

Research Assistance Award Program

The AIFRB Research Assistance Award Program (formerly known as the AIFRB Travel Assistance Program) is gearing up for the 1991 awards. Dr. Joseph Rachlin, coordinator of the program, announces that applications are now being received for this year's awards.

Purpose of the Program: To provide travel assistance for qualified graduate students and other Associate Members so that they may present a paper at a scientific meeting of their choice.

Eligibility: All Associate Members of AIFRB.

Application: Submit a written request, a letter of support from your research mentor or supervisor, a copy of the abstract of your paper, and notification of the paper's acceptance for a specific meeting. Submit these items to Dr. Joseph W. Rachlin, Department of Biological Sciences, Lehman College of C.U.N.Y., Bedford Park Boulevard West, Bronx, NY 10468-1589.

Deadline: Applications should be in Dr. Rachlin's hands by April 1, 1991.

Winners: Any recipient of a Research Assistance Award will have his name and abstract published in BRIEFS.

Remote Sensing of Estuaries

In June 1987, a meeting was held in Washington, D.C. to address the question of the utility of remote sensing of estuaries. Now, a National Oceanic and Atmospheric Administration report by Vytautas Klemas, James P. Thomas, and James B. Zaitzeff has been issued under the title, *Remote Sensing of Estuaries—Proceedings of a Workshop*. The following is adapted from the Executive Summary of the report:

Estuaries are highly productive, producing large quantities of animal and plant biomass each year. They are sites of in-shore fisheries and spawning/nursery grounds for many species of pelagic finfish. They shelter many plants and invertebrates of ecological and economic significance. Estuaries also provide ports, industrial and residential sites, recreational opportunities, and tourist attractions. Because of these attractions, estuarine shorelines are usually the first to be populated when agricultural, urban, and industrial development occurs. To determine the impact of such development on the "health" of estuarine systems, many studies are being conducted requiring extensive monitoring

of a wide range of physical, geological, chemical, and biological properties of the water column, the benthos, and surrounding wetlands. Most of these studies employ ship and field data and make very little use of remotely sensed data.

Remote sensing offers a unique opportunity to observe and monitor entire estuaries synoptically and compare them to other estuaries. However, due to the tidal influences and small features which need to be detected, estuaries place severe temporal and spatial resolution requirements on sensing systems as compared to open ocean or land applications. Also, most estuarine researchers and managers are not familiar with remote sensing techniques and data availability.

Therefore, the National Oceanic and Atmospheric Administration (NOAA) Estuarine Programs Office, and the National Environmental Satellite, Data and Information Service (NESDIS), with the help of other agencies and the University of Delaware, organized a seminar and workshop with the following objectives:

- (1) To evaluate remote sensing techniques as a cost effective means for obtaining useful qualitative and quantitative data for an improved understanding of the physical, biological and geochemical properties of estuaries.
- (2) To review data requirements for hydrodynamic water quality and ecological models of estuaries (with emphasis on data obtainable by remote sensors).
- (3) To review the wide range of remote sensors and techniques available to users for monitoring the physical, biological, and geochemical properties of estuaries and surrounding wetlands and drainage basins.
- (4) To produce conclusions and recommendations for future use and development of remote sensing in estuarine studies.

The following four workshop panels prepared requirements, available techniques, and a list of conclusions and recommendations for future use of remote sensing in estuarine studies.

- (1) Wetlands and Uplands Panel
- (2) Water Column Properties Panel
- (3) Physical Processes and Estuarine Dynamics Panel
- (4) Benthic Environment Panel

The panels concluded that remote sensing, when used with appropriate models and ground requirements, can indeed provide cost-effective, synoptic information on wetlands and estuaries with improved temporal and spatial resolution. This conclusion is also supported by the scientific papers presented at the seminar and included in the latter part of these

Remote Sensing of Estuaries cont.

proceedings. The panel recommendations can be summarized as follows:

1. Basic Research and Model Development

The use of remote sensing data should be integrated into models that describe wetlands and estuarine ecosystems and their forcing functions.

Research should be undertaken to extract the maximum information available about wetlands and estuaries from the integrated use of sensors.

Improved physical and statistical models and algorithms should be developed, and additional basic research in hydrologic optics performed, to improve our ability to remotely identify and measure estuarine water constituents.

2. New Sensor Development

For studies of wetlands plant communities as well as other features of land cover in coastal environments, sensors having better spatial (10 m) and spectral resolution (10 nm) need to be developed. Within the visible and infrared region of the spectrum, examples of such sensors include the Jet Propulsion Laboratory's imaging spectrometers which will lead to better characterization of plant internal composition and physiology, thus improving inferences about other environmental parameters such as nutrient limitations and tidal regimes. The National Aeronautics and Space Administration's AMES Research Center Airborne Ocean Color Imager (AOCI) capabilities for measurement of total phytoplankton concentration, diffuse attenuation coefficients and total sediment load should be evaluated. In the microwave region, multiple wavelengths, look angles and polarizations are needed to improve discrimination of species of wetlands grasses, shrubs and forests, and provide all-weather capability.

Development of the following systems should be expedited in order to improve the measurement of water constituents:

- (a) High spatial resolution (30m) microwave radiometer for salinity and other measurements.
- (b) Narrow band (10nm) multispectral scanner for sensing of estuarine water constituents.
- (c) Development of laser systems for temperature in depth, bathymetry, water constituents, and phytoplankton species composition.
- (d) Development of *in situ* horizontal-profiling acoustic current meters such as scintillation instruments.
- (e) Development of higher resolution and land-based radar systems for discrimination of surface currents and waves.

Improved devices need to be developed for collecting sub-surface information on estuarine living resources and their habitats.

3. Sampling and Experiment Design

There must be a long-term commitment to make satellites available for an improved understanding and management of estuaries. This should include the development of sensors with adequate sampling resolution and frequency in new satellite or aircraft systems, as well as a study for the placement of an OCI-type instrument on GOES. A continuity of data flow is required for trend analysis and assessment of management actions.

Government agencies should sponsor an interdisciplinary estuarine remote sensing panel to plan a demonstration project whereby selected remote sensing systems, used in

conjunction with boat and field measurements, are used to study an estuarine system.

New sampling systems should be developed for collecting large numbers of field samples and measurements coincident with remote sensing operations. This could include radio-controlled buoy systems which collect surface and sub-surface water samples coincident with aircraft or satellite overpasses, or acoustical measurements.

Aircraft-based techniques should be brought into estuarine data collection programs in a more expeditious and cost-effective way.

More emphasis should be placed on integrating remote sensing products with conventional analysis products for improved understanding and use by multidisciplinary teams and managers.

4. Data Management

There should be a lead agency or center whose responsibility would be to coordinate a database of all estuarine remotely sensed and pertinent *in situ* data and provide users with information on sources, data availability, quality, geographic storage unit, product forms and costs.

Geographic information systems should be adopted as the standard way to present data for estuarine management.

When an estuarine project utilizing remote sensors is designed and implemented, data dissemination, standardization, and archiving of the remotely sensed information should be given equal priority with details of the design and performance of the collection platform or system.

Development of inter-calibration techniques to interrelate data from the various sensors is essential to the full utilization of remotely sensed data.

The time between data collection and product dissemination for operational use by researchers and managers should be decreased.

A users guidebook system needs to be prepared which provides information on sensor packages and their capabilities on available software.

Standard unpacking software routines should be written for mainframes, minis, and micros.

Raw and engineering data with digital products, as well as film and paper graphic products, should be made available upon request.

5. Coordination, Training, and Information Dissemination

Better coordination and cooperation among government agencies and other participating institutions is required in the development of a uniform, calibrated database of aircraft and satellite imagery.

Users should receive timely reports on sensor status and estuarine research projects that are underway or are being planned for the near future.

Research among government agencies, universities, and other institutions within geographic regions should be coordinated.

Development of techniques and remote sensing systems should be closely coordinated with estuarine management needs, including both monitoring and research, to assure effective and efficient use of new systems.

More effective methods for transferring remote sensing technologies to the estuarine, oceanographic, and management communities should be developed.

Genetically Engineered Fish Policy

The American Fisheries Society has released its policy on genetically engineered fish.

The advent of genetic engineering of fish and other aquatic organisms raises the possibility of unique environmental impacts. In response to recent research developments, the American Fisheries Society (AFS) has issued a position statement aimed at responsible use of genetically engineered or "transgenic" fish.

Researchers are using genetic engineering to create fish that produce extra growth hormones and may some day produce fish that are more tolerant of changes in temperature, pH, and salt levels. Transgenic animals are produced by inserting novel genes into newly fertilized eggs, the genes then becoming part of the fish's inheritance. At least 14 species of transgenic fish have been produced. Such fishes are being considered for fish farming and possibly, stocking for sport fisheries.

If large numbers of transgenic fish are released or escape into the environment, they may destabilize ecosystems because of substantial differences in their performance compared to natural fish of the same species. The degree of altered performance will vary and different types of transgenic fish will result in different levels of environmental change. Releasing sterile transgenic fish could reduce environmental risks but not eliminate them.

Although government agencies in the U.S. and Canada have produced regulations aimed at preventing or minimizing environmental impacts of transgenic animals, these regulations are incomplete and inadequate for safeguarding aquatic ecosystems.

The AFS position statement discusses the following recommendations to improve predictions of environmental risks posed by different transgenic fishes and to tighten up regulations in order to minimize environmental risk:

Granting organizations should fund special research designed to supply scientific data needed to develop public policies that will effectively minimize environmental risks.

Regulatory agencies should exercise caution in permitting uses of transgenic fish.

The U.S. government must improve the comprehensiveness of the Coordinated Framework for the Regulation of Biotechnology, the master U.S. policy document on the issue of transgenic animals.

The Canadian government should further consolidate Canadian regulatory authority over transgenic animals.

Patenting policy about royalty obligations regarding patented transgenic animals must be clarified, and proprietary rights for such patents must be narrowed to avoid stifling research and development.

Three articles published in *Fisheries* (January-February 1990) provide background information for the AFS position statement.

District News

NORTHWEST WASHINGTON

Donald McCaughran, *Director*

The November 15, 1990 meeting featured a lecture by Ian Todd, Executive Secretary of the Pacific Salmon Commission. Ian's topic was *Pacific Northwest Salmon—International Allocations, Harvest, and Management*. The focus was on the U.S./Canada Salmon Treaty, providing a valuable update on recent developments in the ever-changing shared harvest of Pacific Northwest salmon.

On January 24, the first meeting of 1991 centered on a presentation by Dr. James Anderson of the Fisheries Research Institute of the University of Washington. Dr. Anderson's topic was *Computer Models and Columbia River Management: An Exercise in Fact or Fantasy?* In the talk, Jim stated that management of Columbia River fisheries and hydropower resources have been controversial since conclusions based on models often are given more credibility than qualitative- and intuitive-based conclusions. The controversy on model credibility and use is increasing since the number, complexity, and persuasiveness of models is increasing. In this decade models will play a dominant role in river policy-making. Will they lead to an efficient and equitable management of fisheries and power resources or will they shift the advantage to those who have the best models?

His presentation briefly described the past and future of Columbia River hydropower and fisheries resources models. He gave some examples of what he believes have been proper and improper use, and described efforts to build models for a balanced and equitable management of the river.

Meeting Announcements and New Publications

World Fisheries Congress

The World Fisheries Congress, originally scheduled for April 1991 in Athens, Greece, has been rescheduled for 1992 because of the war in the Persian Gulf. This decision has been made because of concerns for safety, convenience, attendance, and the integrity of the program.

The Congress has been rescheduled for mid-April, 1992, in the same location.

It is hoped that the program will be essentially unchanged. If you are a paper or poster presenter, you will be contacted soon by your theme leader or session convenor with details regarding further program development. Please continue to work on your manuscript. It is intended that the paper review process will continue so that the Congress publications will not be delayed.

Pre-registration fees will be returned as soon as possible.

Estuarine Research Conference

The *11th International Conference of the Estuarine Research Federation* will be held at the Cathedral Hill Hotel in San Francisco, California on November 10-14, 1991.

A plenary session will reflect on 20 years of estuarine science and look to the future. Invited symposia will deal with *The NSF Land-Margin Research Program; Estuarine Fronts; A Comparison of Large River-Delta Estuaries*; and

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Meeting Announcements cont.

Information Exchange Between Estuarine Scientists, Managers, and Policy Makers.

A prominent theme of this Conference will be *Comparative Cycling of Natural and Contaminant Materials in Estuaries*. This topic will be pursued in three contributed sessions devoted to processes of *Geochemical Cycling*, *Microbial Biogeochemistry*, and *Trophic Cycling*. In addition, other special topics will be included.

Registration and other information is available from Jerome Williams, Estuarine Research Foundation Executive Director, Box 544, Crownsville, MD 21032-0544.

Training Course on Hazard Communication

The Environmental Resource Center offers *OSHA's Hazard Communication Standard: Training for Trainers*, a seminar dealing with safety and health information required by the Occupational Safety and Health Administration (OSHA). The emphasis is on training employees effectively in dealing with workplace chemicals.

The agenda for the seminar covers Overview of OSHA: Federal or State Enforcement; Whom and What are covered; Physical and Health Hazards: Understanding OSHA's Basic Definitions; Material Safety and Data Sheets: Requirements and Use; Labels: Requirements for Employers; Information and Training: Employee and Contractor Requirements; and The Written Hazard Communication Program.

The next seminar will be held at the Embassy Suites Hotel in Raleigh, North Carolina on December 13, 1991, and the cost is \$275.

For information and registration write Environmental Resource Center, 3679 Rosehill Road, Fayetteville, NC 28311-6634 or call 800-537-2372.

Large Marine Ecosystems

Kenneth Sherman (AIFRB Fellow), Lewis Alexander, and Barry Gold have edited *Large Marine Ecosystems*, a 250-page book published by the American Association for the Advancement of Science.

Large marine ecosystems (LMEs)—the relatively narrow ocean zones that produce nearly 95% of the world's useable marine biomass—are becoming increasingly stressed by both natural and anthropogenic changes, arousing major international concern about potentially negative ecologic and economic effects.

This volume, from an AAAS symposium, deals with the projected impacts of global changes on ocean productivity, and provides scientific, geographic, socioeconomic, and legal arguments for managing LMEs as multinational units, in order to sustain biomass yields of major coastal regions.

This is an essential book for scientists and students in marine-related fields, and for conservationists, natural resource policymakers, and everyone concerned about the future of the world's marine ecosystems.

The three sections of this volume cover Perturbations and Yields of Large Marine Ecosystems, Biodynamics of Large Marine Ecosystems, and Theory and Management of Large Marine Ecosystems.

The book is available from AAAS Books, Dept. A25, Box 753, Waldorf, MD 20604. It costs \$39.95 (for AAAS members, \$31.95).

Fish Pathology

Fish Pathology, 2nd Edition, edited by Ronald J. Roberts of the University of Stirling in Scotland, has been published by W. B. Saunders Company. The volume has 477 pages and 500 illustrations (56 in color), and sells for \$165.

This is the second edition of the acclaimed reference on fish disease and aquaculture.

In addition to comprehensive coverage of anatomy, physiology, pathophysiology, pathology and immunology, you'll find clear guidelines for diagnosing and managing neoplastic, viral, parasitic, bacterial, fungal, nutritional, and non-infectious diseases of virtually every teleost species.

You'll also find descriptions of laboratory methods for quick, accurate diagnoses. Full-color illustrations of important diseases allow direct comparison, to aid your identification of disorders.

Plus, coverage of fish husbandry and management in light of disease helps you ensure optimal production for commercial fisheries.

Order from W. B. Saunders Co., 625 Walnut St., Philadelphia, PA 19106-3399.

Mariculture Handbook

Volume II of the CRC Handbook of Mariculture, *Finfish Aquaculture*, is being published in February 1991. This book by James P. McVey of the National Sea Grant Program is a companion volume of Volume I, *Crustacean Aquaculture*, which is available from the publisher, CRC Press. The finfish handbook has 256 pages, 64 tables, and 127 illustrations, and sells for \$139.95.

The culture of marine finfish is becoming an important industry in many countries around the world. In Europe, sea bass, sea bream, sturgeon, turbot, sole, and cod are the key species, while in Asia, sea bream, grouper, sea bass, milkfish, and yellowtail are the principal species being cultured. In the United States there is increasing interest in culturing of redfish (red drum), striped bass, striped bass hybrids, sturgeon, and several other marine species.

This handbook is divided into four sections covering representative marine finfish species cultured in Europe, Japan, Taiwan, and the United States. Techniques for both hatchery use and production are presented in a detailed procedural fashion, much like a cookbook. Data are summarized in table or graphic form whenever possible for easy reference. The book focuses on nutrition and diet, disease diagnosis and control, and limiting environmental factors for the culture of marine fish. The species presented in the book are representative of marine fish species currently being cultured. This handbook will give aquaculturalists and marine fisheries scientists an excellent overview of the different culture methods being utilized in many areas of the world.

This book can be ordered from CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, Florida 33431.

New Academic Press Books

Pathology in Marine Science, edited by Frank O. Perkins and Thomas C. Cheng, is a 58-page volume coming from the Third International Colloquium on Pathology in Marine Aquaculture held in Gloucester Point, Virginia in 1988.

This book is a comprehensive examination of diseases in molluscs, crustaceans, finfish, and other estuarine animal groups caused by viral, microbial, parasitic, and chemical agents. The contents include viruses, bacterioses, mycoses,

protozoan diseases, metazoan parasitic diseases, toxicological pathology, teratological and neoplastic diseases, epidemiology/epizootiology, nutritional pathology, and immunology.

The price is \$65.

Polar Oceanography, edited by Walker O. Smith, Jr., is a two-part volume which is an integrated synthesis of the biological, physical, geological, and chemical processes that occur in the polar oceans. The book represents the first modern interdisciplinary synthesis in this field.

Part A, *Physical Science*, deals with a variety of physical phenomena in 406 pages. It costs \$69.50. Part B, *Chemistry, Biology, Geology*, covers various aspects of the biota, sedimentation, and chemical oceanography in 354 pages. The price is \$65.

Dynamic Aquaria, by Walter H. Adey and Karen Loveland, provides complete information on the interactions of the physical and biochemical environments as they relate to aquaria and their natural counterparts. It also covers the organisms within these environments and how they relate to a wide variety of ecological systems.

CONTENTS: Introduction. **Physical Environment:** The Envelope—Shapes, Materials and Construction. Temperature—Control of Heating and Cooling. Water Composition—The Management of Salinity, Hardness, and Evaporation. Water Motion—Waves, Currents, and Plumbing. Tides—Simulating the Effects of Sun and Moon. The Input of Solar Energy—Light Requirements. Substrate—Management of Rock, Mud, and Sand. **Biochemical Environment:** Metabolism—Respiration, Photosynthesis, and Biological Loading. Organisms and Gas Exchange—Oxygen, Carbon Dioxide, and PH. Nitrogenous Wastes and Nutrients—Nitrogen, Phosphorus, and the Micronutrients. Control of the Biochemical Environment—Filters, Bacteria, and the Algal Turf Scrubber. **Biological Structure:** Community Structure—the Framework. Trophic Structure—Ecosystems and the Dynamics of Food Chains. Primary Producers—Plants That Grow on the Bottom. Herbivores—Predators of Plants. Carnivores—Predators of Animals. Plankters and Planktivores—The Floating Plants and Animals and Their Predators. Detritus and Detritivores—The Dynamics of Muddy Bottoms. Other Feeders—Commensalism, Symbiosis, and Parasitism. **Ecological Systems in Microcosms, Mesocosms, and Aquaria:** Models of Coral Reef Ecosystems. A Subarctic Shore—The Maine Coast. Estuaries—Ecosystem Modeling where Fresh and Salt Waters Interact. Freshwater Ecosystem Models. Microcosms, Mesocosms, and Aquaria—A Synthesis. Index.

This book, to appear in Spring 1991, has 704 pages, and the tentative price is \$39.95.

Ecology and Classification of North American Freshwater Invertebrates, edited by James H. Thorp and Alan P. Covich, is to appear in March 1991. This 870-page volume contains taxonomic keys for all groups, taxa distributed in Canada, and generous illustrations.

The tentative price is \$59.95.

All of these Academic Press books are available from Academic Press, Book Marketing Department, 1250 Sixth Avenue, San Diego, CA 92101-9665.

Dissertation and Thesis Abstracts

Distribution, Abundance, and Ecological Requirements for the Larvae and Early Juveniles of Two Sympatric Blennioid Fishes,

Cebidichthys violaceus and *Xiphister mucosus*

Aaron C. Setran, Ph.D. 1990

San Diego State University

Spatial and temporal distribution patterns shown by the larvae and early juveniles (17-46 mm TL) of *Cebidichthys violaceus* and *Xiphister mucosus* (Pisces: Blenniodei) were investigated in the vicinity of Diablo Canyon, San Luis Obispo, California. The seasonal patterns of occurrence and abundance of these larvae were determined by analyzing data from an 18-month ichthyoplankton study conducted by the Pacific Gas and Electric Company. Replicate plankton tows were taken at one nearshore and two offshore stations at approximately weekly intervals from April 1986 through September 1987. Results indicated that there were differences in the overall abundance, seasonal occurrence, and local distribution patterns between the larvae of these species. The seasonal pattern of distribution and abundance for *C. violaceus* larvae was relatively uniform throughout the study period, which suggests that its reproductive cycle does not follow the general reproductive pattern of most other intertidal fishes. There was a pronounced nearshore-offshore gradient in larval densities of *Xiphister* spp. throughout the seasonal occurrence of species. This suggests that the larvae of *Xiphister* maintain a distinct nearshore distribution by avoiding offshore and perhaps longshore drift.

Distribution patterns of early juvenile *C. violaceus* and *X. mucosus* were investigated during four consecutive monthly surveys at three separate field stations within the intertidal zone. In addition, food habits, substratum utilization, and vertical distribution relative to MLLW were determined for both species during each monthly survey, thus permitting the assessment of ontogenetic differences in ecological requirements within and between the two species. Results of stomach content analyses clearly indicated that early juvenile individuals (< 47 mm TL) of both *C. violaceus* and *X. mucosus* are carnivores, feeding mainly on planktonic copepods, amphipods, mysid shrimp, and juvenile spionid polychaetes. This diet differs markedly from the primarily herbivorous diets of adult *C. violaceus* and *X. mucosus*. Index of Relative Importance (IRI) and Percent Similarity Index (PSI) values showed that the food habits for juveniles of both species were nearly identical throughout the study period, both with regard to preferences for particular food items and changes in preferences over time. Preferences for specific substratum types (sand, gravel, and cobble), and changes in those preferences over time, also were nearly identical for early juveniles of both species throughout the study. However, juveniles of the two species showed differences in their vertical zonation.

Laboratory experiments to test preferences for natural substrata (sand, gravel, and cobble) clearly indicated that the early juveniles of both *C. violaceus* and *X. mucosus* selected and utilized very specific substratum types, and that substratum preferences changed over time as individuals of both species grew in size. Moreover, these experimental results for both species were entirely consistent with the field observations. The role of interstitial space as a primary stimulus for substratum preference was investigated in experiments employing artificial substrata; three sizes of glass beads (2, 8, and 15 mm diameter) were used in place of sand, gravel, and cobble, respectively. The results indicated that for both species the number of individuals selecting a given substratum type

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Dissertation cont.

differed little between the natural and artificial substrata presented. This lack of discrimination between natural and artificial substrata indicates that interstitial space serves as a major cue by which early juvenile fishes select substrata.

The apparent absence of resource partitioning for food and substratum requirements suggests that the observed differences in vertical distribution patterns of early juvenile *C. violaceus* and *X. mucosus* may reflect species-specific responses to pressure from subtidal predators. An alternate explanation is that they segregate into overlapping vertical zones to avoid diet interaction in using the same gravel and cobble substrata areas as refuges.

Comparative Community Structure of Surf-Zone Fishes in the Chesapeake Bight and Southern Brazil

Cassiano Monteiro-Neto, Ph.D. 1990
College of William and Mary in Virginia

The structure of surf-zone fish communities at Cassino (western South Atlantic, WSA) and the Chesapeake Bight (western North Atlantic, WNA) is described using historical beach seine data, to examine similarities between geographically isolated fish communities. Numerical classification, ANCOVA, Shannon-Wiener diversity and its components, and species rarefaction are used to describe fish community structure: a) within habitat (community analysis within a nearly homogeneous habitat - Cassino), with emphasis on the characterization of seasonal patterns; b) within region (the study of seasonal and large scale spatial variations in fish communities from separate localities (Cape Hatteras and Sandbridge, Chesapeake Bight) within the same zoogeographical region); c) within the western Atlantic (comparison of patterns of community structure and faunal affinities between Cassino and the Chesapeake Bight).

The surf-zone fish community at Cassino had a low diversity and was dominated by a few species. Seasonal periods identified by cluster analysis correlated well with seasonal environmental changes. The seasonal occurrence, abundance and diversity of fish species reflected recruitment patterns of juveniles, and seasonal variation in the marine and estuarine circulation patterns. Fish species associations usually fitted into three broad categories: a) year-round surf-zone residents (*Trachinotus marginatus*, *Menticirrhus littoralis*, *Oncopterus darwini*, *Odontheistes bonariensis*, *Mugil platanus*); b) spring to fall, estuarine related, pelagic planktivores (*Ramnogaster arcuata*, *Brevoortia pectinata*) or shallow water omnivores (*Xenomelaniris brasiliensis*, *Jenynsia lineata*, *Mugil spp.*); c) summer to fall coastal marine occasionalists (*Porichthys porosissimus*, *Umbrina canosai*, *Chloroscombrus chrysourus*, *Caranx latus*). Water temperature probably played an important role determining the time of the spawning migration and reproduction of adult fish. Faunal similarity between Cassino and other selected locations of the WSA, decreased towards lower latitudes due to faunal replacements.

In the Chesapeake Bight community structure was determined by differences between sampled localities. The community at Sandbridge was characterized by estuarine related species (*Leiostomus xanthurus*, *Bairdiella chrysoura*, *Micropogonias undulatus*, *Syngnathus spp.*) associated with the Chesapeake Bay. Sub-tropical coastal marine species (*Monacanthus hispidus*, *Caranx hippos*, *Trachinotus spp.*) at Cape Hatteras indicated influence of Gulf Stream waters. A few species dominated fish communities both at Sandbridge and Cape Hatteras. The seasonal species occurrence, abundance and diversity was determined by an enhanced seasonal migration along the coast, juvenile recruitment, and the thermal

regime of the Chesapeake Bight. Species assemblages showed considerable seasonality and ubiquitous surf-zone residents were replaced by a wintering group in the colder months. The diversity of estuarine related species at Sandbridge indicated that locally the surf-zone acted as a peripheral habitat for migratory estuarine dependents and estuarine residents. Faunal similarities between the Chesapeake Bight and other WNA localities decreased both northward and southward due to faunal replacements.

