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AES NEWS

○ Spring/Summer
○ Volume 7
○ Issue 2



Dear Members,

Welcome to a new and exciting year. Can you believe that the Aquacultural Engineering Society (AES) has just finished its first decade of existence? What started out as an idea of a small group of people has grown into a successful organization providing engineering education/training to the broader public. The success of AES is attributed first to a core group of people who believe in and tirelessly work towards a common goal of making sure engineering is part of the overall aquaculture picture and secondly to the membership as a whole. It is the members that build a strong, sustainable entity. It can't be done without you.

Before I give my view of the future of AES, I feel I must step back and give thanks to many people. First, and foremost, I would like to sincerely thank our immediate Past-President, Dr. Michael Timmons, for his vision for AES and his commitment to building a stronger, larger society. A new set of officers began their duties at the World Aquaculture Society meeting in Honolulu, Hawaii this past March. As mentioned, Mike Timmons moved to Past President, John Colt from 2nd VP to 1st VP and Sean Wilton was elected as 2nd VP. Thanks to each of you for being committed to moving AES forward. One person who toils behind the scenes and receives little recognition is our secretary/treasurer, Brian Vinci. On behalf of

the society, I want to thank Brain for keeping the society financially secure. Lastly, I would like to thank Oliver Schneider, who is doing a wonderful job maintaining the AES website www.aesweb.org.

Mike Timmons stated two goals for AES in 2003. These were to increase the number of members and to increase the number of services to AES members at the same or lower cost. Several activities were undertaken to achieve these goals. However, the work is not done. Thus, I would like to carry these goals forward into 2004. An additional new goal for AES in 2004 is the increased participation in and exposure of AES in international activities.

Some may question the novelty of Goal #1. I agree. It is not a new, novel idea, but rather a necessary goal to ensure the future success of the society. Mike's pledge at the start of his tenure as President in 2003 to build the membership will be carried over during my tenure. Throughout the society's first decade of operation, we have seen the membership grow from a few dozen to over 250 members. Some may say that's great. I concur. However, we must continue to bring in new, energetic members that have a stake in the future in aquaculture/engineering. As an attempt to encourage students (both undergraduate and graduate) to join, AES is now offering free membership (at the \$25 level) to students who are in "active

status" at their respective schools and have the sponsorship of their academic advisors. Information regarding this offer can be found on the AES website. Also, AES is continuing to support student activities through their travel scholarship program, which began last year. The society has just recently awarded its second travel scholarship to Ms. Andrea Rumberg of West Virginia University (see related story in newsletter). For those current members, I challenge you to encourage your colleagues to join the society. Members do not have to be engineers to join.

As many may have noticed, the AES website is continuing evolving. AES has retained Mr. Oliver Schneider as our webmaster. Oliver is doing a wonderful job expanding our web capabilities to make more information available to our membership. Some of the items that have been added to the "Members Only" section of the website include a discussion thread for members to more easily discuss and debate topics relevant to aquaculture, presentation software, updated membership list, etc. The spreadsheets from the AES workshop session at the World Aquaculture Society meeting in Hawaii have been posted for use. For those of you that have not perused the AES website in a while, please take a look and give us your feedback.

AES is an international society. As such, the membership and activities should reflect this

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Message from the President continued

diversity. Little by little, we are gaining a more visible presence at the international conferences. For this upcoming year, Dr. Jaw-Kai Wang has graciously volunteered to coordinate an AES session at the World Aquaculture Society meeting in Bali, May 2005. Also, Ep Eding has agreed to coordinate the 2007 AES Issues forum, which to date has been held in the United States. The 2007 meeting will be held in Trondheim, Norway. Members will be kept up to date on these and other international opportunities as they progress.

As you can see, AES is moving forward with new and exciting venues and opportunities for participation. I encourage all interested parties to become members of the society. The more the society grows, the more products and services we can offer our members.

Before I sign off, I would like to update you on the Standards and Reporting Task Force. When AES was formed, there was much debate about the need for a set of standard engineering criteria for the evaluation of aquaculture systems. Over the years, there has continued to be much discussion and some advancement. However, a concise set of criteria still do not formally exist. Thus, given the importance of this topic in today's aquaculture arena, the Standards and Reporting Task Force has been rejuvenated under the leadership of Dr. John Colt (see related article in newsletter). Currently John is a committee of one. I encourage anyone who is interested contact John and volunteer your time.

