

ASLO BULLETIN

American Society of Limnology and Oceanography

Volume 6(1)

SPRING, 1997

CONTENTS

MESSAGE FROM THE PRESIDENT	
Conveying the Excitement of Our Discoveries	1
ASLO NEWS	
Call for Papers: Special Symposium Volume of L&O	3
Representing Student Interests in ASLO	3
Applications Requested: Grad. Student Rep. to ASLO Board	3
Interim Report, Ad Hoc Education Planning Committee	4
Notes from the ASLO Business Office	4
International Collaborations in Aquatic Science	5
FUTURE OF ASLO: 1996 Committee Report	6
BIOGRAPHICAL SKETCHES, 1997 ASLO CANDIDATES	9
1997 ASLO AWARDS	
Christopher Freeman Receives Raymond L. Lindeman Award	16
Bess B. Ward Receives G. Evelyn Hutchinson Award	17
Alan R. Longhurst Receives Lifetime Achievement Award	20
Robert H. Peters Receives ASLO Citation for Scientific Excellence	23
Polly A. Penhale Receives ASLO Distinguished Service Award	27
1997 Outstanding Student Poster Award Recipients	28
1997 ASLO Student Travel Award Recipients	30
ASLO FORUM	
San Francisco Bay, the Ecosystem	31
NSF Geosciences Town Meetings	31
Reference Bibliography: Effects of Fish on Lakes	32
EDUCATION	
Raymond P. Gerber Appointed <i>ASLO Bulletin's</i> Ed. Section Editor ..	32
Preparing Successful Education Grant Proposals	32
Environmental Outreach Slide Shows Available	33
ASLO MEETINGS	
Upcoming Meetings	34
1998 Joint ASLO/ESA Meeting	34
JOBS	35
CALENDAR OF EVENTS	35

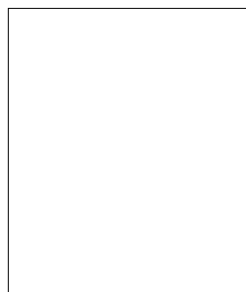
ASLO home Page: <http://aslo.org/>

REMEMBER TO VOTE!
Candidate Bios start on p. 9

MESSAGE FROM THE PRESIDENT

CONVEYING THE EXCITEMENT OF OUR DISCOVERIES

Diane M. McKnight, Institute of Arctic and Alpine Research, University of Colorado, 1500 30th St., Boulder, CO 80309-0450 (Tel: 303-492-4687; Fax: 303-492-6388; mcknight@stripe.colorado.edu)



About 10 years ago, I received a call from a writer from a magazine who was writing an article about interesting scientists and had been given my name by the United State Geological Survey (USGS) Director's office. I enthusiastically explained my research on Antarctic lakes, on lakes in the blast zone of Mt. St. Helens, and on toxic trace

metals in acid mine drainage streams in the Rocky Mountains. Although he had seemed interested during our conversation,

at the end he commented, "Well, I guess what you do just isn't as exciting as nuclear physics." Nuclear physics? I was stunned. I had failed to portray limnology as being fundamentally exciting, as a field with exciting new discoveries. From this and other experiences I have tried to learn to convey more effectively the significance and the inherently interesting aspects of research in freshwater ecosystems.

Working in Antarctica provides ready-made opportunities to interact with reporters, writers and photographers. This past season we were fortunate to have a photographer from *National Geographic* accompanying us in the dry valleys, and it was fascinating to hear an insider's perspective on how the media presents science to the public. Limnology and oceanography should have an advantage over many fields because of the great potential for great photographs that can catch people's attention. Field research also has an expeditionary aspect and a timeline that lends itself to

The ASLO Bulletin is published 3 times annually (March, August and November) by the American Society of Limnology and Oceanography to provide members with up-to-date information on Society activities and to serve as a forum for open discussion.

EDITOR:

C. Susan Weiler, ASLO Executive Director, Whitman College, Walla Walla, WA 99362, USA
Tel: 509-527-5948; Fax: 509-527-5961; Internet: weiler@whitman.edu

TARGET DATES

for submissions: February 10, July 10, & October 10

ADVERTISING:

Jobs, opportunities: \$14/line (80 characters & spaces per line); send to **Susan Weiler** (address above).
For-Profit advertisers: Camera-ready copy only; send to **ASLO Business Office**: (address below).

MOVING?

Send your change of address to: **ASLO Business Office**, 5400 Bosque Blvd. Suite 680, Waco, TX 76710-4446
Tel: 800-929-ASLO (U.S., Canada and Carib.) or 817-399-9635; Fax: 817-776-3767; Internet: business@aslo.com

explanation of the research process to the layperson. Our colleague Bill Green has recently been recognized with the prestigious Burroughs Medal for excellence in natural history writing for his book *Water, Ice and Stone: Science and Memory of the Antarctic Lakes*, in which he recounts the scientific and personal aspects of his experiences studying the dry valley lakes. In receiving this award, Bill Green joins a group of distinguished writers (Rachel Carson, John McPhee, and Barry Lopez) and demonstrates that it is possible for a scientist to successfully convey the excitement of studying lakes and oceans.

Although back in the states, the media is not delivered to our labs and research vessels in the same way that they are flown in by helicopter to our camp in Antarctica, most universities have public relations offices that may be able to help make contact. If many of us increased our efforts to bring our science to the attention of the media we might be able to achieve a higher level of interest than presently exists among the public.

Another major challenge is to increase the standing of limnology and oceanography within the broader scientific community. We need to overcome the impression that some

scientists have that somehow our research is mundane and practical and not on the exciting cutting edge of new understanding. In discussing this problem with George Kling awhile ago, he suggested that a coordinated campaign might be effective in addressing this challenge. Many of us have noted that the number of articles in the journals *Science* and *Nature* which cover new results in limnology and oceanography, or aquatic science in general seem to be few and far between. If it is true that this situation to some extent reflects the proportion of papers from our fields submitted to these journals, then we can collectively act to change this by making an effort to submit more of our most exciting results to these journals. If we think of this as a step taken for the benefit of the fields as a whole rather than for individual career advancement, it may be easier to put up with the extra trouble of writing the paper in less than as few words as possible, presenting the main result with only one or two figures and dealing with the possible disappointment of rejection without review. I put forward these suggestions for consideration and welcome other ideas from the ASLO membership.

Your Vote Counts!

Candidate biographies for Secretary and Members-at-Large start on p. 9. Your ballot and a mailing envelope are enclosed.

Turner Designs Ad

CALL FOR PAPERS: Special Symposium Volume of *Limnology and Oceanography*, The Effects of Multiple Stressors in Freshwater And Marine Ecosystems

Sybil P. Seitzinger, Institute of Marine and Coastal Sciences, Rutgers University, Cook College, P.O. Box 231, New Brunswick, NJ 08903 (Tel: 908-932-6555 x342; sybil@ahab.rutgers.edu)

The ASLO Board has recently approved publication of a special volume of L&O that addresses the effects of multiple stressors in freshwater and marine ecosystems. This volume grew out of a special session on multiple stressors at the recent ASLO meeting in Santa Fe. The volume will contain papers developed from presentations made during that session, as well as additional contributed papers. If you would like to contribute a paper to this special issue of L&O, please contact one of the co-editors immediately. The volume focusses on the basic tenet that marine and freshwater organisms are exposed to multiple stressors of both natural and anthropogenic origin. However, previous studies have primarily addressed the effect of single stressors. Papers in this volume will include studies of multiple stressors at the individual, population, community and ecosystem levels of organization. Papers from both theoretical and applied perspective are encouraged. We are especially interested in papers that explore the question of whether aquatic systems differ in their response to, and ability to recover from, multiple vs. single stressors.

Deadline for submission of papers: 15 JUNE 1997

Please contact one of the co-editors (Denise Breitburg (Tel: 410-586-9711; breit@acnatsci.org), Sybil Seitzinger (908-932-6555 x342; sybil@ahab.rutgers.edu) or James Sanders (410-586-9707; jsanders@acnatsci.org) immediately, if you are planning to submit a manuscript for this volume of L&O.

REPRESENTING STUDENT INTERESTS IN ASLO

Karla B. Heidelberg, University of Maryland's Center for Environmental and Estuarine Science, Horn Point Environmental Laboratory, P.O. Box 775, Cambridge, MD 21613 (Tel: 410)-221-8212; Fax: 410-221-8490; karla@hpel.cees.edu)

The American Society of Limnology and Oceanography has taken a unique stand among professional societies by creating two positions for student representatives on their board of directors. In doing so, ASLO has shown its commitment to respond to a changing scientific community. As the first of these representatives, I hope to function as an active liaison between the ASLO leadership and students. This is our chance to demonstrate that graduate students are interested, involved and should be considered as an integral part of the professional scientific community.

Did you know that students comprise 22% of ASLO's membership (813 students)? Even with these large numbers, I think that there are a lot of students who are not yet members. Through active membership recruitment of our peers, we can further increase our representation. As the representative, my primary goal is to provide a consensus view of

student issues and concerns to the Board of Directors. Specifically, I hope to continue to encourage interdisciplinary research, to enhance awareness of the variety of careers available to scientists, and to increase public awareness of environmental issues facing our aquatic systems. As a unified group, students can provide an important contribution to the direction that our professional society is moving.

One responsibility of professional scientific organizations, such as ASLO, is to help formulate a realistic portrait of career opportunities, both within and outside of research. Students that go on to a career in research will need to have educational experiences that promote work at the interface between disciplines, oftentimes incorporating new technological advances. Some students will choose, or be forced into, work outside of primary research (e.g., government agencies, teaching, or the private sector), so their educational experiences need to promote the development of skills suited for competition in this portion of the job market.

I hope to increase awareness of employment postings of available positions related to limnology and oceanography and to establish a student-forum portion of the webpage. A specific website will better allow the discussion of issues promoting suggestions in a timely manner. Until this site is established, please share your thoughts on such topics as the ASLO Web Page, accessibility and quality of professional meetings, underrepresented minorities in ASLO, why you became a member, or any other topic by contacting me at <karla@hpel.cees.edu>. I want to hear about issues that you have concerning your professional field. This is your opportunity to be heard!

APPLICATIONS REQUESTED: GRADUATE STUDENT REPRESENTATIVE TO THE ASLO BOARD

Susan Weiler, ASLO Executive Director (weiler@whitman.edu)

In recognition of the importance of students in our community, The ASLO Board has decided to have two graduate student representatives to the ASLO Board who will participate in deliberations at the ASLO Board meetings and between meetings. This winter, Karla Heidelberg was selected to be the first Student Representative on the ASLO Board of Directors (see article above). While her term does not officially begin until July 1, 1997, she was invited to participate in the February 9, 1997 meeting of the Board.

Applications are now being accepted for a second student position, also with a one-year term to begin on July 1, 1997.

Current graduate students who are ASLO members can apply for the positions, and selections will be made by a committee of the ASLO Board, which will include the president and president-elect. Details for the application are available on the ASLO homepage or can be obtained by contacting Susan Weiler (weiler@whitman.edu).

Applicants should provide the following:

- 1) Name, address, phone, fax, e-mail, institutional affiliation,

date began graduate study

- 2) Statement of interest in serving on the ASLO Board
- 3) Description of background that would contribute to the ASLO Board
- 4) Brief CV (1 page maximum)
- 5) Letter of recommendation

The deadline for applications is May 30, 1997. Please address questions and applications to Susan Weiler (weiler@whitman.edu).

INTERIM REPORT FROM THE AD HOC EDUCATION PLANNING COMMITTEE

Raymond P. Gerber, Ad Hoc Education Planning Committee Chair, Department of Biology, Saint Joseph's College, Standish, ME 04084 ((Tel: 207-893-7906; rgerber@sjcme.edu)

Progress on defining ASLO's future role in education continued at the Annual ASLO Meeting in Santa Fe. A standing committee on education was created in 1995, and this year an Ad hoc committee was established to discuss and make recommendations on future educational activities as a follow up to the two NSF-sponsored workshops held at the 1995 and 1996 ASLO meetings. Ad hoc committee members included all members of the standing committee on education, plus others with an interest in education (*Raymond P. Gerber, ad hoc committee chair; Brian L. Bingham ; *David F. Brakke; *James B. Cotner, Jr.; *Russell L. Cuhel; *Bart T. De Stasio, Jr.; Linda E. Duguay; Charles R. Goldman; **Nancy H. Marcus; Marilyn S. Mayer; Gisele Muller-Parker; *David M. Karl; Richard W. Spinrad; *Robert W. Sterner ; Barbara K. Sullivan; C. Susan Weiler; Robert G. Wetzel; James A. Yoder; and Stephan I. Zeeman).

