheric Administration

The proposed NOAA budget of $902.6 million represents a severe decrease (−13 percent) from the FY 1987 base level of $1,027.7 million. The administration proposes eliminating state and interstate grants under CZMA, reductions for the Marine and Estuarine Sanctuary Programs and deep cuts in the Marine Fisheries Resources Program (−40 percent) under which NOAA conducts habitat management and research for estuarine environments. In addition, the request includes a proposal to initiate an ocean sportfishing license to raise revenue for the federal government. The license would be required for sportfishing in federal ocean waters and would cost a minimum of $10. Coastal states would issue the licenses, which would be applicable between states. Five dollars of each license fee would be deposited in the federal treasury and the remainder would be kept by the states for administration and for the costs of state fishery management programs.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Base	FY 1987 Proposed
Total Budget* (millions of dollars)	1,279.2	1,180.4	1,027.7	902.6
Selected Accounts:				
Ocean and Coastal Programs (CZMA)	45.8	44.0	8.0**	5.9
Marine Fishery Resource Program	151.4	162.1	158.6	96.7

*Excludes NOAA Loan and Trust Fund accounts.
**Assumes congressional approval of proposed $36.0 million recision.

CZMA—As it has done since coming to office, the administration proposes no funding for state and interstate federal cost-sharing grants under CZMA. The administration argues that since most coastal states have begun implementing their CZMA programs, there is no need to continue the grant program which was intended only to provide seed money to get state programs started. In addition to making no FY 1987 request for the CZMA grant program, the administration proposes to rescind the FY 1986 congressional appropriations of $35 million for state grants and $1 million for interstate grants.

Marine and Estuarine Sanctuary Programs—The administration proposes reducing the Estuarine Sanctuary Program by $0.8 million to $1.3 million from the FY 1987 base of $2.1 million. Most of this cut would be made in funds for sanctuary acquisition. Also, the administration proposes reducing the Marine Sanctuary Program by $.7 million to $2.2 million from an FY 1987 base of $2.9 million. Most of this cut would be made in research funds for the seven designated marine sanctuaries. In addition, program mnagement would be reduced by $0.65 million.

Marine Fishery Resources Program—The administration recommends cutting the Fishery Program's budget by 40 percent, refocusing it to address only management needs of the highest priority. Proposed decreases include: a reduction of $5.1 million and 63 staff positions for estuarine habitat research; a reduction of $2.3 million and 13 staff positions for estuarine habitat conservation; a decrease of $1.5 million for marine mammal and endangered species research; a cut of $1.3 million for protected species biology; a decline of $0.5 million for striped bass research; a decrease of $0.9 million for anadromous fisheries grants; and a cut of $4.3 million in fisheries grants to states.

Adapted from an article by W. J. Chandler, A. Feeney, and R. Magder in Renewable Resources Journal, *Spring 1986*

News From the Districts

CENTRAL CALIFORNIA

Brian F. Waters, Director

Regular District dinner meetings were held on March 13 in Berkeley and on May 8 in San Francisco. Our featured speaker at the March meeting was Dr. Christopher Dewess of the Sea Grant program and is headquartered at the University of California at Davis. The title of his presentation was "Fish or Cut Bait: Innovation in Fisheries," in which he discussed technological and social changes in the groundfish and salmon fisheries of the West Coast. Through survey techniques he evaluated technological in-

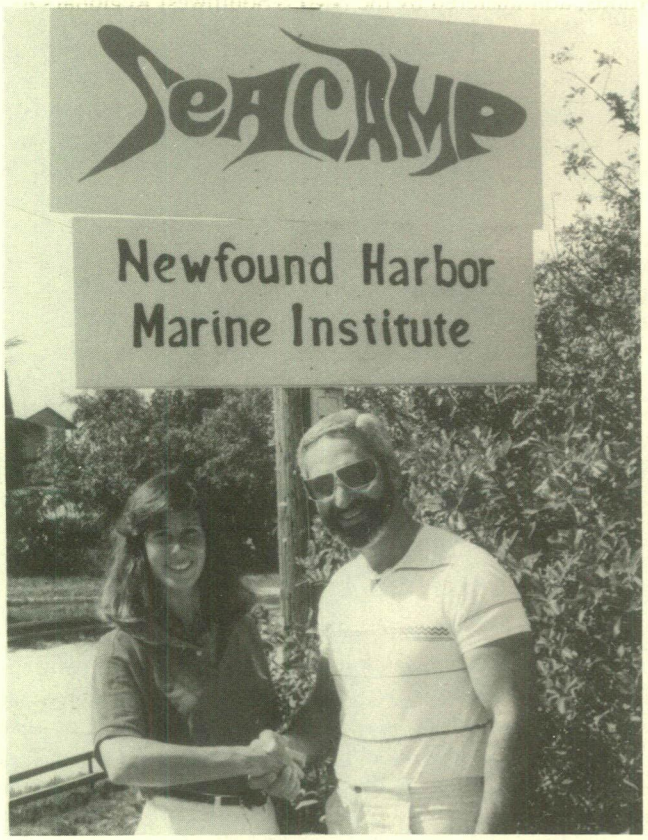
cont. on page 4

novations and how they affect safety, fishing power, and fishing comfort. He also reported on evaluation of factors that drive fishermen to change, and developed profiles of a fisherman's probability of accepting or adopting change.

Our guest speaker at the May meeting was Al Petrovich, Chief of Marine Resources for California Department of Fish and Game, who spoke on "New Directions in California Marine Resources Management." He described the new structure of his organization with shifts in personnel, redistribution of responsibilities, and changes in a research-to-management orientation. He also held a lively discussion of job opportunities in the Department of Fish and Game and covered a question-and-answer period which addressed such issues as a new vessel for the Department, computer sciences, and expanded aquaculture facilities.

FLORIDA **Eric D. Prince**, Director

Newfound Harbor Marine Institute in Big Pine Key, Florida, was the site of a joint meeting between the Florida chapter of AFS and the Florida District of AIFRB in February 1986. Barbara Hoffman (AFS FL chapter President-elect) and Eric Prince (FL District Director AIFRB) felt that the joint meeting concept was so successful that the same format is being adopted for next year's meeting. We would like to see the same spirit of cooperation elevated to the respective society headquarters.



Barbara Hoffman and Eric Prince bridge the gap between AFS and AIFRB at Newfound Harbor Marine Institute.

IATTC International Tuna-Dolphin Program Expanding

The Inter-American Tropical Tuna Commission's (IATTC) international tuna-dolphin data collection program, which began in 1978, has been expanding in recent years as the Latin American tuna fleets have increased in size. The program places scientific technicians on tuna purse seiners of the international fleet to collect data on the incidental mortality of dolphins in that eastern Pacific fishery. These data, along with data from a similar U.S. program run by the National Marine Fisheries Service (NMFS) are used by IATTC staff to estimate yearly incidental dolphin mortality and to assess dolphin stock abundance in the eastern Pacific Ocean. The IATTC and NMFS programs equally share U.S.-sampled trips, while the entire non-U.S. sample is the responsibility of the IATTC program. In 1984, the IATTC program sampled 24 eastern Pacific trips, 16 on U.S. flag vessels and 8 on non-U.S. vessels. In 1985, the number of sampled trips increased to 47, of which 24 were on U.S. vessels and 23 were on non-U.S. vessels. The estimated incidental dolphin mortality for the international fleet in 1985 was approximately 55,000 animals.

With intentions to increase its efforts with the Latin American fleets and to increase general awareness in those countries of the dolphin mortality problem, the IATTC requested and received support from the United States Environment Program (UNEP) as part of UNEP's Global Plan of Action for the Conservation, Management, and Utilization of Marine Mammals. The objectives of the joint IATTC-UNEP program are (1) to achieve a significant increase in the use of dolphin-saving procedures by tuna fishing vessels in the eastern Pacific by the end of 1986, (2) to increase the ability of researchers and others to assess dolphin populations and the impact of the tuna fisheries on these populations, and (3) to improve regional cooperation among Latin American states participating in the tuna fishery to safeguard the tuna-associated dolphin populations.

The joint program began in August 1985 and will continue through 1986. Last year, IATTC staff members traveled to Ecuador, Panama, and Venezuela, conducting seminars and meetings on dolphin mortality reduction techniques at government fisheries agencies, research organizations, and fisheries schools and universities. Meetings were also held with vessel owners and captains to discuss dolphin mortality reduction and the importance of their continued participation in the international program. In addition, the IATTC-UNEP program is providing high-intensity floodlights to several of those countries' vessels to use during late afternoon sets in which the dolphin release procedure occurs in darkness. The IATTC has been experimenting with the floodlights for several years and their effectiveness in reducing dolphin morality in those types of sets has been encouraging. More educational activities are planned in Latin American countries in the future, including courses in marine mammal biology and population assessment.

All Latin American countries that have purse-seine fleets that fish for dolphin-associated tunas have participated in the IATTC international tuna-dolphin program

in the past, except for Mexico which now has the largest tuna purse-seine fleet in the eastern Pacific. In late 1985, Mexico decided to start a joint tuna-dolphin program with the IATTC, which resulted in additional support from UNEP to the IATTC. Mexico's participation in the program will be extremely important in that it will allow dolphin mortality estimates with less bias, a better geographical distribution of the data, and a generally stronger data base for related areas of analysis.

A training course for Mexican biologists was held in December 1985 and technician placements aboard vessels began in January 1986. Floodlights were also made available to many of the Mexican vessels carrying IATTC technicians. As of mid-May the international program had placed technicians on 41 trips, of which 19 were on Mexican flag vessels. The IATTC expects to sample at least 70-80 trips this year on vessels registered in Costa Rica, Ecuador, Grand Cayman, Mexico, Panama, Spain, the U.S., Vanuatu, and Venezuela.

David A. Bratten
Inter-American Trop. Tuna Commiss.
La Jolla, CA 92093

Fulbright Grants

The Council for International Exchange of Scholars (CIES) is accepting applications for the 1987-1988 Fulbright Scholar Awards. More than 300 grants in research and 700 grants in university lecturing are available for periods ranging from 3 months to a full academic year, with openings in more than 100 countries and some opportunities for research in more than one country.

Fulbright awards are granted in virtually all disciplines. Scholars of all academic ranks, including retired faculty and independent scholars, are eligible to apply. Fulbright scholars must be U.S. citizens with a Ph.D. or comparable professional qualifications, have university or college teaching experience and, for selected assignments, be proficient in a foreign language.

Benefits include round-trip travel for the grantee (if the award is for a full academic year, round-trip travel for one dependent will also be covered), a maintenance allowance to cover living costs for the grantee and family, book and baggage allowances, and, in many countries, a tuition allowance for school-age children.

Application deadlines for the awards are as follows:

- June 15, 1986, for Australasia, India, Latin America and the Caribbean.
- September 15, 1986, for Africa, Asia, Europe and the Middle East.
- November 1, 1986, for institutional proposals for the Scholar-in-Residence Program.
- January 1, 1987, for Administrators' Awards in Germany, Japan and the United Kingdom and for the NATO Research Fellowships.
- February 1, 1987, for Spain Research Fellowships and France and Germany Travel-Only Awards.

