

Water Quality Matters



The Newsletter of the Water Quality Section of the American Fisheries Society

Summer 2003

Volume 26, Number 1

PRESIDENT'S MESSAGE

Larry Brown, President

The Water Quality Section (WQS) has been busy since the last Newsletter. We collaborated with the Parent Society on a letter to the EPA regarding proposed rulemaking covering the definition of the "Waters of the United States" in the Clean Water Act. That letter and the EPA's response are posted on the main AFS web site. The Section also provided comments on EPA's proposed 5-year strategic plan to cover the period from 2003-2008, commented on EPA's Proposed Effluent Guidelines for the Construction and Development Category (see below), and commented on the AFS "Guidelines for the Use of Fishes in Research". These latter two activities were completed with the help of interested Section members that responded to requests for help that were posted to the e-mail list. Thanks again to those folks and I encourage all members to help out the Section when we have issues needing your expertise.

As many of you know, much Society business is conducted by the Governing Board and the Management Committee. As one of the Sections with over 200 members, the Water Quality Section has a vote at Governing Board meetings. As President of the WQS, I attended the March 2003 Governing Board meeting. AFS and the Estuarine Research Society jointly organized and hosted a science policy briefing on fisheries issues in estuarine and coastal waters for agency and congressional staff. Everyone who participated in the briefing indicated that they thought it was very successful.

At the Governing Board meeting, Executive Director Gus Rassam reported that AFS is in excellent financial condition. In 2002, membership increased by 3.5%. The contribution to reserves was over \$400,000 in 2002! Gus also reported on the progress of Infobase, the electronic database for AFS journals. All journal articles from 1988 to the present

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have now been digitized and entered into the system. The next tasks are to include articles from *Fisheries* and journal articles from before 1988. The electronic manuscript tracking system is in place for journals and seems to be working well. The next steps for this task are to extend the software for use with *Fisheries* and AFS book publications. As always, I was impressed with Gus's handling of AFS business and the excellent staff he has assembled. AFS is obviously in good hands.



One of the most important items discussed at the business meeting was the formation of the Fisheries Foundation. The purpose of the foundation is to raise large amounts of money from interested individuals and groups to fund projects that promote fisheries science education for the public and decision makers. These projects would be screened by the Governing Board and would provide the means to shape public support for policies need to preserve and enhance the world's aquatic resources. The articles of charter for the foundation were a major topic of conversation at the meeting. There will be an article on the proposed Fisheries Foundation in an upcoming issue of

Fisheries. As one of those technical people that have trouble communicating fisheries issues to the public, I see the Fisheries Foundation as a great idea and look forward to its work.

Finally, I want to encourage everyone to vote for the candidate of your choice for President-elect of the WQS. Current President-elect Georgina Lampman did an outstanding job by rounding up three (!) excellent candidates (pages 5-6). In addition, I encourage you to vote on a WQS resolution (page 7-9) and to complete a brief questionnaire (separate from newsletter). The voting results will be announced at the WQS business meeting in Quebec City, Quebec, Canada. I hope to see you there.

**We Want Your Vote!
Ballots are due 6 July 2003**

**Cast your ballot for WQS
President-elect and Secretary-
Treasurer (candidates on
pages 5-6); and vote on the
Water Quality Section
Resolution (pages 7-9)**

See Ballot on Page 12!

**Deadline for Winter
2003-2004
Newsletter**

November 1, 2003

**Contact: Bob Hughes,
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WATER QUALITY SECTION AFS COMMENTS ON USEPA'S PROPOSED EFFLUENT GUIDELINES AND STANDARDS FOR CONSTRUCTION AND DEVELOPMENT

As professionals in the fields of fisheries and aquatic ecology, we are confident that if all the environmental and societal benefits of reducing runoff from construction and development were measured and evaluated accurately, there would be no argument whatever regarding the appropriateness of such actions. In support of this statement we offer the following observations based on a summary of scientific literature and professional experience.

Storm water runoff is a very significant contributor to water pollution in streams, rivers, and estuaries. It has been estimated as responsible for almost 50% of pollutant inputs to the marine environment (GESAMP 1990), and for major habitat alterations in estuaries (Kennish 2002). Runoff degrades large areas, threatens drinking water supplies, causes beach and shellfish closures, and increases flooding potential. It is a major source of coastal water pollution, especially near urbanized areas. Since total suspended solids (TSS) coming from construction sites have been found to be 150 times greater than from undeveloped land (Tetra Tech 2002), it is vital to reduce the inputs of sediments and other contaminants from construction and development site runoff.