Similarities between surf-zone fish communities within the western Atlantic (Cassino x Chesapeake Bight) were correlated with the temperature range and habitat structure. However, data did not provide enough evidence to characterize either convergence or parallel evolution of communities.

The Gametogenic Cycle of *Placopecten magellanicus* (Gmelin) in the Mid-Atlantic Bight

Anne Catherine Schmitzer, M.A. 1990
College of William and Mary in Virginia

Information concerning reproduction is of vital importance for successful management of a fishery, especially when that fishery is regulated by the weight of a whole or partial organism. The harvest of sea scallops (*P. magellanicus*) from the mid-Atlantic bight is regulated by a maximum average meat count. However, no documentation of the gametogenic cycle of sea scallops in this region existed in the literature. Therefore, this study was initiated to determine the gametogenic cycle of scallops in the mid-Atlantic bight.

Histological quantification of gonadal tissue, as well as gonad weight changes, indicated that a semiannual gametogenic cycle was characteristic of sea scallops from the mid-Atlantic bight. Major spawnings occurred in May and November. Gonadal development and spawning in the spring comprised a longer period of time and resulted in greater fecundity.

High variability in gametogenic processes was due to the lack of a distinct quiescent period between cycles and the sporadic occurrence of oocyte resorption and partial spawning of spermatozoa throughout the year. The timing of gametogenic processes between male and female scallops within each sampling area or month was very similar. Likewise, similar gametogenic cycles were observed throughout the mid-Atlantic bight, although some differences in the timing of gametogenic processes among areas and between depths were evident.

Estimated bottom water temperatures were lowest in the summer and highest in the winter. The elevated temperatures in the winter were due to slope water intrusion onto the shelf, and may be responsible for semiannual spawning in the mid-Atlantic bight.

A strong relationship between adductor muscle weight and gonad weight was verified in this study through regression analysis. Adductor muscle weights generally decreased as gonads developed, increased shortly after spawning, and continued to increase until gonads began to redevelop. The resulting variability and reduced size of adductor muscle weights caused by semiannual gametogenic activity creates increased difficulty for fishermen to comply with meat count regulations. However, semiannual spawning could result in increased recruitment, which would be beneficial to the fishery.

Because semiannual gametogenic cycles are often subject to large interannual variability, researchers should continue monitoring gametogenesis of mid-Atlantic sea scallops for several additional years to verify the repeated occurrence and characteristics of the semiannual gametogenic cycle. Gonad weight changes would be an accurate and simpler method for a long-term monitoring program. The results of this study should be recognized in the sea scallop fishery management plan if this fishery continues to be regulated by a maximum meat count.

In Memoriam

Irwin Alperin
AIFRB Fellow 1985
Fall 1990

Keith A. Havey, Sr.
AIFRB Emeritus 1986
November 23, 1990

Keith A. Havey, Sr., 64, a native of Sullivan and longtime resident of Machias and Hampden, died at his Hampden home, Friday, Nov. 23, 1990, after a long fight with cancer.

Havey fought in Europe with the Renaissance Battalion and after the war he served as a staff sergeant in the Military Police in Munich. Upon his honorable discharge in 1946, Havey married Joan Gray and they lived in Orono while Keith earned a bachelors degree in wildlife conservation and a masters degree in zoology at the University of Maine. Havey then began a distinguished 35-year career working for the Maine Department of Inland Fisheries and Game, first as a regional fisheries biologist stationed in Machias and later as a research biologist in Bangor. Havey's work on the relationships among stocking rates, fish growth, and harvest of landlocked salmon has led to great improvement in Maine Stocking Programs. The author and co-author of numerous works, including papers on the genetics of brook trout, and his work *The Maine Landlocked Salmon: It's Life History and Management*, earned him an award for outstanding contribution to the conservation of cold water fisheries from Trout Unlimited and the Professional Award of Merit of the American Fisheries Society, Northeastern Division, in 1982. Havey retired in 1985.

Warren F. Rathjen
AIFRB Fellow 1976
November 2, 1990

Warren F. Rathjen died of a heart attack on November 2, 1990 in Melbourne, Florida after a 5-month illness.

Upon graduation from high school in 1946, Warren served for three years with the U.S. Coast Guard. He earned a Bachelor of Science in Zoology at the University of Miami in 1953 and pursued graduate studies in fisheries in 1953 and 1954 at the University of Miami and the University of Washington.

Mr. Rathjen served as a hydrographic observer at the Woods Hole Oceanographic Institute in 1953, and then became an aquatic biologist for the state of New York. Warren began his service with the Bureau of Commercial Fisheries in 1956, conducting exploratory fishing surveys for tuna, red snapper, and shrimp in the Gulf of Mexico, Caribbean Sea, South America, and Florida east coast. Then followed exploration and gear research on tunas and shrimp as Assistant Base Director at Gloucester, Massachusetts (1959-62).

As Director of the Exploratory Fishing Base in Juneau, Alaska from 1962 to 64, Rathjen conducted exploratory studies on ground-fishes, shrimps, crabs, and scallops.

In 1964 he went to Barbados as the Chief of Exploratory Fishing for the Caribbean Fisheries Development Project of FAO. Rathjen migrated again to the NMFS Laboratory in Woods Hole in 1969 where he began fisheries surveys on underutilized species in the western North Atlantic. It was during this period that Warren became captivated with squids as an underutilized fishery resource of potentially considerable importance to U.S. fishermen. Warren dedicated the rest of this professional career to studying the squid fisheries and potential. Rathjen's last position with the NMFS was a Fisheries Administrator for fisheries development for 19 states. All but four of his last 22 publications concerned squid fisheries, fishing techniques, and gear.

Warren Rathjen retired from the NMFS in the spring of 1985 and moved to Florida where he became Adjunct Professor at Florida Institute of Technology. From 1987 to 1989 Warren served as Marine Advisor for the University of Florida Sea Grant Program and since 1988 was a consultant on squid and tuna fisheries development.

Warren was a certified Fishery Scientist of the American Fisheries Society, a Fellow of the American Institute of Fishery Research Biologists, and an Executive Member of the Cephalopod International Advisory Council.

The community of cephalopod researchers and squid fishery representatives have lost too soon a productive and valued colleague and a loyal friend.

Membership

Inquiries regarding membership should be directed to Dr. Sammy Ray, Membership Chairman, Texas A & M University at Galveston, Building 3311, Fort Crockett, Galveston, Texas 77551.

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

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APRIL 1991

New AIFRB Directory

AIFRB is issuing a new Directory of Members to replace the 1987 version. This 1991 model will have greater utility than past issues, for it will include entries for name, business address, telephone number, and years of election to Associate, Member, Fellow, and Emeritus status.

The book will be off the press in April, and each member will receive a copy.

The Next Invader

You might think that after all the dire warnings about the zebra mussel, and the Great Lakes' long and difficult experience with the alewife and the sea lamprey, that every effort would be underway to keep more "ecological invaders" from entering the Lakes.

You would be wrong.

The U.S. Congress, the International Joint Commission, and the Great Lakes Fishery Commission have concluded that every ship entering the Great Lakes should switch its ballast first, to leave any potential freshwater invaders out in the saltwater ocean where they can do no harm. Congress, in fact, has decided to require it for ships entering U.S. waters. Canada's Coast Guard, though, thinks the idea is worth studying.

Ships' ballast water is one way, maybe the main way, that invaders like the zebra mussel can make their way across an ocean from a freshwater lake or river on another continent to the Great Lakes. "The health and integrity of the Great Lakes-St. Lawrence ecosystem are jeopardized by the rampant colonization by shipborne exotic organisms," the two bi-national commissions noted in a joint statement on ballast-switching. "It is a problem that can and must be curtailed."

The Coast Guard claims that its voluntary ballast-switching program, in which ship captains are asked to switch their ballast before entering the St. Lawrence, has a 97% compliance rate. A few vessels, they say, cannot safely comply without risking capsizing. Research is needed on alternatives, they say, before switching can be required.

The problem with that is that it only takes one of those vessels to dump something new and dangerous into the Lakes; for all we know, it has already happened. Based on

experience, it seems the question is not whether it will happen, but when.

Surely nothing would inspire shipowners to find safe ways of switching their ballast like the knowledge that they cannot enter the St. Lawrence Seaway until they do.

Any sense of urgency seems distinctly lacking in the Coast Guard's considering of the question: officials are "hopeful" that some funds for research can be found in the fiscal year starting in April, to get some research started maybe sometime this year. The shipping season, meanwhile, opens by mid-March, and another invader could be in a Great Lake in a matter of weeks.

From The Great Lakes Reporter
Jan./Feb. 1991

Anti-Invader Program

The second major piece of Great Lakes legislation to come out of the 101st Congress and be approved by the President was the Nonindigenous Aquatic Nuisance Prevention and Control Act, also known as the Zebra Mussel Act. The law taps into the zebra mussel's notoriety to address exotic invaders, and authorizes new funds for the Fish and Wildlife Service to carry out its Great Lakes work.

Congress ordered the Secretary of Transportation to produce a ballast-water management plan for ocean-going ships entering the Lakes. Over two years the ballast-water exchange rules will go from guidelines to regulations backed with civil and criminal penalties.

According to Senator John Glenn (D-Ohio), the author of the Senate version, the bill "is a direct response to the zebra mussel invasion of the Great Lakes." However, the act recognizes that the zebra mussel is only the most recent exotic species to enter the Lakes. A Senate staffer said, "We jumped on the zebra mussel hysteria to get a nuisance-species program enacted."

The second section of the act authorizes \$50 million over five years in new resources for the U.S. Fish and Wildlife Service's Great Lakes programs. This includes \$4 million per year for five years for the agency to assess the Great Lakes fishery and environment with an eye toward restoration and enhancement. A \$2 million annual allocation will

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Anti-Invader Program cont.

establish a fishery-assistance office in Western New York to service the lower Great Lakes.

Though the legislation was passed too late in the session to receive appropriations in the fiscal-year 1991 federal budget, funds appropriated earlier in the year were channeled to some of the programs enacted.

*From The Great Lakes Reporter
Jan./Feb. 1991*

Whale Tissue Bank

Tissue samples taken by NOAA scientists from the 54 whales which stranded recently on a Massachusetts beach may hold a clue to why the animals beached themselves.

The relatively small whales, mostly mothers and calves from seven to 17 feet in length, stranded themselves on a beach on Squaw Island, Massachusetts on Tuesday, December 12.

Tissue samples from the dead whales were taken by the new National Marine Mammal Tissue Bank, a joint effort of NOAA and the Commerce Department's National Institute for Standards and Technology. The bank was established recently by a team of scientists with expertise in marine mammals, toxicology, chemical contaminants, and specimen banking. The tissues, which are stored at NIST labs in Gaithersburg, Md., are analyzed to compare present and past conditions of tissues as possible indicators or changing environmental conditions. Tissue samples from five of the stranded whales which died were taken on the scene and further processed at the New England Aquarium in Boston.

Additional tissue samples were taken at the scene and will be analyzed by NOAA's Northwest Science Center.

Of the 54 stranded whales, eight were successfully "pushed off"—returned to open water and swimming well. The Aquarium saved two of the smaller calves by moving them to a special holding tank at their facility. These two calves are reported to be in fair condition, and will be released into open waters when they recover. The other whales either died on the beach or were euthanized.

The rescue effort was coordinated by the New England Aquarium, which serves as the lead organization for the National Marine Mammal Stranding Network's northeast region. NOAA coordinates the network, which includes zoologists and marine mammalogy scientists, many large aquariums, and hundreds of volunteers who assist with rescue efforts.

Marine Mammals and Global Warming

Scientists from the National Marine Fisheries Service (NMFS) Southwest Fisheries Science Center (SWFSC) in La Jolla, California, are now in the southern Indian Ocean monitoring the response by marine mammals to underwater

sounds produced during a special internationally sponsored global warming feasibility experiment.

The Heard Island feasibility study, implemented by Scripps Institution of Oceanography, the University of Washington, the University of Michigan, and the Commonwealth Science and Industrial Research Organization (CSIRO) in Tasmania, Australia, is based on the principle that sound travels at a speed that is proportional to water temperature. The concept involves acoustic transmissions generated by a bottom-mounted transducer, which can be detected at distant receiving stations to measure global warming over a proposed 10-year period. This January's Heard Island Experiment was designed to determine the minimum signal level and duration required to accomplish the actual global warming measurement.

Because many species of large whales migrate seasonally to the southern Indian Ocean, there is the possibility that the series of 80 transmissions, lasting 1 hour each, may affect the migration or feeding behavior of these animals in the area. Two observers from Australia, along with observers representing, NMFS, Texas A&M, Hubbs Marine Research Institute, and National Ocean Survey (NOS) aboard the U.S. Navy contract vessels *Amy Chouset* and *Cory Chouset*, will arrive in the vicinity of Heard Island (roughly halfway between the southern tip of Africa and Australia) to determine what effects, if any, the acoustic signals may have on marine mammals in the area.

Prior to the acoustic transmission that began on January 26, and at various points throughout the 10-day transmission period, NMFS observers conducted sound level measurements along predetermined acoustic transects. They also recorded marine mammal vocalizations from launched sonobuoys and deployed hydrophones, conducted pinniped surveys along the shoreline, and conducted an ongoing survey to record the numbers, species, and behavior of marine mammals in and around the Heard Island area.

With the information gained during this feasibility experiment, an evaluation can be made as to whether a long-term study is warranted. If so, these same data will be used to fine-tune the acoustic experiment so as to minimize any effects on marine mammals while still providing needed estimates on global temperature trends.

Carlander Manuscript Copies Available

Manuscript copies of sections of Volume 3 of Dr. Ken Carlander's *Handbook of Freshwater Fishery Biology* are available for a small price. Because it is anticipated that this invaluable volume will not be published until late 1992 or 1993, many fishery people might find these manuscript copies to be useful at this time.

The following revised sections are available.

Species	Date Completed	Price
Yellow perch, <i>Perca flavescens</i>	1991	\$4.25
Sauger, <i>Stizostedion canadense</i>	1989	2.50

Species	Date Completed	Price
Walleye, <i>Stizostedion vitreum</i>	1989	8.00
Darters, <i>Etheostominae</i>	1989	5.00
Striped Bass, <i>Morone saxatilis</i>	1991	2.50

The following not-recently-revised sections are still available:

White perch, <i>Morone americana</i>	1981	2.00
White bass, <i>Morone chrysops</i>	1981	2.75
Yellow bass, <i>Morone mississippiensis</i>	1983	2.00
Hybrid bass, <i>Morone</i> spp.	1989	1.00

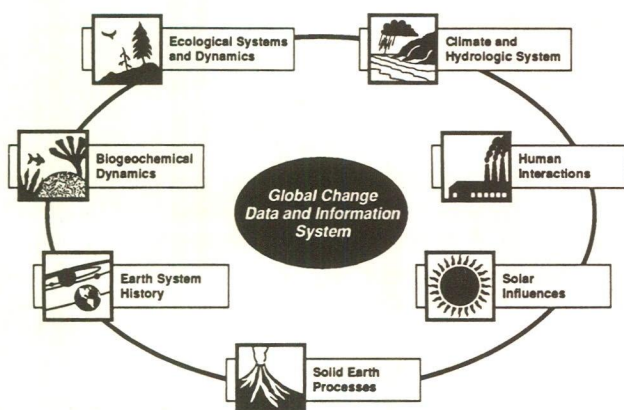
Dr. Ken Carlander, 2200 Hamilton Drive, #702, Ames, Iowa, 50010, will send these upon payment for copying and mailing expenses.

Data Management for Global Change

The Interagency Working Group on Data Management for Global Change (IWGDMGC) was organized to coordinate development and implementation of a data and information system to support global change research. The Group has been meeting since June 1987. Initial participants were NOAA, NASA, the National Science Foundation, and the U.S. Geological Survey. Since then, interest in the IWGDMGC has expanded, and participants now also include the Department of Energy, U.S. Department of Agriculture, Environmental Protection Agency, Department of State, U.S. Navy, National Archives and Records Administration, and Bureau of Reclamation.

Thomas N. Pyke, Jr., Assistant Administrator for Satellite and Information Services, is NOAA's principal representative and functions as the IWGDMGC Chair. Kenneth Hadeen (Director, National Climatic Data Center), Gregory Withee (Director, National Oceanographic Data Center) and Gerald Barton (National Oceanographic Data Center), work on the Contacts level of the Working Group.

The Working Group's charge is to make it as easy as possible for scientists and others to locate and obtain data needed for studies of global change. The Group's goal is to develop by 1995 a national global change data and information system that is consistent across agencies and involves and supports the university and other user communities.



The Working Group is approaching data management problems via a number of activities such as:

- improving interconnectivity and interoperability among existing agency data systems,
- assembling data and information requirements and developing standards for quality control and confidence limits,
- defining requirements for data providers such as documentation standards, and
- fostering international data exchange.

Completed and ongoing projects of the IWGDMGC include:

- the Global Change Master Directory, an on-line computer system for finding global change data sets,
- the Arctic Data Interactive, a CD-ROM that holds a directory of Arctic data, as well as selected Arctic data sets, publications, bibliographies, and images (in preparation),
- the Forum on Data Management for Global Change, a workshop held in Baltimore in 1988 that focused on data management requirements, issues, and problems,
- U.S. Strategy for Global Change Data and Information Management*, a Report by the Committee on Geophysical Data of the National Research Council (planned for late 1990 publication),
- input to the Data Management sections of the FY 90 and FY 91 Global Change Research Plans prepared by the Committee on Earth and Environmental Sciences, and
- recommendations for the U.S. Data Management Policy.

The IWGDMGC works closely with the Committee on Earth and Environmental Sciences (CEES), which is responsible for the U.S. Global Change Research Program (GCRP). The CEES is a committee on the President's Federal Coordinating Council for Science, Engineering, and Technology. The CEES has divided the GCRP into seven science elements: Ecological Systems and Dynamics, Climate and Hydrologic System, Human Interactions, Solar Influences, Solid Earth Processes, Earth System History, and Biogeochemical Dynamics. The IWGDMGC is concerned with data management for these science elements because the data provide the foundation for global change research. The Working Group believes that data management practices instituted now will benefit global change research far into the next century.

By Gerald Barton in *Earth System Monitor*, Sept. 1990

Clean Air and Chesapeake Bay

After 13 years of debate and delay, Congress and the president have approved a clean air bill aimed at clearing smog from the nation's cities, taking toxics from the sky, and, for the first time, tackling pollutants that cause acid rain.

For the Chesapeake Bay, the impact of the long-awaited Clean Air Act will be mixed. It will sharply reduce emissions

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Clean Air cont.

of airborne toxics. But at the same time, it's possible that airborne deposition of nitrogen oxides, one of the most serious Bay pollutants, could increase.

The good news is that without the updated law, the problem would get worse much faster.

The reason for the gloomy outlook—at least for the nitrogen oxide emissions—is the rapid growth expected throughout the Bay watershed. Most nitrogen oxide emissions in the region come from motor vehicles and fossil-fuel burning industries, chiefly power plants.

Projected increases in traffic and power demand threaten to outpace the significant cutbacks mandated by the act.

This can happen because the act is designed to clear the air—not the water.

Nitrogen oxide emissions are regulated as part of the solutions to other problems; not for their cumulative effect on water quality.

For example, the law requires a 60 percent reduction in emissions of nitrogen oxides from motor vehicles in 1998 as part of the solution to urban smog—a problem to which nitrogen oxide is only one of several contributors. To solve the smog problem, the act relies on reductions in other sources as well.

Likewise, emissions from power plants are regulated to reduce acid rain. But nitrogen oxide emissions are not regulated as rigorously as sulfur dioxide, which is seen as the chief culprit in producing acid rain.

Despite the significant nitrogen oxide reductions mandated for tailpipes, it will be years before the full impact is felt because many older, more polluting cars will remain in service long after the 1998 target date.

Meanwhile, the number of people driving, and the distances they drive, are expected to increase.

The Metropolitan Washington Council of Governments estimates that by 2010 the number of miles traveled in the Capital region will increase 87 percent.

The Federal Highway Administration estimates that by 2005, vehicle miles traveled will increase by 35 percent (by low-growth estimates) to 61 percent (using high-growth estimates) in Virginia. In Maryland, the range is 22 percent to 46 percent, and in Pennsylvania the range is 33 percent to 58 percent.

Because traffic growth will also outpace highway construction, the highway administration also forecasts worsening traffic congestion—a factor that would increase pollution.

The legislation does not include money for automobile alternatives, such as mass transit, as some had hoped. But states are required to prepare plans showing how they will reduce emissions of the pollutants that cause ozone pollution. Those include nitrogen oxides and “volatile organic compounds,” which come from sources as varied as gasoline pumps and bakeries, and easily evaporate.

The states can require businesses that employ more than 100 people to study alternative transportation for their workers, such as car pooling. Solving such problems is not as easy as regulation—it involves changing attitudes.

Under its acid rain provisions, the new act attacks nitrogen oxide emissions from coal-burning facilities, primarily power plants. In the Bay watershed, roughly as much nitrogen oxide enters the air from coal burners as from cars and trucks.

The act's restriction of nitrogen oxide emissions from smokestacks are not as strong as the provisions limiting emissions of the larger cause of acid rain—sulfur dioxide. It requires a halving of sulfur dioxide emissions by 2000 and then places a nationwide “cap” on emissions at the lower level.

But for nitrogen oxide, the law requires a halving of emissions by 1996 but does not place a cap on emissions. As new plants come on line, the total amount of emissions could grow.

The lack of a cap is significant because the mid-Atlantic is expected to have the largest growth in power generation in the nation in coming years.

In Virginia alone, plants that have been approved or are under review would add 36,000 tons of NO_x emissions, a 22 percent increase. Electrical demand in the state is expected to grow about 50 percent in the next decade.

Any increases in nitrogen oxide emissions could have a significant impact on the Bay. Nitrogen is one of the most important nutrients entering the Chesapeake, promoting the growth of plants vital to the estuary and to the many aquatic and animal species living there.

But too many nutrients result in algae blooms, which remove oxygen needed by other aquatic species. Overabundance of nutrients has been blamed for a massive decline in submerged aquatic vegetation in the Bay, a decline reflected by a coinciding loss of waterfowl and some marine species. As a result, a state-federal goal of achieving a 40 percent nutrient reduction level by the year 2000 has been agreed upon.

Increases in airborne nitrogen oxide emissions could work to offset any gains made in reducing nutrient runoff from cities and farms.

The amount of nitrogen entering the Bay from the air was thought to be relatively minor compared with runoff from farms, sewage treatment plants, and other sources until a 1988 report by the Environmental Defense Fund estimated that a quarter of the nitrogen was the result of air pollution, with motor vehicles and fossil-fuel burning power plants being the principal sources.

A draft EPA report put the airborne nitrogen as high as 37 percent.

On the positive side, the new Clean Air Act will mean that fewer airborne toxics will enter the Bay.

The law requires industries to install “maximum achievable control technology” for 189 airborne toxics. The goal is to reduce toxic emissions by 90 percent by 2003.

The law does not resolve the long-standing questions of what the level of acceptable risk is for those potentially exposed to toxic emissions but at least we're moving in the right direction.

Utility emissions, including mercury emissions caused by the burning of coal, are exempt from the toxics regulations until EPA determines there is a need for such requirements.

Exactly how big a problem airborne toxics pose for the Bay is uncertain. Some studies in the Great Lakes, though, have suggested half the toxics entering those waters come from the air. In any event, big reductions in toxics emissions should help the Bay, particularly as some evidence suggests that airborne toxics may travel hundreds, if not thousands, of miles.

There is some evidence that air toxics do travel great distances and their effort on the microlayer is serious. The microlayer is the thin film in which the water surface meets the air.

Besides regulations, the act also includes many new research initiatives. Among them are programs to study short- and long-term effects of pollutants on whole ecosystems; continuation of the National Acid Rain Assessment Program which had been ended by the administration Oct. 1; and a program to more accurately monitor emissions of carbon dioxide, the chief "greenhouse" gas.

The act also establishes what amounts to a citizen bounty program. People who provide information that results in a fine to a permit violator can share in any penalty that is assessed.

Adapted from an article by Karl Blankenship in Chesapeake Citizen Report, Nov./Dec. 1990

Our People

Paul E. Carothers (AIFRB Associate 1979), who had been legislative director for Sen. John Breaux, has become director of federal affairs for the Council for Solid Waste Solutions.

The Publications Advisory Committee of the National Marine Fisheries Service has made awards for the best publications authored by NMFS scientists. **Edmund S. Hobson** (AIFRB Fellow 1975) was honored for his co-authorship of a 1988 *Fishery Bulletin* paper on trophic relations of the blue rockfish in a coastal upwelling system off northern California. **Arthur W. Kendall, Jr.** (AIFRB Fellow 1980) received his award for co-authoring a 1987 paper in *Marine Fisheries Review*; the study covered the biology of eggs, larvae, and epipelagic juveniles of sablefish.

Ronald J. Klauda (AIFRB Member 1980) has changed positions from the Johns Hopkins Applied Physics Laboratory to become Director of the Chesapeake Bay Research and Monitoring Division of the Maryland Department of Natural Resources. Ron is stationed in Annapolis.

Roger Rulifson (AIFRB Member 1983), co-director of the Roanoke River Water Flow Committee, has accepted the Governor's Conservation Achievement Award from the North Carolina Wildlife Federation. The award recognizes the Committee as Water Conservationist of the Year.

Fredric M. Serchuk (AIFRB Member 1980), chief of the Northeast Fisheries Center's New England Offshore Fishery Resources Investigation, has been elected to a 3-year term as chair of the Advisory Committee on Fishery Management of the International Council of the Exploration of the Sea. Fred is the first North American ever elected to this post.

District News

NORTHWEST WASHINGTON

Donald McCaughran, Director

At the District meeting on February 28, Dr. Linda Jones of the NMFS Marine Mammal Laboratory, Jay Hastings, Legal Counsel for the Japanese Fishing Association, and Ben Deeble of Greenpeace presented a program on *North Pacific Driftnet Fisheries: Harvests, Management, and Impacts*. The three speakers touched on the history of Asian driftnet fisheries, their past management and the (potential) magnitude of the driftnets on non-target species. Recent reports and speculation suggest that the driftnets cause substantial mortality to tunas, salmon, billfish, sharks, marine mammals, and sea birds. The degree of bycatch is still being debated and the actual population impacts of the bycatches are essentially unknown. The audience learned about the potential magnitude of the bycatch problem and some of the ideas for resolving the conflicts.