For more information and applications, contact the council for the International Exchange of Scholars, 11 Dupont Circle, N.W., Suite 300, Washington, D.C. 20036. Telephone: (202) 939-5401. CIES participates with the U.S. Information Agency in administering the Fulbright Scholar Awards.

✓ Prospects for Establishing U.S. Albacore Fishery in South Pacific

Based on the results of trolling exploration conducted by two U.S. fishing vessels and results from a research survey by the NOAA Ship *Townsend Cromwell* conducted in conjunction with the fishing vessels, scientists at the Southwest Fisheries Center of the U.S. NMFS have concluded that the prospects are favorable for establishing a U.S. albacore fishery in the south Pacific. Relatively high catch rates and total catches made by the fishing vessels, coupled with relatively good weather conditions and the Infrastructure in Pago Pago, American Samoa, for selling catches and supporting vessel needs, suggest that it is economically feasible for U.S. vessels to operate in the South Pacific.

The fishing vessels *Day Star* and *Bald Eagle* conducted the exploratory fishing and made albacore-related scientific observations in the South Pacific. Each vessel received $60,000 in financial support from Saltonstall-Kennedy funds, administered by the NMFS Southwest Regional Office and awarded to the Pacific Fishery Development Foundation in collaboration with the American Fishermen's Research Foundation. In addition to carrying on exploratory fishing, the participating vessels also kept detailed fishing records, conducted albacore tagging operations, and made oceanographic observations. A major objective of the survey was to gain experience necessary to evaluate the feasibility of developing a U.S. troll fishery for albacore in the South Pacific. Such a fishery would operate from January through May, would be centered about 1500 to 2000 mi southeast of American Samoa, and would use the Infrastructure in Pago, Pago for selling catches to U.S. canneries, refueling, making repairs, and reprovisioning.

The *Day Star* caught an estimated 55½ tons of albacore. The vessel was filled to capacity after 29 days of fishing, and delivered 50.6 tons of albacore to the cannery in Pago, Pago. The *Day Star* also tagged and released 602 albacore with estimated weight of 5 tons. The *Bald Eagle* caught about 52 tons of albacore, including 100 fish that were tagged and released. The average weight of the fish caught was 18½ lbs. The fishing was carried on within a rather narrow latitudinal range between about 38° 30' and 41° 30'S. The area of best fishing was between about 141° to 151°W; westward of 151°W the catches dropped off considerably.

Examination of the catch results made by the fishing vessels and the *Cromwell* and oceanographic measurements that were made concurrently with the

cont. on page 6

Prospects for Albacore Fishery cont.

fishing revealed (1) Albacore catches were associated with the Subtropical Convergence Zone (STCZ), (2) Fishing success was highest near the northern boundary of the STCZ, (3) Nearly all albacore catches were associated with sea-surface temperature (SST) fronts, usually with gradients about 0.5° to 1°C per mile or less, (4) Best catches were made in warmwater intrusions, and (5) Catches were made in waters having SST's in the range of 16.5° to 19.0° C, with best catches made by fishing vessels at SST's near 18.3° to 18.6°C.

In summary, it appears feasible to establish a U.S. albacore fishery in the South Pacific. Also, from what is known at this time, the South Pacific albacore population is in good condition and can support a surface fishery. However, substantially more fishery exploration and knowledge of the migration patterns and biology of the population are required before a viabile U.S. fishery can be successfully developed in the South Pacific.

R. Michael Laurs
Southwest Fisheries Center
U.S. National Marine Fisheries Service
La Jolla, CA

F.R.V. W. E. Ricker Christened

A new fishery research vessel has joined the fleet of the Canadian Department of Fisheries and Oceans. The vessel is named in honor of Dr. W. E. Ricker. The Christening Ceremony was held at the Genstar Shipyards, Ltd. in North Vancouver, B.C. on May 24, 1986. The ship will carry out all phases of biological research, oceanographic studies, and stock assessment of all types of fish, and will operate out of the Pacific Biologicial Station, Nanaimo, B.C. The vessel has the following characteristics: Length overall-58m; beam-9.5m; draft-4m; range-10,000 miles at 10 knots; Crew-22; Scientific complement-8; Area of operation-Canadian economic zone Pacific to 200 mile line.

After the christening, there was a reception honoring Dr. Ricker and his distinguished career in fisheries.

Dr. W. E. Ricker was born in Waterdown, Ontario. He studied at the University of Toronto and received his B.A. degree in 1930, M.S. in 1931, and Ph.D. in 1936. He served with the Fisheries Research Board from 1931 to 1938 as a scientist. He was with the International Pacific Salmon Fisheries Commission from 1938 to 1939 before becoming Professor of Zoology at Indiana University. In 1950 he rejoined the Fisheries Research Board, serving in the dual capacity of Editor of Publications and Biological Consultant. He was appointed Acting Chairman of the Fisheries Research Board for approximately 1 year.

He is widely acknowledged as the foremost fisheries scientist in Canada and among the top in his field in the world. During his outstanding career, Dr. Ricker has authored over 200 publications covering all of his principal research areas. Dr. Ricker has received many prestigious awards and was made an Officer of the Order of Canada in January, 1986. He is currently in retirement in Nanaimo but is still actively engaged in research.

Announcements and New Publications

The Coastal Society—10th National Conference

The 1986 meeting of The Coastal Society will be held October 12-15 at the International Hotel, New Orleans, LA. Estuarine and coastal management—tools of the trade will be the theme this year. Contact The Coastal Society, Box 890, Gloucester Point, VA 22062.

This conference will bring together coastal professionals to exchange ideas and information on tools used in estuarine and coastal management. Plenary sessions will examine the strategies and progress of management programs across the country; the changing role of government agencies in these programs; and the pressures of accountability and how managers measure progress. Concurrent sessions and a poster session will focus on tools used in management, science and technology, and planning and regulation as they relate to estuarine and coastal resources. A variety of field trips will be offered to investigate local research laboratories, the cultural history of Louisiana, the dynamics of the Mississippi delta and coastal challenges of the city of New Orleans.

The conference will be held in cooperation with the U.S. Environmental Protection Agency, Office of Marine and Estuarine Protection; National Oceanic and Atmospheric Administration, Estuarine Programs Office; U.S. Fish and Wildlife Service, Division of Biological Services; and U.S. Army Corps of Engineers.

Water Resources Conference

The *21st Annual Conference and Symposium* of the American Water Resources Association will be held on November 9-14, 1986 in Atlanta, GA. Contact Kenneth D. Reid, American Water Resources Association, 5410 Grosvenor Lane, Bethesda, MD 20814.

Midwest Fish and Wildlife Conference

Among the features of the 48th Midwest Fish and Wildlife Conference to be held December 7-10, 1986 at the Red Lion Inn, Omaha, NE will be a symposium entitled *The Missouri River—The Resources, Their Uses and Values.* The goals will be to place the Missouri River in an historical setting, to show the present changes and their effects, and to develop a philosophical perspective for the river as it passes into the next century. Speakers will discuss biological aspects of the river, economic development, physical and chemical modifications, recreational use, water accounting and projected depletions, operating an unbalanced reservoir system to enhance fishery management programs, a regional fish and wildlife mitigation program, and Montana's program for stream preservation in the Missouri River drainage.

For information contact Harold Edwards, Steering Committee Chairman at (402) 464-0641.

Sea Grant Abstracts

Vol. 1, No. 1 of *Sea Grant Abstracts* appeared in the spring of 1986. The purpose of the new series is to document and facilitate the acquisition of publications originating from the National Sea Grant Program. The primary concern of Sea Grant is to promote the utilization and conservation of the nation's ocean, coastal, and Great Lakes resources. *Sea Grant Abstracts* cites, on a quarterly

basis, the majority of the literature which is received by the National Sea Grant Depository. This literature covers pure and applied science, engineering, business management, shipping and navigation, fisheries, wetlands management, law and policy, economics, and education.

Documents are searchable on-line through SGNET, the Sea Grant information system. Procedures for ordering documents are described on the inside back cover. Publication is by the National Sea Grant Depository, Pell Library Building/Bay Campus, Univ. of Rhode Island, Narragansett, RI 02882.

Renewable Resources Journal

The *Renewable Resources Journal* is the official publication of the Renewable Natural Resources Foundation, a consortium of professional, scientific, and educational organizations. The American Fisheries Society is one of several members of the consortium.

The objective of the *Journal* is to provide a forum for the full spectrum of renewable natural resources professionals. Each issue contains original articles, previously unpublished speeches, and selected articles from the publications of our member organizations. Also included are meeting notices, publications announcements, and news from our members and others.

Subscriptions, at $16 per year, are available from the Foundation at 5410 Grosvenor Lane, Bethesda, MD 20814.

The Paddlefish: Status, Management, and Propagation

This book, published as Special Publication #7 of the North Central Division of the American Fisheries Society, contains 10 papers presented at the December 1983 Paddlefish Symposium in St. Louis. The volume covers paddlefish distribution and abundance, management practices, effects of commercialization, and propagation procedures. There is also an extensive bibliography listing all known publications on paddlefish from the 1700s to 1985.

To order, send $9.00 to Joe Dillard, Missouri Dept. of Conservation, 1110 College Avenue., Columbia, MO 65201.

Culture of Nonsalmonid Freshwater Fishes

This book, edited by Robert R. Stickney (AIFRB Fellow), contains state-of-the-art methodology for producing warmwater and coldwater species for human consumption and stocking as sportfish. Channel catfish, carp and buffalo, tilapia, centrarchids, northern pike and muskellunge, yellow perch, walleye, striped bass and hybrids, and various baitfish are covered in detail. For each fish, the following topics are explored, as applicable: culture systems; water quality; stocking densities; reproduction and genetics; feeding and nutrition; diseases and predators; fertilization; harvesting; record keeping; economics and marketing. 216 pp., 7 x 10, 1986. U.S. $79.00/Outside U.S. $91.00.

Order from CRC Press, 2000 Corporate Blvd., N.W., Boca Raton, FL 22431.

Environmental Exposure from Chemicals

These two volumes, edited by W. Brock Neely and Gary E. Blau, provide state-of-the-art information for environmental exposure analysis, including investigations of movement, distribution, and fate of chemicals in the environment. In Volume I, each of the subjects, ranging from determing the physical properties through sorption and degradation reactions, is critically reviewed by well-known investigators in the field. In Volume II these properties are integrated into a series of mathematical models which describe the movement of the chemical in various compartments. Methods for building models from controlled laboratory ecosystems are discussed, together with the problem of scale-up and validation in the field. Specific examples are given for illustration; real world applications are then addressed. Each system such as air, water, and nonpoint source is covered separately. An introduction to risk-benefit analysis from chemical exposure is also included. These volumes will provide a sound basis for estimating environmental exposure from chemicals.