Runoff from construction and development sites, though consisting predominantly of TSS, also picks up toxic contaminants and nutrients that flow into the water bodies along with the storm water. EPA has documented that temperature, nutrients, metals, pesticides and other toxicants and carcinogens are associated with runoff from construction sites and development. In particular, it is critical to control the "first flush" (generally the first hour of a runoff event), and the best control technique is through storm water management.

EPA's original draft version (DCN 01645) recommended a design goal of 80% reduction in TSS, and found that the rule would be technically feasible and

economically achievable, especially with new low-cost storm water control techniques. Unfortunately, the final rule, following OMB's changes, removes the regulatory options for addressing these inputs, removes the 80% TSS goal (which is already in use under Coastal Zone Management rules) and includes no effluent limitation guidelines. These changes make the new rule ineffective, and threaten both the ecological and economic benefits of storm water control.

Inputs of suspended solids cloud the water, which has numerous harmful effects on aquatic ecosystems. They can be detrimental to benthic filter feeders (Bock & Miller 1994, Loosanoff & Tommers 1948), and reduce the ability of visual feeders to find their prey (Miner & Stein 1993, Johnson & Hines 1999). Suspended solids can clog gills and other respiratory membranes, smother embryos by coating them with particles, and change the particle size distribution of the habitat (Christie 1975). Suspended solids reduce light transmission through the water, so that the photosynthesis of submerged plants is reduced. The reduced productivity of aquatic plants can have negative reverberations all the way up the food chain. Suspended solids also may settle on the bottom and have harmful effects on benthic organisms. Furthermore, inputs of sediments change the depth and flow rate of the water.

Siltation in estuaries causes them to become shallower, which may necessitate dredging in order to maintain normal tidal flow, and to maintain deep-water channels for commercial shipping. Dredging is extremely expensive, especially when the sediments are contaminated with toxic chemicals. The need for dredging and its associated costs would be greatly reduced if the inputs of suspended sediments were reduced by 80%.

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COMMENTS ON USEPA'S GUIDELINES & STANDARDS
(continued from page 3)

Storm water discharges result in both short-term and long-term impacts to surface and ground waters. Groundwater recharge is diminished by the construction of impervious surfaces, such as roads and parking lots. Impervious surfaces also affect stream hydrology with concomitant effects on critical stream processes such as nutrient cycling. In contrast, some innovative runoff controls both recharge groundwater supplies and reduce pollutant loadings to surface waters, as recognized in the Draft Proposed Rule of April 2002.

Inputs of toxic chemicals to surface waters are now primarily from non-point source runoff, because the concentrations of such chemicals have been reduced in point source discharges as a result of EPA regulations. These toxic chemicals, even in low concentrations, can have subtle effects on behavior, reproduction, development, and interspecies interactions of aquatic organisms, resulting in lowered health and population density. These adverse responses can result in community changes including loss of sensitive species, decreased species abundance, shifts in age structure of populations, and altered trophic interactions (Howells et al. 1990).

Inputs of excess nutrients also have profound effects on aquatic ecosystems. These inputs and their effects are known as eutrophication. Excess nutrients stimulate algal blooms that may later die, sink to the bottom, and cause de-oxygenation of water as they decay, resulting in death of bottom-dwelling organisms. The large "dead zone" in the Gulf of Mexico is an area of very low oxygen, resulting from eutrophication from nutrient runoff from farms throughout the Mississippi Basin. Input of excess nutrients may also stimulate algal blooms of species that are harmful, and in some cases, toxic, which have direct negative effects on aquatic life due to toxins that they produce as well as the potential for human health effects.

In doing the cost/benefit analysis of the Draft Proposed Rule of April 2002, EPA found that compliance costs would not be a large burden on the construction industry. In their cost/benefit analysis, they did not fully recognize some of the benefits, especially the long-term benefit of the ecological services provided by effective storm water management systems. EPA focused only on removal of TSS, and did not examine benefits of the removal of the other pollutants that occur with TSS. By lowering the levels of nutrients, metals, pesticides and other toxic chemicals, there will be reduced need for water pre-treatment, reduced water treatment costs and decreased impacts on fisheries, shellfish beds, and public health. A more complete cost/benefit analysis should consider impacts on recreational and commercial fisheries, as well as on the biodiversity of fish and benthic communities.