* member, standing committee on education

**chair, standing committee on education

On Tuesday, February 11, 1997 about 14 of us met at the Sweeney Center to share observations and ideas about aquatic science education in the broadest sense. In terms of the disciplines, the group consisted of a mix of both limnologists and oceanographers. In terms of teaching experience the range varied from first-year faculty who had little, to those who had many years of teaching. There was also a good mix of faculty from small liberal arts colleges as well as the larger universities. It was clear that the committee was made up of dedicated educators who wanted to improve aquatic education and who wanted to see ASLO take a more active role in this area.

The plan of the meeting was to provide a open forum for brainstorming of ideas and to get a sense of what was important to the group and to ASLO. Attendees shared their personal teaching experiences indicating the strengths and weaknesses of their programs. Some discussed various ways they are involved with aquatic education beyond their classrooms. Much of the discussion was on undergraduate education plus ways of educating teachers (K-12), the general public and policy makers about the aquatic sciences. Various methods and media to communicate education goals were suggested. The result was a rather full list of recommendations which

ASLO can consider as part of its future education goals.

I thank all committee members for their active participation in developing the report. On behalf of the full committee, I thank David Schindler for reading and commenting on a draft version of the report.

Right now the process of compiling comments from the committee participants, and revising and re-circulating the draft report is underway. I particularly thank David Brakke for his role in this process. The completed report will contain recommendations and ideas for consideration and prioritizing by the ASLO Education Committee, who will in turn make their recommendations to the ASLO Board of Directors.

NOTES FROM THE ASLO BUSINESS OFFICE

Helen Schneider, ASLO Business Manager (Tel: 800-929-ASLO, 817-399-9635; Fax: 817-776-3767; business@aslo.org)

With the spirit rejuvenating sense of Spring fast approaching, we are greeting the new season with much enthusiasm and with high regard for the new friends we have made in ASLO so far. We were glad to meet so many of you in Santa Fe and are glad to have had the opportunity to be a part of such an outstanding meeting. In fact, if you or one of your colleagues has an interest in receiving the **ASLO '97 abstract book**, we do have a small supply available at the costs of \$20 USD per book sent to North American addresses and \$30 USD per book for mailings overseas. Quantities are limited, so contact us as soon as possible if you have an interest in any additional books. This is a tremendous collection that accurately records the papers and invaluable information presented in Santa Fe.

We continue to add new names to the list of ASLO members, and membership numbers remain strong. The most successful avenue for finding new members is word of mouth, so please continue to talk about ASLO to your friends and colleagues. It is interesting for potential new members to know that ASLO has been the leading professional organization for researchers and educators in the field of aquatic science for more than 50 years!

ASLO has acquired booklets presenting the Executive Summary of a report by the National Research Council entitled **Freshwater Ecosystems: Revitalizing Educational Programs in Limnology**. The booklet provides recommendations for strengthening education in the field of limnology in order to ensure the readiness of the next generation of practitioners. Among other things, the work discusses how limnology can contribute to appropriate policies that address the challenges the threaten this nation's freshwater supply. These summary booklets may be particularly useful in gaining support for expanding and enhancing limnological education at your university. This report is available to ASLO members for \$3.00 USD to cover costs associated with shipping and handling. Please contact the business office if you are interested in receiving a copy.

Finally, if you have moved recently and have not sent us your change of address, please contact us immediately. Your ASLO dues were payable on January 1, and fourth notices were recently mailed to all those members who had not yet

responded. It is very important that we hear from you soon. If we do not receive payment of dues before April 1, members will be dropped from the membership, and subscriptions to *Limnology & Oceanography* will cease. Please contact us today via phone at 800-929-ASLO (Inside the U.S.), 817-399-9635 (Outside the U.S.), via fax at 817-776-3767, or via e-mail at business@aslo.org. I look forward to hearing from you.

INTERNATIONAL COLLABORATIONS IN AQUATIC SCIENCE

C. Susan Weiler (weiler@whitman.edu)

A panel discussion on funding international collaborations was held at the ASLO '97 meeting in Santa Fe. Currently 31% of ASLO members reside outside the U.S. While ASLO meetings provide one important way to meet and interact with colleagues from different countries, it is not enough. Many members would like to initiate or expand international research collaborations between scientific meetings. Many members, particularly our students and recent graduates have little knowledge of funding mechanisms for international collaborations.

This panel was organized to address the need for information about agencies and programs funding international collaborations and joint research projects. Representatives of various agencies, within and outside the U.S., were invited to describe their agency's programs and opportunities for international projects and to answer questions from the audience. A variety of programs which enable scientists to travel/work outside their own country or allow international collaborations were described. Panelists included: Paul Filmer, Inter-American Institute for Global Change Elisabeth Lipiatou, European Commission Polly A. Penhale, U.S. National Science Foundation Ronald Tipper, U.S. Office of Naval Research Marsh Youngbluth, U.S. National Science Foundation Eric Chang (U.S. National Science Foundation) and Steven Shugar (National Sciences and Engineering Research Council of Canada) were unable to attend the meeting, but provided material for the meeting. Presentations were excellent, and I everyone for providing printed material for the Panel. The documents prepared for this panel are available on the ASLO home page (<http://aslo.org>).

I am pleased to report that the European Commission's Marine Science and Technology (MAST III) Program will jointly fund the second Dissertations Initiative for the Advancement of Limnology and Oceanography (DIALOG II) Program, along with the U.S. National Science Foundation, National Aeronautics and Space Administration, National Oceanographic and Atmospheric Administration, and the Office of Naval Research. As part of this international program, 43 recent Ph.D. recipients will participate in a symposium to foster international, interdisciplinary, and inter-institutional research collaborations. DIALOG information and application materials are available on the ASLO home page (<http://aslo.org>).

Due to the success of this first panel, Elisabeth Lipiatou

and I are working together to evaluate possibilities for follow-up actions in the context of ASLO meetings and the DIALOG program. If you have any suggestions for future panels or workshops, please contact me (weiler@whitman.edu) or Elisabeth (elisabeth.lipiatou@dg12.ccc.be).

WETLANDS: VALUE, STATUS AND FUNCTION OF U.S. WETLANDS DETAILED IN STATE-BY-STATE REPORT

The role of wetlands in providing habitat for wildlife, reducing floods and erosion and improving water quality is documented as part of a comprehensive assessment of the nation's wetlands compiled by the U.S. Geological Survey.

USGS scientists worked with colleagues from state and other federal agencies and the academic community to provide this first-ever, state-by-state look at the nation's vital wetland resources, including the type of distribution of wetlands, trends on wetland gains and losses, and conservation efforts in each state.

The USGS report provides overviews of wetland protection legislation, research by federal agencies related to wetlands, a discussion of the functions and values of wetlands, as well as an historic look at gains and losses of wetlands across the nation since the time of European settlement.

Selected articles and highlights of the report are available on the Internet from the World Wide Web by accessing: <http://water.usgs.gov/lookup/get?WSP2425>

Copies of the 431-page, full-color report, "National Water Summary on Wetland Resources," published as USGS Water-Supply Paper 2425 are available for \$49 each from the Government Printing Office. To have an order form faxed to you, call 703-648-4888, select option 3, then option 2 and enter document number 5100.

PROCEEDINGS OF A Plankton Ecology Group (PEG) WORKSHOP

Mehner, T. & Winfield, I.J. (editors): "Trophic interactions of age-0 fish and zooplankton in temperate waters", represents the proceedings of a Plankton Ecology Group (PEG) workshop held in Dresden Germany), February 1996. It will be published in May, 1997 as *Arch. Hydrobiol. Spec. Issue Advanc. Limnol.* 49. This special issue contains 13 papers and a summary of a roundtable discussion. For more information, please contact Thomas Mehner (mehner@igb-berlin.de). The complete issue (price about US\$100) may be ordered by the publisher: Schweizerbartsche Verlagsbuchhandlung, Johannesstrasse 3 A, D-70176 Stuttgart, Germany.

THE FUTURE OF ASLO: 1996 REPORT AND RECOMMENDATIONS

Executive Summary

The 1996 Committee to Consider the Future of ASLO met 13-14 December in San Francisco, California. The committee carefully reviewed the report of the 1988 Future of ASLO Committee and noted that the organization has now implemented most of the sweeping recommendations it contained. These changes, including the establishment of an Executive Director position, the setting up of a periodic Bulletin, and the restructuring of the editorial procedures of *Limnology and Oceanography*, have substantially strengthened ASLO.

Over the next decade, the committee recommends that ASLO broaden its membership and activities to reflect the actual breadth of aquatic sciences. Even more important, ASLO must foster the linkages between the strong fundamental aquatic sciences it continues to support and the environmental needs of society. Specifically, ASLO should enlarge its purpose to include the application of good science to the environmental policy-making process, should develop educational programs in aquatic sciences beyond our academic institutions, and should include in all ASLO activities scientific themes relevant to solving problems of the interaction between humans and their environment.

Introduction

The 1996 Future of ASLO Committee was established by the Board of Directors of the American Society for Limnology and Oceanography and appointed by President Diane M. McKnight to be representative of the society's diversity (see committee list below). Its charge was to develop a long-term vision of the directions and actions of ASLO so that the organization may best serve its members and fulfill its leadership role in limnology and oceanography.

The Board suggested these questions for consideration:

- Where is ASLO strong and where does it need to be improved?
- Should ASLO play a role in the public policy arena and, if so, how?
- How can ASLO increase membership and better serve members?
- How can ASLO increase the participation of members in its activities and efforts?
- Should ASLO have more special workshops and more special issues of the journal?
- How can ASLO better serve the needs of young scientists and of scientists from outside the U.S.?
- Is there a need for a career booklet in limnology?
- Is the ASLO statement of purpose still appropriate?
- Should ASLO commit resources to the development of an endowment fund?

Attending the 13-14 December meeting in San Francisco were the members of the committee:

John E. Hobbie (Marine Biological Laboratory), Chair; **Elizabeth A. Canuel** (Virginia Institute of Marine Science); **Nina F. Caraco** (Institute of Ecosystem Studies); **Benjamin E. Cuker** (Hampton University); **Peter T. Doran** (Desert Research Institute); **John J. Magnuson** (University of Wisconsin); **Richard D. Robarts** (National Hydrology Research Center, Canada); **Meinhard E. Simon** (University of Konstanz, Germany); **Sharon L. Smith** (University of Miami); and **A. Michelle Wood** (University of Oregon). Officers of ASLO (President Diane M. McKnight (University of Colorado), President-Elect Thomas C. Malone (University of Maryland), and Executive Director C. Susan Weiler (Whitman College)) aided the deliberations through introductory briefings about history and current activities. Despite the diversity in areas of specialization and scientific experience, the committee quickly achieved a consensus on ASLO's future.

ASLO Floating High

The American Society of Limnology and Oceanography was founded upon the idea that since inland waters and oceans are both a part of the aquatic system of the earth both disciplines would benefit by shared knowledge of fundamental principles and processes. In 1956, ASLO President Alfred Redfield described why marine scientists were brought in to the existing Limnological Society of America and ASLO founded in 1948. He said "Just as it had been accepted from the start that students of the biological, chemical and physical aspects of limnology had much to gain by association, so it was soon realized that the differences between fresh and salt water systems were trivial, when compared to the common principles with which limnologists and oceanographers alike are concerned." (1956. *Limnology and Oceanography*

1:1). Now, 40 years after Redfield's statement, ASLO holds strong meetings and produces an excellent journal. These two successful activities promote a holistic view of aquatic sciences; moreover the high standards of the meetings and the journal have been influential in maintaining the high quality of aquatic science research. The high standards of the science have also been enhanced through an ALSO policy on scientific ethics. Some 30% of the members reside outside the U.S., a sign of international recognition of the society's activities and evidence that ASLO is truly a world-wide society.

Overall, ASLO has achieved a good balance in its membership and leadership. The membership numbers have changed little over the past decade and the median age of 42 indicates a reasonable balance between younger and older scientists. Balance in gender and between the overall disci-

plines of limnology and oceanography exists in both the membership and leadership. In its strong efforts at the undergraduate level to promote cultural diversity, ASLO has been a leader among scientific societies in recent years.