I look forward to serving you as President this year. Feedback and suggestions are always welcome. Remember, this is your society. Its success or failure depends a great deal on your involvement.

Warm Regards,

Kelly

Kelly A. Rusch, President
Aquacultural Engineering Society

New AES Officers and Directors

The AES Officers and Directors plan and coordinate the participation of our society in conferences, workshops and special meetings. Directors serve a two-year term and Officers serve four consecutive one-year terms starting as 2nd VP, then 1st VP, then as President and finally as Past-President. The rotation of Officers and Directors occurs at the end of the AES Annual meeting, which was held at the World Aquaculture Society meeting in Honolulu, Hawaii this past March. The new Officers and Directors are as follows:

New Officers

Pres: Kelly Rusch
1stVP: John Colt
2nd VP: Sean Wilson
Past Pres: Michael Timmons
Sec./Tres: Brian Vinci

Returnig Directors

Greg Boardman
Dave Brune
John Riley
Ep Eding
John Colt

New Directors

Shulin Chen
Brian Brazil
Wayne Peters
Roger Viadero
Richard Patterson

Departing Officer

Steven Summerfelt

Departing Directors

Tim Pfeiffer
James Muir

2004 AES Committee Chairs and Liaison Appointments

| | |
|---|----------------------------|
| Nominating Committee Chair | Michael Timmons |
| AES Liaison with other societies (i.e., WAS, EAS, etc.) | Barnaby Watten |
| Publication Committee Chair | Tim Pfeiffer |
| New Products Publication Co-chairs | John Colt and Mike Timmons |
| Promotions and Meeting Committee Chair | Roger Viadero |
| Awards Committee Chair | Barnaby Watten |
| JSA Aquaculture Effluents Task Force Representative | Ron Malone |
| AES Proceedings Editor | Mike Timmons |
| AES News Editor | Sean Wilton |
| AES Webmaster | Oliver Schneider |
| AES Listserv Manager | Raul Piedrahita |
| Corporate Sponsor Liaison | AES Secretary/Treasurer |

Program Chairs

| | |
|---|--------------|
| <i>World Aquaculture 2005, Bali</i> | Jaw-Kai Wang |
| <i>2007 AES Issues Forum, Trondheim, Norway</i> | Ep Eding |
| <i>Aquaculture America 2005, New Orleans, LA</i> | Sean Wilton |
| <i>5th International Conference on RAS in Roanoke, VA</i> | Mike Timmons |

In Memorium



He will be remembered and missed

PULLMAN, Wash. -- According to the Israeli newspaper, Haaretz, Brit Johnson, 26, was snorkeling in the Red Sea after work when he became entangled with a rock. He was an avid participant in outdoor activities. He rode his bicycle to work, often stopping to swim in the sea.

Johnson won the Best Presentation Award at the 2003 AES Issues Forum. The Project was titled "Improving Waste Transportation and removal efficiencies in floe-through raceways."

His research interest was raising fish in aquaculture systems that purify and recirculate water. With the scarcity of water in Israel, such systems are common there. He was working at the National Center for Mariculture in Eilat, Israel.

At WSU, Johnson earned a master's degree in December 2003 and proceeded into a doctoral program. He earned his undergraduate degree at Georgia Tech.

Johnson's advisor was Shulin Chen, a Professor in the Department of Biological Systems Engineering. Chen said, "His death is a tremendous loss to all of us who knew him. We will really miss him."

David Yonge, a professor in the department of civil and environmental engineering who supervised the National Science Foundation program that supported Johnson, said, "You could not hope to meet a more caring, creative and warm individual."

Pat Huggins, the department's administrative assistant, remembered Johnson as "kind and caring," in spite of enduring the stresses of being a graduate student. "He brought us all flowers his last week to say thank you," she recalled. "He will be remembered and missed."

Johnson is survived by his parents, the Robert Johnsons, Lilburn, Ga.