The meeting on March 28 featured Bill Royce, speaking on *Salmon Management: Wild Stocks and Cultured Stocks*. Bill, a distinguished fisheries scientist and a long-standing member of AIFRB, addressed issues relating to the health of Northwest salmon stocks in relation to hatchery and commercially cultured stocks. Dr. Royce's experience in fisheries spans over a half-century with employment in USFWS, NMFS, former Director of FRI and Associate Director of UW's College of Fisheries, Director of the Woods Hole Laboratory of USFWS, and Assistant Regional Director in charge of research in Alaska. Bill's presentation provided a wealth of information on managing fish resources and the latest news and issues surrounding salmon aquaculture.

Meeting Announcements and New Publications

Toxic Waste Conference

The Rocky Mountain Association of Environmental Professionals (RMAEP), a regional chapter of the National Association of Environmental Professionals, has selected *Toxic Waste Management and Environmental Remediation in the 1990's* as the theme for its 1991 Annual Conference. Established in the early 1980's as a focal point for the exchange of environmental information in the intermountain area, the RMAEP continues its tradition of sponsoring multi-disciplinary educational events targeted for the practicing environmental professional.

The 1991 Conference date and location are May 29-31, 1991 at the Hyatt-Regency - Beaver Creek in Vail, Colorado. Anticipated subjects for consideration and presentation include:

- Toxics
- Right-to-Know Initiatives
- Hazardous Wastes
- Intermountain Area Environmental Concerns
- Facility Siting
- Wetlands
- Cumulative Impacts
- Audits/Risk Assessment

Further information on the Conference program can be obtained by calling Donald Van Buskirk at (505) 884-0950, Tom Napp at (303) 293-6525, or Paul Adams at (303) 277-2057. Also, additional published material will

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Meeting Announcements cont.

be available by March 1991 from the RMAEP. Written inquiries can be directed to: Conference Coordinator, RMAEP, P.O. Box 46171, Denver, CO 80201.

Biological Interactions Symposium

On June 17-20, 1991, *The International Symposium on Biological Interactions of Enhanced and Wild Salmonids* will take place at the Coast Bastion Inn in Nanaimo, British Columbia.

There will be four consecutive sessions:

Production Trends—to determine whether there are common time trends in the rate of production from enhanced stocks, changes in biological characteristics in these stocks, and interactions with wild stocks.

Genetic Concerns—to examine the genetic consequences of enhancement on production of wild and enhanced stocks.

Factors Affecting Freshwater and Marine Production—to look into factors limiting production of salmonids in freshwater and marine environments and ecological interaction of enhanced and wild fish.

Fisheries Management—to explore resource opportunities and concerns resulting from enhancement of Pacific salmon in North America.

Symposium information is available from Mrs. Ann Thompson, Department of Fisheries and Oceans, Pacific Biological Station, Nanaimo, BC V9R 5K6.

American Fisheries Society Annual Meeting

The 121st Annual Meeting of the American Fisheries Society will be held in San Antonio, TX, September 8-12, 1991. Meeting theme is *Habitat: A Place for Fish, A Place for Fishing, A Place for Fisheries*. For more information contact: Executive Director, AFS, 5410 Grosvenor Lane, Suite 110, Bethesda, MD 20814-2199. 301/897-8616; FAX: 301/897-8096.

Southeastern Annual Conference

The West Virginia Division of Natural Resources is pleased to invite you to the 45th Annual Conference of the Southeastern Association of Fish and Wildlife Agencies. The Division will host the conference at The Greenbrier, White Sulphur Springs, West Virginia, November 3-6, 1991.

The Greenbrier, America's premier resort and conference center, set in an upland Allegheny valley, is a historically significant hotel with incomparable decor, expert management, a wide variety of sporting opportunities, and social activities that include dancing and live entertainment. The excellent service and superb accommodations of The Greenbrier are unsurpassed in elegance and style.

Squid Symposium

The International North Pacific Fisheries Commission announces it will hold *Biology, Distribution and Stock Assessment of Flying Squid and Other Species Caught in the High Seas Squid Driftnet Fisheries in the North Pacific Ocean*, a symposium, in Tokyo, Japan on November 4-5, 1991.

The Symposium will be held in conjunction with the 38th annual meeting of the International North Pacific Fisheries Commission (INPFC). The INPFC is a tripartite Commission with Canada, Japan, and the United States as members. Papers will be presented by invited scientists from the international community to address the following topics:

Squid Driftnet Fisheries of the North Pacific Ocean

- ... History of fisheries
- ... Fishing methods, processing, and markets
- ... Management

Oceanography-Biology-Ecology (all species)

- ... Ocean environment
- ... Growth and mortality
- ... Stock structure, distribution and migration
- ... Species assemblages, trophic and species interactions

Catch and Fishery Impact (all species)

- ... Species catch and bycatch
- ... Fishery Impacts
- ... Yield estimation
- ... Modified or alternative fishing methods

The symposium will be held at the Ishigaki Memorial Hall, 9th Floor, Sankaido Building, 9-13 Akasaka 1, Minato-ku, Tokyo, Japan. Symposium material fee is 5,000 Yen payable at the symposium. Those who plan on attending should contact: Bernard E. Skud, Executive Director, International North Pacific Fisheries Commission, 6640 Northwest Marine Drive, Vancouver, B.C., Canada V6T 1X2, (604) 228-1128 or FAX: (604) 228-1135.

The Water Encyclopedia

The second edition of *The Water Encyclopedia*, by Fritz van der Leeden, Fred L. Troise, and David Keith Todd, has been published by Lewis Publishers. This volume has 808 pages and costs \$125.

The second edition of *The Water Encyclopedia* updates—and triples in informative value—the original tome published in 1970. While the original edition was unique in its contribution to emerging environmental awareness, the new compilation exudes volumes of figures on just what we have done to the quality of our waterways.

The encyclopedia also includes a plethora of climatic, hydrologic and water resource information. Organized into 11 chapters of fact and number-filled charts, the book is strong in its description of water environmental issues, its problems and pollutants. It delineates types of water, uses, and even minute data such as the many elements that make up municipal water supplies, the quantity and value of U.S. fisheries, and which days of the week have the most recreational boating-related accidents.

Included among the 630 tables and 112 diagrams and maps are charts comparing water qualities worldwide, acid rain, and water-borne diseases. Many of the tables break down information by state, by waterway, and by substance.

Extensive lists of water-related agencies and organizations on the federal and state levels include commissions and names of universities with water resource and groundwater research programs.

The water encyclopedia is a wonderful tool for anyone working with or on waterways. Information is well presented and easy to locate.

To order, contact Water Information Center, 125 Bethpage Road, Plainview, NY 11803.

1991 Conservation Directory

The latest edition of the most comprehensive list of conservation organizations, agencies, and officials is now available from the National Wildlife Federation. This year's 396 page directory contains the names of 12,000 individuals and 1,900 organizations in the U.S. and 111 other countries. Many natural resource professionals and volunteers find this directory absolutely indispensable to their work. Copies are available at \$18.00 per book (plus \$3.95/order for shipping) from the NWF, 1400 16th St., N.W., Washington, DC 20036.

Fishery Management Effects

California Sea Grant has published *Effects of Different Fishery Management Schemes on Bycatch, Joint Catch, and Discards*. Edited by Christopher M. Dewees (AIFRB Member 1981) and Edward Ueber (AIFRB Member 1980), this 56-page book is a product of a national workshop sponsored in 1990 by California Sea Grant College and the National Marine Fisheries Service.

Chapters in this publication cover unregulated fisheries, seasons, quotas, mesh regulations, limited entry, and individual transferable quotas. Each chapter contains an abstract, a discussion summary, and small group recommendations.

The book costs \$4 and is available from the Communications Department, California Sea Grant College, University of California, 9500 Gilman Drive, La Jolla, CA 92093-0232.

Ecological Applications—A New Journal

Ecological Applications, a new journal from The Ecological Society of America, offers an opportunity for the Society to expand its coverage of research dealing with the integration of ecological science and concepts with their application and implications.

For the past three years the Ecological Society has addressed many of these topics in the "Special Issues" section of its journal *Ecology*. With the growing need to better address research and concepts of applied ecology,

and yet maintain the essential coverage of all areas of ecology as presented in *Ecology* and *Ecological Monographs*, the leading international journals in their fields, it became necessary to extend the journals published by the Society to include *Ecological Applications*.

The manuscripts of *Ecological Applications* will develop the basic scientific principles underlying environmental decision-making, and will discuss environmental policy and management within an ecological framework. The scope is broad, including global change and biogeochemistry, conservation biology, ecotoxicology and pollution ecology, fisheries and wildlife ecology, forestry, agroecosystems, range management, soils, hydrology and groundwater, landscape ecology, and epidemiology. Manuscripts will be well-grounded in basic science, and have broad implications for environmental policy.

Subscriptions cost \$60 (\$70 foreign), and can be ordered from The Ecological Society of America, c/o Center for Environmental Studies, Arizona State University, Tempe, AZ 85287-1201.

Acid Deposition

Springer-Verlag announces the April publication of *Acidic Deposition and Aquatic Ecosystems—Regional Case Studies*. Edited by Donald F. Charles, this volume will have 730 pages and 373 illustrations; the price is \$98.

The book is the most comprehensive, integrated synthesis of regional survey data and intensive site-specific process studies prepared to date. The book discusses current and potential effects of acidic precipitation on lakes and streams in those geographic regions of the U.S. with a high number of low-alkalinity surface waters. This information is presented in a consistent fashion, permitting inter- and intraregional comparisons.

Written by leading authorities, this book examines the current status of water chemistry and characterizes the processes controlling water chemistry on a regional basis by using and comparing high-quality data sets. Methods for the assessment of long-term changes in water chemistry and their effects on fish and other biota are also presented. The book amply illustrates the substantial diversity among geographical regions with respect to the nature of surface waters and the complexity of their response to acidic deposition.

Part I covers background, Part II deals with case studies, with overviews of situations in various parts of North America, and Part III is devoted to synthesis and integration, with emphasis on water chemistry. The back of the book contains appendices, references, and glossary.

Order from Springer-Verlag New York, Inc., 175 Fifth Avenue, New York, NY 10010.

Coastal Zone Management

The 1991 edition of *Coastal Zone Information Exchange* has been issued by the Coastal Zone Information Center of NOAA to review progress on the Coastal Zone Management Act.

This 72-page report addresses legislative highlights for 1990, coastal hazards, interstate grant projects, public education through Coastweeks, the proposed Monterey Bay National Marine Sanctuary, state summaries, an evaluation schedule, upcoming conferences, and recent publications of interest to the coastal community.

This report is available from the Coastal Zone Information Center, Office of Oceanic and Coastal Resource Administration, NOAA, 1825 Connecticut Ave., N.W., Washington, DC 20235.

Dissertation and Thesis Abstracts

Population Dynamics of Young-Of-The-Year Striped Bass, *Morone saxatilis*, Populations, Based on Daily Otolith Increments

Lisa L. Kline, Ph.D. 1990

College of William and Mary in Virginia

Validation of daily increment deposition in otoliths of juvenile striped bass, *Morone saxatilis*, up to 80 days of age was provided through sequential sacrifice of known-age hatchery-reared fish in 1987 and 1989, and through tetracycline marking of otoliths of cage-cultured striped bass in 1989. Ages of fish 80-110 days old were consistently underestimated by 1-3 growth increments.

Known-age juvenile striped bass were raised in the laboratory in 1989 under controlled temperature, feeding, and photoperiod conditions. These experiments provided evidence of an endogenous circadian rhythm controlling daily increment deposition in juvenile striped bass otoliths.

Juvenile striped bass were collected in the James, Rappahannock, Mattaponi, and Pamunkey Rivers, Virginia in 1986 and 1987. A total of 542 otoliths were aged, using daily growth increments. Comparisons of back-calculated birthdate distributions between populations showed consistency between rivers within years, but not between year-classes. Average growth rates appeared to be correlated with the relative cohort size of fish surviving to the juvenile state. A comparison of mortality for 14-day cohorts showed no trends between early- and late-hatched fish, and no relationship was found between mortality and average growth rates for these cohorts.

Population growth rates for the period June-September were linear, and ranged from 0.301-0.597 mm/day and 0.027-0.124 g/day. Mortality estimates for 60 to 90-day-old striped bass ranged from 1.88-3.98% loss/day. Catch-per-unit-effort, as measured as the number of fish per seine haul, ranged from 4.0 to 29.6. Growth rates in both length and weight were positively correlated with condition factor and stomach fullness, suggesting food availability may play an important role in regulating juvenile striped bass growth. There was no apparent relationship between growth and CPUE. The relationships between growth and mortality, and mortality and CPUE, are ambiguous, and more estimates are needed to determine whether a density-dependent effect is controlling year-class strength and recruitment into the juvenile stage.

Geographic and Seasonal Distribution of the Infective Stage of *Ceratomyxa shasta* in Northern California and Comparative Salmonid Strain Susceptibility

Annelise Carleton, M.S. 1989

Humboldt State University

This study was designed to examine three aspects of the biology of the salmonid parasite, *Ceratomyxa shasta*. The geographic distribution of *C. shasta* in northern California was determined through a field survey of 23 rivers and creeks. Rainbow trout (*Oncorhynchus mykiss*) susceptible to infection by *C. shasta* were used as sentinel fish. The infective stage was found in the Klamath, Sacramento, Feather and North Mokelumne Rivers, and in Butte Creek. No evidence of the parasite was found in the 18 other rivers and creeks tested.

Seasonal occurrence of the parasite in the Klamath River was determined. *Ceratomyxa shasta* initiated infection in sentinel fish from April (water temperature 15°C) to December (water temperature 7°C). Sentinel fish exposed in the Klamath River between December 5, 1986 and April 9, 1987 did not become infected with *C. shasta*.

Various strains of coho salmon (*O. kisutch*) and chinook salmon (*O. tshawytscha*) were exposed to *C. shasta* to determine relative levels of susceptibility to infection. In the Klamath River system, Irongate fall chinook salmon and Irongate coho salmon had the lowest incidence of mortality to ceratomyxosis and are considered the best choices for stocking in this system. Feather River spring chinook salmon and Coleman fall chinook salmon were the least susceptible to infection of the Sacramento River strains and are considered the best choices for stocking in the Sacramento River and adjacent infective tributaries.

The results from this study provide information useful for disease management in northern California. The geographic distribution identified current and potential disease problem sites. Seasonal occurrence tests defined seasons of low or no infectivity for most successful stocking and indicate that greater survival of Trinity River strain salmon might be realized through earlier stocking releases. Comparative strain analysis identified salmon strains of high resistance as stocking candidates for the infective waters of the Klamath and Sacramento Rivers. No *C. shasta* infections occurred during the salmon strain comparison test. This aberration suggests that more than one strain of *C. shasta* exists. This possibility is discussed and suggestions for future research are offered.

Membership Report

NEW FELLOWS

Dr. Robert G. Werner NY
Dr. Neil H. Ringler NY

NEW ASSOCIATE

Alan J. Temple VA

EMERITUS

PROMOTION TO MEMBER

William F. Loftus	FL	Arthur L. Oakley	OR
		Kenneth L. Liscom	WA
		Dr. Paul H. Eschmeyer	CO
NEW MEMBERS		Buck Byrd	FL

Gregory R. Blair WA
Thomas P. Keegan CA

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

Direct membership inquiries to the Membership Chairman

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

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FIRST CLASS



*American Institute of Fishery
Research Biologists*
NMFS Laboratory • Beaufort, NC 28516

Open Letter to AIFRB Membership

4627 Harvard Circle
Fairbanks, Alaska 99709

April 2, 1991

I'm writing to propose an idea I've held for several years but was reluctant to express publicly until the recent comments by Past Presidents Cole and Skud (BRIEFS, Volume 19, No. 5 and 6). My proposal may seem like heresy to some but is sincere and not intended to offend.

I propose that AIFRB be dissolved and reformed as the Fisheries Research Section of the American Fisheries Society. Sections, for those who may not know, are discipline-oriented units within AFS whose members share a common interest (e.g., Fishery Management and Fish Health Sections). I'll briefly describe what I perceive as the costs and benefits of my proposal.

Dissolution of AIFRB would mean the loss of a professional fisheries organization. Thus, the organizational diversity of aquatic science in North America would decrease. A tradition in fisheries since 1956 would disappear. The influence of AIFRB, as an institution, on fisheries matters would also be lost. The cost to our profession and the resource would be realized by these losses in diversity, tradition, and influence. The losses would be real but difficult to measure because individual perceptions are involved.

For a variety of reasons, some AIFRB members who do not belong to AFS would not transfer membership if a reformation occurred. This would be a measurable loss that could be evaluated through an opinion poll of AIFRB members. Hopefully, the loss would be low because most AIFRB members now belong to AFS, and many who do not might see the benefits as outweighing the costs.

To me, the benefits of an AIFRB-rooted Fisheries Research Section in AFS are numerous. The FRS would be one of the largest Sections in AFS. It would cost less to belong to FRS than to AIFRB, assuming one already belongs to AFS. The FRS could use the clout of AFS to advance the cause of fisheries research, including issues such as research funding, research-management relations, research quality and ethics, and strategic research planning. Students, the future of our profession, could be a part of an FRS. Funds would go further in FRS because of the economy of scale in AFS.

Section meetings could include research issues and symposia because of the AFS format. In other words, FRS could do all the things AIFRB now does, and more.

As its name indicates, AIFRB is an organization devoted to promoting fisheries research and recognizing excellence, particularly in research, among its members. Although this is a worthy purpose, it seems too narrow in today's arena of fisheries issues. Admittedly, AIFRB activities now go beyond the scope of its original purpose (in fact, a response to concerns about narrow scope), but not much. AIFRB continues to struggle with scope and identity because of built-in constraints of purpose, membership requirements, and, therefore, size. Yet, the potential of AIFRB, in the new and less constrained form of an AFS Section, is great.

Years ago, in an attempt to get more out of my AIFRB membership, I served as the editor of BRIEFS. But over time, it was increasingly difficult for me, many of my colleagues, and all of my students to participate. My present location reduces my membership in AIFRB to the process of paying dues and keeping AIFRB on my resume. Nevertheless, I have no intention of dropping my membership in AIFRB because my dues help support some good projects. My frustration lies in what is and what could be. Whether or not you agree with my proposal, I hope you will convey your feelings to your District Director.

Sincerely,
James B. Reynolds

Research Assistance Awards

AIFRB's Research Assistance Award Program (formerly Travel Assistance Awards Program) provides travel assistance to qualified graduate students and other Associate Members so they may present a paper at a scientific meeting.

Under this program, awards have been made to nine Associate Members for the 1991 period, according to Dr. Joseph Rachlin, who administers the award selections for AIFRB. Dr. Rachlin has forwarded a check for \$250 to each selectee.

The 1991 award recipients are:

Mr. Dana C. Aultman
Mr. Russell W. Brown

Rochester, NY
East Lansing, MI

cont. on page 2

Research Assistance Awards cont.

Mr. David Bushek	Port Norris, NJ
Mr. T. Richard Busby, Jr.	Wilmington, NC
Mr. Jon S. Chen	Gainesville, FL
Mr. Paul L. Donaldson	Wrightsville Beach, NC
Mr. Joseph M. DosSantos	Ronan, MT
Mr. Tung-Shi Huang	Gainesville, FL
Ms. Lisa Pike	Wrightsville Beach, NC

Abstracts of papers presented by these winners will be published in the August issue of BRIEFS.

Sediments Still Toxic

More than half of the sediments at the bottom of the Great Lakes' harbors, bays, and shipping channels are polluted with persistent toxic substances, an environmental problem costing the region's taxpayers and industries millions of dollars each year.

Contaminated sediments have been well-publicized as a problem around the Lakes since the 1970s. To find out just how pervasive the problem is, researchers turned to the Canadian and U.S. federal dredging statistics.

The U.S. Army Corps of Engineers performs about 90% of the dredging on the Great Lakes, keeping several dozen shipping channels and harbors clear to depths ranging from 18 to 27 feet (5½ to 8 metres). Since the discovery that some sediments were contaminated, the Army Corps and the U.S. Environmental Protection Agency (USEPA) have settled on standards for disposing of dredge spoils, based on their levels of contamination.

Dredgings found not to be contaminated are dumped in open-lake waters or used for "beach nourishment" projects if they're sandy enough. Dredgings classified as "polluted" must be disposed of in either hazardous-waste landfills or confined disposal facilities (CDFs), diked settling basins built near the dredge sites.

Claire Reuter of the Army Corps' North-Central Division office said since the mid-1980s, between 55 and 58% of the material dredged by the Corps has been classified as "polluted." In 1990, of 4.3 million cubic yards (3.3 million cubic metres) of material dredged on the Lakes by the Corps, 2.55 million cubic yards (1.96 million cubic metres) was disposed of in either CDFs or landfills.

Ansar Kahn of Public Works Canada, which contracts out dredging of Canadian federal ports and shipping channels, said the department follows similar procedures. Of 280,000 cubic metres (364,000 cubic yards) of material dredged on the Lakes in fiscal year 1989, he said, more than 70% was disposed of in CDFs or landfills.

Open-lake disposal costs less than CDF or landfill disposal: \$3.37 versus \$6.60 (U.S.) per cubic yard in the U.S., and about \$14 versus \$19 per cubic metre (Can.) in Canada. Economies of scale help drive the U.S. costs lower, Kahn said.

Setting aside the material used as beach nourishment, the toxic contamination of the sediments added about \$4.1

million (U.S.) to dredging costs in the U.S. in 1990, and about \$1 million (Can.) to Public Works Canada's bills.

Those are not the only costs of the contamination, though. On the U.S. side of the Lakes, some harbors cannot be dredged at all, either because toxic concentrations are too high for safe disposal, or because a suitable disposal site has not been found. At the moment, portions of Ashtabula, Sheboygan, and Waukegan harbors, the Manistique, Menominee, and Chicago rivers, and the Indiana Harbor and Ship Canal are not being dredged.

In some cases, the lack of dredging is placing hardships on industries and shippers as sedimentation reduces the channel depths. In Waukegan Harbor, for instance, contaminated sediments have kept the Army Corps from dredging the inner harbor since 1972. Two manufacturers, a cement producer and Gold Bond Building Products, rely on the harbor to bring in raw materials.

Authorized to be dredged to 23 feet (7 metres), and most recently dredged to 18 feet (5½ metres), the inner harbor is now down to about 16 feet (5 metres). While a federal "Superfund" cleanup which began last summer will clean up toxic contamination elsewhere in Waukegan Harbor, it does not include the shipping channel.

Currently, said William Teague of Gold Bond Building Products, the firm must bring ships into the harbor only ¾ full, in order to clear the harbor bottom. Moreover, the slip shared by the two manufacturers can no longer hold two ships side-by-side, so ships must wait outside to unload, costing thousands of dollars per day.

All told, Teague said, dredging problems at Waukegan Harbor are costing his company up to \$250,000 (U.S.) each year.

From The Great Lakes Reporter, March/April 1991

Salmon and Steelhead Losses

The American Fisheries Society Endangered Species Committee has released a report documenting the decline of native salmon, steelhead, and sea-run cutthroat trout resources in California, Idaho, Oregon, and Washington. The information comes at a time when numerous populations of salmon in the Columbia River system have been petitioned for protection under the Endangered Species Act as endangered or threatened species.

Documentation is provided of a widespread decline of these migratory fishes along the length of the West Coast of the United States. From Olympic Peninsula rivers that used to support chinook salmon of 100 pounds or more, to southern California rivers that formerly supported tens of thousands of steelhead annually, the report provides a virtual encyclopedia of declining fishery resources.

A total of 214 wild stocks are at risk. Of these, 101 populations are "at high risk of extinction," 58 "at moderate risk of extinction," and 54 "of special concern." Ominously, 106 other major populations of salmon, steelhead, and sea-run trout already are extinct.

Thirty-nine of the populations at risk spawn in California, 58 along the Oregon coast, 76 in the Columbia River basin, and 41 along the Washington coast and Puget Sound.

Dams that block or delay migrations of adults and young, poor logging and livestock grazing practices that clog streams with silt, overfishing of depleted stocks, pollution from mines, and diversions of water from river channels are identified in the report as major problems. Also identified are the mass releases of hatchery-produced fish that once had been presented as a panacea for salmon and steelhead resources, and now are known to be a major causal factor in the decline of native, wild fish.

The report concludes with recommendations that include better protection of critically endangered stocks, restoration of river flows, tighter regulation of hatchery programs, and an emphasis on ecosystem restoration. As the authors note, without a new management philosophy that advances habitat restoration over artificial production, our present losses will only be the tip of the iceberg.

Better Bluegills

Researchers at Michigan State University have developed a technique for producing sterile bluegills through the induction of triploidy, with implications for both aquaculture and recreational fishing. Developed by Dr. Don Garling and M.S. student Andy Westmas, the technique involves subjecting newly fertilized eggs to a cold shock of 5 degrees Celsius shortly after fertilization. The researchers assert that the use of sterile bluegills in ponds and reservoirs would eliminate the problem of stunting due to population growth. According to Dr. Garling, the use of green sunfish-bluegill hybrids now employed to avoid stunting does not preclude the problem, but only delays population growth. In addition, the sterile fish grow faster than normal bluegills, allowing a three-pound fish to be produced in three to four years. The cold-shock technique is not without drawbacks; heavy mortality occurs among eggs subjected to the treatment.

The researchers also hope to develop a way to induce tetraploidy (four sets of chromosomes) in bluegills. Unlike triploid bluegills, which have three sets of chromosomes rather than the normal two, tetraploids can reproduce. Rainbow trout experiments have indicated that triploid young produced from crossing diploid and tetraploid parents are superior to those in which triploidy was induced. For more information, contact Dr. Don Garling, Department of Fisheries and Wildlife, Michigan State University, East Lansing, MI 48824, (517) 355-7493.

What Is The National Marine Sanctuary Program?

The National Marine Sanctuary Program (NMSP) is a unique program that seeks to protect entire marine ecosystems rather than individual components such as fishes

or marine mammals. The Program provides for the long-term, comprehensive protection of outstanding marine environments and their "conservation, recreation, ecological, aesthetic, historic, and human use values." The NMSP also allows and promotes multiple uses as long as they are compatible with resource protection. The Program carries out its goal by enhancing resource protection; supporting and promoting scientific research; and by increasing public awareness, understanding and the wise use of the marine environment. Since 1972, nine national marine sanctuaries have been established.

Chevron Conservation Awards

Chevron U.S.A. announces that the 1991 Chevron Conservation Awards have gone to 25 conservationists. The profile of American conservationists is changing. Today's environmentalists are more likely to be involved in water resource projects than their predecessors, primarily because of the nation's continuing concern over wetland losses. At the same time, an increasing number of women are playing a more significant role in the country's environmental efforts.

This environmental trend was confirmed by a recent Roper poll which found that more women (53 percent) than men are involved in environmental activities. In addition, concern about the nation's wetland losses, estimated to be 300,000 acres in 1990, and severe drought in many parts of the country have increased demand for water resource experts.