Two other activities of the officers deserve mention. They have kept ASLO both affordable and financially healthy. The reorganization they instituted in recent years has improved the effectiveness of the operation of the society through the activities of a part-time executive director; this step led directly to improved meeting planning, to improved communications through the publication of a periodic bulletin, and to development of special programs and initiatives.

ASLO Taking on Water

Despite its success in bringing limnologists and oceanographers together in the same journal and at the same meetings, the goal of examining the common principles of aquatic systems has not been fulfilled. Microbial ecologists probably come closest to the goal as these scientists working on inland waters, estuaries, and oceans actually talk to each other and exchange methods and understanding. Other disciplinary groups of limnologists and oceanographers, however, do not appear to interact as well and seldom exchange ideas. What is more, it is perceived that ASLO does not welcome certain areas of research at its meetings and in its journal. This is a perception rather than a policy but the end result is that some groups, such as those working on physics, groundwater, or on streams and benthos, are underrepresented within ASLO. Another type of research, the large-scale interdisciplinary oceanographic programs such as the Joint Global Ocean Flux Study (JGOFS), is mostly published elsewhere than in *Limnology and Oceanography* although there have been numerous sessions of ASLO meetings devoted to these programs.

The perception of many aquatic scientists also seems to be that the leadership of ASLO does not want to change from its narrow disciplinary focus. The fact is that for many years ASLO officers, committee members, and editors have been chosen to reflect a great breadth of discipline. Evidently ASLO needs better ways to address this misperception. It appears that many aquatic scientists belong to specialized aquatic societies and do not belong to ASLO. Obviously each scientist should belong to several scientific societies, but since ASLO's aim is to become a society where different types of aquatic scientists can interact and learn, the membership numbers should be significantly higher.

Finally, some of the members believe that ASLO should be more active in providing information to legislatures, parliaments, and other policy makers about the consequences for human society of various environmental laws and regulations. ASLO has not followed the recommendations of the 1988 "Future of ASLO" committee on this point.

Recommendations: The Future of ASLO

1) The Goals and Purpose of ASLO should be enlarged to reflect the future ASLO. Our society must continue to evolve to remain a dynamic organization that meets the

needs of its members and of the human society. We must strive to become a scientific society all aquatic scientists will join because of its breadth, quality, and relevance. The committee recommends a new statement of ASLO purpose that contains the present statement (goals a, b, and c below) and an additional goal pertaining to the interactions of science and society (goal d below):

- a) Promote the interests of limnology and oceanography and related sciences,
- b) Foster the exchange of information across the range of aquatic sciences and with the public,
- c) Further investigations dealing with these subjects, and
- d) Link through research and education the knowledge in the aquatic sciences to the identification and solution of problems of human interaction with the environment.

2) ASLO must maintain its tradition of excellence in those activities that communicate and promote aquatic sciences. The committee recognizes ASLO's continuing legacy of excellence and service to aquatic science. Its focus on the basic sciences of our field in the journal, special publications, and its meetings must be continued.

3) ASLO should broaden its membership and activities to reflect the actual breadth of aquatic sciences. Mechanisms to achieve this include:

- Sponsor truly integrated joint meetings with other societies. Such meetings may be used to achieve discipline balance.
- Encourage presentation in the journal and at meetings of high-quality research in all areas of aquatic sciences.
- Review the subject content of its journal and meetings and take steps to achieve a balance of disciplines. The statement of scope in *Limnology and Oceanography* should be revised to recognize and promulgate the expanded statement of purpose (see Recommendation #1).
- Appoint an advisory Editorial Committee whose task is to develop discipline diversity. This should be a large group of about 20 people who would make annual reports to the ASLO Board and membership. Over the long term, this effort may necessitate expanding the journal, establishing a second journal, and adding more special publications.

4) ASLO should link its strong basic science approach to the identification and solution of problems relevant to humans and their environment.

- Hold special symposia, sessions at meetings, and work shops and publish special issues of L&O that deal with problems relevant to humans and their interactions with the environment.
- Recognize by an annual award the contribution by an ASLO member to the links between basic science and environmental problems of society, either directly or indirectly (i.e., a paper can present results with important implications for applied research, but not itself contain much applied content).
- Establish a Congressional Fellowship and extend the

concept to the international arena.

- Solicit and publish papers that link science and environmental problems in *Limnology and Oceanography*.
- Publicize ASLO's efforts to link basic science and environmental problems in the bulletin, web page, and other communications to members and the public-at-large.
- Hire a person to represent the society in Washington, D.C. The board should evaluate innovative ways of carrying this out; this person should be a highly qualified and politically experienced scientist.

5) ASLO should better serve international members and increase its scope and activities at the international scale.

- Support meetings abroad organized by ASLO members. These could be meetings on special topics or meetings of members in a particular region.
- Include international members in ASLO governance.
- Establish an annual lecture by a distinguished international scholar whose travel and meeting costs will be paid by ASLO.
- Extend ASLO's co-sponsorship of workshops and technical working groups to the international level.

6) Aquatic science education should grow to include the general public, decision-makers, and journalists as well as students at all levels.

- Develop the society's main educational goal of having aquatic sciences taught at all universities and colleges.
- Provide information on aquatic sciences as a societal need and as a career; this could be in the form of a brochure and a WWW page.
- Lead in providing resources for teachers at all levels.
- Provide plans and illustrative materials electronically.

- Bring journalists and decision-makers together with our membership. This should be carried out in the context of ASLO's effort to encourage a recognition of the broad human relevance of aquatic sciences and the dissemination of information about aquatic sciences to the public. The committee recommends that the executive director of ASLO investigate how other societies do this and bring ideas to the ASLO board.

7) ASLO must continue to lead in the efforts of scientific societies to increase their human resource diversity.

- Maintain and publish a demographic analysis of scientists in the society and the profession. The Executive Director, working with the Human Resources Committee, should undertake this analysis of gender, ethnic status, age, and subdiscipline.
- Develop innovative ways to reduce costs of ASLO meetings for students and scientists from developing nations. The recent reduction in number of ASLO meetings at universities, will increase costs and likely reduce attendance of students and scientists from developing nations. ASLO should counter this through providing travel funds or through developing "hosting" programs.
- Continue to build ethnic diversity within the society by working with NSF and other funding agencies to bring minority students to annual meetings and associated special activities.

8) The development of ASLO according to these recommendations could be greatly facilitated by the establishment of an endowment.

- Continue the board's efforts to develop an endowment.

BIOGRAPHICAL SKETCHES, 1997 ASLO CANDIDATES

ASLO is governed by a Board of Directors consisting of five elected officers (President, president-elect, Past President, Secretary and Treasurer) and seven Members-at-Large, one for every 500 members of the Society.

This year we will elect: a **Secretary** to succeed Polly A. Penhale, who completes her 12th and final year of service this year; and **three Members-at-Large** to succeed JoAnn M. Burkholder, Jonathan J. Cole, and Sybil P. Seitzinger, who complete their 3-year terms in June. Continuing Members-at-Large are: James J. Elser, Mark E. Hay, Catherine M. Pringle and Karen F. Wishner.

We are grateful to all those who submitted nominations. Selecting among the many outstanding individuals who were nominated was difficult and we thank this year's Nominations Committee (Jonathan J. Cole, Chair; Thomas M. Frost, Lisa A. Levin, Lynda P. Shapiro, Peter G. Verity, and Warwick F. Vincent) for their efforts. Their prime objective was to forward a slate of very well qualified candidates. In addition to excellence in research and community service, the committee considered such things as the present composition of the ASLO executive and the need for broad representation of regions and specialties. ASLO members Wayne Wurtsbaugh and Chris M. Luecke were appointed by ASLO President Diane McKnight to serve as tellers for this election.

We hope that those interested in serving or in nominating a colleague will continue to do so. Next year we will need two candidates for President-Elect, and 4 candidates for Member-at-Large.

**Please vote for your preferred candidates on the enclosed ballot.
ballots must be postmarked by June 23, 1997**

SECRETARY

G. Richard Marzolf, *B.A.. 1957 (Wittenberg College); Ph.D. 1962 (University of Michigan)*

Marzolf began his professional career at Kansas State University. He was on the faculty there, teaching limnology and experimental field ecology from 1962 until 1988, with short-term visiting professorships at University of Oregon, University of Wisconsin, University of Oklahoma, and Michigan State University during that period. In

1988 he accepted an endowed professorial chair of the Commonwealth of Kentucky, at the Hancock Biological Station of Murray State University. Marzolf joined the U. S. Geological Survey at Boulder, CO in 1991. In 1996 he moved to USGS headquarters in Reston, VA to assume duties as Chief, Branch of Regional Research, in the Eastern Region of the Water Resources Division's National Research Program.

Marzolf's early research included studies of river impoundments, especially problems presented by high suspended sediment loads in reservoirs. Marzolf's interest in materials exported from prairie watersheds to reservoirs led to investigations, with students, of tallgrass prairie ecology. His interest in the Kings Creek watershed on Konza Prairie led to its inclusion in the USGS Hydrologic Benchmark Network in 1979 and to the establishment of a precipitation chemistry data set with a 17-year record. He was the originating PI on the NSF/LTER at the Konza Prairie. He presently works on Lake Powell and the Colorado River tailwater in Glen Canyon/Grand Canyon with interest in the biological

processes that mediate water qualities of the Colorado River.

At Kansas State, Marzolf devoted substantial effort to helping Lloyd Hulbert and others set aside the Konza Prairie Research Natural Area with the support of the Nature Conservancy. In the past Marzolf has served on the ASLO Nominations committee, and has served as editor of the aquatic section of the ESA newsletter and as editor of the *ESA Bulletin*. From 1981 to 1985 Marzolf chaired NSF's national coordination committee for the LTER network of sites. He served on the Water Science and Technology Board of the National Academy of Science from 1986 until 1991. As a function of the board he chaired the committee to review the Glen Canyon Environmental Studies of the Bureau of Reclamation until joining the U. S. Geological Survey in 1991 to work on Lake Powell and help coordinate USGS efforts on the Colorado River in the Grand Canyon. He participated in workshops to develop the "freshwater imperative" document, participated in the 1994 symposium on the Regional Assessment of Freshwater Ecosystems and Climate Change in North America, and participated recently with the Science Advisory Board of the Environmental Protection Agency to review documents that set biological criteria for measuring management results in lakes and reservoirs.

Representative publications

- Lira, J., G.R. Marzolf, A. Marrochi, and B. Naugle. 1992. A probabilistic model to study spatial variations of primary productivity in river impoundments. *Ecol. Appl.* 2(1):186-193.
- Marzolf, G. R. 1983. An ecological perspective of flood damage in the United States. Pp. 55-68 in S.I. Changnon (ed.), *Natural*

Disaster Research: Flood Damage Mitigation. *Ill. Water Survey and National Science Foundation SWS Contract Report 302*, 225 pp.

Marzolf, G. R. 1984. Reservoirs of the Great Plains of North America. Pp. 291-302 in F. G. Taub (ed.) *Lakes and Reservoirs of the World. Ecosystems of the World*. W.D. W. Goodall (Ed. in Chief), Elsevier Publishers, Amsterdam, 643 pp.

Marzolf, G.R. 1991. The role of science in natural resource management: The case for the Colorado River. Pp. 28-39 in *Colorado River Ecology and Dam Management*. National Academy of Science Press, 276 pp.

Marzolf, G.R., G. Cantrell, A.W. Groeger, and M.D. Schram. 1989. Spatial variability in 14C estimates of phytoplankton productivity in Kentucky Lake. *Verhandlungen Inter. Verein. Limnol.* XXIV:1300-1303.

Candidate Statement

Our society's half-century of dedication to excellence in limnological and oceanographic investigation, teaching, discussion, and publication is widely recognized. The credibility that attends such recognition is one of ASLO's cherished possessions. One result of this standing is that the pressure on members for technical consultation has increased as water resource problems have become more urgent. Resource problems are becoming more urgent as we reach the quantitative limit of the fresh water resource and as we

further influence the coastal oceans. Errors in resource management are more widespread, last longer, and are more complex to resolve. At the same time, and for many of the same reasons, our sources of financial support more frequently attach "relevance" provisions to grants of money. We are being pulled, therefore, in at least two directions by our scholarly traditions and these times of "freshwater imperatives" and budgetary stricture. One is identified solely by our dedication to excellence, innovation, and creativity. It is our honored, basic, curiosity-driven direction. The other is identified as "problem-solving" and "relevant", and, because this is responsible, it is becoming our honored, basic, utility-driven direction. In this sense, change is inevitable and it is upon us. We know that we must adapt by being more responsible and accountable. We must, nevertheless, be honest to ourselves and we dare not risk our credibility and our standing among scientific societies through some Faustian bargain. This is my attempt to articulate briefly the nature of our dilemma. I cannot claim that resolution is clear; there is no assurance that satisfactory resolutions exist. Some may claim that the distinction I have drawn is false or unimportant. I only claim to see some danger signs and I am willing to devote some of my time and energy to helping the society work through the next four years so that the science will be represented by a vital society in 2001.