New Appointed Chair of Standards and Reporting Task Force

John Colt was appointed chair of the Standards and Reporting Task Force at the BOD meeting in Hawaii. The primary focus of the task force in 2004 will be the development of reporting standards for biofilters and aquaculture production systems. Additional reporting standards for other unit processes will be developed in the future. When developed, these standards will be required for any manuscript published in *Aquacultural Engineering*.

In cooperation with the Oceanic Institute, AES is also organizing a workshop

in Hawaii (November 2004) entitled DESIGN AND SELECTION OF BIOLOGICAL FILTERS FOR FRESHWATER AND MARINE APPLICATIONS. The long-term objectives of this workshop to develop standards for the design and selection of biological filters.

Anyone interesting in working on the Standards and Reporting Task Force, please contact John Colt at john.colt@noaa.gov or 206-860-3243.

AES Paper Awards

Awarded March 3, 2004

Superior

Songming Shu and Shulin Chen

The Impact of Temperature on Nitrification Rate in Fixed Film Biofilters

Citation

The impact of temperature on nitrification rate in fixed film biofilters

Aquacultural Engineering, Vol. 26: 221-237

Honorable Mention

Anthony M. Hart, Ferral E. Lasi, and Edward P. Glenn

SLODS

Slow Dissolving Standards for Water Flow Measurements

Citation

SLODS: slow dissolving standards for water flow measurements

Aquacultural Engineering, Vol. 25: 239-252

Honorable Mention

Roger C. Viadero Jr. and James A. Noblet

Membrane Filtration for Removal of Fine Solids from Aquaculture Process Water

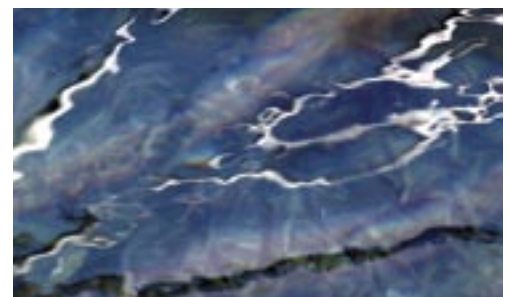
Citation

Membrane filtration for removal of fine solids from aquaculture process water

Aquacultural Engineering, Vol. 26: 151-169

Aquaculture without Frontiers

The AES Board of Directors recently approved a motion to support the newly formed Aquaculture without Frontiers AwF; <http://www.aquaculturewithoutfrontiers.org/> program. AwF is an independent, non-governmental organization founded on two goals; responsible aquaculture within developing countries and the alleviation of poverty. AES has donated \$500 to this cause. Anyone who is interested in the organization can contact Michael New for more information. Michael_New@compuserve.com.



VENTURI FOAM FRACTIONATION

Practical Guidelines For Operation

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INTRODUCTION

When adjusted correctly and used under appropriate environmental conditions, foam fractionation is an effective means of removing dissolved organic material (30 μm) from an aquaculture system. Why then has the foam fractionator developed a reputation for being unpredictable and difficult to manage? The main reason being that fractionator performance is dependent on a number of factors, both environmental and as a result of engineering. There are a number of publications explaining the different types of foam fractionators, the theory behind their operation and the factors that influence their function. Rather than summarize the contents of this literature, this article intends to examine a particular fractionator, the counter-current venturi foam fractionator, from the viewpoint of an aquaculture technician. A simplified description of the design and practical operation of a venturi foam fractionator is followed by a basic plan for optimization and a brief discussion concerning the influence of environmental variables.

THE COUNTER-CURRENT VENTURI FOAM FRACTIONATOR

The counter-current venturi foam fractionator (VFF) is perhaps the most com-

mon type of foam fractionator. A number of commercially manufactured units are available, in a range of sizes from aquarium to production scale. The ability to simply retrofit an existing recirculating system with a VFF is one of the main reasons for its popularity.

A typical VFF is illustrated in Figure 1. To retrofit an existing system with a VFF loop the only requirements are a water pump and a gravity return. The pump not only provides the flow, but also the air bubbles. Culture water enters the top of the fractionator column and flows downward. Air, along with a small volume of water, is injected at the bottom of fractionator column through a venturi. As the air rises, hydrophobic waste material (i.e. organic material, proteins, etc.) attaches to the bubbles and is brought to the surface. The waste material helps to stabilize the foam layer, allowing it to be discharged through the collection cone.