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WQS OFFICER ELECTIONS 2003-2004

CANDIDATE STATEMENTS (Ballots due 6 July 2003, see page 12)

Nominee for President-elect Kevin Whalen

I received a BA in Environmental, Population, and Organismic Biology in 1988, from the University of Colorado, Boulder, an M.Sc. in Fisheries and Wildlife Biology at the University of Vermont in 1992, and a Ph.D. in Wildlife and Fisheries Conservation at the University of Massachusetts, Amherst, in 1998. I also spent a one-year post-doc at the Conte Anadromous Fish Center, in Turners Falls, MA. I have spent the last 4.5 years at the Federal Energy Regulatory Commission dealing with hydropower relicensing, and the USDI Bureau of Land Management as the National Fish Program Lead. I also was a private environmental consultant while attending graduate school. I currently serve on the Loudoun County Water Resources Technical Committee, a citizen science board for my home county in Virginia.

My interest in "water quality" is focused mainly on aquatic community health. I am particularly interested in integrative measures of water quality involving biomonitoring of fish, macroinvertebrates, and/or other fauna/flora, and how these measures relate to land use and landscape development, both at the local and macro-scale levels. I think significant opportunities remain to deliver basic science and research on water quality-linked ecological processes in a manner that is applicable to the full spectrum of potential users of such information, including local communities. I think significant challenges remain in not only defining the cumulative net impacts of failing to address landscape and land use processes causal to degraded water quality, but also in defining the cumulative net benefits of our localized best management practices for enhancing or preserving water quality. At some point in the future I think to achieve our goals and objectives as fisheries scientists and water quality specialists we will need to consider stronger linkages with terrestrial and wildlife issues occurring over the same landscapes, but at different

scales. Finally, having experience in academia, private consulting, and as a federal biologist, I think we need to remain committed to be as inclusive as possible to meet the needs of our professionally diverse constituency. And, we must pay particular attention to the needs of students seeking future professional opportunities. Thanks.

Nominee for President-elect Thomas P. Simon

I received my B.S. from the University of Michigan, Ann Arbor; M.S. from the University of Wisconsin, La Crosse; and doctorate from the University of Illinois, Chicago, in Biological Sciences. I am a life member of the AFS and have been a member of the Water Quality Section for the last 10 years. I served as a Regional Representative and Newsletter Editor for the Early Life History Section and on the Endangered Species Committee. I am a certified fisheries biologist with the American Institute of Fisheries Research Biologists and conduct monitoring and assessment of North American fish and crayfish, including the development of environmental indicators for the U.S. Fish and Wildlife Service, Bloomington, Indiana Field Office. Previously, I worked 14 years as biocriteria coordinator for the USEPA Chicago Regional Office.

If elected President-elect, I want to encourage the development and implementation of multimetric indices into assessment, regulatory, and research roles among all aquatic resource types. The index of biotic integrity (IBI) has been viewed as a family of modified indices that have enabled significant progress in water quality assessment because of its flexibility and regional significance. Many states have been working on the development of biological indicators for the assessment of streams and wadeable rivers. It is time to further these efforts into lakes, wetlands, large rivers, estuaries, Great Lakes,

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CANDIDATE STATEMENTS
(continued from page 5)

great rivers, and other unique water body types. In addition, as aquatic scientists we should explore alternate indicator groups including mussels, aquatic plants, and birds. Explorations of karst systems and improvements in existing indices are needed to keep our focus and enable further progress. I also want to broaden our scope into development of assessment tools beyond the IBI types of assessments, including multivariate statistical assessments, RIVPACS, and other modeling approaches. In addition, I have assisted in editing three volumes that describe biological integrity processes primarily within North America. However, we need to reach out to colleagues outside of North America to assist in the development of appropriate modifications of aquatic indicators and multimetric indices outside of the United States and Canada. Finally, the need to control riparian destruction is necessary to preserve remaining biological integrity of North America. Channelization, otherwise known as “stream improvement or maintenance” should raise red flags within our respective regulatory agencies. These devastating practices have had significant irreparable impacts. If elected President-elect, I will do everything I can to encourage better use of our Newsletter and to encourage wider participation within the section. The Water Quality Section is a vital component of the American Fisheries Society that needs to address anthropogenic disturbance gradients and how these impact natural systems.