SECRETARY

Asit Mazumder *B.S. 1978; M.S. 1980 (University of Chittagong, Bangladesh); M.Sc. 1983 (Brock University, Ontario, Canada); Ph.D. 1989 (University of Waterloo, Ontario)*

After completing postdoctoral research with Environment Canada in Burlington, Ontario and Trent University (Ontario) Dr. Mazumder joined the University of Montreal, Quebec in 1991 as an assistant professor. In 1995 he was promoted to associate professor of Biological Sciences and assumed directorship of the Laurentian Biological Station at the Université de Montréal.

His research interests include aquatic ecology with special focuses on foodweb interactions, nutrient dynamics and fisheries. He has been using size- and community-based approaches to determine how essential nutrients and fish predation interact in regulating ecosystem responses and associated patterns of nutrient and energy flow in aquatic food webs. His work on the responses of mixed versus stratified lakes to nutrients has led to the observation that there is a hierarchy of algal responses to nutrients and grazers in temperate lakes. His research on the physical, chemical, biological interactions in lake ecosystems have focused on the idea that planktonic communities can modify their physical environment, for example, algal communities, by modifying the penetration of sun light into the deeper

water, can regulate heating and associated thermal structure. More recent projects focus on the impacts of eutrophication, fisheries exploitation, fish stocking, acidification and lake size on the biodiversity of algae in lakes. Other collaborative projects involve the impacts of food quantity and quality on the growth patterns and health conditions of juvenile salmon and coastal invertebrates. As the director of the Laurentian Biological Station, he has been providing facilities for research in aquatic and terrestrial ecology to over thirty scientists from Canada and US and their graduate and undergraduate students. He also Coordinates long-term research activities at the Laurentian Biological Station as a part of Canada's Ecological Monitoring and Assessment Network (EMAN).

Dr. Mazumder has been devoting considerable time to an inter-university program to provide high-quality training to university professors in Venezuela. He is one of eight founding members of the Interuniversity Center for Research on Atlantic Salmon (CIRSA). Dr. Mazumder organized special symposium on water-column processes in marine and freshwater ecosystems during the ASLO 1991 meeting. In 1992, he organized a special joint symposium for the Canadian Society of Limnologists and the Canadian Conference for Fisheries Research to address the lack of multi-trophic level studies in limnology and fisheries. Presently he serves

as an associate editor for the *Journal of Great Lakes Research*. He has served as advisory member for Canada's tri-council grant program (Natural Sciences and Engineering Research Council, Social Sciences and Humanities Research Council, and Medical Research Council).

Representative Publications

- Mazumder, A. 1994. Patterns of algal biomass in dominant odd-versus even-link lake ecosystems. *Ecology* 75: 1141-1149.
- Mazumder, A. and D. R. S. Lean. 1994. Consumer-dependent responses of lake ecosystems to nutrient loading. *J. Plankton Res.* 11: 1567-1580.
- Mazumder, A., and W.D. Taylor. 1994. Thermal structure of lakes varying in size and water clarity. *Limnol. Oceanogr.* 39: 468-476.
- Mazumder, A., W.D. Taylor, and D.J. McQueen, and D.R.S. Lean. 1990. Effects of fish and plankton on lake temperature and mixing depth. *Science* 247: 312-315.
- Proulx, M., F. Pick, A. Mazumder, P. Hamilton, and D. R. S. Lean. 1996. Effects of nutrients and fish predation on algal communities under contrasting thermal regimes. *Ecology* 77: 1556-1572.

Candidate Statement

Being born and brought up as well as having finished two of my University degrees in Bangladesh, I have personal

experience with the lack of international exposure of third world countries to international societies. During the last 12 years of my membership with ASLO I have been impressed with ASLO's effort to attract membership from developing countries. I think I can play an important role in developing membership in South-East Asia. During my tenure as ASLO Secretary, I want to put special effort to attracting members from this region, which is poorly represented in ASLO international membership. Another ASLO program I found impressive and well deserved is the Minority Program. During my tenure, I would like to contribute to the success of this program. During my last 12 years of my exposure to ASLO meetings, I have noticed the lack of strong communications between fisheries ecologists and limnologists. I plan to encourage ASLO to develop better communications between these two interdependent, but rarely integrated disciplines in aquatic ecology. This can be accomplished through special symposia, and through joint meetings with other societies. I would also like to play a role to attract more Canadians to ASLO and to develop a better communication between ASLO and other international societies, including the Canadian Society of Limnologists.

MEMBER-AT-LARGE

Nina Caraco

*B.S. 1978 (Cornell University);
Ph.D. 1986 (Boston University Marine Program)*



Dr. Caraco is a Research Associate at the Institute of Ecosystem Studies in Millbrook NY.

Her research has involved studies in lakes, coastal habitats and large rivers, and she has been interested in comparisons between fresh and saltwater ecosystems. Research interests include the

controls of phytoplankton production and nutrient cycling in aquatic systems. This work has varied from the scale of the a single lake to global comparisons in large rivers. Currently she is working on three subjects: 1. Changes in benthic grazing pressure (from species introduction) in relation to changes in phytoplankton species and production, 2. Causes of elevated CO₂ concentrations in lakes and consequences to phytoplankton species selection and nutrient content, and 3. Watershed control of N,P and N:P ratios in large rivers.

Dr. Caraco has been a member of ASLO for 11 years. She served on the 1996 Future of ASLO Committee and the Planning Committee for the 1997 Aquatic Sciences Meeting in Santa Fe, NM. She reviews papers from numerous aquatic and ecological journals and proposals from numerous granting agencies. She has served on the NSF post-doctoral and career advancement committees.

Representative Publications

- Caraco, N.F. 1993 Disturbance of the phosphorus cycle: A case of indirect effects of human activity. *Trends in Ecol. Evol.* 8:51-54.
- Caraco, N.F. 1995. Influence of humans on P transfers to aquatic systems: A regional scale study using large rivers. Pp. 235-244 in Tiessen, H. (Ed.) Phosphorus Cycles in Terrestrial and Aquatic Ecosystems. SCOPE Wiley & Sons, Chichester. 462 pp.
- Caraco, N.F., J.J. Cole and G.E. Likens. 1989. Evidence for sulphate-controlled phosphorus release from the sediments of aquatic systems. *Nature* 34:316-318
- Caraco, N.F., J.J. Cole and G.E. Likens. 1992. "New" and "re-cycled" production in an oligotrophic lake: Insights for summer-time phosphorus dynamics. *Limnol. Oceanogr.* 37:590-602.
- Caraco, N.F., J.J. Cole., P.A. Raymond, D.L. Stayer, M.L. Pace, S.E.G. Findlay, and D.T. Fischer. 1997. Zebra mussel invasion in a large turbid river: Phytoplankton response to increased grazing. *Ecology* 78(2), in press.

Candidate Statement

ASLO represents a diverse group of scientists. This diversity includes subject area of study, type of home institution and (related to this), "pure" science versus applied focus of work. Although ASLO has been very inclusive the future of ASLO committee has found that some groups have been underrepresented and all too often groups remain segregated within ASLO (eg. summer "freshwater meeting" vs. winter "ocean meeting"). I believe a prime challenge to ASLO in the future will be to integrate better the diverse groups included in its membership.

Your vote counts!

MEMBER-AT-LARGE

Gary S. Kleppel

B.A. 1973 (State University of New York);

Ph.D. 1979 (Fordham University)

Dr. Kleppel is an associate professor of Environmental Health Sciences, at the University of South Carolina, in Columbia, where he holds appointments in the Marine Science Program, the Belle W. Baruch Institute for Marine Biology and Coastal Research and the School of the Environment.

For about the past 15 years, Kleppel has been “working the feeding paradigm”, primarily with fishes and zooplankton. Initially, he focused on measuring the diets of zooplankton in situ by using algal carotenoids in the gut contents as taxonomic markers. In the latter half of the 1980s, he began studying the relationships between diet and production in calanoid copepods and to focus on the influence of food quality on secondary production. Currently, he is developing a program of field and laboratory research to more clearly resolve the biochemical links between the nutritional environment and secondary production in aquatic systems. While fundamental in content, this work has applications in water quality, nuisance algal bloom dynamics and ecotoxicology. He has taught marine science courses at several institutions during the past decade and he considers teaching to be a mechanism for broadening the perspective of one’s own research. Currently, Kleppel lectures on biological oceanography and nutritional ecology in the USC Marine Science Program and teaches courses in estuarine water quality and natural resources management for the Department of Environmental Health Sciences.

Dr. Kleppel has been a co-convenor of two special sessions at ASLO annual meetings and was a member of the steering committee of the 1994 annual meeting in Miami, Florida. He served as a member of the Lindeman Award committee for two years, and has been a reviewer for *Limnology and Oceanography* on several occasions. Kleppel has also served as a panelist for NSF, the NOAA Coastal Ocean Program, the Department of Energy and Sea Grant. He currently coordinates the Coastal Ocean Boundaries Interactions and Assessments (COBIA) Program, a southeastern regional marine science network and serves as program director for the Land Use-Coastal Ecosystem Study (NOAA Coastal Ocean Program) that aims to develop models and tools to mitigate the impacts of demographically driven land-use modification on coastal resources.

Representative Publications

- Kleppel, G.S. 1993. On the diets of calanoid copepods. *Mar. Ecol. Prog. Ser.* 99:183-195.
- Kleppel, G.S. and C.A. Burkart. 1995. Egg production and the nutritional environment of *Acartia tonsa*: The role of food quality in copepod nutrition. *ICES J. mar. Sci.* 52:297-304.
- Kleppel, G.S., C.A. Burkart, K. Carter and C. Tomas. 1996. Diets of calanoid copepods on the West Florida continental shelf: Relationships between food concentration, food quality and feeding activity. *Mar. Biol.* 127:209-217.
- Kleppel, G.S., D.W. Frazel, R.E. Pieper and D.V. Holliday. 1988. Natural diets of zooplankton off southern California. *Mar. Ecol. Prog. Ser.* 49:231-241.
- Kleppel, G.S., D.V. Holliday and R.E. Pieper. 1991. Trophic interactions between copepods and microplankton: a question about the role of diatoms. *Limnol. Oceanogr.* 36:172-178.

Candidate Statement

Recent events within ASLO suggest that aquatic scientists are concerned about the future of their discipline and are searching for a sense of direction that is consistent with the perceived research needs and funding environments of the next century. The Plenary Session at the 1997 ASLO Aquatic Sciences meeting in Santa Fe framed the issue poignantly as Alan Longhurst, in accepting the Lifetime Achievement Award, cautioned that we not lose sight of the value of fundamental research, while, in the next talk, Tony Michaels explained how oceanographers and insurance companies can work together, in a future full of uncertainty for the basic researcher. Most of us are straining to come to grips with these extremes, to find a convergence or middle ground between the very basic and the very applied. In fact, that convergence can (and perhaps must) be achieved by realizing that Society, which ultimately determines whether our science is worthwhile, is really on our side. The public strongly supports fundamental research, when its relevance is understood. We, as a scientific society and as a community can excite public support for our work and enlighten as we stimulate. We as scientists, must remember that fundamental research and esoteric research are not the same thing, and that oceanographers and limnologists have for years put fundamental research to work solving very applied problems (fisheries oceanography is an excellent example). While nothing stays the same for very long, and certainly the research world that our students enter will be different from that in which Alan Longhurst came of age, research is still exciting, still challenging and still necessary. It is our job to not only pass this excitement on to our students but to communicate it to Society as well. It is important that ASLO continues to develop the internal dialogue that will help to identify future opportunities and frame the next generation of directions for research and teaching. We must also increase our outreach efforts to build public understanding and advocacy for the aquatic sciences.