During the past several years, this trend has also been reflected in the honorees chosen by the Chevron Conservation Awards Program, the nation's oldest privately sponsored conservation recognition program. This year alone, the program will recognize eight women, the second highest total in program history, and eleven conservationists involved in major water resource projects. In all, the program will honor 25 individuals and groups for their environmental spirit in protecting and enhancing the nation's natural resources.

The Chevron honorees come from 14 states representing a variety of environmental fields including air, water, land, and wildlife resources. They have been invited to the nation's Capitol on May 15 to be recognized for their achievements at a special awards banquet.

Among those receiving awards for efforts on behalf of conservation of water resources were:

Dr. Charles R. Goldman, Davis, California, established a university research group that developed a successful strategy to protect endangered lakes, including Lake Tahoe and Lake Geneva in Switzerland.

Iylene Weiss, Venice, California, led a grassroots campaign to protect and restore Ballona Lagoon, one of the last remaining coastal wetlands in Los Angeles.

Thomas Steinke, Fairfield, Connecticut, has been a leader in protecting and restoring the coastal wetlands of Fairfield for the past 20 years. As the town's conservation director,

cont. on page 4

Chevron Conservation cont.

he developed innovative approaches to wetlands management and created a wetlands restoration model used by various coastal communities throughout the country.

Ted Joanen, Grand Chenier, Louisiana, is a research biologist who was instrumental in helping take the American alligator from an endangered species to a thriving population. Through his research, he developed strategies that helped increase the alligator population twelvefold in Louisiana.

The fishery community should be aware of opportunities for some of our people to win some of these prestigious awards, which yield \$1,000, a bronze plaque, and a trip to Washington, D.C. Information on nomination procedures can be obtained from Chevron Conservation Awards, Box 7753, San Francisco, CA 94120-7753.

Our People

Gerald R. Bouck (AIFRB Fellow 1982) was honored recently by the Bonneville Power Administration for a lifetime of achievement in environmental protection. Bouck is the first recipient of this new award, and was cited for his significant contributions to the enhancement and protection of the environment.

The Tidewater Chapter of the American Fisheries Society has elected its latest slate of officers. **John E. Cooper** (AIFRB Member 1978) is the newsletter editor, **Ron Klauda** (AIFRB Member 1980) is at-large member, and **John Merriner** (AIFRB Member 1975 and BRIEFS production editor) is president-elect.

Nick Parker (AIFRB Member 1983) is president-elect of the Southern Division of the American Fisheries Society.

Rudy Rosen (AIFRB Member 1985) is the new Director of Fisheries and Wildlife for the Texas Department of Parks and Wildlife. Rudy moves to that position from serving as Southeast Regional Director of the National Wildlife Federation.

Thomas F. Waters (AIFRB Fellow 1974) was presented with the Award of Excellence by the Minnesota Chapter of the American Fisheries Society in January 1991. The award recognizes long-term excellence in the fishery profession or outstanding performance in an activity that furthers the goals of the Minnesota Chapter. Tom is world renowned for his pioneering research in stream ecology, particularly secondary production rates and the phenomenon of invertebrate drift.

Jack Wingate (AIFRB Member 1980) is a candidate for the position of second vice-president of the American Fisheries Society. Jack is the acting assistant chief of fisheries for the Minnesota Department of Natural Resources.

William C. Melander (AIFRB Member 1976) has retired from the federal government service and has moved to Mt. Vernon, Washington.

Jack B. Pearce (AIFRB Member 1971) is serving as the Acting Director, Science and Research, Northeast Fisheries

Center in Woods Hole, Massachusetts until October 1, 1991. He holds this position while the Director is on sabbatical leave. Jack is also the new North American Editor for the *Marine Pollution Bulletin* and is soliciting manuscripts for that journal.

District News

NORTHWEST WASHINGTON **Donald A. McCaughran, Director**

The last regular meeting of the year was on March 28, when Dr. William Royce addressed the group on *Salmon Management: Wild Stocks & Cultured Stocks*.

The nomination process for new District officers for the next two years has been completed. The nominees were: Bill Royce, Director; Gregory Ruggerone, Vice-Director; and Gregory C. Bargmann, Treasurer.

The May meeting was Ken Chew's Annual Chinese Dinner, held on May 21 at the House of Hong. This traditional District event was well attended, as always, and all enjoyed this AIFRB highlight of the year.

SOUTHERN CALIFORNIA

M. James Allen, Director

The Southern California District elected new officers on 20 February 1991. The new District Director is Dr. M. James (Jim) Allen of MBC Applied Environmental Sciences, Costa Mesa, CA, and the new Secretary-Treasurer is Mr. Marty (Marty) Golden of National Marine Fisheries Service (NMFS), Southwest Regional Office, Los Angeles, CA. The out-going officers were Marty Golden (Director), Ann Brierton (Vice Director), and Steve Caddell (Secretary-Treasurer).

The first District meeting of the year took place in San Juan Capistrano on 20 February 1991 and included a business session and a presentation by Dr. Waldo Wakefield (National Research Council Postdoctoral Associate at NMFS, Southwest Fisheries Science Center, La Jolla, CA), who spoke on the *Distribution and abundance of demersal fishes of the upper continental slope off central California*. Dr. Wakefield's presentation included comparisons of data collected from camera transects with those from trawl surveys and noted areas where black hagfish (*Eptatretus deani*) reached average densities of 325,000/km².

The second District meeting was held in San Juan Capistrano on 10 April 1991 and included a business session and a presentation by Dr. Tom D. Johnson of the Port of Long Beach, Long Beach, CA, who spoke on *Fish productivity of a southern California artificial reef*. Dr. Johnson's presentation was based on a survey of Torrey Pines Artificial Reef in 1989 which compared differences in fish productivity at reef and soft-bottom habitats. Fish densities were 10 times greater and fish production was 6.5 times greater at the reef than on adjacent soft-bottom areas.

At the business session it was decided to present an award for the *Best Student Paper in Fishery Biology* at the upcoming Southern California Academy of Sciences Annual Meeting on 10-11 May 1991.

Meeting Announcements and New Publications

Stream Restoration Short Course

The Wetland Training Institute and Brightwater Environmental Consulting are sponsoring a series of short courses on *Stream Restoration*. This field-oriented 1½ day course will provide hands-on experience in classifying reaches of a local stream, diagnosing problems and proposing solutions by selecting the correct design parameters. It will emphasize applications of the Rosgen Stream Classification System to stream restoration. The classification system establishes major stream types giving the parameters for stable stream channel geometry. It allows the restoration specialist to select appropriate dimensions and channel shape by stream type giving design parameters that will provide stable channels in equilibrium with natural processes of flow regime and transport of bed and bank materials.

The course will also discuss when stream restoration is appropriate as out-of-kind mitigation for wetland losses. Many times avoidance of wetlands leaves small wetland impacts with little or no opportunity for on-site creation of wetlands. Stream restoration is often a viable approach to out-of-kind mitigation that is acceptable to regulatory agencies. How the opportunity is presented can make a significant difference. The course will make clear when not to propose stream restoration to avoid entanglement conflicts.

This course will be offered at the following times and places:

August 8-9, 1991—Augusta, ME

August 12-13—Hartford, CT

August 27-28—Albany, NY

Sept. 19-20—Seattle, WA

Sept. 23-24—Portland, OR

The cost for the course is \$375; included are tuition, course materials, and transportation to the field site. Registration information is available from Wetland Training Institute, Box 1022, Poolesville, MD 20837-0099.

Protection of the Natural Environment

The Protection and Management of our Natural Resources, Wildlife and Habitat, is a 1991 publication from Oceana Publications. Written by W. Jack Grosse, the volume has 550 pages and sells for \$75.

The protection of the natural environment has become a crucial issue in our times. This publication covers questions of overall management, control, and protection of wildlife and habitat. Additionally, as the Federal Government has recently created numerous acts which serve to control wildlife and habitat, many questions have emerged over shared and conflicting power with the states. These issues are also addressed here.

Chapters cover: History; State Ownership Doctrine; Protection of the Environment (National Environment Policy Act, The Environmental Impact Statement); Endangered Species; Natural Resources Law and Policy (including: Federal Land Policy and Management Act, Bureau of Land Management, Wilderness Act, National Park System, Ocean Dumping, Tuna Conservation, etc.); Protection of Wildlife (The Bald Eagle, Marine Mammals, Fur Seals, Whaling, more,) and International Commitments.

Order from Oceana Publications, Inc., 75 Main Street, Dobbs Ferry, NY 10522.

Montana Fish Guide

A Field Guide to Montana Fishes, has been published by the Montana Department of Fish, Wildlife and Parks. A concise, easily understood handbook for identifying Montana fishes, their habitat characteristics, and statewide distributions. Paperback, 103 pages, including 8 pages of color paintings. Available for \$11.45 (\$9.95 plus \$1.50 shipping) from the Montana Dept. of Fish, Wildlife and Parks, 1420 East Sixth Avenue, Helena, MT 59620.

Aquatic Bioenvironmental Studies

C. Dale Becker (AIFRB Fellow 1985) has written a book, *Aquatic Bioenvironmental Studies: The Hanford Experience: 1944-1984*. This 324-page volume, published by Elsevier Press, sells for \$114.25 U.S. and \$200 Dfl.

From 1944-1971, the Hanford Reach of the Columbia River in Washington State received quantities of radioisotopes, heat, and chemicals from up to 8 plutonium reactors. Subsequently, from 1971-1984 the same part of the river provided cooling water for 3 power-production facilities. Environmental concerns promoted a series of continuing studies to examine various potential adverse effects. No significant impairment of the rivers ecosystem was detected.

This book reviews these studies and places them in a historical framework. It provides a unique overview of studies made over a 40-year period which are now scattered through various published and unpublished documents. It should be of interest to all those concerned with aquatic ecology and environmental concerns.

Chapters include an Introduction; Historical Influences on Hanford Operations; Operation Areas and Land Use at Hanford; Operation of the Single-Purpose Reactors, 1943 to 1971; University of Washington Studies, 1943 to 1960; Setting for Bioenvironmental Studies in the Hanford Reach, 1945 to 1971; Reactor Effluent Monitoring, 1945 to 1971; Field Studies with Radioactivity in Hanford Reach, 1945 to 1971; Laboratory Studies with

Radioactivity and Aquatic Organisms, 1945 to 1971; Thermal Effects Studies in the Hanford Reach, 1960 to 1971; Generic Studies at Hanford after Closure of the Single-Purpose Reactors, 1971 to 1981; and Facility-Specific Studies in Hanford Reach after Closure of Single-Purpose Reactors, 1971 to 1984.

Order from Elsevier Science Publishing Co., Box 882, Madison Square Station, New York, NY 10159.

Fish Kill Field Manual

The Fish and Wildlife Service has published *Field Manual for the Investigation of Fish Kills* as Resource Publication 177. Edited by Fred P. Meyer (AIFRB Fellow 1973) and Lee A. Barklay, this 120-page book treats fish kills, contaminants, toxic substances, fish diseases, natural fish kills, and environmental stressors.

Federal and State agencies have expressed the need for a compendium of known and accepted methods and techniques that should be followed by anyone investigating a fish kill. This manual attempts to fill that need by addressing the many facets involved in fish kill investigation and providing instruction, guidance, examples, and sample forms. The manual will prove to be useful for interpreting evidence at the site of a fish kill, gathering needed evidence and data, making the final decision of the cause and needed remedial and corrective actions, and preparing for appearance as a court witness.

Chapters cover planning, interpreting the scene, toxic substances, fish kills due to natural causes, the role of infectious agents in fish kills, quality assurance and rules of evidence, where to send samples for analysis, how to ship samples, writing the report, preparing for testimony, equipment needed for field assessment, and testing your skill. The book also has a section on suggested reading, several appendices, nine tables, eight figures, and an abundance of high-quality color plates.

This excellent publication may be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. The price is not noted in the book.

Liming Acidic Surface Waters

This book, written by Harvey Olem, will be useful as both a guide and reference book to anyone interested in liming as a tool to mitigate acidic waters. It addresses key mitigation strategies and the effects of liming on water chemistry and biota. Criteria for selecting candidate surface waters for treatment are provided, as well as target water quality and examples of aquatic liming practices in the United States and other countries. Appendices supply useful information on limestone dose calculations and prediction of reacidification rates. Based on the review of the international literature, eight major conclusions are given on the effects of liming and additional research needs are identified.

Liming Acidic Surface Waters (Catalog No. L243LAGX) is available in hardcover for \$69.95 (within the U.S.) and \$84.00 (outside the U.S.) from Lewis Publishers, Inc., 2000 Corporate Boulevard, N.W., Boca Raton, Florida 33431, (800) 272-7737. When ordering be sure to include catalog number.

New Journal—Fish & Shellfish Immunology

Academic Press is offering a new journal to publish rapidly high-quality, peer-referred contributions in the expanding fields of fish and shellfish immunology. It presents studies on the basic mechanisms of both the specific and non-specific defense mechanisms, the cells, tissues, and humoral factors involved, their dependence on environmental and intrinsic factors, response to pathogens, response to vaccination, and applied studies on the development of specific vaccines for use in the aquaculture industry. However, it does not include disease studies or fish/shellfish pathology, except where it has an underlying immunological basis.

Regular features of the journal are review articles, written by the leading authorities on particular aspects of fish/shellfish immunology, and a brief communications section reporting applications and adaptations of new techniques, or preliminary results.

The first issue is dated January 1991, and the editors are A.E. Ellis and M.F. Tatner of Scotland. The subscription rate for this quarterly is \$134, and orders are received at the Journals Promotion Department, Academic Press, 1250 Sixth Avenue, San Diego, CA 92101.

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Meeting Announcements cont.

New CRC Books

CRC Press, Inc. announces the publication of the following fishery-related books:

CRC Handbook of Nutrient Requirements of Finfish by Robert P. Wilson is a 228-page book with 103 tables. It is due in September 1991 and will cost \$129.95.

This handbook will provide a summary of qualitative and quantitative nutrient requirements for almost all cultured finfish for which a significant amount of nutritional information now exists. Information is presented by species and includes how each species is cultured, an index of production, regional locations where each species is being cultured, examples of purified or test diets and special conditions required for laboratory studies, nutrient requirements, and practical diet formulation. Discussions of special diets and feeding practices are included for certain species.

Contents include chapters on arctic char, Asian seabass, Atlantic salmon, ayu, Brazilian finfish, channel catfish, common carp, eels, flatfishes, gilthead seabream, grass carp, milkfish, Pacific salmon, puffer, rainbow trout, red drum, sturgeons, temperate basses and black basses, tilapias, and yellowtail.

Metal Poisoning in Fish by Elsa M. Sorensen is a 383-page volume with 45 illustrations. It was due in May 1991 and costs \$89.95.

This book provides a comprehensive look at many aspects of metal poisoning of euryhaline and stenohaline fish. Metals and metalloids are considered individually and collectively and include arsenic, lead, selenium, copper, cadmium, mercury, and zinc. This informative, readable volume is designed to help regulatory personnel, enforcement personnel, and scientists understand the impact of these elements on fish. Topics covered include mechanisms of action, toxicity, biological effects, accumulation, tissue distribution, concentration factors, maximum acceptable toxicant concentrations, application factors, biological half-lives, uptake kinetics, depuration kinetics, elemental speciation, and detoxification mechanisms. The book emphasizes the use of data gathered from a variety of sources to pinpoint specific elemental agents as causal factors in the morbidity and mortality of fish.

These books are available from CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, Florida 33431.

Dissertation and Thesis Abstracts

Juvenile Penaeid Shrimp Ecology in a Louisiana Coastal Management Area

Everett Eric Knudsen, Ph.D. 1990

Louisiana State University

Juvenile penaeid shrimp were studied by a variety of methods in a southwest Louisiana brackish marsh. Most of the work was conducted in two study ponds, one with a fixed-crest weir and the other without. In mark and recapture studies, both brown shrimp *Penaeus aztecus* and white shrimp *P. setiferus* were found to grow faster in marsh behind a fixed-crest weir. There was no apparent weir effect on mortality of either species. Brown shrimp emigrated an average of 12 d later from the marsh behind the weir; white shrimp were sometimes delayed by the weir. The peak of brown shrimp emigration from both weired and unweired marsh coincided with both new and full moons. I used four methods of estimating juvenile shrimp standing stocks and found that shrimp were usually less abundant in the weired than the unweired pond. The reduction in observed emigration of shrimp from a weired area was likely caused by restricted immigration past the weir. I used density estimates from the unweired study pond and a nearby marsh pond to confirm that export estimates in previous studies of the unweired pond were reasonable, although conservative, estimates of normal numbers of shrimp emigrating from similar marsh ponds. Graphic analysis, linear statistics, and superposed epoch analysis were used to study effects of environmental variables on white shrimp emigration. White shrimp emigration from the marsh was associated with decreasing temperatures, high water outflow, decreasing and/or low barometric pressure, and rainfall.

Stock Identification of Weakfish, *Cynoscion regalis*, by Discriminant Function Analysis of Morphometric Characters

Daniel R. Scoles, M.A. 1990

College of William and Mary in Virginia

The weakfish (*Cynoscion regalis*) is a migratory species of the family Sciaenidae that inhabits near-shore and estuarine waters of the western Atlantic from Florida to Nova Scotia. Weakfish are among the most economically important finfishes harvested from northwest Atlantic coastal waters, but large interannual fluctuations have been observed in both historical and recent commercial and recreational landings. To understand the causes and consequences of fluctuations in weakfish abundance, as well as effectively to manage the weakfish fishery, it is essential to obtain a better understanding of weakfish stock structure and migratory behavior.

In an effort to elucidate weakfish stock structure, discriminant function analysis was conducted on 658 adult and juvenile weakfish collected to one of two reference samples from the extreme ends of the sampled range. The objectives of this analysis were to determine if samples of weakfish differ significantly in morphometric variables using multivariate analysis of covariance, to demonstrate an effective method of classifying weakfish using discriminant function analysis, and to utilize this approach to develop a hypothesis of movements of weakfish and possible stock composition. The results suggested: 1) At least two morphological types of weakfish occur, based on significant differences found between reference samples; 2) The two weakfish sampled from Long Island Sound and Delaware Bay in spring; 3) Medium weakfish sampled from Delaware Bay and Chesapeake Bay in spring are not similar in morphology, in contrast to the results presented in a previous study of weakfish morphometrics; 4) Medium weakfish sampled from Delaware Bay and Chesapeake Bay in fall classify mostly with the northern reference morphological type; 5) Juvenile weakfish of the northern part of the range apparently undergo extensive southern migrations.

This study demonstrated that significant morphological variation occurred among samples of weakfish which were subsequently classified to two reference samples using discriminant function analysis. The results suggested that at the time of sampling a cline of morphometric characters or substantial mixing among the morphological types occurred intermediate in the range for weakfish. Recent genetic analyses of weakfish indicated that Atlantic coast weakfish share a common gene pool, suggesting that morphometric differences which were found may be a result of phenotypic plasticity. Whether or not the observed morphological character variation is genetically or ecophenotypically based, these differences provide fisheries managers with a means to investigate weakfish stock composition and migratory habits.

Membership Report

PROMOTION TO FELLOW

Thomas R. Lambert	CA
Dr. Robert N. Lea	CA
Dr. James M. Hayes	NY
Dr. Eric D. Prince	FL

NEW ASSOCIATES

Paul L. Donaldson	NC
Otto C. Rutten	NC
Lisa A. Pike	NC
T. Richard Busby, Jr.	NC
Michael L. Burton	NC

PROMOTION TO MEMBER

Dr. Mark I. Farber	FL
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EMERITUS

James W. Wood	WA
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NEW MEMBERS

Dr. Joan G. Trial	ME
Dr. Sharon H. Kramer	CA
Dr. Joseph N. Stoeckel	VA
James R. Bybee	CA

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

Direct membership inquiries to the Membership Chairman.

In Memoriam

Carl R. Sullivan

March 18, 1991

Carl R. Sullivan passed away on March 18 at his home in Charles Town, West Virginia. Carl fought valiantly against cancer for two years, and was an inspiration to all as he continued his work with courage and determination.

Carl Sullivan was not a member of AIFRB, but in his capacity as Executive Director of the American Fisheries Society from 1975 to 1991 he showed friendship and cooperation toward our Institute. The large group of AIFRB members and their wives who were with Carl as he directed the American Fisheries Society People-to-People fisheries tour in Finland, Russia, and China in 1984 came to admire and love Carl and Delores as they led us through strange places and unusual experiences.

The fisheries community will miss Sullivan's leadership and personality, which left lasting impressions for those who knew him and worked with him.

Milton B. Trautman

AIFRB Emeritus 1977

January 31, 1991

The death of Milton Trautman on January 31 of this year removed from the scene one of the last, and by any reasonable estimate the greatest, of the old generation of Ohio naturalists. For a number of reasons, not all of them having to do with his scientific talents, we shall never see his like again.

The single most remarkable thing about his career—the fact is well-known but still worth repeating—is that Milt was entirely lacking in formal scientific training. He would himself have sternly rejected any suggestion that he was self-taught, for he learned too much of value during his apprentice years from teachers at Ohio State and the University of Michigan, but in fact he completed only the first two years of high school (a physical problem forced him to drop out) and received no degrees other than his honorary doctorates. This apparent handicap turned out to have been a wonderful opportunity, for he was able to become a recognized authority in both ichthyology (the study of fishes) and ornithology (with additional expertise in herpetology and botany)—something that present-day academic rules would sternly prohibit—leading to the publication of monographs in each of his two major fields that exemplify the highest standards of research and presentation.

After dropping out of high school, Milt trained in his father's plumbing business and became a Master Plumber. An operation in 1930 restored him to normal activity, and he was then able to indulge fully the love of the out-of-doors that he had always had. In 1925 he started the study of vertebrates at the Ohio State Museum under Prof. James S. Hine. From 1925 to 1934 he worked for the Ohio Department of Conservation doing survey work on fishes and birds, continuing his informal studies at Ohio State. In 1934 he moved to the University of Michigan, where he became Assistant Curator of Fishes at their Museum of Zoology and received further tutoring under Carl L. Hubbs and Josselyn Van Tyne. In 1939 he returned to Ohio, joining the research staff at the O.S.U. Stone Laboratory at Put-in-Bay at the invitation of its Director, T.H. Langlois. At this lab he met Mary Auten, herself a Ph.D. in Zoology, who became his close collaborator in scientific work. They were married in 1940. In 1955 the Trautmans returned to the main campus of Ohio State, where the remainder of their careers was spent. His official title was Curator of Vertebrate Collections at the Ohio State Museum. In 1970 he retired as Professor of Zoology, in 1972 he was made Professor Emeritus, and in 1978 he and Mary were jointly awarded the honorary degree of Doctor of Science by the Ohio State University.

One major work of Milton Trautman, produced with the invaluable collaboration of his wife Mary, was *The Fishes of Ohio*. This monumental study, called by Ernst Mayr, "the outstanding state fish fauna," covers the years 1750-1950. Each of the 160 species is represented by a detailed drawing, description, and notes on distribution and habitat.

Among his other honors, he was a Life Fellow of the American Ornithologists' Union, a Life Fellow of the Ohio Academy of Science, a Fellow of the American Academy for the Advancement of Science, a member and Fellow of Sigma Xi, and an elected member (with Mary) of the Ohio Conservation Hall of Fame. It is clear that this recognition pleased him, but it certainly did not turn his head, for up to the end he remained modest and unassuming, a patient and accessible mentor for amateur naturalists or even ordinary birdwatchers.

*American Institute of Fishery
Research Biologists*
NMFS Laboratory • Beaufort, NC 28516



FIRST CLASS



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

American Institute of Fishery Research Biologists

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VOL. 20, NO. 4

AUGUST 1991

1991 Annual Meeting

The 1991 annual meeting of the Board of Control of AIFRB will open at 8 a.m. on September 7, 1991 and adjourn at 5 p.m. on September 8. The meeting will be held at the Convention Center, across the street from the Marriott Riverwalk Hotel in San Antonio, Texas, just before the beginning of the all-day sessions of the annual meeting of the American Fisheries Society at the same location.

The AIFRB membership is encouraged to submit items for the agenda to President Jack Helle prior to the meeting, and all Associate Members, Members, Fellows, and Emeritus Members are welcome to attend the Board of Control meetings. The basic agenda is:

Board of Control Agenda

1. Call to Order
2. Adoption of Agenda
3. Introductions
4. Treasurer's Report (Rachlin)
5. Secretary's Report (Nakatani) (including minutes from 1990 meeting in Pittsburgh)
6. Report of Membership Committee (Ray)
7. Report of BRIEFS Editor (Cope)
8. Report of Production Editor (Merriner)
9. Reports from District Directors
10. Summary Comments by President (Helle)
11. Other Business
12. Status and Discussion of Awards
 - A. Travel Assistance Awards
 - B. W. F. Thompson Awards
 - C. Outstanding Achievement Award - individual
 - D. Outstanding Achievement Award - group
13. New Business
14. Nomination Committee for President
15. Arrangements for 1992 meeting
16. Adjournment

Response to Open Letter

Prompted by the *Open Letter to AIFRB Membership* that appeared in the June 1991 issue of BRIEFS, President Jack Helle has prepared a response to the proposal that AIFRB become a research section of the American Fisheries Society. Jack's response follows here:

COMMENTS FROM THE PRESIDENT AIFRB and AFS—Why Have Both?

Pete Cole's candid, "soul-searching" President's Report (BRIEFS, Vol. 19, No. 5), followed by Past President Bernie Skud's Comments on President's Report (BRIEFS, Vol. 19, No. 6), prompted Jim Reynolds' Open Letter to AIFRB Membership (BRIEFS, Vol. 20, No. 3) recommending that AIFRB be dissolved and reformed within the American Fisheries Society (AFS). As current President of AIFRB, I feel compelled to add some comments to this discussion.

I felt, after reading Pete Cole's report, that he was frustrated and pessimistic with the direction that fishery biology has taken in recent years and with the inability of universities, AIFRB, and AFS to accommodate the preparation of students and needs of fishery biologists. Pete's "airing" of the perceived overlapping goals of AIFRB and AFS was not new to the Board of Control or the AIFRB District meetings. These discussions have been going on for some time. I thought Bernie Skud's optimistic discussion of the need for both AIFRB and AFS was based on an objective historical perspective. I disagree with Jim Reynolds' recommendation that AIFRB be reformed as a section of AFS.

I share Pete Cole's concern for the direction that fishery biology has taken during the past 15 years or so. The straying from biological management to political management of fishery resources is part of the progression of gradual privatization of public resources. Demands for allocation of fishery resources and fish habitat among governments, sport and commercial interests, gear groups, aquaculture interests, water power interests, et al., have made "biological management" of these resources very complex. The identity of AIFRB and AFS has changed as our profession has evolved during the past 15 years or so, as well.