Nominee for President-elect Anne Brasher

I am an aquatic ecologist with the Water Resources Discipline of the USGS in Salt Lake City, Utah. I have been an AFS member since about 1988, and am currently a member of the Hawaii and Bonneville Chapters, the Introduced Fish Section, and the Water Quality Section. I received my M.S. and Ph.D. in Aquatic Ecology from the University of California at Davis. My M.S. research focused on

sublethal effects of selenium on aquatic invertebrates, and my Ph.D. on the impacts of habitat alteration (especially water diversion) on native stream fauna in Hawaii. Following graduation, I spent five years as a research biologist with the Hawaii (Oahu) National Water Quality Assessment (NAWQA) program, examining the impacts of urbanization on stream systems. Current research interests involve using a multidisciplinary watershed approach to assess stream quality, and developing a better understanding of the interactions between water quality, instream habitat, riparian habitat, and the establishment of introduced species.

I am a co-founder of the Hawaii Stream Bioassessment Working Group, a forum composed of federal and state agencies, university researchers, and community groups interested in water quality. The purpose of the group, which meets four to six times a year, is to encourage cooperation and exchange of ideas between the various entities. I see the Water Quality Section of the American Fisheries Society as playing a similar role: facilitating interaction and sharing of information between researchers working in a variety of locations on similar issues, stimulating collaborative projects, and developing consistent methodologies and new research strategies between agencies and scientists in different regions. Another role that I envision for the Section is to support student participation in AFS, encouraging students to take an active role in Section activities.

Nominee for Secretary-Treasurer John W. Meldrim

I am the current Secretary-Treasurer of the AFS Water Quality Section, a position I have held since the formation of the Section in 1977. In addition to maintaining the records and financial accounts for the Section, I serve as its resident historian. I am employed by MWH Americas, Inc. (in Chicago), and work on water quality and fisheries problems around the world. I have a Ph.D. in fisheries from the University of Washington, have been a member of AFS since 1964, and am an AFS Certified Fisheries Scientist.

WQS RESOLUTION: IMPLEMENTATION OF A NATIONAL ASSESSMENT PROGRAM FOR SURFACE WATERS

(Recommended by the WQS officers, but requiring your vote before forwarding it on for an eventual vote by the AFS membership. Cast your ballot by 6 July 2003. Ballot on page 12)

Whereas: The Clean Water Act's objective is to restore and maintain the ecological integrity of the Nation's waters.

USA states are required by Clean Water Act Sections 305b and 303d to report on the quality of all their waters and to report all waters not meeting water quality standards.

Enforcing the Clean Water Act costs USA governments and private institutions up to \$65 billion per year; stringent enforcement would cost up to \$99 billion.¹

Whereas: Most state water resource assessments are based on non-statistical sampling designs and chemical indicators.

Most state assessments of surface waters are unrepresentative and lack adequate ecological indicators.² For example, Delaware's assessment based on chemical indicators at hand-picked sites indicated 12% impairment vs. 88% with a statistical design and biological indicators (e.g., macroinvertebrate assemblage indices).²

Half of USA states reported no stream/river impairment from habitat degradation;³ however, USEPA's Environmental Monitoring & Assessment Program (EMAP) and Regional EMAP (REMAP) pilots throughout the USA indicated that frequently 20-30% of water bodies in a basin, state, or multi-state region were in poor condition.^{4,5} Common stressors in those regions were diffuse pollutants, physical habitat alteration, and alien species.^{4,5}

EMAP & REMAP pilots and some state agencies have developed quantitative biological indicators for assessing entire aquatic assemblages.⁶⁻¹²

Between 1991 and 2002, EMAP & REMAP pilots have been conducted on inland surface waters in 38 states, all USEPA regions, and on lakes, streams, large & great rivers, and estuaries & near coastal systems.⁶⁻¹²

Currently, 14 states (NH, DE, MA, VA, WV, AL, FL, KY, MS, SC, IN, MS, TX, OR) are employing probability designs in their surface water monitoring programs; and 13 others (RI, VT, NJ, WI, LA, OK, MT, WY, CA, Guam, AK, WA, ID) desire to do so.

Whereas: Several government panels (NRC, GAO, ITFM) have recommended a national, scientifically-designed program for monitoring ecological status and trends.¹³⁻¹⁷

At its winter 2003 meeting, the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) favored establishing a national program for determining the national status and trends of all USA waters. The states felt that this was a good way to meet USEPA's need for a national assessment without necessarily forcing each state program to conform to all others.

The European Union is beginning an international program for assessing ecological integrity in its member nations, employing indicators and designs similar to those developed by EMAP.¹⁸

(continued on page 8)

*WQS RESOLUTION**(continued from page 7)*

Whereas: National implementation of an EMAP-like program for streams and rivers would cost about \$8,000 per site per year for gear, sampling, and sample processing.