MEMBER-AT-LARGE

Louis Legendre

B.S. 1967 (*University of Montreal, Quebec, Canada*);
Ph.D. 1971 (*Dalhousie University, Nova Scotia, Canada*)

Dr. Legendre is a professor of biological oceanography at Laval University, Quebec, and Fellow of the Royal Society of Canada in the Academy of Sciences.

His research activities are focussed on the hydrodynamic controls of primary production and flux of biogenic carbon in polar, temperate and tropical oceans and

in lakes. His papers cover the coupling between hydrodynamics and photosynthesis, physiological ecology of algae, ecology of pelagic and sea-ice biota, methodology, and theoretical aspects of biological oceanography. He is also active in numerical ecology.

Dr. Legendre has served in various capacities for funding agencies, e.g. Natural Sciences and Engineering Research Council of Canada, and Quebec's FCAR Fund. He chaired the Steering Committee of Canadian JGOFS and is currently Chair of the Science Coordinating Group for the International Arctic Polynya Programme (Arctic Ocean Sciences Board), Vice-president of Modelenvironment (Belgium), and member of JGOFS Task Team on Photosynthesis Measurements, SCOR Working Group on Ecology of Sea Ice Biota, and Scientific Committee of the Oceanographic Institute (France and Monaco). He is member of the Editorial Boards of the *Journal of Plankton Research*, *Aquatic Microbial Ecology*, *Polar Biology*, and *Journal of Marine Systems*.

Representative Publications

- Fortier, L., J. Le Fèvre and L. Legendre. 1994. Export of biogenic carbon to fish and to the deep ocean: the role of large planktonic microphages. *J. Plankton Res.* 16:809-839.
- Legendre, L., S.F. Ackley, G.S. Dieckmann, B. Gulliksen, R. Horner, T. Hoshiai, I.A. Melnikov, W.S. Reeburgh, M. Spindler and C.W. Sullivan. 1992. Ecology of Sea Ice Biota. 2. Global significance. *Polar Biol.* 12:429-444.
- Legendre, L. and S. Demers. 1984. Towards dynamic biological oceanography and limnology. *Can. J. Fish. aquat. Sci.* 41:2-19.
- Legendre, L. and F. Rassoulzadegan. 1996. Food-web mediated export of biogenic carbon in oceans: Environmental control. *Mar. Ecol. Prog. Ser.* 145:179-193.
- Rivkin, R.B., L. Legendre, D. Deibel, J.E. Tremblay, B. Klein, K. Crocker, S. Roy, N. Silverberg, C. Lovejoy, F. Mesplé, N. Romero, M.R. Anderson, P. Matthews, C. Savenkoff, A. Vézina, J.C. Therriault, J. Wesson, C. Berube and R.G. Ingram. 1996. Vertical flux of biogenic carbon in the ocean: Is there food web control? *Science* 272:1163-1166.

Candidate Statement

In the 1996 Report on the Future of ASLO, it is recommended that ASLO better serve international members and increase its scope and activities at the international scale (31% of ASLO members reside outside the US and Canada). As a North American, non-US member of the ASLO Board, with strong research connections in Canada, Europe, and Japan, I would work to develop the international component of ASLO. There are several aspects to the matter. Foreign researchers mostly join ASLO because of the high quality of its journal and meetings. The latter are especially important for oceanographers, because there is no international oceanographic society equivalent to SIL for limnologists. The involvement of ASLO in the promotion and organisation of high-quality meetings outside the US and Canada would be an additional incentive for foreign researchers to join our Society. In return, this would benefit all ASLO members in offering new opportunities for international collaboration. In addition, national policies on fresh and marine waters presently try to address environmental problems that have become global. In that context, international membership in ASLO is a major asset, since it provides the international perspective and expertise without which global problems cannot be efficiently addressed.

MEMBER-AT-LARGE

Mark D. Ohman

B.A. 1974 (*University of California, Santa Cruz*);
M.A. 1976 (*California State University, San Francisco*);
Ph.D. 1983 (*University of Washington*)



Dr. Ohman is an associate professor of oceanography at the Scripps Institution of Oceanography, University of California at San Diego, where he has been since 1985. He held postdoctoral positions at the Friday Harbor Laboratories, University of Washington, then jointly at the New Zealand Oceanographic Institute and the

Portobello Marine Laboratory, University of Otago, N.Z., prior to coming to Scripps.

Dr. Ohman's research concerns zooplankton population ecology, with a particular interest in prey-predator interactions. Together with colleagues, he has been actively refining and applying numerical methods for zooplankton mortality estimation, using new optical-acoustic methods for tracking natural zooplankton behavior, developing a CD-ROM based expert system for euphausiids of the world ocean, and investigating risk-related constraints on copepod life history traits. He has ongoing collaborative research with a number of colleagues abroad.

Dr. Ohman has served as a faculty mentor in Ben

Cuker's Minorities Program at three ASLO meetings, as a member of the Program Committee of the 1994 ASLO/AGU Ocean Sciences Meeting, at the NOAA 'Expanding Opportunities in Ocean Sciences' Conferences in 1995 and 1996, and at various national workshops. He is a member of the editorial board of the *Journal of Plankton Research* and recipient of an editor's citation for excellence in refereeing from the *Journal of Geophysical Research*.

Representative Publications

- Juhl, A. R., M. D. Ohman, and R. Goericke. 1996. Astaxanthin in *Calanus pacificus*: Assessment of pigment-based measures of omnivory. *Limnol. Oceanogr.* 41:1198-1207.
- Ohman, M. D. 1990. The demographic benefits of diel vertical migration by zooplankton. *Ecol. Monogr.* 60:257-281.
- Ohman, M. D. 1992. Immunochemical recognition of oligotrich ciliates. *Mar. Biol.* 114:653-660.
- Ohman, M. D., and J. A. Runge. 1994. Sustained fecundity when phytoplankton resources are in short supply: Omnivory by *Calanus finmarchicus* in the Gulf of St. Lawrence. *Limnol. Oceanogr.* 39:21-36.
- Ohman, M. D., and S. N. Wood. 1996. Mortality estimation for planktonic copepods: *Pseudocalanus newmani* in a temperate fjord. *Limnol. Oceanogr.* 41:126-135.

Candidate Statement

ASLO symbolizes for many of us a standard of excellence in scientific endeavor. As ASLO evolves, its new directions—whether in scholarship, education, or other contributions to society—must maintain this foundation of high standards. With this foundation, we can be a credible voice in any new science arena the membership chooses to pursue. In a changing climate for research, our credibility and effectiveness as a scientific society will rest foremost upon on our accuracy and objectivity. A second issue of importance to me is the need to reinforce and strengthen links between freshwater and marine scientists. The last two Aquatic Sciences meetings (in Santa Fe) have been highly stimulating and a step in the right direction. Other efforts could be launched to bring smaller groups of aquatic scientists together on thematically focused topics of mutual interest. A third issue is the diversity of our membership, both within N. America and beyond. Science knows no ethnic or national borders. Vigorous efforts to expand the reach of our society, of the sort launched by Ben Cuker, should be strongly supported. ASLO can also play a valuable role in facilitating international research collaborations and educational opportunities.

Your vote Counts!

MEMBER-AT-LARGE

Saran Twombly

B.S. 1973 (St. Lawrence University);

Ph.D. 1983 (Yale University)

Dr. Twombly is an associate professor of biological sciences at the University of Rhode Island.

Her research lies at the interface of freshwater ecology, life-history evolution, population dynamics and population structure, and seeks to understand the ecological and evolutionary processes that determine patterns of abundance and life-history strategies of freshwater crustaceans, particularly copepods. Twombly's current research focuses on identifying the causes and consequences of individual variation in growth, development, and the timing of metamorphosis and maturation, and on refining mathematical models for estimating stage-specific demographic rates for natural zooplankton populations. Her studies combine quantitative field sampling, laboratory experiments and theoretical models, and include temperate (Rhode Island, Norway, New Zealand), tropical (Malawi, Venezuela) and marine (Narragansett Bay) populations. She teaches a broad array of courses including limnology, aquatic ecology, population ecology and evolutionary biology at both the undergraduate and graduate levels.

Dr. Twombly participates actively in the activities of ASLO and the Ecological Society of America by serving on various committees within these societies, organizing sessions for national meetings, and planning or participating in conference workshops. She reviews for the NSF as well as for a number of scientific journals (*Limnology and Oceanography*, *Ecology*, *Hydrobiologia*, *Archiv fur Hydrobiologie*, *Marine Biology*, *Estuaries*, *Progress in Oceanography*). Locally, she has been a member of the Water Quality Advisory Board for the Rhode Island Department of Environmental Management and is active in Rhode Island's Watershed Watch program.

Dr. Twombly participates actively in the activities of ASLO and the Ecological Society of America by serving on various committees within these societies, organizing sessions for national meetings, and planning or participating in conference workshops. She reviews for the NSF as well as for a number of scientific journals (*Limnology and Oceanography*, *Ecology*, *Hydrobiologia*, *Archiv fur Hydrobiologie*, *Marine Biology*, *Estuaries*, *Progress in Oceanography*). Locally, she has been a member of the Water Quality Advisory Board for the Rhode Island Department of Environmental Management and is active in Rhode Island's Watershed Watch program.

Representative Publications

- Twombly, S. 1994. Comparative demography and population dynamics of two coexisting copepods in a Venezuelan floodplain lake. *Limnol. Oceanogr.* 39:234-247.
- Twombly, S. 1995. Phenotypic variation in metamorphosis in four species of freshwater copepods. *Freshwater Biology* 34:29-38.
- Twombly, S. 1996. Timing of metamorphosis in a freshwater crustacean: Comparison with anuran models. *Ecology* 77:1855-1866.
- Twombly, S. and C.W. Burns. 1996. Effects of food quality on individual growth and development in the freshwater copepod *Boeckella triarticulata*. *J. Plankton Res.* 18:2179-2196.
- Twombly, S. and C.W. Burns. 1996. Exuvium analysis: A nondestructive method of analyzing copepod growth and development. *Limnol. Oceanogr.* 41:1324-1329.

Candidate Statement

The role that scientific societies play in fostering research and education continues to grow and to change as the need to integrate basic research, policy, resource management and public support increases. Counteracting these needs, scarcity of funds for research and education continues to isolate scientific disciplines and to divorce research from educational or public needs. ASLO has assumed an increasingly active role in addressing these conflicting needs by expanding its influence on governmental policies, increasing its emphasis on education and minorities, assuming an international membership and presence, and actively integrating disciplines within the society. I am eager to contribute to ASLO's efforts, and particularly to improve science education, to advocate ASLO's international role, and to integrate marine and freshwater scientists in order to address important environmental and political issues.

MEMBER-AT-LARGE

Michael J. Vanni

B.A. 1979 (University of Montana);

Ph.D. 1985 (University of Illinois)

Dr. Vanni is an associate professor in the Department of Zoology at Miami University (Ohio), where he has been on the faculty since 1989. Before joining the Miami faculty, Dr. Vanni conducted postdoctoral research at the Experimental Lakes Area and the Center for Limnology at the University of Wisconsin.

His research focuses on the effects of animals in freshwater ecosystems via food-web interactions and nutrient recycling, and has spanned habitats such as boreal forest lakes, reservoirs, Lake Erie and tropical streams. Current research projects examine the role of sediment-feeding fish in transporting nutrients from sediments to open waters and its impacts on community and ecosystem dynamics in Ohio reservoirs; the impact of zebra mussels on nutrient and phytoplankton dynamics in western Lake Erie; and the role of species richness and species identity in regulating community- and ecosystem-level processes in Venezuela streams. He teaches limnology, food webs and community ecology, and fundamentals of ecology.

Dr. Vanni has served the aquatic sciences and ecological communities in numerous ways. He has served ASLO as a meeting mentor for the Under-represented Minorities in Limnology and Oceanography Program; as a member of the

committee to develop the first DIALOG symposium; as an ad hoc reviewer of manuscripts for *Limnology and Oceanography*; and as a session organizer at ASLO meetings. In addition he is currently the Vice Chair of the Aquatic Ecology Section of the Ecological Society of America (ESA) and serves as a judge of student papers and posters at ESA meetings. He recently began a 2-year term as the ESA representative to the Federal Government's Advisory Committee on Water Information. In addition he is an associate editor for *Oecologia* and has reviewed manuscripts for numerous journals and grant proposals for several agencies.