VOLUME I: Introduction. Estimation of Physical Properties. Pollutant Sorption in Environmental Systems. Air/Soil Exchange Coefficients. Air/Water Exchange Coefficients. Biodegradation. Hydrolysis. Photochemical Transformations. Equilibrium Models for Initial Integration of Physical and Chemical Properties. Index. 256 pp., 7 x 10, 1985. U.S. $88.00/Outside U.S. $101.00

VOLUME II: Environmental Systems Analysis: Overview. Modeling Chemical Transport and Mass Balances in the Atmosphere. Modeling Chemical Transport in Lakes, Rivers, and Estuarine Systems. Nonpoint Source Pollution Models for Chemicals. Risk Assessment and Risk Management Decision-Making for Chemical Exposures. Index. 160 pp., 7 x 10, 1985. U.S. $66.00/Outside U.S. $76.00.

Order from CRC Press, 2000 Corporate Blvd. N.W., Boca Raton, FL 33431.

A Bibliography of Important Tilapias for Aquaculture

This 99-page book by Peter Schoenen is available from ISBS, Portland, Oregon for $15.00 or from the American Fisheries Society at a 5% discount. The volume covers eight species, with subject and geographical index for each species. This is a companion to earlier bibliographies on eight more well known tilapias.

Nutrition and Feeding in Fish

This collection of 27 reviews and original papers is edited by C. B. Cowey, A. M. Mackie, and J. G. Bell. The contents come from an international symposium, and feature anabolic metabolism and diet composition. The price of the 489-page book is $45.00 from Academic Press in Orlando, Florida or from the American Fisheries Society at a 5% discount.

A Guide to Approved Chemicals in Fish Production and Fishery Resource Management

This 1986 book of 28 pages was prepared by R. A. Schnick, F. P. Meyer, and D. L. Gray. It is free of charge from the Technical Information Officer, National Fishery Research Laboratory, Box 818, LaCrosse, WI 54602-0818.

Membership Report

NEW FELLOW

Dr. P. A. Larkin	BC

NEW MEMBERS

Paul D. Cross	MT
Dr. Michael P. Dombeck	CA
Paul G. Scarlett	NJ
Dr. Robert G. Otto	MD
James J. Long	WA
R. Eugene Geary	CA

NEW ASSOCIATES

Clifford W. Long	WA
Randy A. Brown	CA
Melinda Sue Bartlett	CA
Carol A. Reilly	CA

EMERITUS

Dr. Frederick C. June	WA

Sammy M. Ray, *Membership Chairperson*
Texas A & M University at Galveston
Building 311, Fort Crockett
Galveston, Texas 77550

Direct membership inquiries 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 $15 a year to Institutions and Non-Members.

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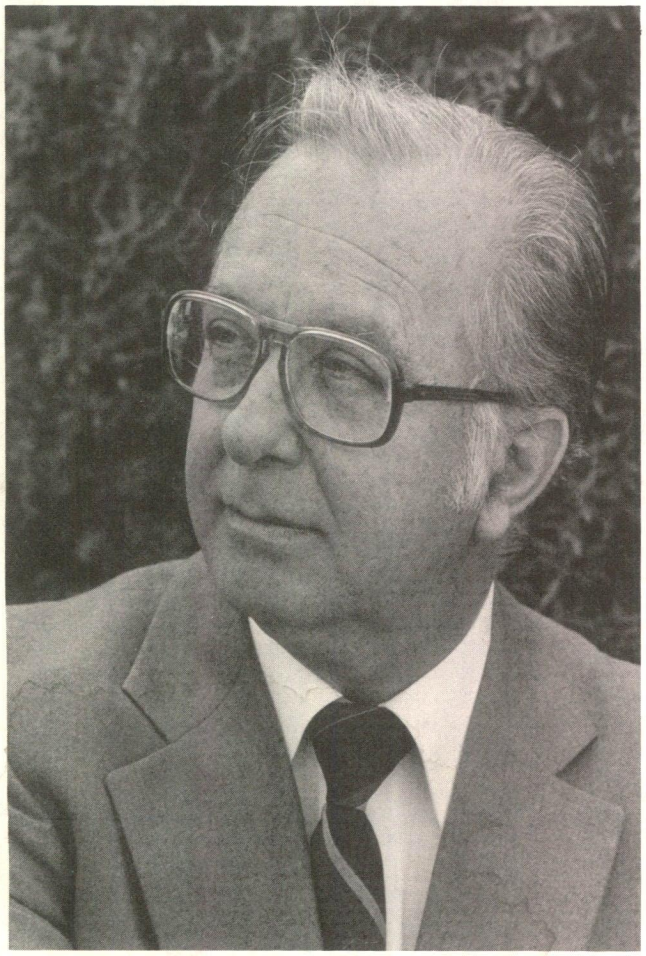

Peter Larkin—Outstanding Achievement Award Winner

The American Institute of Fishery Research Biologists selected Professor Peter Larkin, University of British Columbia, Canada as the recipient of its Outstanding Achievement Award for Individuals for 1985. Professor Larkin holds positions with the university as Vice President for Research, Professor of the Institute of Resource Ecology, and Professor in the Department of Zoology. In addition to his university duties, he is currently a member of the Board of Governors of the Arts, Science and Technology Centre, serves on the B. C. Conservation Foundation, is a member of the Board of Directors of British Columbia Packers Limited, and the British Columbia Research Council, a member of the B. C. Special Advisory Committee on Wilderness Preservation, the Board of Trustees of the Discovery Foundation, the Governing Council of the International Development Research Council, and the Board of Directors of the Science Council of British Columbia.

He attended the University of Saskatchewan, was a Rhodes Scholar and received his doctorate from Oxford University in 1948. He was elected a Fellow of the Royal Society of Canada in 1965. He was made a Nuffield Foundation Fellow at Oxford in 1961-62, and a Fellow of the Royal Society of Canada in 1965. He received the Canadian Centennial Medal in 1967, Master Teacher Award from the University of British Columbia in 1971, the Queen's Jubilee Medal in 1977, and the Fry Medal by the Canadian Society of Zoologists in 1978. He received the Canadian Sports Fishing Institute Award in 1979, the American Fisheries Society Award of Excellence in 1983, and the Rawson Academy of Aquatic Science Award of Excellence in 1984.

Dr. Larkin has published over 130 papers, mostly on the subjects of mathematical modelling of fish population dynamics, theory of resource management, predator-prey relations, science policy mechanisms, and research management. He is a member of the American Fisheries Society, Canadian Society of Environmental Biologists, Canadian Society of Zoologists, International Limnological Asssociation, Canadian Association of University Research Administrators, and Canadian Management Research Association. He is a member of the Canadian Association of Rhodes Scholars, Rawson Academy of Aquatic Sciences, Royal Society of Canada, and Sigma Xi, and is Honorary Live Governor of the Vancouver Public Aquarium.

1986 AIFRB Awards

Nominations are requested for the AIFRB Outstanding Achievement Award for Individuals and the AIFRB Group Award for Excellence. Criteria for these awards are similar: significant publications, exceptional service, outstanding teaching or training of students, important discoveries or inventions, and major contributions to the advancement of Fishery Science.

AIFRB members are invited to submit nominations for these awards to R. J. Myhre, 18920 Sound View Place, Edmonds, WA 98020. Nominations should be submitted by August 1, 1986, and should include a brief summary of noteworthy qualifications of the nominee. Selections for the two awards will be made by the Board of Control at its September meeting.

Federal Acid Precipitation Mitigation Program

Since the first signs that acidification had adverse effects on aquatic habitats and fish populations, fishery scientists and managers have become increasingly interested in remedial measures to restore and protect commercial and sport fisheries. As the primary federal agency with the mandated responsibility for protecting and enhancing the nation's fish and wildlife resources, the U. S. Fish and Wildlife Service (FWS) plays a major role in developing and evaluating mitigation strategies for aquatic resources. This activity is under the Aquatic

cont. on page 2

Federal Acid Precipitation cont.

Effects Task Group of the National Acid Precipitation Assessment Program (NAPAP).

As part of this federal effort, the Eastern Energy and Land Use Team of the Fish and Wildlife Service has designed a 5-year research program, the Acid Precipitation Mitigation Program (APMP), to evaluate the ecological responses to mitigative liming in lakes and streams adversely affected by acid deposition. The program is concerned with research and evaluation of appropriate mitigation tools that could rehabilitate aquatic resources already damaged by acidification. A second concern is with protecting sensitive systems that may be affected by acid deposition. The program is concerned with research and evaluation of appropriate mitigation tools that could rehabilitate aquatic resources already damaged by acidification. A second concern is with protecting sensitive systems that may be affected by acidification before acid deposition is reduced.

The mitigation program has been implemented as a federally coordinated and integrated set of research projects in the Northeast, Southeast, and North Central regions. Formal cooperative agreements have been established with Massachusetts and West Virginia (Northeast), Tennessee (Southeast), and Minnesota (North Central). In addition, in New York the Fish and Wildlife Service Cooperative Fisheries Research Unit at Cornell University is evaluating lake liming, restocking strategies, and fish population response in 10 small Adirondack lakes and has initiated a specific project on thermal stratification following liming.

The first phase of APMP evaluated state surface waters to select sites suitable for conducting specific, long-term research studies based on a set of site selection criteria. This phase also evaluated how typical the individual sites were in relation to impacted or potentially susceptible water bodies in different geographic regions. Five APMP research sites were selected: Thrush Lake in northern Minnesota, Little Simon Pond in New York, Whetstone Brook in the Miller River drainage of Massachusetts, Dogway Fork in the Cranberry River drainage of West Virginia, and Laurel Branch in the Tellico River drainage of eastern Tennessee. Massachusetts and West Virginia chose research sites that once had a thriving sport fishery but whose populations have declined or no longer exist because of acid deposition. Minnesota and Tennessee selected project sites with still-healthy fish populations that have begun to show signs of stress resulting from low pH and low alkalinity during spring snowmelt over the past few years.

The second phase of APMP will conduct specific research studies on the biological, chemical, and physical responses to mitigative liming at the state sites. The state research proposals have been approved, and the mitigation projects began in the fall of 1985. Massachusetts and West Virginia will conduct mitigation research studies for the rehabilitation of affected surface waters and restoration of lost fish populations. Mitigation research in Minnesota and Tennessee will focus on the protection of fish populations in surface waters susceptible to impacts of acid deposition. All studies will include a 1- to 2-year pretreatment monitoring to characterize the physical, chemical, and biological properties of the selected water bodies as baseline information. This will be followed by 3- to 4-year posttreatment monitoring of lake liming, or continuous-treatment monitoring of similar duration for stream liming.

The primary abiotic parameters to be monitored include precipitation, outflow, lake level, snow storage, streamflow, turbidity, evapotranspiration, temperature, specific conductance, color, pH, acid neutralizing capacity, dissolved inorganic and organic carbon, sulfate, nitrate, total phosphorus, ammonium, sodium, potassium, calcium, magnesium, chloride, aluminum, dissolved oxygen, and sediment pH. These features have been selected because they are important to the biological components of the aquatic ecosystem.

Biological descriptors include fish community composition and relative abundance, reproductive success, population estimates, age and growth, and *in situ* bioassay. Macrophytes, zooplankton, and macroinvertebrates will also be measured. The biological monitoring program is designed to allow comparison with studies conducted on other systems.