An inherent advantage of the VFF over units using air stones is that the smaller bubbles produced by the venturi have a greater surface area per unit volume and a slower rise time. These factors improve fractionator efficiency by increasing the contact time between the culture water and the air bubbles. Other design characteristics such as the counter-current air/water flow and column height also aim to increase contact time. In fact, the main purpose of "tuning" a fractionator is to achieve the maximum contact time for a given flow rate of water under specific environmental conditions.

A VFF has 4 main valves for adjustment (Figure 1). Valve 'A' controls the flow of

separatory water into the fractionator. Valve 'B' controls the flow of water into the venturi apparatus, thereby also affecting the flow of air into the fractionator. Valve 'C' also controls the flow of air into the venturi. Valve 'C' is not normally included, but is useful for fine-tuning the volume of air introduced. Valve 'D' controls the flow of water out of the device. Adjustment of valve 'D' affects the level of water in the column, also referred to as the "bed height". On many units, valve 'D' is replaced by a standpipe.

The addition of several metering devices greatly facilitates fractionator tuning (Figure 1). A device measuring the flow of separatory water into the fractionator (Qsep) is essential. An air-metering device upstream of valve 'C' is beneficial to adjusting the flow of air (Qair). However, it must be noted that the negative pressure exerted by the venturi skews the calibration of the flow meter. Despite this inaccuracy, the readings are still useful in making day-to-day adjustments of Qair. An absolute necessity is the ability to visually monitor the bed height. Commercially available fractionators generally feature a transparent top portion just for this purpose. The capacity to visually assess the entire column for even dispersion of bubbles and overly turbulent flow is also advantageous, although not always practical for large units.

To optimize a VFF the effluent must be collected. There can be dramatic changes in the rate of effluent discharge over a 24-hour period. A vessel capable of holding a days worth of discharge allows for the total volume to be measured directly. To determine the concentration of solids removed, a sample can be drawn from the effluent and visually compared with those from previous days. While these concentrations can be enumerated for research purposes, a visual assessment of clarity may be all that is necessary within a production setting.

A GENERAL GUIDE TO FRACTIONATOR TUNING

Initial setting and subsequent adjustments to the fractionator should be made at the same time daily. In high-density systems, it is recommended that this setting be

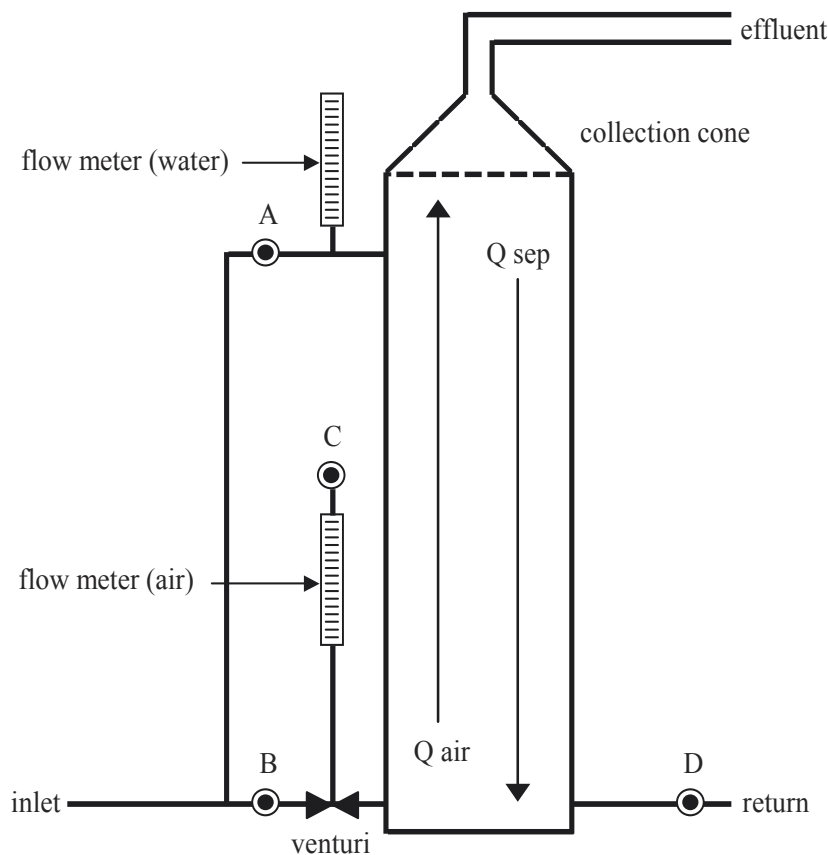


Figure 1. Typical counter-current venturi foam fractionator. The adjustment valves referred to in the text are labelled as A, B, C and D.