Representative publications

- Arnott, D.L. and M.J. Vanni. 1996. Nitrogen and phosphorus recycling by zebra mussels (*Dreissena polymorpha*) in the western basin of Lake Erie. *Canadian Journal of Fisheries and Aquatic Sciences* 53:646-659.
- Vanni, M.J. 1996. Nutrient transport and recycling by consumers in lake food webs: Implications for algal communities. Pp. 81-95 in: Polis, G.A. and K.O. Winemiller, eds. Food webs: Integration of patterns and dynamics. Chapman and Hall.
- Vanni, M.J. and C.D. Layne. 1997. Nutrient recycling and herbivory as mechanisms in the "top-down" effects of fish on phytoplankton in lakes. *Ecology* 78:21-41.
- Vanni, M.J., C.D. Layne and S.E. Arnott. 1997. "Top-down" trophic interactions in lakes: Effects of fish on plankton and nutrient dynamics. *Ecology* 78:1-20.
- Vanni, M.J., C. Luecke, J.F. Kitchell, Y. Allen, J. Temte, and J.J. Magnuson. 1990. Effects on lower trophic levels of massive fish mortality. *Nature* 344:333-335.

Candidate's statement

We are at a critical juncture with regard to the fate of the world's aquatic resources, freshwater and marine. Increasing threats to these resources will require society to make important decisions and to be educated so as to be able to make these decisions. I would like to see ASLO play a lead role in this process. Development of ASLO conference symposia addressing these issues may be one means of achieving this goal. Toward this end, I would encourage ASLO to continue efforts to increase the participation of minorities in the society and to expand efforts at involving members of developing nations. I also would like to encourage ASLO to continue to have a strong voice in rethinking how we teach aquatic sciences at various educational levels, and in encouraging the integration of research and teaching. I also think it is important that ASLO interact strongly with other scientific societies and government agencies, such as through jointly-sponsored meetings, workshops and symposia. I would also like to see the younger members of ASLO, including students, become more involved in ASLO affairs. It is critical that this segment of ASLO become active in the early stages of their career, for the continued growth of ASLO and for the effective stewardship of our aquatic resources.

ASLO AWARDS

CHRISTOPHER FREEMAN RECEIVES 1997 RAYMOND L. LINDEMAN AWARD

Maurice A. Lock, School of Biological Sciences, University of Wales,
Bangor, Gwynedd LL57 2UW, U.K.

The 1997 Raymond L. Lindeman Award was presented to Christopher Freeman for the paper, **Freeman, C. and M.A. Lock, 1995. The biofilm polysaccharide matrix: A buffer against changing organic substrate supply? *Limnology and Oceanography* 40(2): 273-278.** This award has been presented annually since 1987 to recognize an outstanding paper by a young limnologist or oceanographer. Papers published in 1995 were eligible for the 1997 award.

Freeman was born in Nottingham, England, in 1961. He

graduated from Nottingham Trent University in 1986 after completing an Honours degree in Biological Sciences. He received a Ph.D. in 1990 from the University of Wales, under my supervision. Freeman has since conducted post-doctoral research with the UK Natural Environment Research Council's Institute of Terrestrial Ecology and currently holds a prestigious Royal Society Research Fellowship at the University of Wales, Bangor.

Freeman became interested in the microbial metabolism of dissolved organic matter (DOM) after reading of the impacts of organic substrate depletion on the activity of heterotrophic bacteria within biofilms. The expected response was clearly a decline in activities, and yet those workers had found that the treatment either had no effect, or even stimulated, the biofilm metabolism. That paradox was to form the basis for Freeman's Ph.D. research program.

Freeman's paper is exceptional, in that it was able to answer a particularly perplexing problem; namely why pelagic microbial biofilms are able to thrive despite starvation of exogenous carbon.

Prior to this paper, the literature suggested that two mechanisms could account for the phenomenon; i) cryptic growth, or ii) utilisation of endogenous carbon reserves. However, Freeman proposed that in the unique conditions within biofilms, a third (previously unrecognised) mechanism was feasible; namely, that carbon could be stored within the polysaccharide matrix.

The author used an elegant series of manipulative experiments to confirm the following four postulates, which he proposed would need to be addressed for his hypothesis to remain tenable:

- 1) The DOC content of waters above a biofilm should not influence bacterial population density.
- 2) The DOC content should also not affect bacterial growth rates.
- 3) Even complete elimination of organic matter from the overlying waters should not enforce utilisation of bacterial endogenous carbon reserves (PHA).
- 4) Stored carbon should permit elevated heterotrophic activities following the alleviation of inorganic nutrient deficiency despite the continued absence of exogenous organic substrates.

These observations have revolutionised the way that we consider the biofilm matrix. Rather than merely a passive support for the microbes, the matrix is now viewed as a dynamic participant in biofilm-mediated carbon cycling processes. The matrix can be considered to act as a buffer which allows carbon to be sequestered from the water column in times of plenty, and the utilised in times of nutrient scarcity; i.e. the very conditions that characterise many pelagic environments. No longer is that matrix considered a passive support for the microbes. Instead, it is seen as a dynamic participant in biofilm-mediated carbon cycling processes.

My own involvement in this paper may lead you to believe that my views are somewhat biased. However, the best way that I can illustrate the wider support for Freeman's achievement with this paper, is to briefly describe the exceptional reception that the manuscript received during the review process. For example, one reviewer commented "having no real suggestion for the improvement of this excellent manuscript, let me offer the somewhat jocular suggestion that the author should compile a treatise on "how to write a scientific paper!". Setting out a series of salient points to be addressed in the introduction and 'nailing' them in the results and discussion is a very useful exercise and lends an intellectual clarity that is often missing". - (anon.).

Dr Freeman also noted that stimulatory responses to DOM removal often occurred in streams in which the dominant source of DOM was from wetlands. That interesting observation led him to shift the focus of his research to the wetlands, the very ecosystems upon which R.L. Lindeman's pioneering studies were based. Currently, Freeman is focusing his attention on the influence of extracellular enzymes on the biogeochemical export of materials from those ecosystems.

NOMINATION DEADLINE

for 1998 Awards: **NOVEMBER 15, 1997**

See 1997 ASLO Handbook/Directory pp. vi-viii for details

BESS B. WARD RECEIVES 1997 G. EVELYN HUTCHINSON AWARD

Samantha B. Joye, Department of Oceanography, Texas A&M University, College Station, TX 77843 (joye@astr.tamu.edu)

The 1997 G. Evelyn Hutchinson Award was presented to Bess B. Ward of the University of California at Santa Cruz, **for pioneering applications of molecular methods to key conversions of nitrogen and methane, connecting per-cell rates within defined taxa to integrated rates in the field.**

This award has been presented annually since 1982 to individuals who exemplify the standards of scholarship and creativity set by Professor Hutchinson's work in limnology and oceanography. The award was initiated to recognize mid-career scientists demonstrating excellence in any aspect of limnology or oceanography, and to symbolize the quality and innovations toward which the society strives.

Bess was born in New York and grew up in Alabama. It had been acknowledged since childhood that she would grow up to be a scientist (always asking questions to the exasperation of her playmates, so we are told), but her interest in oceanography in particular arose about the time she first went away to school. She didn't know then that the road to oceanography was via the traditional disciplines, so she simply undertook to learn as much science as possible. Ward's first degree (1976) was in zoology, with emphasis in chemistry and botany, from Michigan State University. Her first love, however, was chemistry and biochemistry, and with that focus in mind, she sought graduate training in oceanography. She received her Ph.D. in 1982 from the University of Washington under the advisorship of Mary Jane Perry. It was during this period that she first acquired an appreciation for bacteria and recognized the overall importance of nitrogen, to which she has devoted her subsequent research efforts. She went to Scripps Institution of Oceanography as a post doctoral scholar in the Food Chain Research Group where she worked mostly with Angelo Carlucci and Dick Eppley. She continued there as a research scientist as a member of the FCRG until 1989, when she moved to the University of California at Santa Cruz. She was promoted to full professor in 1995 and has served as department head since that time.

Bess is an exceptional scientist who maintains active research programs in a number of disciplines including molecular biology, microbial ecology, marine microbiology, and nutrient and trace gas biogeochemistry. She is a voracious reader of general science and science history, which has allowed her to broaden the range of oceanographic questions she addresses by exposing her to techniques developed in other fields. Her research extends from the level of individual species to global scale questions regarding carbon and nitrogen cycling in a variety of oceanic

environments. Bess's research deals primarily with microbial transformation processes which contribute to marine biogeochemical cycles, with particular interest to the biological nitrogen cycle and trace gas transformations. Her approach to the study of ocean biogeochemistry is novel. She has vigorously contributed to and encouraged the introduction of modern microbiological methodology into oceanography. These approaches include the use of various immunological tools to study the distribution of nitrifying and denitrifying bacteria (Ward & Perry 1982; Ward 1982; Ward & Carlucci 1985; Kerkhof & Ward 1992; Ward & Cockcroft 1993) and flow cytometry to study natural marine microplankton communities (Ward 1990). Implementation of such techniques allows careful, sophisticated measurements to be made in the field in oceanographic settings to address phenomena of regional and global significance.

While a graduate student at the University of Washington, Bess developed the first immunological probe for the identification (Ward & Perry 1980) and enumeration (Ward 1982) of an ammonium-oxidizing bacterium in natural samples. Bess moved to Scripps in 1982 and expanded her previous work with immunofluorescence to include other species of nitrifiers (Ward & Carlucci 1985). She also combined immunofluorescence with autoradiography to calculate species-specific CO₂ fixation by nitrifiers (Ward 1984; Ward et al. 1989) and combined immunofluorescence with ¹⁵N-tracer measurements to calculate cell-specific nitrification rates (Ward et al. 1982; Ward 1985). Her exploitation of molecular methods has expanded from immunology to include nucleic acid based methods for the identification and detection of bacteria in the nitrogen cycle, focusing on both ribosomal and functional genes (Ward et al. 1993; Voytek and Ward 1995; Ward 1995). This use of molecular biological assays in concert with traditional techniques, such as isotope tracer experiments, is now recognized as a powerful research tool in oceanography (DeLong & Ward 1992).

Another unique aspect of Bess's work involves the physiology of nitrifiers and interactions between methane and ammonia oxidation. Bess demonstrated that methane and ammonia are co-oxidized by *Nitrosococcus oceanus*. (Ward 1987 & 1990). Although *N. oceanus* co-oxidizes these two substrates in culture, it does not appear that nitrifiers oxidize methane at similar substrate ratios and concentrations in the environment (Ward & Kilpatrick 1990). Bess's desire to study the interactions between ammonia and methane oxidation required that she develop a method to quantify methane oxidation rates in sea water (Ward et al. 1987 & 1989b); the resulting technique led to some important finding with respect to methane biogeochemistry in the ocean. Measurements of in situ methane oxidation rates suggest that methane turnover is very slow in surface waters and that methane is not an important part of the carbon cycle in the euphotic zone. Much more carbon cycles through methane in stratified environments, where methane, which diffuses into the oxic water column across an oxic/anoxic interface, supports high rates of oxidation (Ward et al. 1987 & 1989b; Reeburgh et al. 1991).

Recent work completed by Bess and colleagues illustrates the process-oriented style and global scope of her research. Bess was a key player in studies that have led to a revision of the dogma regarding 'new' versus 'regenerated' primary production and nitrogen cycling in the sea (Ward et al. 1984; Bronk et al. 1994). Bess found that nitrification is an important in situ nitrate source in the euphotic zone and that dissolved organic nitrogen (DON) plays a central role in the oceanic nitrogen cycle. Nitrification in the surface ocean was previously thought to be unimportant because the process is light limited. Bess's work illustrated contemporaneous nitrification and nitrogen assimilation (by phytoplankton) in the euphotic zone (6% ambient light). Ward & Zafiriou (1988) showed that nitrification rates were approximately equivalent to the loss rate of particulate nitrogen below the euphotic zone, implying a close coupling between organic matter decomposition, particle flux, and regeneration of nitrate in the water column. Ward et al. (1989a) showed that nitrification could supply all of the phytoplankton nitrate demand at the level of 6% light and below. They also suggested a rapid cycling of DON between micro-grazers and bacteria, with phytoplankton begin the main link to inorganic pools, based on data obtained from ^{15}N tracer experiments. Subsequent work completed by Bess and Deborah Bronk, a postdoctoral researcher, found that the release of ^{15}N to the DON pool during nitrogen uptake experiments resulted in an underestimate of the total nitrogen flux into the cells. The resulting paper introduced the concept of gross nitrogen uptake and presented the first DON release rates for an oligotrophic ocean (Bronk et al. 1994).