Before AFS chapters formed in the East and West Coasts, AIFRB was the only organization representing fishery biologists in these areas. AIFRB was involved in many activities, e.g., doing studies on comparison of state and federal salaries; sponsoring and publishing symposia on effects of logging on fisheries resources, fish and wildlife relationships in old-growth forests, technical writing, marine fish management; publishing "white papers" on introduced species and genetic considerations in management of hatchery and wild stocks of salmonids; sponsoring workshops on

cont. on page 2

Response to Open Letter cont.

scientific writing, statistics, public speaking; sponsoring seminars and invited speakers. AIFRB districts are still doing many of these activities; however, developing local chapters of AFS have also taken on many of these activities. Hence, the present situation.

AIFRB and AFS are complementary organizations, but the major goals and qualifications for membership are quite different. The primary roles of AIFRB are "advancing fishery biology and related sciences and recognizing achievement and competence". The primary role of AFS is "promoting the development and wise use of the fisheries". Both professional and non-professional people can be members of AFS. Only professional people can become members of AIFRB.

AIFRB was originally formed to support the "fishery research biologist" or fishery scientist. In the late 1960's, before AFS local chapters developed, AIFRB saw the need to include managers and administrators (many of which started their careers as researchers) in order to broaden the membership. Membership was still limited to professionals, however. This broadening of the membership probably put AIFRB and AFS closer together, at least as far as the professional membership is concerned. Certification of fisheries scientists by AFS narrowed the gap between the two organizations, also.

In spite of the apparent tendency of convergent evolution of the professional aspect of the two organizations, the goals of AIFRB and AFS are different. Let's go back to the original Articles of Incorporation of the American Institute of Fishery Research Biologists. Article IV - Purposes states:

"The purposes for which this Institute is incorporated are the following:

1. To advance the theory, practice and application of the science of fishery research biologists; and thereby to promote the conservation and proper utilization of fishery resources.
2. To maintain high professional standards in fishery research 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."

Purpose number 4 above states the major role of AIFRB very clearly. The primary role shall be concerned with professional development and performance and recognition of competence and achievement. That's what AIFRB does best and that's what would tend to get lost in a merger with AFS.

I have been an active member of AFS since 1959 and AIFRB since 1968. I intend to stay active in both organiza-

tions. The enormous expansion of AFS was absolutely necessary to accommodate its members. Nevertheless, I am a little concerned that AFS may have over-expanded. Additions of Sections by disciplines was a strong move to attract professionals (I joined the Genetics Section as soon as I heard about it). But, to reform AIFRB as a Section (as Jim Reynolds suggested), would dilute the efforts to foster the "professional development and performance of its members (fishery research biologists), and the recognition of their competence and achievement". The proposed Fishery Research Section would be a small part of AFS. Fishery Scientists would be relegated to minority status in their own organization.

Therefore, I recommend that we keep the status quo and that AIFRB concentrate on promoting the conservation of fishery resources and accommodating the development and recognition of fishery scientists.

(I encourage you to spread the word about what AIFRB is and does. How many fishery scientists in your organization do not belong to AIFRB? Remember, students can become Associate members and they have good chances to compete for annual travel awards.)

AIFRB Award Nominations—Now

The AIFRB general membership is invited to submit nominations for two of our prestigious awards for 1990 and 1991. Awards were not presented in 1990, so more than one award in each category may be considered. The Board of Control is acting as the nominating committee for these awards, but because some members are not represented by Districts, the general membership is being solicited for nominations. Because time is limited, nominations may be faxed. Final selection will be made by the Board of Control at the annual meeting in San Antonio on September 7 and 8. Outstanding accomplishments by individuals and groups that reflect the high standards we expect for these honors are solicited.

Nominations may be submitted by letter or Fax to:

Dr. Roy E. Nakatani, Secretary
Fisheries Research Institute, WH-10
University of Washington
Seattle, Washington 98195
Phone (206) 543-4652
Fax (206) 685-7471

Nominations may also be presented to your District Director or other members of the Board of Control prior to the San Antonio meeting.

AIFRB Outstanding Achievement Award for Individuals

This award is reserved for persons who have authored significant publications in fisheries, have rendered exceptional service to the profession, have demonstrated outstanding teaching or training of students, have been responsible for important discoveries or inventions, or have made major contributions to the advancement of Fishery Science.

Nominations for the individual award should reach Dr. Nakatani or Board of Control members not later than September 4, 1991. These nominations should include brief summaries of the noteworthy qualifications of the nominee.

AIFRB Group Award of Excellence

This award is given to an organization which has established an outstanding record for contributions to fisheries. The criteria for judging are similar to those for the award for individuals — significant publications, exceptional service, outstanding teaching or training, important discoveries or inventions, and major contributions to the advancement of Fishery Science.

Nominations for the group award should reach Dr. Nakatani or Board of Control members not later than September 4, 1991. These nominations should include summaries of the group's qualifications.

W. F. Thompson Best Student Paper Award—1989 and 1990

Two awards will be given—one for papers published in 1989 and another for 1990.

This award recognizes outstanding student research in fisheries. The criteria for nomination and selection are: the research was done while the nominee was a student; the publication of the research may be multi-authored; the papers must have been published in 1989 or 1990; the papers must pertain to fish or aquatic sciences; and only the student who did the research is eligible for the cash award.

This award is \$750 and a Certificate. Any co-authors will receive Certificates, but no cash.

The chairman of the committee to review nominations for this award is Dr. William H. Bayliff (a Fellow and previous recipient of the award). Inter-American Tropical Tuna Commission, La Jolla, California.

Nominations (including reprints of the papers), must reach Dr. Bayliff by September 30, 1991, and the award (awards) will be presented before the end of the year. Send nominations, with reprints, to:

Dr. William H. Bayliff
Inter-American Tropical Tuna Commission
Scripps Institution of Oceanography
8604 La Jolla Shores Drive
La Jolla, CA 92037

Nominations for the 1991 W. F. Thompson Award will be due April 30, 1992. Another announcement for the 1991 award will be made in a later edition of BRIEFS.

Our Vanishing Members

Treasurer Rachlin, in his continuing efforts to keep AIFRB records up to date, reports that the following people are apparently not at the addresses listed in the Institute files:

Gene Deschamps, Olympia, WA
Michel R. Griben, Pasadena, CA
Eldon P. Hughes, Sacramento, CA

Christopher M. Moore, Blacksburg, VA
A. L. McLain, Homosassa, FL
Robert F. Sewak, San Marcos, TX
Mark E. Wilkins, Seattle, WA

Thanks will go to anyone who provides AIFRB with the current address of any on this list. Notify Dr. Joseph W. Rachlin, AIFRB Treasurer, Dept. of Biol. Science, Lehman College, Bedford Park Blvd. West, Bronx, NY 10468.

People-To-People Visit

The Citizen Ambassador Program of People to People International is arranging activities for a delegation of professionals in fisheries science to visit the Pacific Coast of the Soviet Union. The delegation will discuss biological and management issues connected with the fish harvesting and aquaculture industries with counterpart professionals. Professor Ole Mathisen of the University of Alaska will lead the delegation.

The delegation will visit the Soviet Union at the personal invitation of Academician Yevgeniy Velikhov, Vice President of the USSR Academy of Sciences. The purpose of the visit is to exchange information and to solidify contacts with some of our key counterparts in the North Pacific. We will focus our exchange on subjects dealing with current practices and research in the North Pacific fisheries. The emphasis will be on biological problems, as well as the training of professional fisheries biologists. The delegation will visit fisheries institutes, universities, laboratories, research stations and fish farms, fishing ports, and processing facilities. Our meetings, which will include formal and informal discussion sessions as well as site visits, will be an excellent forum to share experiences and current work and to assess long-range plans for the use and preservation of this shared and vitally important resource.

The delegation will convene in Anchorage on October 6, and will visit Khabarovsk, Petropavlovsk and Valdivostok in the USSR. Though Petropavlovsk has been a "closed" city to visitors from the West, Academician Velikhov has arranged for us to visit important fishery research institutes there. We will return to Anchorage on October 20, 1991. A full professional program is being planned in each city. There also will be a program of cultural and sight-seeing activities, which will be expanded for spouses and guests.

The professional and travel arrangements will be administered by the Citizen Ambassador Program. The estimated cost per delegate or guest is U.S. \$4925 (departing from and returning to Anchorage). This includes all professional meetings, transportation, accommodations, most meals, and substantially all other costs.

Those interested in joining the delegation should contact John H. Luppert, Director, Science and Technology Projects, People-To-People Citizen Ambassador Program, Dwight D. Eisenhower Building, Spokane, WA 99202. Phone (509) 534-0430.

Wetlands Manual Revision

It doesn't turn up on any lists of recommended light summer reading, but the Federal Manual for Identifying and Delineating Jurisdictional Wetlands is getting a lot of attention these days — and will soon get even more.

The Federal Manual, as it's commonly called, was adopted in 1989 as a uniform standard to be used by EPA, the Army Corps of Engineers, the Fish and Wildlife Service, and USDA's Soil Conservation Service.

The four agencies started working last fall on revisions which have already stirred opposition among environmental organizations though they are only now slated for publication and public review.

"The goal of revising the Federal Manual is to improve the Manual's ability to properly identify wetlands and to minimize the potential for erroneous wetlands determinations," EPA Administrator William K. Reilly told a Senate subcommittee July 10.

"The changes we are developing are intended to tighten the evidence requirements for the three essential parameters in the definition of wetlands," Reilly testified. "... Of paramount importance to us, however, is to maintain and improve the scientific validity of our delineation methods."

"There has unfortunately been a great deal of unnecessary confusion and misperception on all sides..." Reilly said. "What we need to do is to clear the air, find common ground, and work together to build a more effective and more fully understood program that will allow us to advance the President's goal of no overall net loss of wetlands."

Because of the "significant public interest" in the Federal Manual and any revisions, Reilly said proposed changes will be published in the Federal Register for public comment. EPA will accept comments for a 60-day period after publication.

The three parameters Reilly referred to are wetland hydrology, hydrophytic vegetation, and hydric soils. Proposed revisions are expected to clarify that — except in special circumstances — all three conditions must be met in identifying a wetland.

"For regulatory purposes," said Reilly, "there is a need to place a sharp, narrow line on the ground to delineate wetland areas, though nature follows broader, less distinct changes between upland and wetland areas."

"Moreover," Reilly said, "there are ecologically important wetlands that may not be readily apparent year round due to seasonal dry periods or droughts."

Farmers, land owners, environmentalists, hunters, commercial and sports fishermen, and many others have a stake in the delineation issue.

EPA and the Corps of Engineers establish wetland boundaries in carrying out regulatory provisions of the Clean Water Act. The Soil Conservation Service identifies wetlands on agricultural land to ensure compliance with Swampbuster provisions of the Food Security Act. The Fish and Wildlife Service is responsible for mapping wetlands and has an advisory role in regulatory programs.

The need for uniformity among this mix of agencies and programs is broadly accepted; it's the delineation criteria

and their application that are at issue. Land owners complain that the wetland tag is used excessively under the current rules; environmental groups fear the amount of land protected will shrink sharply if the rules are changed.

Reilly told the Senate panel there has been "confusion and concern" in the agricultural community about the wetlands provisions under section 404 of the Clean Water Act.

"I wish to emphasize that the great majority of agricultural activities are exempt from regulation," said Reilly.

"Some critics of the 404 program have indicated that it has been cumbersome and frustrating for the regulated community, without necessarily being environmentally effective in protecting wetlands," Reilly added. "I would like to stress that the rate of wetland loss has declined since the advent of the 404 program in 1972."

Wetland losses in the lower 48 states averaged an estimated 450,000 acres a year from the 1950s to the 1970s, he said. The rate of loss declined to 290,000 acres a year after the mid 1970s, he noted.

John W. Meagher, director of the Wetlands Division in EPA's Office of Wetlands, Oceans and Watersheds, points out that a blue ribbon scientific panel will be named to field test proposed revisions before any changes are adopted.

From Coastline, June/July 1991

Ocean Pollution Data and Information Network

During FY 1991 the Federal government will spend a projected \$150 million dollars on ocean pollution research, monitoring, assessment, and related activities. Ensuring that the wealth of data and information resulting from this investment is readily available to those who need it is the job of the Ocean Pollution Data and Information Network (OPDIN), a cooperative effort of 11 participating Federal agencies and departments.

OPDIN is now 10 years old, having been organized in 1981 in response to the Section 8 mandate of the National Ocean Pollution Planning Act of 1978 (Public Law 95-273). OPDIN is managed by a Central Coordination and Referral Office (CCRO) within NOAA's National Oceanographic Data Center.

OPDIN has two major goals: to improve the accessibility and usefulness of Federal ocean and Great Lakes pollution data and information to both Federal and non-Federal users; and to strengthen inter-agency communication and coordination regarding ocean and Great Lakes pollution data and information, as well as state, regional, and private sector awareness of these resources.

OPDIN's coordinating function has become increasingly important in recent years because of the continued growth in the volume of marine and Great Lakes pollution data and information produced by the Federal government. It is critical for this valuable body of knowledge to be readily accessible to scientists, managers, policy makers, and other interested parties to support their research, assessment, planning and decisionmaking activities, and to avoid duplication of effort.

The CCRO maintains a number of PC-based information systems and data bases. These include directories and inventories of federally conducted or sponsored pollution programs, projects, scientists, managers, and literature, as well as other automated data and information resources. OPDIN staff members conduct specialized searches of these resources in response to customer requests. Much of this material has been published, and the CCRO furnishes copies of these publications on request.

During the past year, OPDIN staff have focussed on updating and developing component data and information bases that will be incorporated into a new fully automated customer servicing system. The new system will be used to provide our network members and customers with products tailored to meet their specific needs. As the new system develops, and OPDIN acquires the staff, hardware, and software to support it, OPDIN will be capable of more timely response to larger numbers of complex requests.

Inquiries may be made of:

OPDIN/CCRO
National Oceanographic Data Center
1825 Connecticut Ave., NW
Washington, DC 20235

A Fish-Friendly Dam

The United States Bureau of Reclamation dedicated the Buckhorn Dam and Reservoir on May 16, 1991. The dam and reservoir, part of the Trinity River Basin Fish and Wildlife Management Program, are located 12 miles southeast of Weaverville, California. The dam will trap sand and sediment from Grass Valley Creek which had severely degraded salmon and steelhead spawning habitat in the Trinity River. The reservoir will also be operated as a fishery enhancement facility for Grass Valley Creek. The project is one element of the ten-year Trinity Restoration Program which is legislated to continue through 1995, with over \$57 million allocated to restoring the Trinity River fisheries. For more information, contact Darlene Harrod, Bureau of Reclamation, Mid-Pacific Region, 2800 Cottage Way, Sacramento, California, 95825; or call (916) 978-4919.

Our People

Marco Bianchini (AIFRB Fellow 1990) of Rome, Italy has been elected to the Board of Directors of the European Aquaculture Society and to the position of Secretary of the Society.

In July, **Dan Odenweller** (AIFRB Member 1977) transferred from the Fish Facilities Program of the California Department of Fish and Game. After 17 years on the Fish Facilities Program Dan reported to Inland Fisheries, where he now works on the water diversion/fishway (fish screen) component of the Central Valley Anadromous Fisheries Enhancement Program.

Meetings and New Publications

Conference—San Francisco Bay and Delta

The Aquatic Habitat Institute and the San Mateo County Office of Education will present *Teaching About the San Francisco Bay and Delta* on November 9, 1991, with optional field trips on November 10 and 11. The California Academy of Sciences will host the conference in San Francisco. The conference will feature symposia, workshops, and naturalist-led excursions out to the Bay. Goals are to provide educators with tools to teach effectively about the estuary and to spark a greater interest in teaching about the Bay and Delta.

Conference highlights for November are *Environmental Issues Facing the San Francisco Bay and Delta*; *Dancing on the Brink of the World: The Bay Area Prior to the Arrival of Europeans*; *What About Mud? Dredging in San Francisco Bay*; *Wetlands Activities for the Classroom*; *Hands-On Activities: Teaching About the Bay*; and additional lectures on *Restoration Ecology in Action*; *Kids in Creeks*; *The California Endangered Species Program*; *Action-Oriented Education for the 90's*; and *Using Computers to Teach Ecology*. Field trip highlights are *Kayak the Bay*; *Learn Science by Doing Science*; *Rocky Shore, Docks, and Piers*; and *Mudflats and Salt Marshes*. For more information, call Kathy Kramer at (415) 231-9539.

Canadian Fisheries Research Conference

The *Canadian Conference for Fisheries Research* has issued a call for papers. The conference will be held at Dalhousie University, Halifax, Nova Scotia, 3-4 January 1992.

Authors are asked to adhere to the following major themes: "Large Scale Environmental Effects on Fish Survival and Abundance"; "Role of the Early Life History Stage in Population Dynamics"; and "Migration, Mixing, and Dispersal in Fish and Invertebrate Stocks." A typed abstract (maximum 200 words, single-spaced) stating the nature of the presentation (oral/poster) should be submitted by 30 August 1991, to Dr. Steve Campana, Bedford Institute of Oceanography, Biological Sciences Branch, Department of Fisheries and Oceans, P.O. Box 1006, Dartmouth, NS B2Y 4A2, 902/426-3233.

World Fisheries Congress

The World Fisheries Congress, originally scheduled for April 1991 in Athens, Greece and postponed because of unrest in the Persian Gulf, has been rescheduled for May 4-9, 1992. Announcements and notices will be distributed soon to notify sponsors and participants. The program has been strengthened by the year's delay and the Congress should be an even better educational opportunity than before.

International Genetics Symposium

The University of Alaska Sea Grant College Program is seeking expressions of interest from people wishing to participate in a 3-day symposium entitled *International Symposium on Genetics of North Pacific Fish and Shellfish* to be held in Alaska in May 1993. Potential topics include the genetics of marine populations, genetics of salmonid populations, quantitative genetics of fish and shellfish, and ploidy manipulation and cytogenetics of fish and shellfish. Genetic concerns of other regions that parallel those of the North Pacific may also be appropriate.

For further information, or to express your interest, please contact:

Brenda Baxter, Symposium Coordinator
University of Alaska Sea Grant College Program
138 Irving II, Fairbanks, Alaska 99775-5040
Tel. (907) 474-7086; Fax (907) 474-6285

Other Meetings

18th Annual Aquatic Toxicity Workshop at Government Conference Center, Ottawa, Ontario, September 20-October 3, 1991. Contact Dr. Margaret Taylor, Water Quality Branch, Environment Canada, Ottawa, ON, K1A 0H3, 819/953-1553.

Annual Meeting, Southern Division of the American Fisheries Society at Greenbriar Hotel, White Sulphur Springs, West Virginia, November 3-6, 1991. Contact Bert Pierce, West Virginia Department of Natural Resources, Box 697, Sutton, WV 26601, 304/364-5659.

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Meeting Announcements cont.

Annual Meeting, North Central Division of the American Fisheries Society at Marriott Hotel, Des Moines, Iowa, November 30-December 4, 1991. Contact Al Farris, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319, 515/281-5145.

53rd Midwest Fish and Wildlife Conference at Marriott Hotel, Des Moines, Iowa, November 30-December 4, 1991. Contact Al Farris, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319, 515/281-5145.

Environmental Quality Report

Environmental Quality: 21st Annual Report of the Council on Environmental Quality documents the environmental conservation policy achievements of the Bush Administration and the 101st Congress. It lays out the strategic principles that continue to define the Administration's environmental agenda. The book includes in-depth reports on cross-cutting issues such as economics in the environment, technology to prevent pollution, the link between ecosystem management and conservation of biodiversity, and better integration of the National Environmental Policy Act into federal decisionmaking.

Another section of the report presents 141 tables and figures with text that describe the state of the environment in the following categories: air, water, land, population, the economy, energy, agriculture, forestry, protected lands, cultural and living resources, waste, and environmental hazards.

This annual report can be used as a reference by policy makers, journalists, foreign leaders, businesses, non-profit groups, and educators. For more information, call (202) 395-5750.

Artificial Reef Construction Guide

A Guide to the Construction of Freshwater Artificial Reefs, published by the Sport Fishing Institute's Artificial Reef Development Center and the Bass Anglers Sportsman Society, has been reprinted and is now available.

The handbook presents proven methods and materials for building freshwater artificial reefs. It specifically outlines the types of materials needed for reef construction, the costs associated with the use of these materials, and the methods used to construct reef habitat. The handbook is intended for use by fishery resource managers, local angling and conservation groups, and civic associations who are interested in undertaking properly designed and constructed freshwater reef projects. It is hoped that the handbook will enable local sport fishing groups, in cooperation with government agencies, to enhance their own sport fishing opportunities.

Write Sport Fishing Institute, 1010 Massachusetts Ave., N.W., Washington, DC 20001.

Ohio River Fishes

The Tennessee Valley Authority in 1990 published *Reproductive Biology and Early Life History of Fishes in the Ohio River Drainage. Volume 1: Acipenseridae through Esocidae*, by R. Wallus, B.L. Yeager, and Y.P. Simon. This is the first of a five-volume treatise on early life histories of 11 families of mid-American fishes: sturgeons, paddlefishes, gars, bowfins, eels, herrings, mooneyes, trouts, smelts, mudminnows, and pikes. The book has family chapters with dichotomous keys organized into species accounts describing range, habitat and movement, distribution and occurrence, spawning, eggs, development, taxonomic diagnosis, ecology, and literature cited. This is an essential reference for larval fish specialists and other riverine biologists.

The volume has 273 pages and cost \$40 from the Tennessee Valley Authority in Chattanooga, Tennessee.

Estuary Fishes and Invertebrates

The Distribution and Abundance of Fishes and Invertebrates in Central Gulf of Mexico Estuaries, published by the National Oceanic and Atmospheric Administration's (NOAA) Estuarine Living Marine Resources Program, presents information on the spatial distribution, temporal distribution, and relative abundance of 43 fish and invertebrate species in nine estuaries along the Gulf Coast of Louisiana and Mississippi. This report is available for free from NOAA's Strategic Environmental Assessments Divisions. To obtain a copy of the report, contact: David M. Nelson, Marine Resources Specialist, NOAA N/OMA 31, 6001 Executive Boulevard, Room 220, Rockville, Maryland 20852, (301) 443-0453.

New Springer-Verlag Books

Springer-Verlag New York, Box 2485, Secaucus, NJ 07096-2491 announces the publication of new books in its Ecological Studies Series. Place orders at the above address.

Ecological Heterogeneity, edited by J. Kolasa and S.T.A. Pickett.

This volume examines the most salient feature of any environment, its heterogeneity, and the consequences it has for individuals, populations, and communities of plants and animals. The book takes a fresh look at the concept of heterogeneity, refines its understanding, and illustrates its relevance for a wide range of both theoretical and applied areas of ecology.

The wealth of perspectives and applications presented here makes *Ecological Heterogeneity* stimulating and informative reading for researchers and advanced students in all areas of ecology, as well as for environmental managers concerned with practical aspects of the topic.

Contents: Introduction: The Heterogeneity of Heterogeneity: A Glossary. Concept and Terminology of Homogeneity and Heterogeneity in Ecology. The Role of Heterogeneity in Scaling of Ecological Systems under Analysis. Heterogeneity as a Multi-Scale Characteristic of Landscapes. Heterogeneity and Spatial Hierarchies. Communities in Patchy Environments: A Model of Disturbance, Competition, and Heterogeneity. Stochastic Population Models. Managing and Monitoring Ecosystems in the Face of Heterogeneity. Biological Heterogeneity in Aquatic Ecosystems. Working with Heterogeneity: An Operator's Guide to Environmental Gradients. Relationship among Spatiotemporal Heterogeneity, Population Abundance, and Variability in a Desert. Ecological Consequences of Heterogeneity of Consumable Resources. Patterns of Heterogeneity during Succession: A Cyclic Model of Invasion and Exclusion. Physical Heterogeneity and the Organization of Marine Communities.

1991/332 pp./72 illus./Hardcover \$79.00

(Ecological Studies, Volume 86)

Antarctic Ecosystems, edited by K.R. Kerry and G. Hempel.

Here is a collection of research results from the world's leading experts on antarctic studies. Topics include both short- and long-term changes in ecosystems and community structures caused by natural and human factors, with an aim to understanding the ecological processes taking place in such a changing environment. Understanding the variability of ecological factors is necessary for developing realistic monitoring strategies and sound conservation practices.

Contents: Long- and Medium-Term Changes in Antarctic Environments. Seasonal Changes in Sea Ice Zones and off South Georgia. Ecological and Population Changes in Sea Birds and Mammals. Actual and Potential Fisheries. Human Impacts on Terrestrial and Marine Systems. Review. General Index. Genera and Species Index.

1990/427 pp./197 illus./Hardcover \$90.00

Comparative Ecology of Microorganisms and Macroorganisms, by John H. Andrews.

This unique textbook offers a solid conceptual foundation for interpreting the ecology of all organisms, whether large or small. Dr. Andrews draws on examples from diverse areas of ecology to illustrate that all organisms have been similarly shaped by evolution operating through differential reproductive success, thereby promoting the development of analogous traits.

Comparisons are focused at the level of the individual and cover a wide range of areas, including: genetic variation, nutritional mode, size, growth and growth form, life cycle, and species interaction with the environment.

The result is a thorough conceptual synthesis of plant, animal, and microbial ecology. This intriguing microorganismal and macroorganismal life history approach yields many novel insights into ecological and evolutionary principles. The book assumes no more than a general biology background and is written in a style which is both clear and engaging.

Contents

1. Introduction: Prospects for a Conceptual Synthesis. Differences and Similarities. A Framework for Comparison. What is an Individual? Suggested Reading (at the end of each chapter).
2. Genetic Variation. Introduction. Mechanisms. Sex and Meiotic Recombination. Somatic Variation and the Concept of the Genet.
3. Nutritional Mode. Introduction. What is a Resource? Some Fundamental Resource Categories and Their Implications. Resource Acquisition.

4. Size. Introduction. Constraints: Phylogenetic, Ontogenetic, and Allometric. Why Are There Macro-organisms? On Seeing the World as an Elephant or a Mycoplasma. Some Correlates of Size. Some Ecological Consequences of Size. Size and Life History Theory.
 5. Growth and Growth Form. Introduction. Unitary and Modular Organisms: An Overview. Fungi as Modular Organisms. Bacteria as Modular Organisms. Some Implications of Being Modular. Some Implications to Modular Organisms of Being Sessile. Form in the Natural World.
 6. The Life Cycle. Introduction. Simple Versus Complex Life Cycles. Senescence.
 7. The Environment. Introduction. The Environment and Organism are Coupled. How Organisms See Environments. How Organisms Respond to Environments. Traffic Lights and Progress Through the Life Cycle. Habitable Sites and the Evolution of Gene Flow.
 8. Conclusion: Commonalities and Differences in Life Histories. Levels of Comparison. On Being a Macro-organism or a Micro-organism. Natural Selection as the Common Denominator. Microbial Ecology and Macro-Ecology are Complementary.
- 1991/approx. 320 pp., 57 illus./Hardcover \$59.00

The Rivers of Florida, edited by R. J. Livingston.