performed prior to the first feeding of the day.

BASELINE SETTING OF THE FOAM FRACTIONATOR

Open valves 'A', 'C' and 'D' completely. Close valve 'B' completely. In this configuration Q_{sep} is at a maximum and the highest volumetric turnover rate of the system is achieved. Record this value for reference.

Close valve 'A' until the Q_{sep} necessary to produce the desired turnover of the fractionator is achieved.

Open valve 'B' until Q_{air} is equal to 0.2 Lpm per cm^2 of the fractionator diameter. Depending on the unit, it may be necessary to slightly readjust valve 'A'. Do not include water entering through the venturi in the turnover calculation.

Slowly close valve 'D' until the surface layer stabilizes at the lower edge of the

collection cone. Now that a baseline setting has been achieved, the VFF can be adjusted to suit the system.

BED HEIGHT ADJUSTMENT

First, determine your target volume of effluent per 24 hours. From practical experience a target effluent volume of even 0.1 to 0.25 percent of the system volume can be effective. If water replacement is not an issue, a greater discharge is likely to increase the total removal.

Run the fractionator for 24 hours at the baseline setting.

Check the volume of effluent in the collection vessel. If the volume is too low, slightly increase the bed height by closing valve 'D'. If the effluent volume exceeded the target volume, slightly lower the bed height by opening valve 'D'.

Repeat steps 2 to 4 until the desired effluent volume is achieved. Mark this level on the fractionator column.

AIRFLOW ADJUSTMENT

Prior to emptying the collection vessel, take a sample of the effluent daily. The samples can be refrigerated in capped containers and will serve as a benchmark for adjustments.

Slightly decrease Q_{air} by closing valve 'C'. If necessary, re-adjust the bed height using valve 'D'.

Run the fractionator for 24 hours.

Visually compare a sample of the effluent with that from the day before. If the new effluent is more dilute, increase Q_{air} by completely opening valve 'C', then slightly open valve 'D' to increase the flow of air further. If the new effluent is more concentrated, decrease Q_{air} by closing valve 'C' until effluent concentration peaks.

Continue with these adjustments until the fractionator is optimized. Regular monitoring of the effluent can then be reduced to weekly or bi-weekly.

ENVIRONMENTAL VARIABLES AND VFF PERFORMANCE

The impact of environmental variables on VFF performance can be great. Perhaps the most influential of these variables are salinity and pH. Both salinity and pH affect the hydrophobic attraction of organic wastes. Increases in either parameter generally results in a more stable foam layer and increased removal. Water quality parameters that influence the flow of gases and water (i.e. temperature) also alter VFF function. These changes are likely to be minimal under normal culture conditions. Changes to the feed regime can also change fractionator performance. Increases in ration increase the load on the system and often boost performance until the capacity is achieved. Even changes in the composition of feed can impact VFF operation. Components of feed, presum-

Continued on page 6



To the Fifth International Conference on Recirculating Aquaculture

To be held at the Hotel Roanoke and Conference Center in Roanoke, Virginia, on July 22-25, 2004.

Our biennial conference and trade show is the premier forum for sharing ideas, the latest research, opportunities and technologies in recirculating aquaculture systems. It is designed for entrepreneurs, researchers, operators, managers, fishery biologists, veterinarians, engineers, food technologists, teachers, government regulators and administrators, financial managers and lenders, advisory and extension personnel. The conference features symposia on nutrition, waste management, genetics and physiology, recirculatory pond systems, species and endangered species, aquaria, fish health,

bait fish, ornamentals, business management, economics and financing, international operations, education and outreach. Our popular trade show will feature exhibits from businesses, government and educational organizations that provide equipment and services to producers and supporting businesses in the aquaculture industry. Also included again this year will be guided tours of selected recirculating aquaculture research facilities.