An adequate national assessment can be conducted by surveying about 70 river/stream sites per year in each of 12 ecoregions, major river basins, or EPA regions—at an annual cost of \$5.6 million. These funds would primarily be made available to the States, Interstate Agencies, and Tribes for sampling costs.

An additional \$2.4 million per year is needed for training, data entry, acquisition and interpretation of remote sensing data, data analyses, report writing, and journal and pamphlet publication.

Similar site costs would be applicable for other aquatic ecosystems—wetlands, lakes, estuaries, the Great Lakes, and near coastal marine systems.

If funding were available in 2004 to begin the national design and programmatic organization with the states, national-scale field surveys could begin as early as 2006.

Whereas: There are numerous scientific and management values in implementing a national strategy for assessing surface waters.

Expeditious national implementation and continuing support of an EMAP-like program will lead to a consistent, statistically rigorous, ecologically defensible database for assessing current status and long-term trends in a variety of indicators of ecosystem extent and condition.

Such a database will offer researchers a golden opportunity to evaluate surface water ecosystems at continental and smaller scales. Already, EMAP data have provided unique opportunities for ecological analyses at multi-state scales.^{10,19-21}

Remote sensing data, as well as consistent, quantitative chemical, physical and biological indicators, will support holistic landscape and watershed research models for assessing potential effects on aquatic ecosystems of alternative land management scenarios.

A national ecological database will provide managers and legislators the information necessary for rigorously evaluating the impacts of management plans and legislation on alternative future scenarios.

Intensified state programs can be nested within, and apply to, the national design—yet still apply to state-, basin- or ecoregion-scale assessments.

Therefore: We strongly recommend implementation of a permanent, national EMAP-like program, which would provide a consistent framework and indicators for evaluating Clean Water Act compliance and successes at the state or regional levels, and a consistent, national, publicly-available database of ecological information. We thereby urge the USEPA Office of Research & Development and Office of Water to request from Congress multi-year funding specifically targeted for an EMAP-like program in appropriation bills, and that grants to state and interstate agencies be provided under Section 103.

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**Cast your vote by
6 July 2003
See Ballot on
Page 12!**

WATER QUALITY SECTION BUSINESS MEETING

The time and date of the business meeting have not been set. We traditionally have the business meeting in the morning or afternoon of one of the first days of the meeting. We always have refreshments at the meeting so feel free to come and eat while you help conduct the business of the Section. We will inform you via the e-mail list when the date and time of the meeting are set. The date, time, and place of the business meeting will also appear in the Annual Meeting schedule on the AFS website and in your printed program at the Annual Meeting. Please Attend!

UPDATE ON THE SYMPOSIUM AND BOOK: EFFECTS OF URBANIZATION ON AQUATIC ECOSYSTEMS

AFS accepted our proposals for an annual meeting symposium and a book based on the papers presented in the symposium. As the title implies, the presentations and book chapters cover more than just fishes and include effects of urbanization on habitat, benthic macroinvertebrates, and periphyton. As the human population continues to grow and urban areas continue to expand, understanding the effects of urbanization will be essential for protecting and managing our aquatic resources.

We have 19 speakers lined up for the symposium, enough for a full day. A list of the talks and presenters appears below. The Program Committee has not set the date and time of the symposium yet. We will inform you by the e-mail list when the information is available. You can also check the Annual Meeting web page or just check your Program at the meeting. We hope to see you there!

We have continued to recruit book chapter authors to cover a few topics not included in the original proposal. At present we have commitments for 25 chapters, including most of the papers to be presented in the symposium. We will keep you updated on the status of the book in upcoming Newsletters.

Presentations Included in the Symposium:

Fish in Urban Arid West Streams: An Enigma, Contradiction, Treasure, or Memory. Todd L. Harris, Metro Wastewater Reclamation District, Denver, CO

Managing Conflicts on the Lower American River: Can Urban and Agricultural Demands be Met While Maintaining Healthy Fisheries? Leo Winternitz, Sacramento Region Water Forum, Sacramento, CA

Persistence of Organic Compounds in Urban Watersheds Across the United States and the Potential Detrimental Effects to Stream Biota. Anne M. D. Brasher, USGS, Salt Lake City, UT

Land Use Effects on Stream Habitat and Fish Assemblages in a Small Southern California Catchment. Cindy J. Lin, USEPA, San Diego, CA