The rivers of Florida vary widely in their geographical characteristics, ranging from subtropical to moderate climate ecosystems. With the drastic population increase in this state, many river habitats are threatened by destruction, either through housing development, excessive drainage for drinking water, or contamination. This book examines these diverse river systems and uses them as case studies for other parts of the country, covering such aspects as geography, vegetation, fisheries, response to physical modification, and ecological stability.

1990/289 pp./55 illus./Hardcover \$59.00

ICES Journal of Marine Science

The ICES Journal of Marine Science is a long established journal of high repute which has been given a new publisher and will be expanded from three to six issues per volume over the next several years.

For 65 years it has been published as the *Journal du Conseil* by the International Council for the Exploration of the Sea (ICES). Under its new name, but still under the auspices of the Council, it will continue to publish original papers within the broad field of marine and fisheries science, with particular reference to living resources and their environment. It will continue to be a primary source of high quality papers and a standard reference on fishery-orientated marine science including ecology, population studies, plankton research, and physical and chemical oceanography. Short notes and book reviews are also welcomed.

The *Journal* has traditionally drawn its contributions primarily from research work in the North Atlantic, the Council's area of competence, but relevant papers from all geographical areas and marine science disciplines are welcomed and encouraged. Many contributions from within the ICES area stem from among the documents submitted to the Council's annual Statutory Meeting; particular issues will feature sets of papers focusing on topics considered at Theme Sessions and Mini-Symposia at Statutory Meetings.

In recent years, *Journal* papers have encompassed theoretical developments in fish population studies, the design of improved transducer array geometry for acoustic surveys, studies of the diurnal rhythm in the spawning of North Sea plaice, and long-term climatic change off Australia and southern Africa.

Research areas covered are population biology and ecology of anadromous and catadromous fishes, marine mammals and invertebrates, fisheries assessment, plankton and benthos research, pollution studies, physical and chemical oceanography relevant to the dynamics and productivity of marine resources. The institutional rate is \$90 per year and the personal rate is \$49.50.

Order from Academic Press, Inc., 1250 Sixth Avenue, San Diego, CA 92101.

Fishery Laboratory Book

Fisheries Laboratories of North America is being published by the American Fisheries Society. This 1991 book of 181 pages is a collection of articles that originally appeared in *Fisheries* and have been updated, revised, and compiled into one volume. Dr. C. Dale Becker is the

editor of this helpful guidebook which sells for \$16 (\$13 to American Fisheries Society members). Order from the American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, MD 20814.

Dissertation Abstract

Evaluating Statistical Bias in Using Catch-Rate Indices from the U.S. Recreational Fishery for Estimating Abundance by the Use of a Simulation Model

Mark Ivan Farber, Ph.D. 1990

University of Miami

Catch-rate data are traditionally used to index abundance in fishery science. An objective of this research was to evaluate the bias in the assumption of linear proportionality between the catch-rate, characterized as the number of fish hooked per 100 hours trolling (HPUE), and the abundance, for the U.S. recreational billfish fishery. To investigate the relationship between HPUE and abundance a mathematical model of the general fishing process was first developed. Then the modular BLSIM (BiLLfish SIMulation) model was constructed, using the northeastern Gulf of Mexico as the study area. Starting with a fixed initial abundance, both the boat and the fish would move throughout the spatial grid as the fishing day progressed. Spatial data were defined for three possible scenarios that represented the environmental quality (EQ). Fish movement was accomplished by the MOVEFISH algorithm which used the Circular-Normal distribution with the concentration parameter serving as a proxy for the EQ gradient. Hence, fish had a statistically induced preference to continue to move in the direction of high EQ.

The stochastic model dynamics of BLSIM allowed for the determination of whether a fish and boat were in proximity, then if a fish in that proximity was raised to the bait, and then if a raised fish was hooked. Simulations were repeated at varying levels of abundance, and the functional relationship between HPUE and abundance was derived using nonlinear regression techniques. Results were found to be similar to those of the mathematical model. Relationships were significantly nonlinear and could be conservatively estimated with HPUE being proportional to the square-root of abundance. The bias in the assumption of proportionality was tabulated in terms of estimated percentage decrease in abundance for a given decrease in HPUE. Statistical power was estimated via a Monte Carlo simulation routine, ESTPOWER. This generated the probability of detecting various decreases in abundance at different relative levels of HPUE. Results indicate strong ramifications to this fishery because, for example, at acute low levels of HPUE a 20% decrease in HPUE indicates an approximate 34% decrease in abundance with a probability of being detected of 49%.

In Memoriam

Elmer J. Guthertz

AIFRB Fellow 1977

June 10, 1991

Elmer Guthertz, retired Chief of of the MARMAP Surveys, Branch of the Resource Surveys Division at the Pascagoula facility of the Mississippi Laboratories, died Monday, June 10, 1991, after a three-month valiant struggle against a brain tumor. Elmer received a B.S. degree from Idaho State College in 1957 and a M.S. degree from U.C.L.A. in 1966.

Elmer had been a fishery biologist in Pascagoula, Mississippi since 1969 until he retired this year and with the Bureau of Commercial Fisheries in Brunswick, GA before

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In Memoriam cont.

that since 1960. His research efforts were directed toward zoogeography of marine fishes, resource assessment, systematics, and species training. Recently, he had been working with NMFS Law Enforcement in training enforcement personnel in fish and crustacean species identification. He published a variety of papers including new species descriptions, larval development, fishery descriptions, assessment methodology, biomass estimates, and reef fish assessment techniques. Significant contributions are description of seven new species of flatfish (family Bothidae), larval development of *Cyclopsetta fimbriata*, a field guide to the bothids of the western North Atlantic, a section on biology of groundfish species in groundfish management plan, and development of a methodology for reef fish assessment. He also wrote the description of flounders for *ENCYCLOPEDIA BRITANICA*. Elmer was a member of the American Society of Ichthyologists and Herpetologists, the American Institute of Fisheries Research Biologists, and the American Fisheries Society.

Elmer's scientific expertise, as well as his keen sense of humor, are missed within the lab and throughout the Fisheries Service as well.

Elmer's widow, Ivajean Guthertz, resides at 4210 Emerson Street, Pascagoula, MS 39581, and her phone number is 601-769-2989. All of their six children are adults.

Membership Report

PROMOTION TO FELLOW

NEW MEMBERS

Dr. William W. Taylor	MI	Dr. Albert E. Giorgi	WA
Dr. Richard H. Stasiak	NE	Dr. Timothy J. Mulligan	CA

PROMOTION TO MEMBER

EMERITUS

Dr. Michael R. Meador	NC	John R. Gilbert	WA
		Paul E. Hamer	NJ

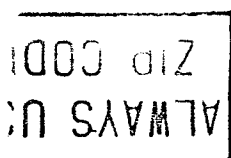
Sammy M. Ray, *Membership Chairman*
Texas A & M University of Galveston
Building 3311, Fort Crockett
Galveston, Texas 77551

Direct membership inquiries to the Membership Chairman.

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

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American Institute of Fishery Research Biologists

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VOL. 20, NO. 5

OCTOBER 1991

1991 Board of Control Meeting

President Jack Helle called to order the AIFRB Board of Control meeting for 1991 at 8:30 a.m. on September 7 at the San Antonio River Walk Hotel in San Antonio, Texas. Present during the 2-day meetings were: Jack Helle, President; Roy Nakatani, outgoing Secretary; Katherine Myers, incoming Secretary; Charles Cole and Bernard Skud, Past-presidents; Sammy Ray, Membership Chairman; Judy Wern, Assistant to the Membership Chairman; Oliver Cope, BRIEFS Editor; John Merriner, BRIEFS Production

Editor; James Allen, Director, Southern California District; Malin Babcock, Director, Southeast Alaska District; Steve Fried, incoming Director, Northern Alaska District; William Royce, Director, Northwest Washington District; William Wilson, outgoing Director, Northern Alaska District; Churchill Grimes, and Gary Sakagawa.

It was determined that a quorum was present, the agenda was approved, and the meeting went forward.

Secretary Nakatani offered the minutes of the 1990 Board of Control meeting, and the minutes were approved.



Board of Control meeting participants at the San Antonio River, September 1991. Front row: **John Merriner**, *BRIEFS Production Editor*; **Roy Nakatani**, outgoing *Secretary*; **Sammy Ray**, *Membership Chairman*. Back row: **William Royce**, *Director*, Northwest Washington District; **Oliver Cope**, *BRIEFS Editor*; **Malin Babcock**, *Director*, Southeast Alaska District; **James Allen**, *Director*, Southern California District; **Judy Wern**, *Assistant to the Membership Chairman*; **Jack Helle**, *President*; **Katherine Myers**, incoming *Secretary*; **Charles Cole**, *Past-president*; **Steve Fried**, incoming *Director*, Northern Alaska District; **William Wilson**, outgoing *Director*, Northern Alaska District.

Board of Control Meeting cont.

President's Report

Welcome to the four new District Directors—Malin Babcock, Southeastern Alaska; Stephen Fried, Northern Alaska; William Royce, Northwestern Washington; and James Allen, Southern California! And sincere appreciation for their work and dedication to the outgoing District Directors—John Karinen, Southeastern Alaska; William Wilson, Northern Alaska; Donald McCaughran, Northwestern Washington; and Marty Golden, Southern California.

Welcome to our new Secretary, Katherine Myers. Katherine lives in Seattle and is a fishery research biologist with the Fisheries Research Institute, University of Washington. She won our W. F. Thompson Award in 1985. Our outgoing Secretary, Roy Nakatani, has served during four Presidents and has done an outstanding job.

Welcome also to our new Chairman of the W. F. Thompson Award Committee—William Bayliff. Bill also was a recipient of the W. F. Thompson Award, in 1968. Bill is with the Inter-American Tropical Tuna Commission at La Jolla, California.

My first year as President was made easy by the tireless efforts of the officers of AIFRB. Oliver Cope, our BRIEFS editor, puts out a top quality publication that really reflects what AIFRB is all about. And he does in on time. Joe Rachlin, our Treasurer, not only keeps track of our money and investments (he could moonlight on Wall Street) but also heads up the AIFRB Research Assistance Award Program and is also a District Director. Sammy Ray directs the continuous operations of the Membership Committee, which runs like a fine watch. Sammy is supported by a dedicated committee and an efficient assistant, Judy Wern. John Merriner, our Production Editor, keeps the BRIEFS and mail flowing, the stationary up to date, works on the membership book, the bylaws, displays for meetings, and volunteers for many other tasks and does it with a smile. Roy Nakatani, our outgoing Secretary, summarized our meetings, sent out our notices, and provided us with his special brand of wisdom. Our District Directors and Officers provided our regional roots. Our members provided our support.

Three items on which I had hoped to make progress this year were: 1) find someone to take on the job of writing a history of AIFRB; 2) explore the feasibility of acquiring an executive secretary; and 3) create some dialogue about the possibility of initiating an AIFRB publication.

A history of AIFRB would include: the funding, sponsorship of meetings and publications, awards, officers, et al. This paper could be the introduction to our 40th anniversary (1996) celebration. At this Board of Control meeting in San Antonio, Bill Royce volunteers to take on the task but he will need lots of help from the Districts, especially to reconstruct the history. This could be one of the first orders of business this fall for the Districts to undertake.

AIFRB could run more efficiently if we had an executive secretary. Then, when the President is ill or out of the country, continuity of programs would be carried out. My idea was that perhaps a recent retiree could take on the job with a modest travel budget. The Board of Control is generally enthused about the idea but the duties need to be specified before any decisions are made.

The idea of AIFRB sponsoring a publication was discussed some at last year's Board of Control meeting. Joe Rachlin and John Merriner talked about the need for a publication that would publish good peer-reviewed papers on regional research. It seems that most of the regional journals have folded or gone global. This publication could also publish polemics preceded by a disclaimer that AIFRB was providing the forum but did not endorse either side. The publication could also be an instrument for "white-papers". It could be an occasional papers type of journal with no regular publication schedule (the kind that drives librarians nuts because they don't know how to file them). This idea has pros and cons and needs more discussion.

There are lots of issues out there in which AIFRB could be involved on both regional and national levels. Our Articles of Incorporation and Bylaws give us a broad mandate. We can make the organization do what needs to be done 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." I'm looking forward to a productive year of AIFRB.

Treasurer's Report

Treasurer Joseph Rachlin's report on fiscal matters was reviewed by those present; the report appears as a separate item in this BRIEFS issue.

AIFRB's checkbooks were audited by the officers and members at the meeting and declared to be accurate and proper; their approval was voted. Joseph Rachlin was sustained as AIFRB Treasurer for the coming year and authorized to sign checks and transact business for AIFRB.

Those present discussed a list of 29 members who are 3 years delinquent in their AIFRB dues. It was determined that many of these members have been contacted and have agreed to pay their back dues.

Report on Publications

BRIEFS Editor Cope reported as follows:

This report on publication of BRIEFS for the past year involves the contents of six issues—the last two of Volume 19 and the first four of Volume 20. Each issue contained eight pages, and the October 1990 number had one group photograph.

No innovations appeared in content or format this year—emphasis continued to focus on AIFRB-related items and fishery, ecology, and aquatic science research matters, with low priority on articles and announcements of a management nature.

As Editor, I have tried to depend upon contributions from the membership to produce a publication of the greatest interest and utility to AIFRB people, but this year I did not receive a wealth of submissions. A few individuals were generous with their offerings—John Merriner sent 34, Joe Rachlin sent 7, and Sammy Ray sent 6. The Northwest Washington District sent six reports, Southern California offered two, and Northern Alaska, Northern California, and Carolina transmitted one each. Nothing was received from any other District.

Thesis and dissertation abstracts were published from the University of Washington, the University of Miami, Humboldt State University, Louisiana State University, and the College of William and Mary in Virginia.

On an area basis, the Mid-Atlantic, including the Washington, D.C. area, sent 85 items, New England sent 40, the West sent 29, the Mid-West sent 25, the South sent 21, Canada sent 1, and other areas sent 2. Of the 285 items received from all sources, 102 were used, for a 35.8% utilization.

Production Editor Merriner described his operations in getting BRIEFS to the membership, told of problems and progress in the preparation and printing of a new AIFRB membership directory, and displayed a new exhibit to be used at fishery meetings, including this year's American Fisheries Society annual meeting. During John's report there was discussion of the need for a revised AIFRB brochure; it was decided that members should give John ideas for a new brochure so he can prepare the latest version.

Membership Report

Sammy Ray gave a detailed report on the work and accomplishments of his Membership Committee. He revealed that 23 new applications were processed since the last Board of Control meeting. Of these, 22 were approved for membership and 1 is pending before the Board of Control. The ranks assigned to those approved were: Associates-10; Members-9; Fellow-3. The new people were recruited by the following means: 12 nominated by the membership; 8 sent curricula vitae with initial correspondence; 3 sent applications with initial correspondence.

The following areas of employment were represented in the new membership; 13% U.S. government; 13% state government; 17% private sector; 22% university-employed; and 35% graduate students. Geographic areas represented among the new members were: Northwest Washington District-5; Southern California District-1; Metropolitan Washington, DC District-4; New York-New Jersey District-3; Carolina District-5; At-large (Southwestern States and Northeastern States)-2.

The Committee approved 13 promotions during the year.

The membership Committee consisted of Bruce Wing, Barbara Warkentine, Joan Browder, Kendall Warner, and Sammy Ray.

Awards

AIFRB Research Assistance Awards were made to nine Associate Members, as reported in the June 1991 issue of BRIEFS. There is a strong feeling within the Board of Control that these \$250 awards are providing a healthy stimulus for participation in AIFRB affairs on the part of our younger members.

The Board selected Robert L. Burgner as the recipient of the AIFRB Outstanding Achievement Award for 1991.

No selection was made for the AIFRB Group Award of Excellence for 1991.

Awards for the W. F. Thompson Award Best Student Papers for 1989 and 1990 will be announced in November 1991, and nominations for the 1991 award will be due April 30, 1992.

District Reports

Northern Alaska District

Outgoing District Director William Wilson presented the following report:

Compared with the past, 1990-1991 has been a relatively quiet year in the Northern Alaska District. We continued with

an informal newsletter to our membership which was distributed as the need required. Our members were asked to nominate Associates who might apply for the AIFRB Research Assistance Award Program. Other news and information was disseminated as necessary.

We hosted a seminar on Genetic Stock Identification of Arctic Fishes, which focused on mitochondrial and nuclear DNA stock assessment work on Alaskan whitefishes and salmon; the seminar was given by Dr. John Bickham with LGL Ecological Genetics.

Of particular interest to the District's members, and to the entire membership of AIFRB nationally, was a proposal by District member Dr. Jim Reynolds to dissolve AIFRB and incorporate the organization as a Section of the American Fisheries Society. Debate over the pros and cons of such an action has occurred in our District and will likely continue until the Board of Control tackles the recommendation at the annual meeting in San Antonio. The Northern Alaska District's membership at present has taken no poll, but would be willing to debate the issue and report our feelings if the Board requires us to do so.

Dr. Stephen Fried, Regional Research Supervisor with the Alaska Department of Fish and Game in Anchorage, will be the new Director of the Northern Alaska District after the September Board meeting. Special thanks are conveyed to Chuck Meacham and the members of the District's Nominating Committee, for their efforts this past year. Dr. Fried is responsible for all of the Department's fisheries research activities in southcentral and southwest Alaska, which includes the controversial fishing districts of Cook Inlet and Bristol Bay. I am pleased to turn over the directorship to Dr. Fried; the District is in capable hands.

I have enjoyed the challenges of organizing and leading our District these past three years. I particularly enjoyed working with the Directors from other districts nationally, and found the Board officers very professional and easy to work with.

Southeast Alaska District

The report by immediate Past-director John Karinen was delivered by the new Director, Malin Babcock:

In the 1990 annual report we indicated that we would have an election in the fall for a new Director and Director-elect. Candidates were: Drs. Brian Allee, Norman Howse, Mason D. (Buck) Bryant and Malin M. Babcock. Availability of half of the candidates changed before we could hold the election so we had to go back to the nominating committee for additional candidates. Dr. John Strand was selected, and with some modification of election procedure I am happy to report that we were able to complete an election albeit belated.

The Southeast Alaska District held an election for Director and Director-elect on August 21, 1991. Three candidates were on the ballot. Candidates receiving the highest and second highest number of votes were elected Director and Director-elect. A 53 percent ballot return and a very close election resulted in Malin Babcock being declared Director and Dr. John Strand, Director-elect. Congratulations to the winners and thanks to the candidates for running. The new officers assumed their duties on September 1, 1991. Tamra L. Faris will continue as Secretary/Treasurer.

The Southeast District again provided support for a Juneau Natural Resources Laboratory on the University of Alaska

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Board of Control Meeting cont.

Southeast campus through letters to key congressional members. As a fisheries-research-oriented organization we support the concept of increasing the research and educational base of Southeast Alaska and believe that the proposed facility on the UAS campus will benefit the cooperative efforts of all research organizations in the area. Such cooperative efforts will likely increase research output and provide positive benefits to fish and forest management in the area. Acknowledgement and thanks for our letters were received from many individuals.

Few joint activities, formally supported by AIFRB, were undertaken but several members continued to act individually on various issues—the Exxon Valdez oil spill, the Technical Advisory Group for the Alyeska Ballast Water Treatment Facility, Finfish Farming Task Force, mariculture in Alaska, logging issues, genetics problems, and disease issues relating to salmon culture. All of the issues mentioned in my 1990 report are still of significance.

The financial status remains the same. We have a small balance but if activities increase within the District we can expect the need to solicit a small dues contribution from the membership. No dues have yet been collected in 1991.

We continue to lose ground in membership. Several nominations for membership have been offered to well qualified scientists but the rate of follow-thru to join the organization is poor. There are a large number of potential young members in the Juneau area and I believe that with increased activities in the District we can attract a number of them. I am hopeful that our new leadership will generate some momentum here.

Southern California District

District Director M. James Allen gave the following report:

The Southern California District of the American Institute of Fishery Research Biologists ended 1990 with little activity but has been moderately active during 1991. The District held three meetings during the Spring of 1991, elected new officers, held two executive meetings, and sponsored a student paper award at the Southern California Academy of Sciences meeting in May 1991.

General meetings were held on February 20, April 10, and May 23, 1991, at El Adobe Restaurant in San Juan Capistrano. The dinner meetings are held from 6:30 pm to 10:00 pm and consist of a business meeting and a talk presented by a guest speaker. In general, meetings attract two groups of fisheries biologists, one from San Diego and one from the Los Angeles area. At present, many of the persons attending the meetings are not members.

New officers were elected at the February 20, 1991 meeting. The new District Director is Dr. M. James (Jim) Allen of MBC Applied Environmental Sciences, Costa Mesa, CA, and the new Secretary-Treasurer is Marty (Marty) Golden of National Marine Fisheries Service (NMFS), Southwest Regional Office, Los Angeles, CA. The outgoing officers were Marty Golden (Director), Ann Brierton (Vice Director), and Steve Caddell (Secretary-Treasurer).

The following guest speakers presented talks at the meetings:

February 20—Dr. Waldo Wakefield (National Research Council Postdoctoral Associate at NMFS, Southwest Fisheries Science Center (SWFSC), La Jolla, CA —

“Distribution and abundance of demersal fishes of the upper continental slope off central California.”

April 10—Dr. Tom D. Johnson (Port of Long Beach, Long Beach, CA) — “Fish productivity of a southern California artificial reef.”

May 23—Dr. Tom Ebert (Department of Biology, San Diego State University, San Diego, CA) — “The red sea urchin fishery in California.”

Our next meeting is tentatively scheduled for September 26, 1991, with Dr. Dale Squires (NMFS, SWFSC, La Jolla, CA) speaking on “Individual transferable quotas (ITQs) in fisheries management: panacea or Pandora’s box?”

We presented an award of \$100 for the Best Student Paper in Fishery Biology at the Southern California Academy of Sciences meetings, May 10-11, 1991, to Christina Swanson (Department of Biology, University of California, Los Angeles). Christina’s paper was entitled “Salinity adaptations in the milkfish, *Chanos chanos*: bioenergetic patterns and consequences.” Jim Allen, Marty Golden, and Pete Haaker served as judges for this and other student paper awards. We also set up a table with our new AIFRB logo banner and handed out brochures and applications, and answered questions about the organization.

Our goal for the year is to increase communication among fishery biologists in southern California. We now include a one-page District Newsletter on the back of our meeting announcements and hope to expand on this in the future. This newsletter includes items of importance to the members (project status, issues, recent published literature and dissertations in the area) and gives a schedule of upcoming conferences and AIFRB meetings. We hope to become involved in related meetings and conferences (Southern California Academy of Sciences, California Cooperative Oceanic Fisheries Investigations, etc.) and, if possible, to make our presence known by setting up a table with information. We also hope to stimulate other fisheries-related groups in the area (e.g., Southern California Ichthyologists). We also plan to submit a District Report to the Briefs on a regular basis—the last appeared in the June issue.

The Southern California District intends to conduct a one-day symposium on harvest refugia issues applicable to California in late November or January. In the past we have conducted several successful symposia, including a California Halibut Symposium (1989), Fisheries Techniques and Technology Symposium (1988), Kelp Bass Symposium (1987), Gill Net Symposium (1985). These symposia are usually cosponsored by other fisheries groups (e.g., American Fisheries Society (Cal-Neva), California Department of Fish and Game).

We also hope to develop a directory to fisheries organizations and fisheries biologists, ichthyologists, and related marine biologists for southern California. With the help of the Northern California District, we could extend this to California in general. This directory would include current workers in fisheries and related subjects and would not be restricted to AIFRB or AFS members. It would give some information on the interests of the workers and of the organizations. We think that this would be useful to most fisheries biologists. We could charge a small fee to cover printing costs and distribute it at conferences.

At present we have about 70 members and about 20 additional persons who are likely to attend some meetings

during the year. Some of these guests have applied for membership. We have about \$1,000 in our treasury at present.

Carolina District

District Director John Dean's report was presented by John Merriner:

The Carolina District has a wide geographical range and relatively low population density so it is difficult to convene a meeting in these times of limited travel budgets. In addition, time budgets are equally constrained. We have therefore necessarily become opportunistic for our limited AIFRB activities and scheduled a gathering in association with some other function that will bring some of our colleagues together. We also take advantage of that occasion to encourage our professional associates to consider AIFRB membership.

Why should they do so when memberships in their other professional societies are becoming more expensive and there are questions about the validity of AIFRB? I have asked several of our local members about maintaining AIFRB or merging with AFS. The consensus is that AIFRB is unique as an association of professional fishery scientists with an emphasis on research. It has no other agenda and stands beside AFS. We complement one another. AIFRB does not concern itself with issues such as certification and the organization and conduct of national meetings, which we encourage. We can operate as a level of conscience and, on occasion, constitute the loyal opposition for other fishery organizations. It is important to have such entities, but they must have credibility, and to have that credibility, they must be active. Our challenge at the local level is to fill that niche by maintaining a modest level of activity and providing intellectual stimulation with our meetings.

After that preface, I am pleased to announce that we will have a meeting this fall in conjunction with the public announcement of the establishment in South Carolina of the Cooperative Institutes of Fisheries Molecular Biology, which is going to be called FISHTEC. FISHTEC has been established to promote and conduct research needed to address fisheries management, habitat, and marketing issues which are tractable through the use of molecular biology.

This cooperative organization consists of university, state, and federal agencies whose individual efforts will be markedly enhanced by providing a mechanism for scientists from different agencies to jointly plan and execute projects involving fisheries (which includes fish and shellfish) research. FISHTEC will provide an avenue for the fundamental research needed to deal with critical fishery resource issues. This Institute has a policy-driven research agenda.

The following organizations have components within FISHTEC:

- University of South Carolina
 - Institute for Biological Research and Technology
 - Belle W. Baruch Institute for Marine Biology and Coastal Research
- National Marine Fisheries Service, Southeast Fisheries Center, Charleston Laboratory
- South Carolina Wildlife and Marine Resources Department
- South Carolina Sea Grant Consortium

The cooperating institutions each have a member on the Executive Board and elected Dr. Brad Brown (AIFRB

Fellow) as Chairman. The Executive Board has selected Dr. Bert Ely of the University of South Carolina as Director, and the Board will develop policy guidelines for the operation of the Institute.