If you need more information, please email us at aqua@vt.edu or call 540-231-6805. We hope to hear from you soon!

Continued from page 5

ably lipids, can collapse the foam layer of a fractionator resulting in little or no effluent. Over a period of hours, the surface layer gradually stabilizes and with it the rate of effluent discharge. This is a particularly important point to consider when adjusting the fractionator bed height. If bed height is set while the surface layer is unstable, an excessive volume of effluent may be discharged following stabilization.

CONCLUSION

The number of variables influencing VFFs and the wide range of environmental conditions present in aquaculture make estimation of foam fractionator performance complex. Perhaps the best advice for those interested in pursuing foam fractionation is to define the operating parameters of their culture system and determine how these conditions will impact VFF performance. Then, if a fractionator still appears feasible, size it correctly and become familiar with its design and adjustment. Finally, set up a plan for regular monitoring and adjust the unit to suit the specific needs of the system.

James Webb, M.S. Aquaculture

Since joining the Aquaculture division in 2003, James has focused primarily on the design of new recirculating culture systems and facilities. As these facilities have become completed, James develops the operational and management protocols neces-

Upcoming Conferences

- | | |
|-------------------|--|
| June 22-24 | Stavanger, Norway – Aqua Vision website: http://www.aquavision.nu/index.html |
| July 19-23 | Imperial College, London, England – FSBI/EAS International Fisheries & Aquaculture Conference. website: http://fp.paceprojects.f9.co.uk?FSBI2004home.htm |
| July 22-25 | Roanoke, VA, USA – Fifth International Conference on Recirculating Aquaculture. website: http://www.conted.vt.edu/aquaculture/r-aqua |
| Sept 12-15 | Manila, Philippines – ISTA VI International Symposium on Tilapia Aquaculture. website: http://ag.arizona.edu/azaqua/ista/announce2.htm |
| Sept 26-29 | Sydney, Australia – Australasian Aquaculture 2004 website: http://www.australasianaquacultureportal.com/conference.asp |

Membership Renewal Notice

Aquacultural Engineering Society
 c/o Freshwater Institute
 P.O. Box 1889
 Shepherdstown, WV 25443
 (304) 876-2815
 www.aesweb.org

If this notice has crossed in the mail with your payment, please accept our apologies and disregard this notice.

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Please check the contact information to the left and if necessary cross out any information and correct below.

Name
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 Postal Code
 Country
 Phone
 Fax
 Email

2. SELECT YOUR MEMBERSHIP OPTIONS

\$25 2004 Annual Membership

Includes: One year subscription to the AES quarterly newsletter AES News (Volume 7)
 AES Member Directory for 2004
 Access to the Members Only section of the AES website

Options (additional cost to the \$25 annual membership dues):

\$63 One year subscription to Elsevier's journal Aquacultural Engineering (Volumes 30 & 31).

\$25 Express delivery of international journal mailings (not required if surface mail is acceptable).

_____ Total

3. SEND YOUR PAYMENT

Check enclosed (Made payable to *Aquacultural Engineering Society* in US Funds)

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Credit Card #: _____ Expiration Date: _____

Name on Card: _____ Signature: _____

Please send this form and payment to:
 Aquacultural Engineering Society, c/o Freshwater Institute
 P.O. Box 1889, Shepherdstown, WV
 25443, USA
 Fax: (304) 870-2208



AES Student Travel Scholarships

Last year, AES began offering a \$500 travel scholarship to a student presenting at an AES sponsored conference/workshop. Ms. Andrea Rumberg, a graduate student in the Department of Civil and Environmental Engineering at West Virginia University, recently won this award for her presentation titled "Characterization of Quiescent

Zone Hydrodynamics in Flow-Through Aquaculture Systems: Implications for Solids Removal". This talk was presented at the World Aquaculture Society Conference held in Honolulu, Hawaii, March 1-5, 2004. Ms. Rumberg's graduate advisor is Dr. Roger C. Viadero.