The individual state cooperative projects have been standardized; the APMP Guidance Manuals specify the parameters to be measured and the protocols to be used. This two-volume manual will guide the researchers and administrators responsible for the planning, implementation, and analysis of APMP research projects.

Volume I addresses site selection criteria for screening candidate sites, project planning, field and laboratory procedures, specific analytical protocols for field and laboratory activities, major research elements specific to APMP lake and stream projects, data handling and management, and quality assurance/quality control procedures and protocols. To ensure that the results of APMP research are accurate and comparable, each study will follow the guidelines and project protocols in this volume.

Volume II describes neutralization materials applicable to lake and stream liming projects. It also contains technical descriptions for selected mitigation techniques that may be employed in the APMP. In this research program, approved treatment methods must have been proven effective in meeting short-term water quality targets in previous field tests, and must allow for adequate control over the quantities and dissolution of base material. The techniques describe application methods for direct water-column liming of lakes: fixed-wing and helicopter application, boat-based distribution systems, pressurized tank and barge systems, and the Kalkade technique. Techniques for streams include electrically powered dry-powder dosers, electrically powered wet-slurry dosers, battery powered dry-powder dosers, and water-powered mechanical systems including rotary drums, water-powered silos, and fluidized diversion wells.

Results of the APMP research projects should improve the understanding of (1) the effects of liming on biological systems and water quality; (2) the amenability of aquatic resources to protection or rehabilitation by base neutralization; and (3) management strategies that can be useful to resource and fisheries managers responsible for protecting the nation's inland fisheries.

Adapted from a **Lake Line** *(May 1986) article by Rita Villella and R. Kent Schreiber, U.S. Fish & Wildl. Serv., Kearneysville, WV*

Breakthrough in Halibut Culture

California halibut, a highly desired commercial and recreational species, was recently spawned for the first time under simulated natural conditions at the Redondo Beach hatchery as a part of California's Ocean Resource Enhancement Program. A brood stock of nine males and females were observed spawning more than nine times in 4 weeks, which provided scientists at the Redondo hatchery with over 2 million fertilized eggs. Various stages of the young halibut are now being reared with the advanced stages settling out of the water column. Scientists now plan to experiment with optimal rearing techniques to efficiently accelerate growth rates of these young halibut. The ultimate goal is eventually to release them in coastal waters.

From MRF Highlights, March 31, 1986

Latin America's Expanding Role in the Eastern Pacific Tuna Fishery

The fishery for tunas in the eastern Pacific Ocean, until the last few years, has been dominated by the United States industry centered in Southern California. U.S. vessels fished as far south as Peru as early as the 1930's, but there was virtually no participation in the fishery by Latin American vessels prior to World War II.

During the late 1940's several joint U. S.-Peruvian tuna ventures were developed, and by 1950 their catch had increased to about 10,000 metric tons. A fleet of about 50 small Peruvian-flag purse seiners fished for tunas during most of the 1950's. The catchers of these vessels decreased in ensuing years, however, and Peru's catch of tunas in 1985 was virtually zero.

Ecuador developed a fleet of small boats during the 1950's, and within about 10 years this fleet of small vessels, plus a few larger ones, was landing in excess of 15,000 tons of tunas, mostly skipjack. The Ecuadorian fleet currently consists of 34 vessels, most of them larger than those of the 1950's, and these caught 36,000 tons of tunas in 1985. These fish are canned at Manta and other ports or exported frozen to other countries for processing there.

Mexico had a small fishery for tunas prior to World War II, but significant catches were not made until the late 1950's. In 1960 Mex-

ico's harvest investment in tuna fishing and processing was initiated, and the catch increased to 33,000 tons by 1980. The Mexican fishery continued to grow during the 1980's, and the catch by its fleet of 53 purse seiners and 12 baitboats amounted to 86,000 tons in 1985. Mexican-caught tunas are processed in about 10 canneries, located mostly in Ensenada and Mazatlan, or exported frozen to other countries.

There are approximately 12 large Venezuelan-flag purse seiners which regularly fish in the eastern Pacific. The 1985 catch of these vessels in the eastern Pacific was nearly 30,000 tons. These vessels, and other Venezuelan-flag vessels, also fish in the Atlantic Ocean. A large portion of the catch is canned in Venezuela, mostly at four canneries in the vicinity of Cumana. The remainder is exported frozen, mostly to U. S. canneries in Puerto Rico.

Other Latin American countries, including Chile, Colombia, Costa Rica, El Salvador, Nicaragua, and Panama, have also participated in the fishery for tunas in the eastern Pacific, but the amounts of fish involved have been considerably less than those caught by vessels of Ecuador, Mexico, and Venezuela.

The catch by the U. S. fleet in the eastern Pacific declined from 216,000 tons in 1978 to 89,000 tons in 1985, but the total catch by U. S.-flag vessels has remained about the same, as a fleet of 14-60 U. S. vessels has been fishing in the western Pacific during the 1980's. (This fishery is described in AIFRB BRIEFS, Vol. 13, No. 6) The U.S. canning industry has undergone significant changes. The imports of frozen tuna have declined by about 40 percent during the past 5 years, while those of canned tuna have increased by about 200 percent. Southern California, which at one time was the tuna processing capital of the world, presently has only one small cannery. U. S. processing capacities have increased substantially in Puerto Rico and American Samoa, however. The catches by U. S.-flag vessels operating in the eastern Pacific are usually canned in Puerto Rico, and those by U. S. vessels in the western Pacific usually go to American Samoa.

The surface fishery for tunas in the eastern Pacific is supported primarily by yellowfin and skipjack. From 1966 through 1979 yellowfin was the object of a management program, based upon recommendations made by the Inter-American Tropical Tuna Commission, which maintained the stock at a level which supported catches of about 160,000 tons per year. The management program was successful from a scientific point of view, but it was abandoned after 1979 because the various countries involved in the fishery could not agree on allocation of the catches among themselves and modes of access to the fishing grounds within the Extended Economic Zones of the various countries. The abundance of yellowfin initially decreased, but then an exodus of vessels from the eastern to the western Pacific and the strong El Niño of 1982-1983, which reduced the vulnerability of the fish in the eastern Pacific to capture, permitted the stock to increase. The catch rates were considerably higher during 1984 and 1985, and U. S.-flag vessels began to return from the western Pacific. The stage appears to be set for overfishing of yellowfin during 1986 and 1987 unless the various nations involved in the fishery can agree on a management scheme. Unfortunately, however, such agreement does not appear likely in the near future.

James Joseph
Inter-American Tropical Tuna Commiss.
La Jolla, CA 92037

Our People in the News

Barry Smith

Barry Smith (AIFRB Member 1979) has left the Alabama Department of Conservation and Natural Resources, where he was chief of fisheries, to start a business venture called American Sport Fish. Barry and his partner expect to have 50 acres of hatchery ponds for production and marketing of a variety of sport fish including Florida and northern largemouth, Alabama spotted bass, hybrid striped bass, coppernose bluegill, redear, and triploid white amur.

Charles Zimmerman

Charles Zimmerman (AIFRB Member 1977) has become senior biologist at Dames & Moore, where he is based in the firm's Atlanta office. Since 1973 Charles has specialized in providing consulting services for nuclear power plants in the U.S. and Europe. Recently he has been involved with licensing hydroelectirc facilities in the U.S.

Announcements and New Publications

Lake and Reservoir Management: Influence of Nonpoint Source Pollutants and Acid Precipitation

The North American Lake Management Society will hold its 6th Annual International Symposium in Portland, Oregon on November 5-8, 1986. The theme this year will be *Lake and Reservoir Management: Influences of Nonpoint Source Pollutants and Acid Precipitation.*

Topics for concurrent sessions will include numerous subjects such as wetlands and water quality, urban lake management, aquatic plant management, data analysis, surveys, water quality assessment, predicting change caused by acid precipitation, effects of liming, pesticides, sediment problems, and several others. Workshops will be held on lake ecology and management, lake monitoring and property management, aquatic plant management, and other topics.

Information on submission of abstracts and symposium details is available from NALMS, Box 217, Merrifield, VA 22116.

Turtle Symposium—WATS II

The Intergovernmental Oceanographic Commission's Sub-Commission for the Caribbean and Adjacent Regions will sponsor the Second Western Atlantic Turtle Symposium (WATS II) in October 1987 at the University of Puerto Rico, Mayaguez.

Sea turtles of the western Atlantic are an important natural resource that would make a significant contribution to the regional economy if populations could be restored to levels which would permit controlled exploitation. Further research is required to get a better estimate of regional population sizes and to provide the data which each country can use in selecting rational management options for its sea turtle resources.

The first Western Atlantic Turtle Symposium, held in Costa Rica in 1983, brought together government representatives from 35 countries to discuss the status of the sea turtle resource and problems related to its management and conservation.

The Second Western Atlantic Turtle Symposium will be held at the University of Puerto Rico, Mayaguez, in October 1987, and will be a region-wide symposium consisting of discussion panels and workshop sessions. Participation in the WATS II is by invitation. The Symposium, however, will be open to the public and there will be opportunity for public response to the panel discussions. There will be no invited papers, but participants are encouraged to provide information on the regional sea turtle resources through the poster exhibition.

For information, write Dr. Robert R. Lankford, Executive Secretary WATS II, Dept. of Marine Sciences, University of Puerto Rico, Mayaguez, PR 00708.

Coastal Wetland Inventory

The NOAA National Ocean Service has published *An Inventory of Coastal Wetlands of the United States,* the first comprehensive coastal wetlands inventory since the Fish and Wildlife Service developed their detailed wetland classification system in 1979.

Information is presented on the extent of saltwater marshes, freshwater marshes, tidal flats, and swamps in individual coastal counties for 22 coastal States in the contiguous United States, excluding the Great Lakes. The inventory represents the most complete and comprehensive national compilation to date. The purpose of this inventory is to compile all available information, evaluate its adequacy, and provide an initial data base for habitat management. It relies heavily on the previous work of many Federal and state agencies, particularly the U.S. Fish and Wildlife Service. The data base should contribute to better understanding, and ultimately to better management, of coastal wetland resources of the United States. This publication is available without charge from the NOAA Strategic Assessment Branch, 11400 Rockville Pike, Rockville, MD 20852.

Fisheries Research

Fisheries Research, an international journal on fishing technology, fisheries science, and fisheries management, is now in its 4th volume. This journal provides an international forum for the publication of papers in fisheries research. As these areas inevitably impinge on, and

cont. on page 4

Fisheries Research cont.

interrelate with each other, the approach of the journal is multidisciplinary. Authors are enouraged to emphasize the relevance of their own work to that of other disciplines covered by the journal. The scope covers salt, brackish, and freshwater systems, and fishing as an economic activity but not as a recreational one. Both practical and theoretical papers are eligible for publication. The journal will interest fisheries biologists, gear technologists, naval architects, fisheries economists, administrators, policy-makers, and legislators.

Information on manuscript submission and subscriptions is available from Journal Information Center, Elsevier Science Publishers, 52 Vanderbilt Ave., New York, NY 10017.