Associations of Biological Assemblages with Environmental Variables in the Highly Urbanized Santa Ana River Basin, California, U.S.A. Carmen A. Burton, USGS, San Diego, CA

The Occurrence, Condition, and Abundance of Brown Trout (*Salmo trutta*) in Urban Streams Along the Wasatch Front, Utah. Elise M. Giddings, USGS, Raleigh, NC

The Utility of On-Site Habitat Measurements and GIS-Derived Landscape Metrics for the Assessment of an Urban Setting. Steven V. Fend, USGS, Menlo Park, CA

Setting Limits: The Development and Use of Factor-Ceiling Distributions for an Urban Assessment Using Macroinvertebrates. James L. Carter, USGS, Menlo Park, CA

Hydrology, Geomorphology, and Habitat of Urbanizing Streams, Chicago Area, Illinois. Faith A. Fitzpatrick, USGS, Middleton, WI

Importance of Stream Buffers in Easing Impacts of Watershed Urbanization on Fish and Macroinvertebrates. Lizhu Wang, Wisconsin DNR Research Center, Monona, WI

Measuring the Economic Benefits of Urban Water Quality Improvement: Benefit Transfer to the Cape Fear River. John C. Whitehead, University of North Carolina at Wilmington, Wilmington, NC

Effect of Urbanization on Fish Assemblages and Habitat Quality in a Piedmont River Basin. David M. Walters, USEPA, Cincinnati, OH

Effects of Urban Growth on Fish Assemblages in a North Carolina Metropolitan Area, 1970-2000. Jonathan G. Kennen, USGS, West Trenton, NJ

Urbanization Causes and Consequences: Case Studies in the Hudson River Watershed. Karin E. Limburg, SUNY-ESF, Syracuse, NY

Use of Urban Intensity Index and Gradient Design to Assess Effects of Urbanization on Streams in Three Contrasting Environmental Settings. Cathy M. Tate, USGS, Denver, CO

Characterizing Disturbance and Habitat Relationships in Urban Streams. Terry M. Short, USGS, Menlo Park, CA

A Comparison of The Influences of Urbanization on Stream Periphyton Communities in Contrasting Environmental Settings. Stephen D. Porter, USGS, Denver, CO

A Comparison of The Effects of Urbanization on Benthic Macroinvertebrate Communities In Contrasting Environmental Settings: Massachusetts, Alabama, And Utah. Tom F. Cuffney, USGS, Raleigh, NC

Comparison of Fish Assemblage Responses to Gradients of Urban Intensity in Contrasting Metropolitan Areas. Michael R. Meador, USGS, Reston, VA

WORLD EVENTS

Compiled by Bob Gray

2003

June 26 -July 2

ANNUAL MEETING OF THE AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

Manaus, AM, Brazil

Contact: Mo Donnelly, asih@fiu.edu

July 6-11

9TH INTERNATIONAL CONFERENCE ON RIVER RESEARCH AND APPLICATIONS
New South Wales, Australia

Contact: Elizabeth Medley,
conference@conlog.com.au;
www.conlog.com.au/NISORS

August 10-14

AFS 133RD ANNUAL MEETING
Quebec City, Quebec, Canada

Contact: Betsy Fritz;
bfritz@fisheries.org;
(301) 897-8616, ext. 2112

August 10-16

2003 WATER WEEK / WATER SYMPOSIUM AT THE STOCKHOLM INTERNATIONAL WATER INSTITUTE

Stockholm, Sweden

Contact: www.siwi.org/
waterweek2003

2004

May 2-6

FOURTH WORLD FISHERIES CONGRESS
Vancouver, Vancouver BC, Canada

Contact: fish2004@advance-
group.com;
1-800-555-1099;
www.worldfisheries2004.org

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American Fisheries Society
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Corvallis OR 97339*

ADDRESS SERVICE REQUESTED

**2003 BALLOT FOR WATER QUALITY SECTION
OFFICERS & WQS RESOLUTION (SEE PAGES 5-9)**

Please submit ballot to Larry Brown before **6 July 2003** via
email (lrbrown@usgs.gov), fax (916-278-3071), or
mail (5083 Veranda Terrace, Davis, CA 95616)

Please vote for one

President-elect: Brasher___ Simon___ Whalen___

Please vote for one

Secretary-Treasurer: Meldrim___ Write In_____

I support the WQS Resolution (pages 7-9): Yes___ No___