At the University of California at Santa Cruz, Bess has continued to be remarkably productive in several areas of oceanographic research. She has also become a valued teacher in the Department on both undergraduate and graduate levels. One of Bess's most unique and endearing characteristics is her continued love of the laboratory. Working alongside students, technicians and post-docs, she participates in all phases of research. She is extremely objective and her perseverance and determination make it possible for her to attack difficult problems and see them through from beginning to end.

Bess sets high standards and goals for herself and has the self-motivation and determination to achieve those goals. Her attitude and work ethic influence all of those around her; interacting with and learning from her inspires intellectual growth and scientific maturation. Bess is an inspiration to us all; she is truly 'science' personified. Bess makes time for her students and colleagues and is always willing to provide time, resources and/or intellectual input. I met Bess when I was a graduate student and I consider myself extremely fortunate to have had her as a mentor. Now, I feel honored to call Bess my colleague. I can think of no other scientist active in oceanography today that serves as a better role model for young, aspiring oceanographers than Bess Ward. She is the ideal example of a successful oceanographer whose work crosses disciplines and brings separate fields together. Her pioneering work in the field of marine molecu-

lar biology, her important contributions to the study of oceanic nitrogen and carbon cycling, and her role as mentor and teacher, make her an ideal recipient of the G. Evelyn Hutchinson Award.

Selected References

- Bronk, D.A., P.M. Glibert & B.B. Ward, 1994. Nitrogen uptake, dissolved organic nitrogen release, and new production. *Science* 265:1843-1846.
- Delong, E.F. & B.B. Ward, 1992. Biological oceanography from a molecular perspective. *Oceanus* 35:47-54.
- Reeburgh, W.S., B.B. Ward, S.C. Whalen, K.A. Sandbeck, K.A. Kilpatrick & L.J. Kerkhof. 1991. Black Sea Methane Geochemistry. *Deep Sea Res.* 38 (Suppl):S1189-S1210.
- Voytek, M.A. & B.B. Ward. 1995. Detection of ammonium oxidizing bacteria of the Beta-Subclass of the Class Proteobacteria in Aquatic samples with the PCR. *Appl. Environ. Microbiol.* 61:1444-1150.
- Ward, B.B., 1982. Oceanic distribution of ammonium-oxidizing bacteria determined by immunofluorescent assay. *J. Mar. Res.* 40:1155-1172.
- Ward, B.B., 1985. Light and substrate effects on marine ammonium assimilation and oxidation rates. *Mar. Chem.* 16:301-316.
- Ward, B.B., Editor, 1985. Aquatic Nitrogen Cycles. Special edition of *Marine Chemistry*.
- Ward, B.B., 1990. Kinetics of ammonia oxidation by a marine nitrifying bacteria: Methane as a substrate analog. *Microb. Ecol.* 19:211-226.
- Ward, B.B. 1995. Diversity in denitrifying bacteria: Limits of DNA RFLP analysis and probes for the functional gene, nitrite reductase. *Arch. Microbiol.* 163:167-175.
- Ward, B.B. & A.F. Carlucci 1985. Marine ammonium- and nitrite-oxidizing bacteria: Serological diversity determined by immunofluorescence in culture and in the environment. *Appl. Environ. Microbiol.* 50:194-201.
- Ward, B.B. & A.R. Cockcroft, 1993. Immunofluorescence detection of the denitrifying bacterium, *Pseudomonas perfectomarina*, in seawater and intertidal sediment environments. *Microb. Ecol.* 25:233-246.
- Ward, B.B., A.R. Cockcroft & K.A. Kilpatrick. 1993. Antibody and DNA probes for detection of nitrite reductase in seawater. *J. Gen. Microbiol.* 139:2285-2293.
- Ward, B.B. & K.A. Kilpatrick 1990. Relationship between substrate concentration and oxidation of ammonium and methane in a stratified water column. *Cont. Shelf. Res.* 10:1193-1208.
- Ward, B.B., K.A. Kilpatrick, P.C. Novelli & M.I. Scranton, 1987. Methane oxidation and methane fluxes in the ocean surface layer and in deep anoxic waters. *Nature* 327:226-229.
- Ward, B.B., K.A. Kilpatrick, E.H. Renger and R.W. Eppley, 1989a. Biological nitrogen cycling in the nitracline. *Limnol. Oceanogr.* 34:493-513.
- Ward, B.B., K.A. Kilpatrick, A.E. Wopat, E.C. Minnich & M.E. Lidstrom, 1989b. Methane oxidation in Saanich Inlet during summer stratification. *Cont. Shelf. Res.* 9:65-75.
- Ward, B.B. & M.J. Perry, 1980. Immunofluorescent assay for the marine ammonium-oxidizing bacterium *Nitrosococcus oceanus*. *Appl. Environ. Microbiol.* 39:913-918.
- Ward, B.B., M.C. Talbot & M.J. Perry, 1984. Contributions of phytoplankton and nitrifying bacteria to ammonium and nitrate dynamics in coastal water. *Cont. Shelf Res.* 3:383-398.

MY LIFE AS AN OCEANOGRAPHER: Acceptance

Speech by Bess Ward

Bess B. Ward, Marine Sciences Program, University of California at Santa Cruz, Santa Cruz, CA 95064 (bbw@cats.ucsc.edu)

Sue Weiler phoned me with the news that I was to be awarded the Hutchinson Medal. After hanging up the phone in wonder, I became convinced that it would all be resolved the next day, when Sue would undoubtedly phone back and say, “Omigosh, I made a mistake. I was supposed to ask you if you would serve on the nominations committee. Don’t you worry about that Hutchinson stuff!” But she never made that second phone call, so here I am.

My thanks to ASLO and the committee who were involved in this decision. I’m very intimidated by the list of previous recipients and I could never conceive of considering myself to walk in the same plane. Perhaps beginning with me, the effort to make the award signify mid career achievement with promise of the best work still to come has been realized. If so, I still have hope of truly earning this honor.

In the meantime, I’ve enjoyed my life as an oceanographer so far, and I’m delighted to have this opportunity to thank some of the people who have been important to my involvement in science so far. One must always start with the parents and mine have been a huge influence. They are both physical chemists. It was always assumed that I would grow up to be a scientist, but when I turned out to be a biologist instead, they were greatly disappointed. They’re gradually getting used to the idea.

My scientific parent, Mary Jane Perry, has been the most important person in my development as a scientist. We never really did much work together and she quit trying to tell me what to do a long time ago, but I’m still learning from her. Not just the details of being a careful skeptical researcher, not just writing proposals and papers, but facing intangible challenges and intricacies of academic science as well. Now and then, I round a corner or come up against some event in my career, and I have this flash of recognition and I say “Ah, so that’s what Mary Jane meant! That’s what that was all about!” My hope now is that I’ll be able to be of use to others in the same way, because one can never repay a mentor like that.

Generationally next, I’d like to thank the Food Chain Research Group at Scripps. It had long been my ambition to join the Food Chain, and Angelo Carlucci let me write a post doc proposal that made that happen. While I was there, I learned the most from Angelo, and from Dick Eppley, my academic grandfather and previous recipient of this award. Angelo cemented my love of nitrifying bacteria and taught me how to care for them. Dick had been my hero for so long that it took me a year to call him by his first name. I didn’t call him anything for that whole time — he probably still thinks I’m just rude. But he taught me many things, especially an appreciation for the literature, that I’m trying to pass on to my own students.

The person I miss the most from those days, however, is George Jackson. Everyone should be so lucky as to have a George Jackson down the hall from him or her. Someone to

whom you can say, “Does this make sense? How do I deal with this?” and George will pull out the chalk or the back of the envelope and say “Let’s look at it this way. What if it were 10%....” and you walk out of there with your feet on the ground.

I’ve had the very good luck and pleasure to be able to work with several extremely compatible and talented technicians. Kay Kilpatrick at Scripps was an indispensable part of my work there and losing her was the worst thing about leaving there. I’m very lucky now to have Mary Hogan in that position and she continues the tradition of making it possible for me to get some work done.

Thinking now about the next generation, I owe an awful lot of the fun that I’ve had in recent years to my two Ph.D. students, Lee Kerkhof and Mary Voytek. They both taught me an immense amount. Lee took us down the molecular path and Mary brought nitrifiers into that pathway. I’m extremely proud of them both and grateful to have had the opportunity to work with them.

In the other side of my life in nitrogen, my work in biogeochemistry and stable isotopes has been enriched by associations with Debbie Bronk and Mandy Joye. These two share my obsession with nitrogen and they make the hardest work into fun.

Mention of these two areas of my research interests, biogeochemistry and molecular biology, brings me to the short scientific part of my remarks. I have found the combination of tracer isotope work, the actual measurement of biogeochemical processes in the nitrogen cycle, with molecular ecology of the organisms involved in those transformations, to be an excellent combination in many ways. What I want to know is how the world works, how the biogeochemistry of the world ocean works. So I want to know how fast and who does it and how it is all regulated. The isotope work is labor intensive and slow, but it gives you information that you can’t get any other way. To balance the tedium of working for two years to get a data set of tracer results, I find the instant gratification of PCR to be irresistible. And I think this dual approach is one of the exciting things happening in aquatic sciences today. Oceanography, especially biological oceanography, has always been methods limited, due to the nature the medium. We don’t all need to become technowizards, but willingness, eagerness, to embrace new methods, has always been a mark of the field. I just have a big toolbox and an ever expanding horizon of ignorance, of things I want to learn about. So I won’t presume to tell you where the field is going, but I know it’s going to be fascinating along the way.

The field I’m involved in, of course, is biological oceanography. I’m not much of an ecologist, so I’m making my apologies to G. Evelyn Hutchinson. I have a friend at UCSC, Jean Langenheim, who is a past president of the Ecological Society of America. Jean recently gave me a reprint of a review she had written, saying “You’re not an ecologist, but you might enjoy it anyway.” So there you have it from an expert that I’m not an ecologist. I will still strive, nevertheless, to reach the standards that were set by G. Evelyn Hutchinson, and to which the development of modern limnol-

ogy and oceanography owes so much.

I said that my career has been and continues to be a process of learning how the world works. And speaking of learning, I want to say a few words about scientists and education. I had always wanted to be a scientist, but it was only late in life that I realized that I had to be a professor to make a living doing it. I didn't come naturally to teaching, but I've become aware of how important it is. It's clear that the economic structure of this country and the rest of the world means that only a small percentage of the populace can afford to be directly involved in scientific research or teaching at the university level. But how the world works is important to everyone in it. Educating the voting public is in their interest as well as the interest of scientists. We must undertake this job at all levels, from grade school to congress. I've never been brave enough to teach at the primary and secondary levels, but I think that is an extremely important group to reach. Not to make them all want to grow up to be scientists, but to appreciate the importance and excitement of science, to learn to think critically about the science to which they are exposed in the popular press, to be educated thoughtful voters. ASLO is making some efforts along those lines and I urge you to support them however you deem appropriate.

And with that, I'd like to thank you all very much.

ALAN R. LONGHURST RECEIVES 1997 LIFETIME ACHIEVEMENT AWARD

Kenneth H. Mann, Bedford Institute of Oceanography, Box 1006, Dartmouth, NS B2Y 4A2

The 1997 Lifetime Achievement Award was presented to Alan R. Longhurst, **in recognition of sustained excellence in the study of marine food webs and biogeography, and of outstanding leadership in the development of international collaboration and in the administration of world-renowned oceanographic programs.**

This award was initiated in 1994 to recognize and honor major, long-term achievements in the fields of limnology and oceanography, including research, education, and service to the scientific community and society.

Longhurst was born a stones throw from the MBA laboratory in Plymouth, England, in 1925, and was a late starter at the University of London in 1948 because of four years war service in the Army, ending up in East Africa and Somalia. Bird-watching and African wildlife led naturally to a B.Sc in Zoology at Chelsea College and then to Bedford College for a Ph.D. on the taxonomy and ecology of notostracan shield-shrimps in ephemeral rain pools; his thesis adviser was Prof. H. Munro Fox, limnologist and cladoceran physiologist. Later, he was awarded the D.Sc. of his university for work on tropical benthic ecology. In many ways, Longhurst is the complete biological oceanographer,

having substantial experience and understanding of all trophic levels as well as of the physical environment in which they perform. His career has been distinguished by a continuing look at variability in ocean systems, from plankton to fish, and how they relate to the changing physical environment. He has distinguished himself in fisheries ecology, zooplankton biology and systems science. In addition, he has contributed to the development of oceanography by his wise administration of various scientific laboratories and his untiring service on international committees.