The pressures of the commercial and recreational fishing industries have created an overfished and overcapitalized condition and fishery resources cannot meet the demand. In addition, habitat degradation has further stressed fishery resources and the insertion of foreign fishing interests into stock management issues has further confounded policy development.

Several major issues resist the development of policies that will permit their resolution. The development of molecular biology provides the fundamental techniques to attack these issues. FISHTEC has members with backgrounds and knowledge of the issues and skill in the implementation of appropriate techniques. They will focus their expertise to assist in resolution of the many public policy issues which hinge on sound scientific investigation. This is required to answer such questions as:

- (1) How can we differentiate morphologically non-distinguishable stocks?
- (2) How can we differentiate between wild and cultured fish stocks?
- (3) How can we differentiate stocks of highly migratory and presumably vulnerable fish species?
- (4) Are juveniles from those adult stocks being harvested?
- (5) What is the rate of recruitment of juveniles into the stock?
- (6) Are spawning adults from a stock that is overfished?
- (7) Are fishery stocks infected with disease and/or parasites?

Recent developments in molecular biology have provided new tools which can be utilized to address many previously intractable scientific issues. Numerous conventional molecular biology programs exist; however, none are focused on fishery issues. FISHTEC links several organizations to promote inter-agency cooperation, and provides them with funds to enable them to concentrate research projects on fishery problems.

As soon as the date of the announcement is fixed, we will circulate it and we will invite other AIFRB members to attend. Good public policy is based upon good research.

New York-New Jersey District

District Director Joseph Rachlin transmitted the following report:

As of August 1991 the current membership for the NY-NJ District is 37 members.

During the past year the District was pleased to welcome three new members:

- Mr. Dana C. Aultman (NY-SUNY Brockport) Associate
- Dr. Robert G. Werner (NY-SUNY Syracuse) Fellow
- Dr. Neil H. Ringler (NY-SUNY Syracuse) Fellow

Two of our district members were promoted. Congratulations are extended to Dr. James M. Hayes (NY), who was promoted to Fellow, and to Paul E. Hamer (NJ) on his promotion to emeritus status.

Two of our district Associate members were selected to receive research awards from the AIFRB's 1991 Research Assistance Award Program. Our congratulations go to

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Board of Control Meeting cont.

Mr. Dana C. Aultman of SUNY Brockport and to Mr. David Bushek of Rutgers University, NJ.

Membership material was distributed by the District Director to a number of participants at the 47th Annual Northeast Fish and Wildlife Conference held in Portland, Maine this past May, in the hopes of continuing to increase our membership.

The District Director again ran the AIFRB Associate Member Research Award Program and is pleased to announce that nine awards were granted. The names of the Awardees has been published in BRIEFS, and the abstracts of their papers will be published in an upcoming issue of BRIEFS.

I will be pleased, assuming approval by the Board of Control, to continue this activity for the next fiscal year.

Texas District

District Director Sammy Ray told of the limited activity of the Texas District during the year. There is need for meetings and a symposium to revive the District; he hopes to hold meetings during the coming year and to organize a symposium dealing with bycatch problems.

New Business

The Board approved the idea of creating a logo for AIFRB, and John Merriner was appointed to draw up a set of specifications for a competition among members who submit designs for a suitable symbol. The rules will designate the amount of prize money for the winner, the identity of the judges, dates of submission and judging; etc.

The committee appointed in 1990 to consider changes in AIFRB by-laws recommended the following changes: (1) Qualifications to become a Member would consist of 5 years experience with a Bachelor's degree, 4 years experience with a Master's degree, or 2 years experience with a Doctor's degree; (2) AIFRB would have two classes of Associate membership. Associate (Student) would be an undergraduate in a fishery curriculum, and Associate (Professional) would be one who has received a Bachelor's degree. The Board carried the motion to put these changes into effect.

The Board of Control discussed the proposal by James B. Reynolds in an open letter to the AIFRB membership (see BRIEFS, June 1991, p.1), President Helle's comments on the proposal (see BRIEFS, August 1991, p.1), and other comments received from the membership. Reynolds proposed that AIFRB be dissolved and reformed as the Fisheries Research Section of the American Fisheries Society. After considerable discussion, the Board reaffirmed the intent to maintain AIFRB as an organization separate and distinct from the American Fisheries Society.

William Royce was appointed to head a project to write a history of AIFRB.

The Board discussed the planning of a 1996 celebration of the 40-year anniversary of the formation of AIFRB.

The possibility of the publication of occasional papers by AIFRB was reviewed. No action was taken.

The Board showed great interest in emphasizing the publication of abstracts of fishery theses and dissertations beyond the present emphasis in BRIEFS. It was agreed that letters should be sent to universities to solicit recent abstracts to be published in BRIEFS or in a separate publication.

1992 Meeting

The 1992 meeting of the AIFRB Board of Control will be held on September 13-14 at the Rapid City Convention Center, Rapid City, South Dakota.

Adjournment

President Helle adjourned the meeting in the late afternoon of September 8, 1991.

AIFRB Treasurer's Report, Fiscal 1991 as of 6 August 1991

CREDITS:

Dues Receipts	\$16,713.41
Balance Carryover from Fiscal 1990	12,263.83
Rental of Mailing List	690.00
Total Credits	\$29,667.24

DEBITS:

Treasurer's Expense:

Assistant	\$ 1,161.00
Insurance Bond	100.00
Computer Supplies, Mailing Labels	315.69
Treasurer's Stationery Stock	203.22
Bank Charges—Canada Exchange Costs	4.12
Subtotal	\$ 1,784.03

BRIEFS:

Production and Postage	\$ 1,950.00
Coastal Press, Printing	3,932.47
Editor's Costs	39.04
Subtotal	\$ 5,921.51

Awards:

Associate Member Research Award Program	\$ 2,250.00
Subtotal	\$ 2,250.00

Other:

AFS 1990 Meeting Contribution	\$ 300.00
Travel to 1990 AIFRB Board Meeting	1,458.22
Contribution to World Fisheries Congress	1,000.00
President's Postage	100.00
Institute Stationery	141.07
Subtotal	\$ 2,999.29
Total Debits	\$12,954.83

ASSETS:

I-Liquid:

Prudential-Bache Money Market	\$ 631.00
Prudential-Bache Cash Account	76.90
Checkbook Balance	16,712.41

II-Asset Funds:

Blackstone Income Trust Inc. 360 sh.	\$ 3,465.00
P-B Municipal Ser Fnd NJ 1,284.521 sh.	13,734.55
P-B Equity Fund 720.816 sh.	8,664.21
Franklin Tax-Free Trust NJ 508.138 sh.	5,574.27
Van Kampen Merritt 695 sh.	6,936.10
Putnam Invest. Grade Muni. Trust 425 sh.	5,046.88
Total All Assets	\$60,841.32

The AIFRB Archives

A 35-year-old treasure—the AIFRB Archives—lies in the Montlake Boulevard offices of the National Marine Fisheries Service in Seattle, Washington. This depository of AIFRB documents and photographs has materials dating from the birth of our Institute in 1956, and is invaluable to those who wish to delve into the background and development of AIFRB.

As priceless as these old records are, their worth becomes even greater if there is a persistent effort to bolster the files by adding to the collections from year to year. The Board of Control invites and urges the membership to contribute to the accumulation by donating items for incorporation in the Archives.

Documents relating to the history and operations of AIFRB, its Districts, and its people are desired, as are photographs, announcements of programs, newspaper clippings describing awards and their presentations, and other materials appropriate for preservation in this central conservatory. District Directors can play a large part in this effort by encouraging members to forward additions to the Archives.

Items intended for the AIFRB Archives should be sent to Katherine W. Myers, AIFRB Secretary, Fisheries Research Institute, University of Washington School of Fisheries, WH-10, Seattle, WA 98195.

Our People

Mary C. Fabrizio (Member 1988) has changed positions, leaving ManTech Environmental Technology, Inc. at Research Triangle Park, NC to become a Research Fishery Biologist at a National Fisheries Research Center of the Fish and Wildlife Service. Mary is located at the NFRC-Great Lakes Laboratory at Ann Arbor, MI.

At the American Fisheries Society meeting in San Antonio, AIFRB people continued in their leadership roles in AFS. **Larry W. Nielsen** (Member 1982) became Past-president and **Carlos M. Fetterolf** (Fellow 1973) moved up to become President-elect.

Meeting Announcements and New Publications

Coastal Wetland Symposium

The Louisiana Sea Grant Program, the National Audubon Society, the Department of Oceanography and Coastal Sciences of Louisiana State University, and several private and governmental agencies will sponsor *Coastal Wetland Ecology and Management Symposium* (Sustained Wetland Productivity Through Scientific Research) at the Clarion Hotel in New Orleans, LA on December 3-7, 1991. The purpose of the symposium is to strengthen the scientific understanding of wetland ecological processes that form a basis for management in a shrinking and complex world. Several well-focused sessions are being organized by experienced experts that will be supplemented by contributed papers. The invited papers are intended to be good new science efforts that present the context of what is known, the needs of the field, and reveal new data. Additional contributed papers and poster sessions are solicited with this circular. The positive responses to the first circular indicate that 175 people are already planning to attend (as of June 1991) and present 125 papers. A special effort is being made

to cultivate student interest through paper awards, reduced room costs, and subsidized social events.

Invited sessions will cover coastal wetland hydrology, coastal wetland sediments, comparisons of marsh types, long-term coastal marsh studies, wetland regulation, fisheries/wetland habitats, wetland restoration, recent advances in wetland soil ecology, wetland pollution, wetland economic valuation, wetland management in developing countries, and contemporary examples of sea level rise and wetland responses. Additional sessions and contributed papers are solicited to complement the invited and other sessions.

For information on registration, abstract preparation, fees for the symposium and associated social events, and other activities, write R. Eugene Turner, Coastal Ecology Institute, Center for Wetland Resources, Louisiana State University, Baton Rouge, LA 70803.

Environmental Negotiation Seminars

RESOLVE, a program of World Wildlife Fund (incorporating The Conservation Foundation) offers a series of seminars dealing with mediation and facilitation for environmental conflicts. All sessions will take place in Washington, D.C.

Negotiation and other consensus-building processes are playing an increasingly important role in the resolution of complex public policy decisions. The primary objective of such negotiations is the development of sound and broadly supported public policies that address the needs and concerns of all significantly affected parties. This is no easy task, however.

Representatives of all interests are being called on with increasing frequency to participate in dispute resolution processes. Thus, the ability to effectively represent a constituency through negotiation is quickly becoming an essential skill to successful participation in public decision making.

The Seminars, with dates and fees, are:

Building Consensus on Wetlands Disputes, Oct. 29-31, \$595.

Negotiating Environmental Disputes, Jan. 15-16 and Apr. 7-8, 1992, \$495.

Negotiating Waste Management Issues, March 4-6, 1992, \$595.

International Environmental Negotiations, May 13-15, 1992, \$595.

For information on registration, write to Jenny Billet, RESOLVE, WWF, 1250 24th Street N.W., Washington, D.C. 20037.

Pacific Salmon Life Histories

Cornelis Groot and Leo Margolis have edited *Pacific Salmon Life Histories*, a 608-page volume with 16 pages of color illustrations and 197 black and white illustrations.

Pacific salmon are an important biological and economic resource of countries of the North Pacific rim. They are also a unique group of fish possessing unusually complex life histories. There are seven species of Pacific salmon, five occurring on both the North American and Asian continents (sockeye, pink, chum, chinook, and coho) and two (masu and amago) only in Asia.

Pacific Salmon Life Histories provides detailed descriptions of the different life phases through which each of the seven species passes. Each chapter is written by a scientist who has spent years studying and observing a particular species of salmon. Some of the topics covered are geographic distribution, transplants, freshwater life, ocean life, development, growth, feeding, diet, migration, and spawning behaviour. The text is richly supplemented by numerous maps, illustrations, colour plates, and tables, and there is a detailed general index, as well as a useful geographical index.

This volume brings together for the first time, and in a comprehensive form, most of the available biological information on the seven species of Pacific salmon. It is an invaluable source of information for students and teachers of biology and fisheries science, people in the fishing and aquaculture industry, and interested laypersons in countries of the North Pacific and elsewhere.

Robert L. Burgner (AIFRB Fellow 1968) wrote the chapter on sockeye salmon, William R. Heard (AIFRB Member 1965) did the one on pink salmon, E. O. Salo (AIFRB Fellow 1968) prepared the part on chum salmon, M. C. Healey wrote about chinook salmon, F. K. Sandercock authored the chapter on coho salmon, and Fumihiko Kato covered the section on masu and amago salmon.

This book costs \$49.95 and is available from UBC Press, University of British Columbia, 6344 Memorial Road, Vancouver, BC, Canada V6T 1Z2.

cont. on page 8

New Publications cont.

Wetlands Report

Wetland Creation and Restoration: The Status of the Science is the first major work resulting from research on wetland creation and restoration under USEPA's Wetlands Research Plan. Copies are available for \$35 from Inland Press, 1718 Connecticut Avenue NW, Suite 300, Washington, DC 20009.

Membership Report

NEW ASSOCIATE

Richard C. Pyzik

OR

NEW MEMBERS

Dr. William A. Walsh

HI

Dr. Thomas H. Kerstetter

CA

EMERITUS

Dr. Hugh A. Poston

NY

Sammy M. Ray, *Membership Chairman*
Texas A&M University at Galveston
5007 Avenue U
Galveston, Texas 77551

Direct membership inquiries to the Membership Chairman.

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

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FIRST CLASS

*American Institute of Fishery
Research Biologists*
NMFS Laboratory • Beaufort, NC 28516



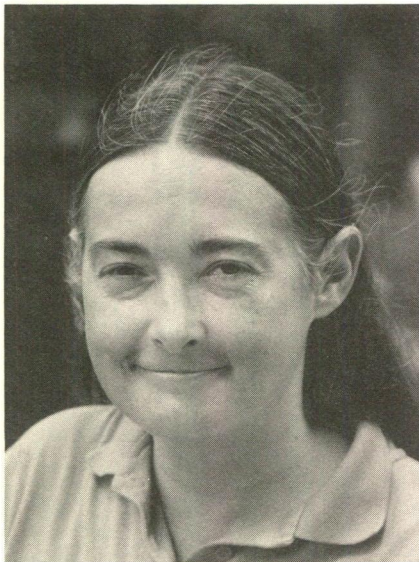
American Institute of Fishery Research Biologists

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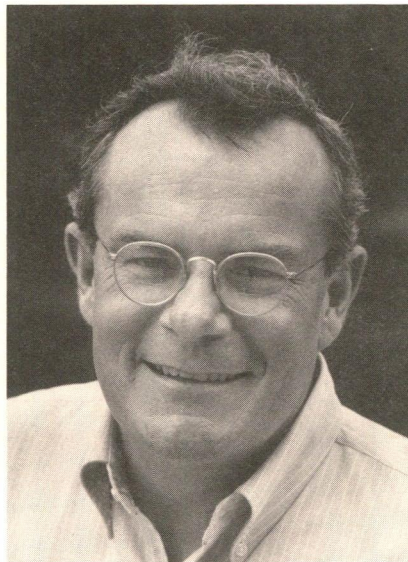
VOL. 20, NO. 6

DECEMBER 1991

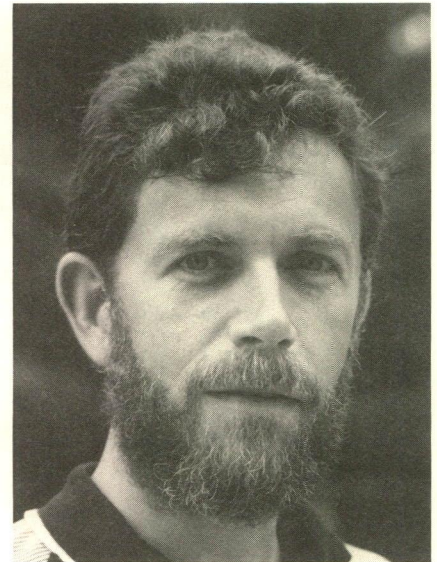
Some AIFRB Leaders



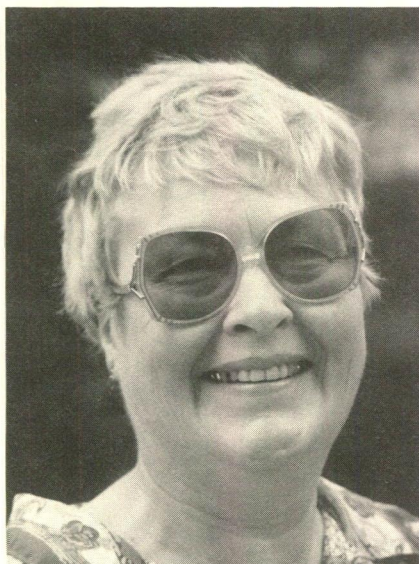
Katherine Myers
AIFRB Secretary



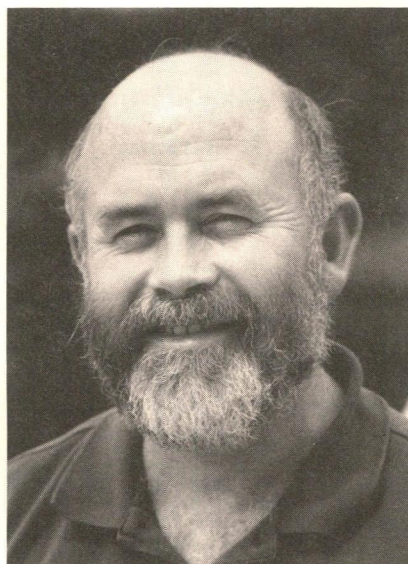
John Merriner
Production Editor



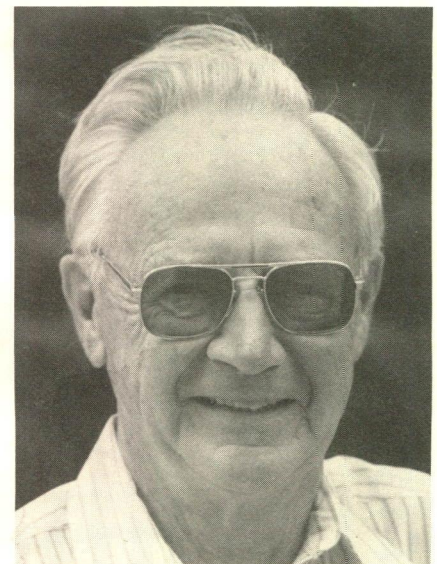
Stephen Fried
Director, North Alaska District



Malin Babcock
Director, SE Alaska District



Jim Allen
Director, South California District



Bill Royce
Director, NW Washington District

Abstracts of Papers of Research Assistance Awardees

The June 1991 issue of BRIEFS carried the names of AIFRB's Associate Members who had won awards for assistance in travel to deliver papers at scientific meetings. Abstracts of the winners' papers are presented here:

Mr. Dana C. Aultman, a graduate student working under the direction of Dr. James M. Haynes at SUNY Brockport, presented a paper on aspects of his thesis research at the 1991 meeting of the Northeast Fish and Wildlife Conference in Portland, Maine in May. This paper was also presented at the AFS Annual Meeting in San Antonio, Texas in September.

SALMONINE CATCHES IN LAKE ONTARIO ARE HIGHER AT THERMAL FRONTS IN THE SPRING: EXPERIMENTAL VERIFICATION

Haynes et al. (1986) hypothesized that radiotagged rainbow trout (*Oncorhynchus mykiss*) moved offshore in Lake Ontario with thermal fronts in spring and early summer. In 1990 we tested this hypothesis for salmonines generally by comparing catches in non-frontal water and three types of fronts (thermal bar, 4 C; spring thermocline, 6-8 C; thermal break, ≥ 9 C). A thermal front in the spring on Lake Ontario is a rapid temperature cline across the surface of the lake (≥ 0.15 C/min at standard trolling speed for this investigation) parallel to shore that extends obliquely from the surface toward shore and the bottom. Surface temperature was recorded every 2 min during 45 hours of experimental fishing. Only 20% of the time was spent fishing thermal fronts where 35% of the 88 strikes occurred. CPUE at thermal fronts was significantly greater than non-frontal CPUE on all 11 sampling dates ($p < 0.001$). Catches were better in thermal breaks ($p < 0.002$), spring thermocline ($p < 0.01$) and thermal bar ($p < 0.05$) than in non-frontal waters. The data suggest that there is a relationship between species distributions and thermal fronts. Relative to non-frontal water, coho salmon CPUE was greater in the spring thermocline ($p < 0.01$); rainbow trout CPUE was greater in thermal breaks ($p < 0.05$), spring thermocline ($p < 0.05$) and thermal bar ($p < 0.002$). It appears that anglers can effectively target salmonine catches by fishing specific thermal structures. These results likely are applicable to other pelagic habitats utilized by salmonines.

Mr. Russell W. Brown, a graduate student working under the direction of Dr. William H. Taylor at Michigan State University, presented a paper on aspects of his thesis research at the AFS Annual Meeting in San Antonio, Texas in September.

EFFECTS OF EGG COMPOSITION AND PREY DENSITY ON THE LARVAL GROWTH AND SURVIVAL OF LAKE WHITEFISH

Lake Whitefish eggs were collected from two stocks of lake whitefish in Lakes Michigan and Huron to assess the effect of egg composition and prey density on larval growth and survival. Egg composition parameters including wet weight (g/egg), dry weight (g/egg), percent lipid content, and lipid content (g lipid/egg) were measured. Fish hatched from six parental females in each stock were fed one of four rations (0, 18, 24, 50 brine shrimp/larva/day) after yolk-sac absorption. Length at hatch, endogenous growth, exogenous growth, and survival were measured during a 42-day laboratory experiment. Length at hatch of larvae was positively related to egg caloric content ($r^2 = 0.780$), while endogenous growth was positively related to egg caloric density ($r^2 = 0.896$) and egg lipid content ($r^2 = 0.876$) of parental females. Exogenous growth and survival of larval lake whitefish was positively related to prey availability and growth was accurately modelled ($r^2 = 0.973$) using a threshold-corrected hyperbolic equation. These results indicate that egg composition has the potential to be an important influence on the growth and survival dynamics of larval lake whitefish.

Mr. T. Richard Busby, Jr., a graduate student working under the direction of Dr. David G. Lindquist at the University of North Carolina at Wilmington, presented a paper on aspects of his thesis research at the Fifth International Conference on Artificial Habitats for Fisheries in Long Beach, California in November.

SPATIAL CONSIDERATIONS OF PREY SELECTION IN THE SLIPPERY DICK (*HALICHOERES BIVITTATUS*) ON INNERSHELF REEFS IN ONSLOW BAY, N.C.

Several studies have examined the diet selection and feeding ecology of *Halichoeres* species. The diet of the slippery dick (*Halichoeres bivittatus*)

was examined in 210 specimens (60-150mm SL) taken from an innershell boxcar reef and a natural limestone ledge. Gut contents were analyzed using a method devised by Hyslops (1980). Core samples from the benthic substrata of these sites were taken from the reef's hard substrate, from 1m off-reef and from 10m off-reef, to determine where feeding actually takes place for these fish. Spatial considerations have not been examined previously in these fishes; however feeding studies have shown these fishes to be opportunistic feeders. Should this be the case with the fish in the current study it may be found that similar proportions of their diet should come from the various distances sampled. Statistical analyses have yet to be performed; however, preliminary data suggest that these fish do take some prey items from off-reef areas. Considerations from predator avoidance, inter- and intraspecific competition, foraging behavior, and physical parameters should be made, however difficult to quantify, before stating any conclusive findings.

Mr. David Bushek, a graduate student working under the direction of Dr. Standish K. Allen, Jr. at Rutgers University's Shellfish Research Laboratory, presented a paper on aspects of his research at the 1991 meeting of the National Shellfisheries Association, in Portland, Maine in June.

REPEATABILITY OF TRIPLOID INDUCTION IN *CRASSOSTREA VIRGINICA* (GMELIN) USING STRIPPED GAMETES

Successful production of triploid oysters requires precise control of the timing of fertilization of eggs. Logistically, using stripped gametes is the most practical method for producing triploids because the time of fertilization can be easily controlled. We examined several factors that may affect the survival and the yield of triploid *C. virginica* from stripped gametes during large-scale spawns.

Triploidy was induced by inhibiting polar body II with cytochalasin B. Variables examined included: time allowed for stripped eggs to ripen, average female fecundity, egg density during treatment, development rate, percent of eggs exhibiting first polar body extrusion at treatment initiation, and treatment order. Fourteen groups of 17-49M eggs were treated. Survival and percent triploidy of 48-hour-old larvae were not correlated: mean survival was 22% and mean triploidy was 79%. Survival to the eyed stage was about 6%. A sample of 138 spat was 72% triploid, indicating that the triploid estimate from 48-hour larvae was accurate. Overall, 400.0M eggs yielded about 17.8M triploid spat, an efficiency of 4.4%. All linear regression models incorporating the measured variables were not significant. The variability observed in triploidy and survival appears to be random, dependent upon egg quality, or both.

Mr. Joseph M. DosSantos, Fisheries Program Manager for the Confederated Salish and Kootenai Tribes of the Flathead Nation, presented a paper on his research at the Warmwater Fisheries Symposium in Arizona in June.

ECOLOGY OF A RIVERINE NORTHERN PIKE POPULATION

Esox lucius' historical relationship with man is both colorful and devilish, thereby its species name. Past and present distribution within the State of Montana is discussed. The general ecology of a riverine population in the Lower Flathead River is presented, including: age and growth, food habits, spawning chronology, and seasonal migrational patterns. Hydropower operations have a direct effect upon available spawning habitat, year-class strength and localized adult spawning movements. Interpretation of movements based on angler tag returns reveal only one-way travel either upstream or downstream, with no detailed information between tagging and recapture locations except total time. Radio tracking of implanted adults revealed three distinct cyclic seasonal migration patterns. Present-day ecological concerns based on lentic environments are not always applicable to lotic environments.

Mr. Jon S. Chen, a graduate student working under the direction of Dr. Cheng-t Wei at the University of Florida, presented three papers on aspects of his thesis research at the 1991 Institute of Food Technologists Annual Meeting in Dallas, Texas in June.

INHIBITORY EFFECT OF KOJIC ACID ON SOME PLANT AND CRUSTACEAN POLYPHENOLOXIDASE

The inhibitory mechanisms of kojic acid on the oxidation of various phenolic substrates by polyphenoloxidases (PPO) of plants and crustaceans were investigated. A competitive type inhibition was observed for the oxidation of chlorogenic acid and catechol by potato PPO, and the oxidation of 4-methylcatechol and chlorogenic acid by apple PPO. Using

beta-3,4-dihydroxyphenylalanine (DOPA) and catechol as substrates, a mixed-type inhibition was observed for white shrimp, grass prawn, and lobster PPO, while a mixed-type and a competitive inhibition was obtained for mushroom PPO when DOPA and L-tyrosine was used as substrate, respectively.