Tidemarsh Fish Guide

The Tidemarsh Guide to Fishes is a unique treatment of all the coastal freshwater and saltwater fishes from amphioxus and anchovies to striped bass, sturgeons, trouts, and tomcod. The arrangement makes it possible to identify all these fishes without having knowledge of special anatomical terms.

This publication is available from Mervin F. Roberts, 1 Duck River Lane, Old Lyme, CN 06371 for $10.95.

Publication on Artificial Reef Siting Model

Jerri L. Evander has written *Application and Evaluation of An Artificial Reef Siting Model in the Galveston, Texas Region,* which applies reef planning guidelines and exclusion mapping procedures developed by the Sport Fishing Institute to the Galveston and Freeport regions of Texas. The model assesses the demand for artificial reefs and the extent of infrastructure necessary for optimal use by reef anglers. Much of the information was gathered through on-site and telephone interviews. Information was also solicited to determine artificial reef constituency support.

In assessing the feasibility of establishing an artificial reef development plan in a given location, it becomes important to include technical data as well as information on expressed needs and support within the local community. By gathering this information it should be possible to produce an effective artificial reef plan within the area. This model serves as a demonstration project for local efforts throughout the nation.

Copies are available from the Publication Department, Sport Fishing Institute, 1010 Massachusetts Ave., NW, Suite 100, Washington, DC 20001. The price is $8.00.

From SFI Bulletin, May 1986

In Memoriam

Ross V. Bulkley

Ross V. Bulkley, who became a Member of AIFRB in 1970, passed away in December 1985. Ross was born and educated in Burley, Idaho and received his B.S. and M.S. degrees from Utah State University and his Ph.D. from Iowa State University. He was assistant leader of the Iowa Cooperative Fishery Research Unit for 13 years, and then returned to Utah State as professor in the Fish and Wildlife Department and leader of the Utah Cooperative Fishery Research Unit.

While at Utah State, Ross contributed greatly to the Department of Fisheries and Wildlife, the university, and fishery science. His teaching and commitment to continuing education influenced many graduate students. His work as a researcher, research leader, reviewer, and consultant will long be remembered, and his passing leaves a large void.

Membership Report

NEW ASSOCIATES	
David H. Thomas	CA
Stephen M. Kaimmer	WA
Dr. Tony Amandi	OR
Paul B. Brown	TX
Rodney Rountree	SC
Dennis M. Bassin	SC
Rodolfo B. Baldevarona	SC
Edward C. Cyr	SC
Peter Vanriel	Manit.
Gary E. Whelan	MI

NEW MEMBERS	
Dr. James K. Schooley	OK
Dr. Mary G. Henry	MI

PROMOTED TO FELLOW	
Stephen H. Hoag	WA

EMERITUS	
William E. Pitney	OR
C. L. Peterson	CA
J. Y. Christmas	MS
Keith A. Havey	ME

Sammy M. Ray, *Membership Chairperson*
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Building 311, Fort Crockett
Galveston, TX 77550
Direct membership inquiries to the 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 $15 a year to Institutions and Non-Members.

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American Institute of Fishery Research Biologists

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VOL. 15, NO. 5 OCTOBER 1986

Ken Warner shows the AIFRB exhibit at the American Fisheries Society 1986 meetings in Providence, Rhode Island. The exhibit featured information on membership, publications, and awards.

The Board of Control Meeting

The 1986 annual meeting of AIFRB's Board of Control took place on September 12-13 in Providence, Rhode Island in connection with the annual meetings of the American Fisheries Society. President Hugh R. MacCrimmon presided over the proceedings, which covered a broad array of AIFRB business, progress, and concerns.

An article describing details of the Board of Control meeting will appear in the December 1986 issue of BRIEFS.

New Officers on Duty

AIFRB has two new national officers at the helm—a new President and a new Secretary.

Dr. John R. Hunter, our new President, accepted the gavel from Dr. Hugh R. MacCrimmon at the Board of Control meeting in September and has already settled into his duties as our leader. BRIEFS carried an article in February 1986 to familiarize the membership with John's background and accomplishments, so we know we can expect a fine performance during the next 2 years.

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New Officers on Duty cont.

Dr. Roy E. Nakatani, whose picture appeared in the August 1986 issue of BRIEFS, is the new Secretary, succeeding Dr. G. H. "Herb" Lawler of Winnipeg, MB, Canada. Roy is Associate Director of the Fisheries Research Institute at the University of Washington, became a Fellow of AIFRB in 1972, and is obviously well qualified to serve as our Secretary. BRIEFS will have an item in a future issue to cover Dr. Nakatani's career so all AIFRB people will come to know him better.

We all welcome these two officers to their new posts, wish them successful tenures, and pledge to assist them in making their jobs easier and more pleasurable.

Announcements and New Publications

Globescope II

Environmentalists will be joined by leaders in business, government, and civic affairs from the United States, Canada, and around the world to discuss critical long-term trends in global environment, development, resources, and population at GLOBESCOPE II: AN INTERNATIONAL FORUM. The forum is sponsored by the Lincoln Filene Center for Citizenship and Public Affairs and the Global Tomorrow Coalition and will be held on October 24-26, 1986 at Tufts University, Medford, Massachusetts.

Over 40 workshops and keynote addresses will cover a wide range of issues including acid rain, hazardous waste, water supply, nuclear policy, fisheries, international development agencies, endangered species, agriculture, environmental ethics, and population. GLOBESCOPE II will consider the environment of New England and eastern Canada; the relationship of the states and provinces to one another; and the region's role in the global environment.

GLOBESCOPE II will be the first conference to include leaders from both New England and eastern Canada in a discussion about regional environmental issues. The forum is uniquely designed to open new lines of communication through discussion of individual workshop consensus questions and informal networking among participants.

For a brochure or additional information call Michele Zador or Nancy W. Anderson at (617) 381-3451, or write: GLOBESCOPE II, Lincoln Filene Center, Tufts University, Medford, MA 02155. A summary of the record of proceedings is planned for publication and attendance will be limited by space availability.

Fisheries Acoustics Symposium

The International Symposium of Fisheries Acoustics (ISFA) will be held June 22-26, 1987, in Seattle, Washington under sponsorship of the Northwest and Alaska Fisheries Center of the U.S. National Marine Fisheries Service. It is being organized with the assistance of the International Council for the Exploration of the Sea (ICES) and the Food and Agriculture Organization of the United Nations (FAO). Its purpose is to provide an interdisciplinary holistic review of the use of acoustics in fisheries management and science. The principal themes of the Symposium are 1) survey-based stock assessment and management results and their evaluation; 2) the accuracy and repeatability of calibration measurements, and the factors affecting quantitative assessments; 3) advances in acoustic techniques and auxiliary technology, and the limitations imposed by physics and biology; 4) the patchiness of fish and plankton populations and the problems of direct and remote sampling for species and size distributions; and 5) special topics, including but not limited to: applications of acoustics in population and ecosystem modeling, the instrumentation of sampling gear, biological oceanography, environmental monitoring, and aquaculture.

Papers will be presented by individual authors unless the number accepted leads to a requirement for other methods of presentation, i.e. by rapporteurs or in poster sessions. Abstracts of proposed papers (300-500 words) should reach the Chair of the Steering Committee before October 1, 1986 and registration is by March 15, 1987. For information contact Martin O. Nelson; Chair, ISFA Steering Committee; Division of Resource Assessment and Conservation Engineering; U.S. National Marine Fisheries Service; 7600 Sand Point Way NE, Bldg. 4; Seattle, Washington 98115-0070 USA.

Florida Aquatic Habitat and Fishery Resources

This book, edited by William Seaman, Jr. (AIFRB Member) for the Florida Chapter of the American Fisheries Society, is the first of its kind in Florida, dealing with freshwater and marine fishery resources and habitats—how they function, their current status, management issues and trends, and potential solutions to problems. The chapters draw upon the experience and knowledge of 44 authors who collaborated to summarize the latest scientific information for Florida's economics of fisheries and habitat, lakes, rivers, salt marshes, mangrove forests, estuaries, and ocean.

The book is informative for lay audiences and interested citizens, yet it contains sufficient detail for use by scientists, planners, and resource managers. Over 1,000 references are cited. It is a natural text for the library, classroom, and laboratory alike.

Subjects include the ecology of different aquatic systems, fish population dynamics, catch rates in different fisheries, current problem issues such as eutrophication and contaminants, and management practices including fish attractors and drawdown, etc.

Florida is a state facing major decisions about its future. This book is intended to assist that process as a state-of-the-art reference and summary for one element of the Florida economy and lifestyle—namely, the valuable fishery and aquatic habitat resources that benefit so many people.

This 50-page volume can be ordered for $15 from the Florida Chapter of the American Fisheries Society, Box 1903, Eustis, FL 32727-1903.

Technical Marine Literature Survey

Clarence R. Hickey, AIFRB Associate, has written *Survey of the Technical Literature on the Marine Finfishery Resources of the Peconic/Gardiners Bay*

System, New York, 1900-1984, with Recommendations for Resource Conservation and Study. The book is Special Report 65 of the Marine Sciences Research Center, State University of New York at Stony Brook.

The 106-page volume contains sections on fish biology and life histories; fish disease, pollution, and toxicity; fishery studies in the Bay system; and an extensive bibliography.

Copies of the book can probably be obtained from the Center at Stony Brook, NY 11794-5000.

FAO Publications from UNIPUB

The following publications can be ordered from UNIPUB, 10033-F King Highway, Lanham, MD 20706:

Billfishes of the World. 1985, 65 pages. $7.50. Order -607C-F2766.

The Fish Resources of the Northwest Pacific, by S. Chikuni. A case study of the region with the world's highest production. 1986, 190 pages. $14.75. Order -607C-F2869.

World Review of Interactions between Marine Mammals and Fisheries. 1985, 190 pages. $16.00. Order -607C-2709.

Variability and Management of Large Marine Ecosystems

This book, edited by Kenneth Sherman (AIFRB Member) and Lewis M. Alexander, is the proceedings of an AAAS symposium. The 17 papers, which provide state-of-the-art review of problems in ocean management, are organized around: 1) perturbation impacts (pollution and overfishing); 2) measuring temporal and spatial variability in biological and physical parameters; and 3) the institutional framework for managing LMEs. The price from Westview Press, Boulder, Colorado is $31.95. 1986, 319 pages.

The Zoogeography of North American Freshwater Fishes

This volume, edited by Charles E. Hocutt (AIFRB Member) and E. O. Wiley, appeared in 1986 and has 866 pages. It is a comprehensive monography which describes species distributions in the various ichthyofaunal provinces of North America, and offers interpretive analysis of why fish are where they are based on the relationship of geological change to dispersal opportunities and evolution. The book is available from John Wiley & Sons, New York, for $89.95, and from the American Fisheries Society at a 5% discount.