Free Membership For Students

AES is now offering free membership to students (undergraduates and graduates) with an interest in the society.

Interested students can fill an application form out online at www.aesweb.org.

They must also provide:

- 1) Proof that they are in "active" status at their school.
- 2) A written statement from their advisor supporting their membership. Researchers and faculty are encouraged to let their students know of this opportunity.

Submission Info

The Proceedings of the ISTA's have been one of the most important sources of information on tilapia aquaculture and the advances in the science and industry over the last 20 years. Prospective authors are invited to submit manuscripts to:

Dr. Remedios B. Bolivar
Freshwater Aquaculture Center
Central Luzon State University
Munoz, Nueva Ecija 3120
PHILIPPINES
Phone: (044) 456-0681; (044) 456-0680
Fax: (044) 456-0681
email: rbolivar@mozcom.com

Please submit manuscripts in electronic file form. MS word for PC is the preferred format. Additional conference details, registration, and author instructions are available at <http://ag.arizona.edu/azaqua/ista/announce2.htm>

The AES is looking for sponsors within the aquaculture industry to support the cost of producing the AES News. The sponsors listed below have donated generously to support the AES in 2004.

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|---|--|--|--|
| <p>Aquatic Eco-Systems, Inc. 1767 Benbow Court Apopka, FL 32703 ph: (407) 886-3939 fax: (407) 886-6787 aes@aquaticeco.com www.aquaticeco.com</p> | <p>PRAqua Technologies Ltd. 1635 Harold Road Nanaimo, BC, CA V9X 1T4 ph: (250) 714-0141 fax: (250) 714-0171 info@praqua.com www.praqua.com</p> | | |
| <p>Aquaculture Systems Technologies, LLC. P.O. Box 15827 New Orleans, LA 70175 ph: (800) 939-3659 fax: (504) 837-5585 info@BeadFilters.com www.BeadFilters.com</p> | <p>Water Management Technologies, Inc. P.O. Box 66125 Baton Rouge, LA 70896 ph: (225) 755-0026 fax: (225) 755-0995 info@w-m-t.com www.w-m-t.com</p> | | |
| <p>Aquaneering, Inc. 8280 Clairemont Mesa Blvd., Suite 117 San Diego, CA 92111-1708 ph: (858) 541-2028 fax: (858) 541-2048 info@aquaneering.com www.aquaneering.com</p> | <p>Marine Biotech, Inc. 54 West Dane Street, Unit A Beverly, Massachusetts 01915 ph: (978) 927-8720 fax: (978) 921-0231 sales@marinebiotech.com www.marinebiotech.com</p> | | |
| <p>Holder Timmons Engineering Ltd.</p> <table border="0"> <tr> <td data-bbox="110 1843 272 1982"> <p>USA Office: 126 Sunset Drive, Ithaca, New York 14850 ph: (607) 255-1630, mibt3@cornell.edu</p> </td> <td data-bbox="347 1843 509 1982"> <p>CDN Office: 606 Evergreen Ave. Courtney, BC, CA, V9N7N5 ph: (250) 897-1334, jholder@island.net</p> </td> </tr> </table> <p>www.holdertimmons.com</p> | <p>USA Office: 126 Sunset Drive, Ithaca, New York 14850 ph: (607) 255-1630, mibt3@cornell.edu</p> | <p>CDN Office: 606 Evergreen Ave. Courtney, BC, CA, V9N7N5 ph: (250) 897-1334, jholder@island.net</p> |  |
| <p>USA Office: 126 Sunset Drive, Ithaca, New York 14850 ph: (607) 255-1630, mibt3@cornell.edu</p> | <p>CDN Office: 606 Evergreen Ave. Courtney, BC, CA, V9N7N5 ph: (250) 897-1334, jholder@island.net</p> | | |



AES Information

For donations, the AES will be inserting a one-page product literature sheet in one of the newsletter mailings, and list the vendor as an AES supporter in four consecutive newsletters. Please contact one of the AES News Co-Editors if you would like to be a sponsor.

The AES News is printed quarterly by the Aquacultural Engineering Society. You can receive the AES News by joining the Aquacultural Engineering Society. If you would like to discuss the contents of the AES News, or, if you would like to contribute information to the AES News, please contact the editor:

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