COMPARISON OF DIFFERENT EXTRACTION METHODS ON THE PURIFICATION OF SHRIMP POLYPHENOLOXIDASE

Effect of various stirring time and different extraction methods on the recovery of shrimp polyphenoloxidase (PPO) were investigated. A 0.5 hour stirring time was adequate to yield minimal total protein content and maximal enzyme activity. With respect to the specific activity, PPO yield, and purification fold, the phenylsepharose CL-4B chromatography, employing butanol extraction, was superior to that of ammonium sulfate fractionation. White shrimp PPO was more susceptible to inactivation than pink shrimp PPO during the purification procedures.

INHIBITORY OF POLYPHENOLOXIDASE BY KOJIC ACID

The inhibition mode of kojic acid on mushroom, potato, apple, and spiny lobster polyphenoloxidase (PPO) was investigated using spectrophotometric and polarographic methods. Kojic acid exerted an inhibitory effect on the uptake of O_2 required for the enzymatic browning by PPO. Kojic acid inhibits melanosis either by reducing Cu^{2+} to Cu^+ at the active site, rendering PPO inactive, or by interacting with o-quinones to form the complex preventing the melanin formation, or the combined actions of both. Incubation of PPO with kojic acid at different temperatures did not yield any significant difference ($p < 0.05$) on PPO inhibition.

Mr. Paul L. Donaldson, a graduate student working under the direction of Dr. Ileana E. Clavijo at the University of North Carolina at Wilmington, presented a paper on aspects of his thesis research at the Fifth International Conference on Artificial Habitats for Fisheries, in Long Beach, California in November.

THE IMPORTANCE OF DEMERSAL ZOOPLANKTON IN THE DIET OF THE ROUND SCAD (*DECAPTERUS PUNCTATUS*) ON A NATURAL AND AN ARTIFICIAL REEF IN ONSLOW BAY, N.C.

Artificial reefs are not likely to support completely fish populations associated with them although studies have reported fish feeding directly on artificial reef fauna and flora. Stomach contents of *Decapterus punctatus* collected from a natural and an artificial reef are being compared to determine if a significant amount of demersal zooplankton is present, indicating energy transfer from the surrounding soft bottom is occurring. Preliminary results suggest that *D. punctatus* feeds to a large extent on organisms that reside on or in the benthos. Many of these organisms appear to be associated with soft bottoms that surround reefs. If this is truly the case, an important energy link will be documented from soft bottom fauna via demersal zooplankton to an abundant reef-associated bait fish. A "halo" effect may also be apparent. This becomes important when managing existing artificial reefs to avoid damaging areas surrounding the reef with activities such as dredging and dredge spoil disposal. These findings suggest that future artificial reefs can be more productive if a proposed site has a high enough energy yield (i.e., microalgae and demersal zooplankton) to support active transport by reef-associated fish.

Mr. Tung-Shi Huang, a graduate student working under the direction of Dr. Cheng-t Wei at the University of Florida, presented a paper on aspects of his thesis research at the 1991 Institute of Food Technologists Annual Meeting in Dallas, Texas in June.

PRODUCTION OF KOJIC ACID BY *ASPERGILLUS CANDIDUS* IN THREE CULTURE MEDIA

Aspergillus candidus ATCC 44054 grown in a stationary position produced more kojic acid in the modified Czapek-Dox liquid medium than during shaking at 100 rpm. Of the three culture media tested, the yeast extract-sucrose medium permitted more kojic acid production by the fungus than the modified Czapek-Dox liquid medium and the Tadera medium. Kojic acid (57-59 mg/ml) was produced in the extract-sucrose medium on day 9-12 of cultivation in the stationary position. No aflatoxin was detected from the fungus in these three media.

Ms. Lisa A. Pike, a graduate student working under the direction of Dr. David G. Lindquist at the University of North Carolina at Wilmington, presented a paper on aspects of her thesis research at the Fifth International Conference on Artificial Habitats for Fisheries, in Long Beach, California in November.

FEEDING ECOLOGY AND THE ROLE OF ALGAE IN THE DIET OF SPOTTAIL PINFISH: A COMPARISON BETWEEN A NATURAL AND ARTIFICIAL REEF

A major question about reef communities concerns the source of the productivity supporting reef-associated fish populations. The diet of the spottail pinfish (*Diplodus holbrooki*) has been examined on a small scale ($n=100$, 70-200 mm SL) at both an innershelf artificial boxcar reef and a natural limestone ledge in Onslow Bay, N.C. Previous studies primarily looked at juvenile spottail pinfish from jetty and shallow seagrass areas. Adults, even in temperate areas, have been assumed to be dependent on an algal diet. Using a combination of the Jones (1968) and Ellison (1976) techniques, stomach contents were analyzed. Preliminary data suggest that the spottail pinfish are feeding from a variety of habitats including planktonic, benthic (on-reef) and demersal (off-reef). Furthermore, specific individuals seem to be specializing in different areas. Invertebrates such as calanoid copepods, larval polychaetes, barnacles, larvacean tunicates, skeleton shrimp, and amphipods have been identified in the gut contents. There is minimal evidence to suggest that spottail pinfish are dependent upon algae, though some algae (*Champia* sp., *Griffithsia* sp., and *Polysiphonia* sp.) have been found in the stomach contents.

People-to-People Reunion

A few years ago, AIFRB Past-President Bernie Skud led a group of fishery scientists on a People-to-People venture to observe fishery activities in China, Korea, and Japan. The AIFRB delegates who made that trip enjoyed a reunion in San Antonio, Texas in September.



Back row—Bernie Skud, Charles Liston, Bob Gray, Bill Wilson, Jack Helle.
Front Row—Fred Copes, Corkey Perret.

Gobies and the Zebra Mussel

The Great Lakes' newest ecological invaders just might help put a dent in the spread of the zebra mussel, researchers have found.

The tubenose goby and the round goby, two closely related bottom-dwelling fish, were found in the St. Clair River in

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Gobies and the Zebra Mussel cont.

April 1990 and this past winter. A trio of Michigan researchers say the fish, native to the Black and Caspian seas, seem to have established populations in the river.

David Jude and Gerald Smith of the University of Michigan and Robert Reider of the Detroit Edison Co. wrote in a recent research paper on the fish that "gobies are robust, know for their ability to adapt to low salinities and to habitats not accessible to other fishes." The two species, Jude told the *Great Lakes Reporter*, are likely to compete actively with native Great Lakes bottom-dwellers such as sculpin, darters, and logperch, all important prey for wall-eye and other key Lakes predators. Gobies are commercially harvested for human consumption in Russia, Jude said.

The St. Clair River and other streams with strong currents and rocky bottoms appear to be "optimal habitat" for the invaders, the researchers wrote, noting that gobies have successfully colonized other habitats such as San Francisco Bay, the Arabian Gulf, the Aral Sea, and Australian waters. The gobies "will probably spread through the Great Lakes with time," they wrote, and "their impact on native benthic fish communities could be severe," since they spawn several times per year and are likely to feed on the eggs of other fish.

Among the gobies' principle prey are bivalve mollusks, such as the zebra mussel. Jude said the researchers are planning further studies to determine whether the gobies are eating zebra mussels in the St. Clair River, or are likely to in large quantities.

Like the zebra mussel, the ruffe, and other invader species, the gobies probably entered the Great Lakes system in the ballast water of a foreign ship, the researchers say. Canada's Coast Guard maintains a voluntary program of ballast-switching for vessels entering the St. Lawrence Seaway, but has so far resisted calls by the Great Lakes Fishery Commission and other organizations for a mandatory program.

From The Great Lakes Reporter, Sept/Oct 1991

Shasta Environmental Report

The planning report-final environmental statement (PR-FES) on the Shasta Outflow Temperature Control Project is now available for public review. The proposed project is designed to use the cold water resources of Shasta Lake to improve water temperatures in the upper Sacramento River for the survival of the winter-run chinook salmon. The salmon are listed as an endangered species by California and as a threatened species by the Federal Government. The AFS California-Nevada chapter has asked the Fish & Wildlife Service to upgrade its federal status to endangered, as the stock has continued to decline despite the threatened listing.

The Shasta PR-FES deals with construction of a shutter-type device which would allow the selective withdrawal of water from different depths of the reservoir. Critics of the plan point out that, as long as total water allocation for fisheries resources remains the same, the measures would

simply leave less water for other species with different spawning cycles. To request copies of the PR-FES, write the Regional Director, Bureau of Reclamation, Attn: MP-750, 2800 Cottage Way, Sacramento, CA 95825-1898 or call (916) 978-5130. For more information, call Don Erman at (415) 642-5285.

Aquaculture Database

For computer users with access to a modem, the University of Idaho is providing a free aquaculture database and bulletin board. The Aquaculture Electronic Bibliography features over 6,000 fish culture and aquaculture citations, and is updated regularly. Only the citations, not the articles, are kept on-line; however, the university Aquaculture Library will locate and mail cited articles which can not otherwise be obtained. The Aquaculture Bulletin Board can be used to post items for other readers of the board. Private electronic mail is provided for responding to bulletin board items. Contact John Whisenant at (208) 885-5992.

Our People

Ira R. Adelman (AIFRB Fellow 1989), professor and head of the Department of Fisheries and Wildlife, University of Minnesota, has been elected first president of the newly-formed National Association of University Fisheries and Wildlife Programs (NAUFWP).

NAUFWP is an organization formed to advance the science and practice of fisheries and wildlife conservation and to increase public understanding of natural resource issues. According to Adelman, "NAUFWP will take an active role in communicating our research and education priorities to anyone involved in natural resource policy decisions, research funding and program implementation. The impacts of human activities on fisheries, wildlife and other natural resources must receive greater attention in our decision-making processes and in all educational activities. NAUFWP will represent this need, and our regional makeup ensures that all appropriate perspectives will be expressed." Current membership in NAUFWP includes representatives from 42 U.S. universities, including most major land-grant institutions.

David J. Mackett (AIFRB Member 1981), planning officer at the National Marine Fisheries Service's (NMFS) Southwest Fisheries Science Center (SWFSC) in La Jolla, California, was recently awarded the 1991 NOAA Administrator's Award at the Army-Navy Country Club in Arlington, Virginia. Mackett was recognized by the National Oceanic and Atmospheric Administration for "bringing new, more effective, and time efficient program planning and management techniques to NOAA's National Marine Fisheries Service (NMFS).

Stanley A. Moberly (AIFRB Member 1973), former president of the American Fisheries Society, recently became the second recipient of the Carl R. Sullivan Award, the American Fishery Society's highest aquatic achievement award. The award is awarded annually to an individual, organization, or corporation who has made a significant and lasting contribution to the conservation of aquatic natural resources.

John B. Pearce (AIFRB Fellow 1975), Acting Science and Research Director at the Northeast Fisheries Science Center at Woods Hole, Massachusetts, has recently been named as the North American Editor for the *Marine Pollution Bulletin*. John wishes to get additional input to the Bulletin, especially in areas concerned with local, regional, and national news, as well as information about new products that might be useful in measuring or assessing marine environmental phenomena. He also wishes to increase the number of manuscripts concerning recent research findings. Correspond with John Pearce at his NMFS laboratory in Woods Hole.

Meetings and New Publications

World Fisheries Congress

The World Fisheries Congress, originally scheduled for 1991, has been postponed to May 3-8, 1992 at the Stadium of Peace and Friendship in Athens, Greece.

Aquatic ecosystems provide major nutritional, recreational, and ecological benefits throughout the world. Projections of current trends show that our oceans, lakes, and rivers will become increasingly important to succeeding generations. At the same time, the sustainabilities of aquatic resources are being reduced by over-exploitation, habitat destruction, and inadequate knowledge. The future, therefore, demands that we increase our understanding and improve our management of aquatic resources worldwide.

More than 45 scientific and professional fisheries organizations worldwide have initiated a process—the World Fisheries Congress—to address that demand. The World Fisheries Congress will assess the state of the world's aquatic resources, establish a benchmark for future developments in fisheries research and management, and provide a structure for continuing collaboration among the world's fisheries scientists and managers. This is the first effort of such size and scope in the history of fisheries—to be followed, we hope, by similar efforts of even greater purpose and utility.

The keystone event will be the Congress conference. The Congress will feature more than 400 verbal and visual presentations, including keynote addresses by the leading fisheries scientists and managers of our time. The Congress' proceedings will be published in a 7-volume library that will serve as a guide for future research, development, and practice. The contacts and networks formed as part of the Congress, with scientists and professionals from more than 50 nations participating, will foster the collaborative efforts necessary to assure the sustainability of aquatic resources into the next century.

The program will consist of addresses on the state of fisheries in many parts of the world and the state of fisheries science. Main theme symposia will deal with a variety of

fishery issues, and main theme workshops will address many vital fishery topics. Three computer workshops will cover the use of computers in fishery research, and the Congress closing sessions will have discussions and conclusions focused on main theme subjects. The final presentation will deal with fishery resources and management in the 21st Century.

For detailed registration and other information, write World Fisheries Congress, c/o American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814.

Fish Ecology in Arctic North America

The Alaska Chapter of the American Fisheries Society is organizing a symposium on *Fish Ecology in Arctic North America*. The symposium will be held May 19-21, 1992, on the campus of the University of Alaska Fairbanks. The purpose of the meeting is to summarize current knowledge on the ecology of freshwater, estuarine, and marine fishes in arctic Alaska and Canada. A plenary session will provide a circumpolar perspective of the importance of fish resources within the arctic ecosystem and how anthropogenic changes such as global warming and development of energy resources could affect these resources. There will be technical sessions on:

- Biology of Arctic Fishes
- Arctic Fisheries Oceanography
- Stock Composition of Arctic Fishes
- Arctic Ecological Relationships: Dynamics of Main Food Webs
- Life History Strategies of Arctic Fishes: Migration and Movement
- Contributed Papers Session and Poster Session on Arctic Fish Ecology

The deadline for titles and abstracts has been extended to January 1, 1992. Prospective authors should identify the session for which they are submitting the paper. Abstracts should not exceed one page, single spaced. Please submit all abstracts to Alex Wertheimer, Auke Bay Fisheries Laboratory, 11305 Glacier Highway, Juneau, Alaska 99801, USA (Phone 907/789-6040; Fax 907/789-6094).

For information on meeting registration and accommodations in Fairbanks, contact Sharon Oien, Conference Coordinator, Conferences and Special Events, 117 Eielson Building, University of Alaska Fairbanks, Fairbanks, Alaska 99775-0540, USA (Phone 907/474-7800; Fax 907/474-5592).

Instream Flow Conference II

Trout Unlimited and the Bureau of Reclamation announce the co-sponsorship of the 1992 Western Regional Instream Flow Conference II. The two-day conference will be held in Jackson Hole, Wyoming on October 2-3, 1992, and the theme will be "Tools and Strategies for the Enhancement and Maintenance of Instream Flow."

The first Western Regional Instream Flow Conference, sponsored by Trout Unlimited, was held in 1989. It addressed the problems created by the strict application of western water law to instream flow issues in the intermountain West, with particular emphasis on the preservation and enhancement of fish, riparian, and aquatic stream habitats. The first conference took a broad approach to the water issues with the idea that future conferences would focus on specific topics.

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Meetings and New Publications cont.

The goals of this first conference were to promulgate creative ideas that would foster solid knowledge of western water law and management rules and practices that currently govern stream flows.

The conference was attended by representatives from federal and state government agencies, the academic community, public and private advocacy groups, and the general public. The conference was well received and considered so successful that a second conference has been scheduled for 1992.

For information, contact Suzanne VanGytenbeek, Trout Unlimited, P.O. Box 1212, Jackson Hole, Wyoming 83001, (307-733-0484).

Lobsters

Lobsters: Florida-Bahamas-the Caribbean, by Martin A. Moe, Jr. (AIFRB Member 1972) is a new 512-page book with more than 100 black and white illustrations. It sells for \$22.95.

The Caribbean spiny lobster, *Panulirus argus*, is one of the most important marine natural resources of the central, western Atlantic. There is a great need for comprehensive, objective, and accurate information on this intensively fished resource, and Martin Moe's new book fulfills this need. This book includes a fascinating account of the natural history and the science of spiny lobsters; a description of the evolution, morphology, and taxonomy of all the tropical western Atlantic lobsters; the care and culture of spiny lobsters in aquariums, hatcheries, and farms; an account of the recreational and commercial lobster fisheries; and the latest laws, regulations, and management measures on the Florida spiny lobster resource.

Moe's style of writing combines the accuracy and intensity of a scientist with the casual, informative, and entertaining manner of an accomplished writer of popular science. The information in this book is drawn from hundreds of scientific papers (224 scientific papers are cited), the first-hand experience of the author in catching and cultivating spiny lobsters, and extensive interviews with fishermen, scientists, and divers. This book is the only reference that brings all the scattered information on spiny lobsters together in a format that is useful to marine science students and professional marine scientists, and that the general reader can also understand and appreciate.

Anyone interested in the ecology of coral reefs, the natural history of spiny lobsters, tropical spiny lobster fisheries, and the care and culture of marine crustaceans in aquarium systems will find this book an educational and entertaining reference. This book is available from bookstores, aquarium shops, public aquarium shops, and Green Turtle Publications, P.O. Box 17925, Plantation, FL 33318.

The author, Martin A. Moe, Jr., has been a Florida marine biologist, fishery scientist, and marine fish culturist for over 30 years. He spent 10 years in the Florida Keys working with marine tropical fish and spiny lobster, and has also written numerous scientific and popular articles and two best-selling books on small marine aquarium systems.

Fishes of the Great Barrier Reef and Coral Sea

John E. Randall, Gerald R. Allen, and Roger C. Steene are the authors of *Fishes of the Great Barrier Reef and Coral*

Sea, a 1991 volume of 564 pages with color and black-and-white illustrations.

The Great Barrier Reef, the largest coral formation in the world, is a vast assemblage of reefs, shoals, and islands. To its east lies the Coral Sea, rimmed by Papua New Guinea, the Solomon Islands, Vanuatu, and New Caledonia. Despite their massive dimensions and ability to withstand the forces of nature, these natural formations are not immune to depredations by man—many forms of life there face extinction. Not all plants and animals of the reef have yet been classified.

This book identifies approximately ninety-five percent of all known fishes in the region. The 1100 species included here, divided into 102 families, are those creatures most likely to be seen by visitors to their habitat. Each family is introduced with scientific and common names, information on food habits, reproduction, and geographical distribution. More than 1500 drawings and color under-water photographs complement the work.

The collaborative effort makes it quick and easy for anglers, divers, and beach walkers to identify virtually every fish they may encounter. It is an important contribution to scientists and hobbyists alike.

The book sells for \$54 and can be ordered from the University of Hawaii Press, 2840 Kolowalu Street, Honolulu, Hawaii 96822.

Discovering Sharks

Discovering Sharks, edited by Samuel H. Gruber (AIFRB Member 1974), and published by the American Littoral Society, is a compendium of 23 chapters written by 27 scientists who currently conduct research on the world's shark populations, from deep-sea dwellers to coastal cruisers. Their research shows that commercial landings of sharks have risen seven-fold in the past five years. Because sharks are such slow breeders, they say that many species are not replenishing themselves and some populations are crashing. Their studies belie many of the myths that have grown up about sharks, such as:

Sharks are man-killing machines. They are not. More people die from bee stings or dog bites than from shark attacks.

Sharks are eating machines. Scientists have found that most sharks eat sparingly. A 200-pound sandbar shark, for example, can eat as little as one pound per day.

Sharks, like other marine species, are reproducing quickly enough to keep up their numbers. Instead, studies show that sharks have long gestation periods (the spiny dogfish female carries her young for up to 24 months), and sharks have small litters, often only two pups every two years.

At the same time, demand for shark meat and fins is at an all-time high. In the book the scientists call for support of shark fishing management plans to limit the catches of sharks in trouble. They also call for more studies of shark life histories. The book covers feeding habits, reproductive strategies, anatomical features and sensory systems. They can navigate across oceans, dive to 12,000 feet and raise their body temperatures, but they cannot breed fast enough to compensate for the rate they are being killed.

This 122-page book is available from the American Littoral Society for \$10, including postage and handling. To order send a check for \$10, payable to the American Littoral Society to: ALS, Highlands, New Jersey 07732. For more information on the Society or the book, contact: Hannah Johnson at (908) 291-0055. For more technical information, contact: Dr. Samuel H. Gruber at (305) 274-0628.

Los Peces Marinos de Venezuela

Volume 1 of the second edition of *Los Peces Marinos de Venezuela*, by Fernando Cervigon, has come off the press. In this second edition, the author has updated species classification and nomenclature, and has incorporated all new species records from Venezuela since the publication of the first edition in 1966 and all the information published or available about the known Venezuelan species, including theses, publications, or manuscripts.

The volume has 434 pages, 251 black and white original hand drawn illustrations, and 24 color plates. The book covers 336 species, with information on meristic and morphometric characters, coloration and diagnostic characters, length and weight, general and local distribution, and notes on biology and commercial importance. Fish Orders included are: Elopiformes, Anguilliformes, Clupeiformes, Gadiformes, Siluriformes, Aulopiformes, Myctophiformes, Zeiformes, Ophidiiformes, Batracoidiformes, Syngnathiformes, Dactylopteriformes, Scorpaeniformes, and Perciformes.

This book costs \$100 and can be ordered from Juan M. Posada, Dept. of Marine Sciences, University of Puerto Rico, Mayaguez 00681-5000, Puerto Rico.

Bluefin Tuna Stock Assessment

The Inter-American Tropical Tuna Commission has just published its Special Report 7, *World Meeting on Stock Assessment of Bluefin Tunas: Strengths and Weaknesses*, edited by Richard B. Deriso (AIFRB Member 1982) and William H. Bayliff (AIFRB Fellow 1981). This 357-page volume contains the proceedings of a world meeting on stock assessment of bluefin tunas, held in La Jolla, California, on May 25-31, 1990, review papers on northern bluefin in the Pacific Ocean, northern bluefin in the Atlantic Ocean, and southern bluefin, and three appendices. Copies are available from the Inter-American Tropical Tuna Commission, care of Scripps Institution of Oceanography, 8604 La Jolla Shores Drive, San Diego, California, 92037, for \$10.00 each (postage paid).

Marine Fisheries Conservation and Management

John P. Wise (AIFRB Fellow 1971) is the author of *Federal Conservation & Management of Marine Fisheries in the United States*, a 285-page book published by the Center for Marine Conservation of Washington, D.C.

This volume focuses on the Magnuson Fishery Conservation and Management Act of 1976, legislation passed after several years of heavy domestic and foreign overfishing had severely reduced many stocks. Although the Act appears at first glance to have been a success, the elimination of gross foreign overfishing and increased production and consumption in the U.S. has only exacerbated U.S. fishery problems and resulted in replacement of foreign overfishing by domestic overfishing. The failure of the Magnuson Act to eliminate overexploitation of national fisheries resources is not due to the Act itself, but to the way in which it has been

administered. The book discusses several means by which this failure must be rectified.

This large volume presents a massive amount of information on U.S. marine fisheries conservation and management previous to the Magnuson Act; the Magnuson Fishery Conservation and Management Act; fishery management plans under the Act; major international treaties and agreements; studies and recommendations since 1977; programs and budgets related to federal fisheries management; conclusions and recommendations; the basics of fisheries population biology and management; miscellaneous statistical tables; non-governmental organizations interested in marine fisheries; Dingell-Johnson/Wallop-Brough federal funding for marine and anadromous fisheries projects; and diagrams illustrating the process of fishery management plan formulation and implementation.

Copies of this book are available without charge from the Center for Marine Conservation, 1725 DeSales St., NW, Washington, DC 20036.

Job Search for the Technical Professional

David Moore has authored a Wiley Professional Book entitled, *Job Search for the Technical Professional*, a book of 256 pages. This is not just another handbook on finding a job—because it focuses specifically on the special needs of technical people. It shows you how to tailor all the basic tools of a job search to maximize marketability in technical fields. You'll get insights of particular value to a technical person, such as tips on how to evaluate a technical job or measure a company's chances for technical and financial survival. It also discusses the importance of attributes often neglected by technical people but critical to the success of a job search: for example, self-esteem, image, and attitude.

The book, selling for \$29.95, can be ordered from John Wiley & Sons, Dept. 063, One Wiley Drive, Somerset, NJ 08875-9977.

Thesis Abstract

Estimating Abundance and Annual Production of Striped Bass Eggs with *In Situ* Silhouette Photography

John Douglas Field, M.A. 1991

College of William and Mary in Virginia

In situ silhouette photography was evaluated to increase the accuracy and efficiency of striped bass egg production surveys in 1989-1990. Specific objectives were to: 1) make extensive comparisons between estimates of egg density obtained from the camera system and concurrent traditional collections; 2) generate annual egg production estimates for the Pamunkey River, VA spawning grounds from photographic data; 3) compare annual egg production estimates derived from traditional and photographic data; 4) compare the times required to process paired film records and traditional samples; 5) examine small-scale patterns of vertical distribution of eggs seen in photographic records; and 6) document developmental staging of images of striped bass eggs in the film records.

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Thesis Abstract cont.

The technique utilized a 35-mm camera opposed by a flash assembly. The cod-end of a standard plankton net was attached to a photographic chamber between these two components and fish eggs were photographed in silhouette as they passed from the net through the chamber. Two towing frames were used to deploy the camera over the study period: a paired-net frame which yielded both photographic and preserved collections, and a smaller single-net frame. Comparison tows were made with a 60-cm bongo frame fitted with 1-mm and 333- μ m mesh net and a 1-m Hensen net fitted with 35- μ m mesh Nitex.

Egg density estimates ranged from 0.0 to 908 eggs/100 m³ in the preserved samples and to 4,167 eggs/100 m³ in the film records. Log-transformed paired density estimates derived from paired-net frame collections generally showed a strong relationship, and simple linear regression of that data was significant. However, significant differences did exist between paired density estimates obtained from synoptic comparisons of the single-net frame and bongo nets.

The clarity of egg images in the films facilitated ontogenetic staging of live eggs, and age structures were calculated for photographic collections and synoptic Hensen-net samples. Age structures were dissimilar and did not exhibit expected frequency distributions across the five stages. Depth distributions of eggs calculated from film records exhibited three patterns that were related to tide stage. Spatio-temporal distributions of eggs were similar to those observed in previous surveys of the Pamunkey spawning grounds.

Distributions observed during the 1990 photographic survey suggested more elevated and sustained spawning activity than in the previous year, and the annual egg production estimate for 1990 was twice as large as the 1989 estimate.

Although annual egg production estimates derived from photographic surveys were considerably higher than estimates from previous surveys, annual estimates from 1980-1990 indicate a substantial increase in striped bass spawning activity over the last 11 years in Virginia rivers.

Membership Report

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