Thesis and Dissertation Abstracts

Reproductive Biology of Black Skipjack *(Euthynnus lineatus)*
Kurt M. Schaefer, M.S. 1986
San Diego State University

Black skipjack *(Euthynnus lineatus)* were sampled from commercial landings during 1980-1982 from Mexico to Ecuador. Spatial and temporal aspects of spawning were determined from ova diameter measurements and gonosomatic indices. Spawning occurred during August through October off Mexico from around the Revillagigedo Islands to Clipperton Island; during October through June off Central America; during November through March in the Gulf of Panama; and there was essentially no spawning activity off Colombia and Ecuador. Overall sex ratios did not deviate significantly from the expected 1:1. However, a significant deviation occured in length-classes greater than 550 mm fork length due to a preponderance of males. The fork length at which 50% of the females were mature was 495 mm off Mexico, 470 mm off Central America, and 457 mm in the Gulf of Panama. These lengths at 50% maturity were significantly different for fish from these three areas. The smallest females found with mature ovaries in these areas were 431, 406, and 400 mm, respectively. Estimates of spawning frequency were based on the incidence of females with hydrated oocytes.

In the area off Mexico an average of 46.8% of the females sampled were spawning per day, in the area off Central America 17.6%, and the Gulf of Panama 27.8%, thus indicating that the average intervals between spawning new batches of eggs were 2.1, 5.7, and 3.6 days and the average mature female probably spawned 43, 47, and 58 times a year in these respective areas. The spawning batch fecundity was estimated from counts of hydrated oocytes. Mean batch fecundity for fish from off Mexico was 350,336 oocytes, from off Central America 221,828 oocytes, and from the Gulf of Panama 242,462 oocytes, with the mean relative batch fecundity being 136, 99, and 106 oocytes per gram body weight, in these respective areas. Significant differences were found for the linear relationships of batch fecundity and fork lengths among these three areas; primarily, batch fecundity increased with latitude. The higher fecundity and spawning frequency off Mexico apparently compensates for the shorter duration of the spawning season and the larger size at maturity.

An Assessment of Age Determination Techniques of Northern Bluefin Tuna *Thunnus thynnus L.* from the Eastern Pacific Ocean
Terry J. Foreman, M.S., 1986
San Diego State University

Hard-part ageing techniques for bluefin tuna *(Thunnus thynnus L.)* in the eastern Pacific Ocean were assessed by comparison of artificial marks created by injection with oxytetracycline during tagging experiments to natural marks. Both diel and annual marks were validated for fish 0.3-1.3 yr old. Annuli form in vertebrae around February. Corroborative evidence for validation included comparison of extrapolated birth month with the period of larval occurrence and comparison of size at age from tagging data compared with annulus formation.

Using scanning electron microscopy, otolith preparatory techniques were assessed, areas of difficult interpretation were resolved, and criteria to lessen bias and variability were developed.

Daily increments in otoliths underestimate vertebral age in fish over 3 yr, probably due to the replica technique and not some physiological phenomenon.

Growth rates were estimated from vertebral size-at-age estimates to be 1.62-1.90 cm per month for fish 1-6 yr old. Bluefin grow rapidly in the summer, as estimates for 1981 through 1983 averaged 3.1 cm per month.

The von Bertalanffy growth equation was fit to the vertebra data for the eastern Pacific catch, and t_o adjusted to compensate for the difference between time of first annulus formation (February) and onset of spawning (April).

Repeatability (precision of estimates) was estimated using an index of precision based upon coefficient of variation. The daily increment method was most precise, followed by vertebrae, scales, and spines.

Vertebrae have the best combination of factors to be used in an ongoing age determination study in the eastern Pacific. Daily increments in otoliths can be utilized for young fish when extremely precise age estimates are needed.

Scales may be lost during handling and unloading of the catch prior to sampling and thus are not suitable under all circumstances.

The center of the dorsal spines are resorbed during growth, thus obliterating the preceding growth record and precluding independent age estimation in older fish.

Seasonal Immune Response in Juvenile Summer Flounder *(Paralichthys dentatus)* to the Hemoflagellate *(Trypanoplasma bullocki)* in the Lower Chesapeake Bay
Linda J. Frizzell, M.A., 1985
College of William and Mary in Virginia

The hemoflagellate *Trypanoplasma bullocki* (Strout) infects juvenile summer flounder *Paralichthys dentatus* (Linnaeus) from the

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Thesis and Dissertation Abstracts cont.

lower Chesapeake Bay in fall and winter, but is not detectable in summer flounder in the spring when water temperature increases. To determine if the host's humoral immune system is responsible for this disappearance, an immuno-blot enzyme assay was used to measure specific antibody production of immunized, ethanol-treated, and non-immunized summer flounder maintained at 20°C and ambient environmental temperature (2°-25°C). At 20°C, immunized and ethanol-treated fish had significantly higher antibody titers than control (non-immunized) fish, but all fish were able to eliminate the infection within 8 weeks. At ambient temperatures, fish that survived did not eliminate the flagellate until 26-34 weeks post-challenge with live flagellates. Mortality was 60% in immunized fish, and 50% in ethanol-treated and control fish, with the highest occurrence of mortalities in January and February when water temperature was below 5°C.

Attempted suppression of the immune response via ethanol injection was not successful. Protective immunity of fish through immunization of formalin-killed *Trypanoplasma bullocki* did not occur; however, protective immunity was established in fish kept at 20°C that recovered from *T. bullocki* infections. Rechallenged summer flounder exhibited typical secondary immune response with titers 5 times greater than titers of the primary immune response.

Naturally infected summer flounder collected from the York River exhibited similar patterns and magnitudes of antibody titer and flagellate intensity as control fish maintained at ambient temperature. The prevalence of *Trypanoplasma bullocki* in flounder from the York River was highest from December to January, and gradually decreased in the spring. By July no infected summer flounder were found. After the initial growth phase of the flagellate, antibody titer varied directly with temperature and titer was inversely related to flagellate intensity in both experimentally and naturally infected summer flounder. Therefore, the immune system of summer flounder appears to be responsible for the spring disappearance of *T. bullocki.*

Systematics of Morone *(Pisces: Moronidae),*
With Notes on the Lower Percoids
John R. Waldman, Ph.D., 1986
Texas A & M University

Monogeneric classification for *Morone* is supported by dental characters in its four American members—*americana, chrysops, mississippiensis,* and *saxatilis* and the two Afro-European forms—*labrax* and *punctata,* often referred to a separate genus, *Dicentrarchus. Morone* is unique in the possession of elongated lingual tooth plates lateral to but separate from the basihyal. These lateral tooth plates, and tooth patches anterior to the basihyal possess a previously unrecognized diagnostic value, incorporated in a dental key to the species of *Morone.* The presence of a single basihyal tooth patch, a primary distinguishing character for *chrysops,* was found to be unreliable inasmuch as many individuals showed paired patches as in *saxatilis.* Additionally, the smaller number of rows of vomerine teeth in the yellow bass provides a new discriminatory osteological character between it and the white perch.

The proposed phylogeny, as well as renal evidence, supports marine ancestry for *Morone.* Distribution of these species in relation to their phylogeny suggests the Mediterranean Sea and the Gulf of Mexico as secondary dispersal zones. Fisheries records demonstrate that the striped bass was found along much of the Texas coast into the 1930s, a westward extension of their known Gulf coast range by approximately 500 miles. Inasmuch as no evidence was found that *Morone* belongs among the Percichthyidae or any other established family, familial status as the monogeneric Moronidae is proposed. The presence of extended epioccipital processes, and features of the preopercle and scales suggest a trichotomy between *Morone, Lateolabrax,* and the Percidae. Characters of the dermal upper jaw, preopercle, and postcranial region indicate that *Siniperca* is a centropomid, most probably the sister taxon to the Latinae. The fossil percoid genus *Mioplosus* is not a percid but instead, appears closely allied to the Percichthyidae. A correlation was noted among, and hypothesis of function proposed for, the taxonomic distributions of an extended caudal lateral line and accessory caudal sensory canals, procurrent spur, and secondarily cycloid scales.

Membership Report

New Associates

Ian R. Waite	MT
Standish K. Allen, Jr.	WA

Sammy M. Ray, *Membership Chairperson*
Texas A & M University at Galveston
Building 311, Fort Crockett
Galveston, Texas 77550

Direct membership inquiries 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 $15 a year to Institutions and Non-Members.

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At the 1986 AIFRB Board of Control Meeting in Rhode Island were ***John R. Hunter,*** *incoming President;* ***Hugh R. MacCrimmon,*** *outgoing President;* ***Ronald E. Westley,*** *Director, NW Washington District;* ***Brian Waters,*** *Director, Central Calif. District;* ***Joseph W. Rachlin,*** *Director, NY-NJ District;* ***Charles F. Cole,*** *AIFRB Treasurer;* ***Eric Prince,*** *Director, Florida District;* ***Kendall Warner,*** *Liaison, AIFRB/AFS meeting;* ***W. Kwain,*** *W. F. Thompson Award Chairperson;* ***K. V. Koski,*** *Director, Alaska District.*

Regional Best Paper Award

President John Hunter has written the following to familiarize the membership with a new award program for AIFRB:

To increase visibility of AIFRB on a Regional or District level I wish to initiate a Regional Best Paper Award program. I strongly encourage districts to participate in the program when the requirements can be met. The requirements for the program are as follows:

1. Program shall be administered by the District.
2. An award shall be presented to the best presentation of a paper at a regional fisheries meeting. On the west coast, the Western Groundfish Conference, California Cooperative Fisheries Investigations (CalCOFI), Tuna Meetings, and Western (California-Nevada) AFS meetings would qualify.
3. No other Best Paper Award Program exists for that meeting.
4. Approval shall be obtained from the meeting coordinator that a formal presentation of the award be scheduled for the meeting.
5. Selection committee shall be formed, composed of 3-5 AIFRB members who attend the meeting and rate the papers; the chairman of the committee (appointed by the District Director) shall present the award during the meeting. I presume the committee

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Regional Best Paper Award cont.

would consider both the quality of the presentation and content, but the criteria would, of course, be the sole responsibility of the committee.

6. The existence of the award shall be noted in the printed program for the meeting.
7. A minimum of 5 presentations shall be considered. Awards may be restricted to "best student paper", or "best fishery paper" or "best first paper" or any other restrictions the committee deems appropriate but there must be sufficient number of papers considered to make the program seem worthwhile.
8. The chairman shall be responsible for writing a brief news note for BRIEFS indicating the winner, the type of award (best student paper or best paper, etc.), the meeting name, and a few sentences describing the content or conclusions of the paper, etc.
9. To begin support of the program the National Organization of AIFRB shall provide funds for two $50 awards per year per district (maximum is one $50 award per meeting and two meetings per year). In the long term, I would like to have such regional projects to be supported from the district funds, but to get the program started we will fund it from the national funds.
10. District should apply by writing me and confirming that the above criteria will be met and indicating the meeting, dates, chairman, and other pertinent details. I will send a copy to the Treasurer requesting that a check be forwarded to the chairman for the cash award.

New Editorial Series

President John Hunter has proposed that BRIEFS adopt a policy of publishing editorials. We encourage members and nonmembers to submit editorials to the Editor on any scientific or policy matters of interest to fishery scientists. BRIEFS will also publish rebuttals of the editorials we publish. We encourage authors to take a sufficiently provocative stance to stimulate interest, thought, and possible rebuttals from the readership. We, of course, reserve the right to reject articles if the author doesn't use good taste or makes personal attacks. Editorial length is not to exceed 950 words (about 3 double-spaced pages). The editorial will be printed as it is written and will not be altered without consent of the author except for obvious spelling, grammatical, or typographic errors. The views expressed are only those of the author and do not reflect policy of AIFRB.

To get the program started, President Hunter has written the following:

Fecundity Measurement Requires More Than Counting Eggs

J. Roe Hunter

Many of the procedures routinely used in marine fisheries were developed for the great fish stocks of Europe during the early years of fishery science. Some of these procedures have been applied to many stocks in more or less unaltered form since then. Often little thought was given to whether techniques developed for boreal fish stocks could be uniformly applied to all species, to the biological meaning of the measurements, or to their accuracy. In no group of fishery measurements is this stagnation in development more prominent than in those used to estimate size and age of maturity and annual fecundity. The "classic" technique for assessment of maturity has been to classify the ovaries of females using a staging system developed by Hjort in 1910 and based on the gross appearance of the ovary. The classic method for estimation of annual fecundity has been to count the standing stock of oocytes in the ovary that exceed a certain minimum oocyte diameter; the rationale for specifying a minimum diameter was often weak or not expressed. These techniques may work well for herring or cod but they are nearly worthless for most temperate and tropical marine stocks that reproduce at temperatures of 15° C or higher and may be worthless for some pelagic stocks that spawn at lower temperatures, such as the Atlantic mackerel.

Use of the standing stock of oocytes to estimate annual fecundity is worthless for most temperate or tropical fishes because such fish probably continue to mature batches of eggs throughout a season. Annual fecundity in such multiple-spawning fishes is indeterminate and the standing stock of advanced oocytes gives no indication of the number of eggs to be spawned in a season. In such fishes, annual fecundity can be underestimated by an order of magnitude when standing stocks of oocytes are used as a measure of fecundity. This underestimation leads to gross errors in biomass estimates based on ichthyoplankton data and gross underestimates of the cost of reproduction. The only way to estimate annual fecundity in such fishes is to estimate the number of eggs produced in a spawning batch (batch fecundity) and the frequency at which females spawn.

Similarly, estimates of size and age at maturity based on the Hjort scale, or modifications of it, can be greatly in error. Classifications such as "spent" have little meaning in multiple spawning fishes with indeterminate fecundity. During peak spawning months anchovy and sardines spawn about once a week and skipjack spawn every day. Consequently, the ovary of any given female is briefly in the spent condition at daily or weekly intervals throughout the spawning season. For fishes with indeterminate fecundity no useful gross anatomical criteria exist for identifying truly postspawning individuals and many of the other Hjort stages are either ambiguous or meaningless. The central issue for size and age at maturity, however, is to discriminate between immature females and ones which have spawned or will spawn during the season. Although grading systems always include a class for spent ovaries this is a very ephemeral condition for all fishes, even those living in cold water with apparently determinate annual fecundity. At some time after cessation of spawning ovaries of postspawning females are indistinguishable from immature females. A common practice is to assess age or size at maturity using fishery collections taken without regard to seasonality of reproduction. Clearly, samples taken early in the spawning season are preferable for such measurements because the risk of misclassifying

postspawners as immature is lessened. In the Dover sole, we find the difference in estimates of age at 50% maturity between specimens taken in the first month and those taken over the entire season is about 3 years of age. If a Hjort scale were used this error in age at maturity is even greater because the period when spent females can be distinguished from immature ones is much shorter.

A final problem with routine fecundity methods is the common use of Gilson's fluid, a solution used to dissolve connective tissue and free oocytes from the follicle for subsequent counting. It would be beneficial if this technique were completely abandoned. Treatment with Gilson's fluid destroys hydrated oocytes (the final maturation stage, characterized by the presence of large, transluscent eggs), shrinks the remaining oocytes, and renders the ovary useless for any analysis other than egg counting. The effect of this treatment is elimination of all histological and morphological information contained in the ovary. By using this technique the investigator makes a tacit assumption that the species has determinate fecundity; that is, all eggs to be spawned in a season can be identified. I think this is rarely the case.

In sum, fecundity and size-at-maturity estimates are not routine fishery measurements in which a manual can be routinely followed without grave risk of serious bias. The requirement for such data is routine but the measurement is not. A requirement to assess these parameters should be viewed as a fundamental research problem on the reproductive biology of the stock. The central issues of such a research problem should be to discover: if annual fecundity is determinate or indeterminate; if determinate, what proportion of the potential fecundity is realized; and if indeterminate, the rate of spawning and batch fecundity. I hope the day will come when fisheries papers on fecundity will be routinely rejected by fishery journals if adequate documentation on these questions is not provided. What constitutes adequate documentation may remain an evolving research issue in the years to come. Some possible approaches as well as documentation for much of what I have said in this editorial can be found in NOAA Technical Report NMFS 36, 1985.

Award Committee Chairmen

President John Hunter announces appointment of the new chairmen of AIFRB's award committees.

David Farris of San Diego State University is Chairman of the W. F. Thompson Award Committee.

Richard Myhre will continue his good work as Chairman of the Outstanding Achievement Award Committee as well as Chairman of the Group Award of Excellence Committee.

Joseph Rachlin, Director of the NY-NJ District, is Chairman of the Travel Assistance Award Committee.

Halibut Commission Wins Group Award of Excellence for 1986

The AIFRB selected the International Pacific Halibut Commission as the recipient of its Group Award of Excellence for 1986. The Commission was established by treaty between Canada and the United States to manage the Pacific halibut resource on behalf of both countries. The Commission was formed in 1925 as the International Fisheries Commission, and the name was changed in 1953. In 1925 the stocks of halibut were declining and the fishing industry requested that the governments take action to conserve the resource. Five years of intensive investigation convinced the Commissioners that overfishing was the primary cause of the depletion. The Commission's first report provided evidence for this conclusion and recommended that regulations be adopted to allow the resource to rebuild.

A new treaty was signed in 1930 and the first regulations went into effect in 1932. The Commission published numerous scientific reports on the halibut resource, the halibut fishery, and the effects of management. Within a few years after regulations were adopted the resource began to rebuild and this improvement continued until 1960 when the Commission reported that the stocks were at the maximum sustained yield level. However, it was in the early 1960s that a massive foreign trawl fishery for other groundfish was developing in the North Pacific Ocean and the Bering Sea. This fishery operated several years before its impact on the halibut resource could be shown. By this time the resource had once again declined and Commission had no choice but to severely reduce the allowable catch by the halibut fishery. Although the catch reductions imposed severe economic hardship on the North American halibut fishermen, they supported the Commission's action. The Commission had no authority to regulate the foreign fisheries to protect the halibut resource and could only advise the Canadian and U.S. governments of the problem. Nearly 10 years passed before the Commission was able to provide adequate evidence with which Canadian and U.S. negotiators could secure international agreements to impose reductions in the incidental catch of halibut by the foreign trawl fisheries. Since 1976, when the U.S. Fishery Conservation and Management Act was passed and both Canada and the U.S. extended their respective zones of exclusive jurisdiction to 200 mi offshore, the foreign fisheries came under regulation by the North Pacific Fishery Management Council and the halibut resource responded by rebuilding rapidly to a level which is, according to Commission research, again close to the maximum sustainable level.

Thus the Commission has twice shown by its scientific research the cause of depletion, and twice under Commission management the resource has been restored to its maximum sustainable yield level. This is an outstanding achievement that is unmatched by any other fishery agency in the world.

The Commission staff has published over 71 scientific reports, over 20 technical reports, and 17 annual reports in its own publication series, in addition to numerous reports published by Commission staff members in other journals. Many of these publications deal with advanced techniques for stock assessment and have been acclaimed by the fisheries community as substantial contributions to the fisheries scientific literature.

The Commission is frequently cited as an outstanding example of good fishery management, particularly in the

cont. on page 4

Halibut Commission Wins Award cont.

case of international fishery agencies. The Commission has achieved recognition throughout the world for its accomplishments, but the stanchest supporters of the Commission are the North American halibut fishermen and halibut-processing industry who have actively participated in the management process and have benefited directly from the Commission's management achievements.

Travel Raffle — Travel Assistance

An action taken by the AIFRB's Board of Control at the 1986 annual meeting in Rhode Island resulted in a name change and a rule change for the program formerly known as the Travel Raffle. Dr. Joseph W. Rachlin, Director of our NY-NJ District, was appointed Chairman, so the applications should be sent to him at: Dept. of Biological Sciences, Lehman College of C.U.N.Y., Bedford Park Blvd., W. Bronx, NY 10468. Deadline for applications is April 1st. The application should consist of a written request, letter of support from your research mentor or supervisor, and for a specific meeting, abstract of paper and notification of paper's acceptance.

It is now called the AIFRB Travel Assistance Program and the important change was made in the eligibility requirements for travel funding. Previously, winning Associate Members were funded to *attend* scientific meetings. Under the new rules, an Associate Member must *present a paper* at a scientific meeting to be eligible for AIFRB money for travel to the meeting.

Nominations—1987 W.F. Thompson Award

In each of several recent years AIFRB has presented an award to the student writing the best paper *published* during the past 3-year period. The award is the W. F. Thompson Award, and the person receiving it would receive a certificate from AIFRB, as well as a check for $750.

The award committee of AIFRB is now receiving nominations for the 1987 W. F. Thompson Award which will cover *the period 1984-1986.* Papers can have multiple authors, but the student nominated for the award must be the principal author. Peers and professors can be listed as junior authors. Where a student receives the award and certificate for a multiple-authored paper, the professor will receive a certificate acknowledging his role in the outstanding paper.

Papers should be concerned with freshwater or marine fisheries topics and problems, and may deal with biology or management problems. The papers are evaluated by the AIFRB award committee on the basis of originality, organization and development, and pertinence to current problems in fisheries. Nominations for papers should be received no later than 31 July 1987. A final decision will be announced by 29 August 1987. Five copies of each paper nominated should be sent to Dr. David A. Farris, Chairman, AIFRB W. F. Thompson Award Committee, Biology Department, San Diego State University, San Diego, CA 92182.

If there are questions in regard to the award, the Chairman can be reached at (619) 265-6230.

AIFRB Associate Member Receives Honors

Ms. Barbara Warkentine, AIFRB Associate Member who received funding through the AIFRB Travel Raffle program in 1986, attended the 42nd Annual Fish and Wildlife Conference at Hershey, PA in April 1986. At this meeting she received the 1986 Student Award of Merit from the NE Division of the American Fisheries Society for her extensive publication record (14 published papers). Ms. Warkentine also received in 1986 a substantial research grant from the Women's Research and Development Fund of the City University of New York.

At the NE meetings Barbara presented a paper (co-authored with her major professor, Dr. J. W. Rachlin, Director, NY-NJ District of AIFRB) on sand flounder diets; an abstract of the paper is printed here.

Spatial Dietary Diversity of the Sand Flounder From the Inner New York Bight

Barbara E. Warkentine and Joseph W. Rachlin
Dept. of Biol. Sciences, Lehman College of C.U.N.Y.
Bronx, New York

Spatial dietary diversity and feeding preference were determined for the sand flounder, *Scophthalmus aquosus*, from the inner New York Bight. Fish were collected by otter trawl from six stations, 1) Absecon Inlet; 2) Little Egg Inlet; 3) Beach Haven Crest; 4) Seaside Heights; 5) Sea Girt; and 6) Elberon Ground, in June 1984. Upon capture, stomachs were excised from all fish collected in the nets and their contents identified to the lowest possible taxon and enumerated. To assess the resource base, at any particular collecting site, stomach contents from all fish collected at that site were pooled. Diet diversities, for *S. aquosus* from each station, were calculated using the Shannon information index.

Diet diversity was highest (0.5890) for *S. aquosus* from Beach Haven Crest and lowest (0.0908) collected at Little Egg Inlet. Feeding preferences, for *S. aquosus* collected from each station, were determined using two mathematical models; the Manly Preference Index and the Relativized Electivity Index of Vanderploeg and Scavia, which evaluate the proportional representation of food items in the diet of the fish against the proportional representation of the same food items in the resource base. These indices indicate *Neomysis americana* to be the most preferred food item for *S. aquosus* collected from all stations. Sand flounders collected from Absecon Inlet showed preference for the decapod, *Crangon septemspinosus* and the amphipod, *Gammarus annulatus.* Those collected from Little Egg Inlet preferred *Gammarus annulatus, G. marinus,* nematodes, and campanularian hydroids. *S. aquosus* from Beach Haven Crest showed preference for *G. annulatus, G. marinus,* and nematodes. Sand flounders from Seaside Heights exhibited preference for mysids. *Mysidopsis bigelowi,* amphipods, *G. annulatus,* nematodes, and campanularian and halecium hydroids. Sand flounders from Sea Girt preferred *M. bigelowi, C. septemspinosus,* shrimp zoea, nematodes, and campanularian and garland hydroids, while those from Elberon Ground preferred the sand launce, *Ammodytes hexapterus.* These results show spatial differences in diet and feeding preference.

Announcements and New Publications

30th Great Lakes Research Conference

The University of Michigan and the Great Lakes Environmental Research Laboratory, NOAA, will host the Thirtieth Annual Conference on Great Lakes Research on the University of Michigan Campus, Ann Arbor, Michigan. Registration will begin on May 10, 1987, followed by 3½ days (May 11-14) of technical sessions.

The purpose of the conference is to exchange information on applied and basic research having a direct relation to the Great Lakes in general. In addition to the open program, a number of special symposia/sessions

have been planned. These are: Areas of Concern, Connecting Channels Research, Great Lakes Geology, Microbial Food Webs, Paleolimnology, Particle Flux Research, The Role of Lipids in the Transport, Fate, and Effects of Contaminants in Aquatic Environments, Versatile Approaches for Understanding Toxic Contaminant Problems in the Great Lakes, Benthic Process Research from Submarines, Human Health Implications of Great Lakes Contaminants, Community-Based Rehabilitation, New Approaches to Perennial and Developing Fishery Problems, and Great Lakes Management: A Long-Term Perspective.

Conference abstracts are due January 15, 1987; the program will be finalized in March 1987. For additional information, please contact IAGLR-87, Department of Conferences and Institutes, The University of Michigan, 200 Hill Street, Ann Arbor, Michigan 48104.

Annual Tuna Conference

The 38th Tuna Conference will be held at the University of California Conference Center, Lake Arrowhead, CA, May 17-20, 1987. The Tuna Conference has been an annual event providing an opportunity for scientists, fishery managers, government officials, and industry representatives to meet, exchange information, and discuss current research on tuna, billfishes, and other tuna-like species. The participants at the conference come from all parts of the globe and the research is discussed in terms reflecting that world-wide representation. This meeting is sponsored by the U.S. National Marine Fisheries Service and the Inter-American Tropical Tuna Commission.

It has always been the aim of the conference to keep the participants abreast of progress in tuna research and to give them an opportunity to evaluate or, when applicable, to coordinate some of the research projects among different organizations. Over the last several years a special topic has been chosen for each conference. A section of the forthcoming conference will be devoted to the status of collection of catch and effort statistics. Effective fisheries management requires knowledge on the status of the stocks of target species, and catch statistics are of paramount importance in acquiring that knowledge. As in the past, presentation of topics, especially pertaining to research-in-progress, is requested.

An additional fact about the conference merits a remark. The gathering in Southern California of tuna experts from around the world presents the opportunity of organizing specialized workshops prior to or following the conference. Indeed, on a number of occasions such workshops have taken place. In addition, attendees at the conference often take advantage of their trip to visit some of the research centers in Southern California or nearby Baja California.

For further information and registration forms write to Witold L. Klawe, Inter-American Tropical Tuna Commission, c/o Scripps Institution of Oceanography, Mail Code A-003, La Jolla, California 92038, Telephone (619) 453-2820.

Coregonid Symposium

The Finnish Game and Fisheries Research Institute, the University of Joensuu, and the University of Helsinki have organized an *International Symposium on Biology and Management of Coregonids*, to be held August 24-28, 1987 in Joensuu, Finland. The program will be conducted in English and will cover the biological basis of coregonid management; the results of management, including impacts at the species community level; profitability and socio-economic impacts of coregonid management; and policies for coregonid fisheries.

Information is available from Dr. Hannu Lehtonen, Finnish Game and Fisheries Research Institute, Fisheries Division, P.O. Box 193, SF-00131, Helsinki, Finland.

Florida Aquatic Habitat and Fishery Resources

In the October 1986 issue of BRIEFS, this book was described as having 50 pages. This was an error; the number should be *550* pages.

Surface Water Alkalinity Maps

The U.S. Environmental Protection Agency recently produced three *Surface Water Alkalinity Maps* at the Environmental Research Laboratory in Corvallis, Oregon. These regional maps identify general patterns of the potential sensitivity of surface waters to acidic deposition, and furnish a tool and rationale for selecting geographic areas for more detailed studies. The sampling design of EPA's current National Surface Water Survey, for instance, is based heavily on these regional maps. Maps of the New England/New York Region, the Upper Midwest Region, and the Western Region are available free of charge in limited quantities from The Center for Environmental Research Information, ORD Publications, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

Ocean Forum

Ocean Forum, an interpretive history of the International North Pacific Fisheries Commission, was written by Roy I. Jackson and William F. Royce, both distinguished AIFRB Fellows.

The setting of Ocean Forum is the vast expanse of the North Pacific Ocean, one of the greatest of the world's fishing grounds, which has been fished by Japan, the USSR, Canada, and the United States for nearly 2 centuries. As vessels, fishing methods, gear, and processing technology improved, voyages could be extended further and further offshore and, before the start of World War II, Japan declared her intention of fishing salmon off the coast of Alaska. At that time the 3 nautical mile limit of maritime jurisdiction was vigorously supported by most maritime nations, among which were the three protagonists, Canada, Japan, and the United States.

As it became apparent that Japan possessed the capability to operate in the salmon fishing grounds near the North American coast, the realization developed that the 3-mile limit would offer little protection to the salmon fisheries, nor to the North American halibut and herring fisheries. For this reason, negotiations were started which resulted in the formation of the International North Pacific Fisheries Commission, the purpose of which was 'to ensure the maximum sustained productivity of the fishery resources of the North Pacific Ocean'. This book, by two distinguished fishery personalities, outlines the general background and then gives, with clarity and insight, a detailed account of the work of the Commission in each decade, with a final appraisal and look to the future.

The work of the Commission involved promoting and coordinating the scientific studies necessary to ascertain the conservation measures required to secure its objective. The Contracting Parties were to carry out its conservation recommendations and provide for necessary restraints on their own nationals and fishing vessels. This brought about a remarkable degree of international cooperation in scientific research and fisheries management, resulting in the current stable, but flexible, framework for the solution of ever-changing fisheries problems.

The Commission's history is a story of countries, people, and businesses, deeply divided at first, that have worked together at their common fishery problems and developed or enhanced friendships. The Commission has overcome many problems and remains an example of international cooperation in conducting fishery research and fostering high-seas conservation.

Ocean Forum must have an appeal to those interested in the history of this area and its fisheries but, for a much larger audience, it teaches important lessons for the international scientific management of other ocean fisheries.

This 240-page book has 19 illustrations, is bound in simulated leather, and is available for $30 from Fishing News Books Ltd., 1 Long Garden Walk, Farnham, Surrey, England.

Recreational Fisheries and the Environment

Recreational Fisheries and the Environment—Past, Present, and Future is a proceedings of the Walford Memorial Convocation edited by Anthony L. Pacheco. The Walford Convocation series of lectures and workshops was initiated in 1979 to provide a forum for the public to focus on coastal issues and problems. This series is sponsored by institutions making up the marine science community of Sandy Hook, New Jersey. They include: the National Marine Fisheries Service, which is concerned with the assessment of the living marine resources and pollution impacts on stocks and their habitats; The American Littoral Society, a nonprofit organization of amateur and professional naturalists that encourages the study of marine life, particularly nearshore, and fosters public awareness in coastal issues and needs for conservation actions; and The New Jersey Marine Consortium, which provides educational programs, university research support, and advisory services to broaden public awareness and interest in marine resources.

The proceedings cover fishery research development, and management of such diverse topics as inshore fisheries, striped bass, and estuaries. Fishery policies and a bibliography of local saltwater angling are also included. The proceedings is available from the Sandy Hook Laboratory, NOAA/NMFS, Sandy Hook, NJ, as Technical Services Report No. 32, May 1986.

Thesis and Dissertation Abstracts

Systematics of Morone (*Pisces: Moronidae*), With Notes on the Lower Percoids

John R. Waldman, Ph. D. 1986

This Ph. D. degree was erroneously reported in the October 1986 issue of BRIEFS as having been granted by Texas A&M University. The City University of New York was the university granting the degree.

In Memoriam

Louella E. Cable

Louella E. Cable, an AIFRB member since 1961 and emeritus since 1976, passed away on May 25, 1986 at age 85 in Ann Arbor, Michigan. After receiving the M.A. degree from the University of South Dakota in 1927, Louella took a position with the U.S. Bureau of Fisheries in Beaufort, NC for studies on commercial fish life histories.

In the 1930s, Miss Cable worked in Washington, D.C. and at Woods Hole, Massachusetts, where she worked on methods of rearing saltwater fishes in captivity. At the Gloucester, Massachusetts Laboratory, she studied the effects of freezing on fish muscle. From 1937 through the 1940s, she worked in Charleston, SC, and in 1950 moved to the U.S. Fish and Wildlife Service Great Lakes Fishery Laboratory, where she studied the coregonine fishes of the Great Lakes. Louella earned her Ph. D. at the University of Michigan in 1959. During her 42 years of federal fishery research, Miss Cable authored many scientific publications.

Membership Report

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