Longhurst's first job (1954-1963) was with the British Colonial Research Service, serving in Sierra Leone and Nigeria. He published 17 papers embodying pioneering work on identification of fish stocks and their ecological relationships off West Africa. During this period he also completed the requirements for a Ph.D. on freshwater Notostraca.

In 1963 he moved to California working first at the Scripps Institution of Oceanography, and then as Director of the NOAA-NMFS Fisheries Oceanography Center in La Jolla. While there, he developed the Longhurst-Hardy plankton recorder that was widely used up to the introduction of contemporary electronic instruments, and made important contributions to our understanding of the vertical distribution of zooplankton.

His next move was to Plymouth, England, where he was Deputy-Director of the Institute for Marine Environmental Research. He gave strong leadership to a group that made a large simulation model of the Bristol Channel and Severn Estuary, with particular attention to benthic and pelagic invertebrate communities.

In 1977 he became Director of the Marine Ecology Laboratory in the Bedford Institute of Oceanography and two years later was appointed Director General of the whole Institute. Not only did he work to ensure optimal conditions for the pursuit of scientific endeavors, but he gave strong scientific leadership and continued his own lines of research. He continued to undertake research cruises and published valuable information on the vertical distribution of zooplankton in the tropical Pacific ocean, the Arctic ocean and the North Atlantic. He considered such questions as whether the zooplankton aggregate at the depth of maximum phytoplankton biomass or at the depth of maximum phytoplankton productivity, or what is the significance of vertical migration in zooplankton as a contribution to the vertical transport of carbon and nitrogen.

He retired from his executive position in 1987 to work as a full-time research scientist. His most important contribution, A.R. Longhurst, 1995, Seasonal cycles of pelagic production and consumption, appeared in *Progress in Oceanography* 36:77-167. He undertook to review the dynamics of phytoplankton and zooplankton communities world wide. From an enormous data base he arranged the material in functional groups and identified 57 biogeochemical provinces, further grouped into 5 major domains. He has thus provided an overview of the functioning of the plankton communities of the world's oceans, in enormous detail but with sweeping breadth. This is indeed an undertaking of epic

proportions. In collaboration with Drs. Platt and Sathyendranath he married the water column chlorophyll data of each biogeochemical province to satellite data on surface chlorophyll values at different seasons. This has permitted a new and independent estimate of global marine primary production (see *J. Plankt. Res.* 17:1245-1271, 1995). Although now officially retired, he is well along with a book "Ecological Geography of the Ocean", that will expand on his view of the functioning of plankton in the global ocean. This will not be his first book. In 1981 he edited a volume "Analysis of marine Ecosystems", and in 1987 collaborated with Dr. D. Pauly to produce a book "Biology of the Tropical Ocean".

In addition to his contributions as a biological oceanographer and as an administrator, Alan Longhurst has made important contributions to international scientific endeavors through service on committees and delegations. He has chaired or served on several working groups of the International Oceanographic Commission (IOC), the Food and Agriculture Organization (FAO), and the Scientific Committee on Oceanic Research (SCOR). He was particularly heavily involved in SCOR, served as Secretary for a number of years and was involved with its important Committee on Climate Change and the Ocean. He was elected Fellow of the Royal Society of Canada in 1988, and has served on committees of the Society's Global Change Program.

Alan Longhurst has published about 60 original research papers in journals, and about 20 scholarly reviews. In these he has made important contributions to our understanding of biological oceanography and fisheries, especially in the tropics. In particular he has made important contributions to the study of marine zooplankton, and has brought a breadth of vision to the study of marine ecosystems worldwide that has culminated in a synthesis of global plankton dynamics of exceptional breadth and detail. At the same time, he has undertaken onerous administrative and executive positions that have greatly contributed to the well-being of oceanography in several parts of the world, and has advanced international endeavors in oceanography by giving unstintingly of his time to serve on international committees and working groups.

When he is not working on his latest book ("Ecological Geography of the Ocean"), he now spends much of the year at Cajarc, in the Lot valley in southwest France, helping his wife Françoise to run their small gallery of contemporary art. Apparently, you may apply for a special ASLO discount at Galerie l'Acadie anytime you care to pass by....

ON LIVING IN AN IVORY TOWER: Acceptance Speech by Alan Longhurst

Alan R. Longhurst, Galerie l'Acadie, Place de l'Eglise, 46160 Cajarc, France (Tel: 33-5-65-40-76-37)

Before venturing into a little philosophising, I want to thank all of you for the honour you do me today, which gives me a nice warm glow that will stay with me a long time. Some of the younger people in this room will receive the same honour one day, and perhaps - looking back as I do now - they will share my feeling of surprise at how much

science changed during a working life. I'd like to talk a little about some remarkable changes that have occurred in oceanography since the 1950's when I got my first job.

It seems very strange today that I was totally untrained in marine science, which wasn't taught in crowded, post-war British universities. The closest I got to water was an Easter course at Plymouth and a doctoral thesis on temporary rain-pool ecology, an odd subject since rain-pools are so permanent in England! Then, I had no idea that my future jobs would change very much. Science seemed like a great Status Quo that I would simply apply to a succession of hopefully interesting problems. I had absolutely no idea that both science and the way scientists were employed would change as they have. Today, I think nobody could be so naive, for surely we all expect that each coming decade will be unique: economically, technologically, socially, and in its scientific problems.

A scientist's job was very simple back then. Whether you chose basic or applied science, you had simply to try to understand things not yet understood. Mostly, you didn't expect—or want—to be asked how your findings might best be used. Your job was (in the French) simply to be a "chercheur" (a scientist) whose vocation was to seek ("chercher"). A recent cartoon in *Le Monde* had such a scientist asking, "But what if I find? What am I then?" And that's what I really want to talk about in responding to the award today.

My first job, in 1954, was in a marine lab in West Africa that was about as well equipped as anywhere in those days, but we had - if I remember correctly - only two kinds of instruments that required electricity: microscope lamps and magnetic stirrers for titrating oxygens, salinities and phosphates. Though we had a good library, a literature search before starting work was easily done: the whole of the Gulf of Guinea was essentially unknown, Sverdrup's model had been published only the year before, and all my essential reprints fitted in one box. Yet we were not so isolated that we didn't know about Sverdrup, for we discussed him in relation to wet season turbidity off the Sierra Leone coast. I worked at sea with van Veen's grab, Peterson's dredge and the Aggasiz trawl, all then state-of-the-art, and corresponded (slowly) with Gunnar Thorson of Copenhagen about "Peterson benthic communities." I stumbled on the effect of the shallow tropical thermocline (only 25-30 m deep off West Africa) on benthic organisms, demersal fish communities and fisheries, which proved to be the key to understanding continental shelf ecology in eastern tropical oceans. But none of this prevented Italian trawlers from making mayhem in the fisheries, later on, and that's a point I'll come back to.

That 40 years later I would be helping to archive 25,000-odd chlorophyll profiles from all oceans without lifting a pen, and using them to interpret global chlorophyll images obtained from an earth-orbiting satellite, would have seemed to me pure fantasy. More, it would have been quite literally unimaginable. However, the thread of Sverdrup's model was still running through what I was doing, and I was still concerned with the consequences of the tropical thermocline.

It must be very hard for you to realise how thin the literature was in the mid-1950's and how few marine scientists there were to contribute. Today, we have become accustomed to a most extraordinary rate of accumulation of new knowledge - what about solving the tropical high nitrate-low chlorophyll enigma, which had been with us for 30 years, by means of a mid-ocean Fe fertilisation experiment at the km-scale, monitored by satellite sensors. Wonderful! And what about the continuing development of extraordinary new tools: like tracking the deep circulation of the ocean with fleets of drifting PALACE floats (Profiling Autonomous Lagrangian Circulation Explorers) which, as a bonus, transmit high-quality profiles of salinity and temperature as they surface every couple of weeks, communicating for the cost of a cellular phone call?

But the other side of the coin is that in the last ten years or so a sociological change has swept across science, which makes me very uncomfortable and uncertain what a scientist is, or is supposed to be, today. Consider the nature of so many organisations which manage scientific institutes today, probably even yours, and compare it with ours in 1954.

We were run from London by the Fisheries Adviser to the Colonial Research Service. He was an ex-hake biologist (C.F. Hickling), helped by one administrative assistant and a couple of secretaries. Over a five-year period this little group established, staffed and equipped marine labs, each with a ship and half-a-dozen scientists, in Guiana, Sierra Leone, Jinja on Lake Victoria, Zanzibar, Mauritius, Singapore and Hong Kong, and several of those labs survive to this day. Hickling visited each one regularly, went to sea with us, told us what we were doing right and what wrong, suggested what to try next and then went off to catch the mail-boat home. In between times, he edited our house journal. The only paper-work required of each scientist was an annual estimate of expenditures for the coming year which you negotiated with your director. We had never heard of committees, public relations, or research proposals, and there were neither politically-sensitive issues to be avoided nor politically-correct issues to be chased. The whole organisation worked (I like to think) with lots of enlightened common-sense and informal peer-review. We got through a prodigious amount of work, uncovered our share of what is now commonplace and we published in good journals—even though L&O hadn't yet been invented.

Today, even while extraordinary progress is made in our basic understanding of the ocean, we are urged to get out of our ivory towers, to communicate with managers in ways they can understand, and to sell our products to a customer. It is a rare scientist these days who is not exposed to this. At the best, unless you are still a post-doc, the hours you spend in committee are progressively eating into what I happen to think you get paid for—actually doing research. At the worst, you are fighting fires to protect political backsides, a style which is certainly worse in government labs than elsewhere, but is probably a trend we can all recognise. It's true that the sums of public money expended on oceanography today are so great that management must be tighter than

it was: but what if management becomes a self-justifying activity? And that seems to be the central problem which is, I believe, far more damaging than the mere downsizing of research effort, to which nobody can object if it is done sensibly: no nation should spend more than it can afford on science. The corollary must be that the less there is, the better it must be spent—and there's the rub. On the whole, it is not.

Now, even in the academic environment, there is an increasing belief that each oceanographic research project should be specifically designed to solve a problem, address an issue, or create wealth. It is as if we embracing "super-market science" now because we already have sufficient predictive ability to go straight toward the solution of practical problems, even those involving complex systems, like landfall prediction for hurricanes. Or is the planning of science being forced into this mode simply so that detailed decision-making can progressively become the prerogative of upper management? Yet another example of executive empowerment? I think you know what my judgement would be.

Really, of course, modern management and the search for relevance simply reflects the fact that oceanography, like every other enterprise, follows contemporary social norms, so that what has happened was bound to happen. For the same reason, the organisation of the marine sciences in the future will simply reflect what happens in our societies at large. Wherever you work, you should be prepared for big surprises: even ten years ago, we would not have guessed that some of the best and most powerful oceanographic ships anywhere would be carrying tourists today, rather than the science projects of the Soviet Academies for which they were built. Nor could anyone have guessed that much of the Canadian research fleet would be scrapped and replaced with Coast Guard hand-me-downs, or that the oceanographic programmes at our major Canadian institutes would be scaled down by a large fraction: this is a further example of the general erosion of national scientific effort.

The way you will all be organised, funded and managed in future decades will certainly differ from how it is done today, will track changes in contemporary management styles, and will reflect the will of your nation to support marine science. I hope you won't find the results as uncomfortable as I would find the Canadian management style of 1997.

One final thought, and then I'll quit. Back to the mayhem in the demersal fisheries off West Africa which our research did nothing to stop. Could it have made any difference to the outcome that we knew the ecological reasons for the rich fishing that the Italian trawlers rapidly found close inshore? Obviously, had there been a fisheries management agency in Sierra Leone then, instead of only a fisheries research programme, our findings could have been the basis for a trawler exclusion zone, reserving the neritic zone for canoe fishermen. But there was no such agency, so the unregulated fishery quickly collapsed.

But you mustn't think that the existence of a full-blown management agency, supplied with the best scientific information, will necessarily avoid such an outcome. During the

even worse mayhem in the 1980's on the Grand Banks of Newfoundland, and the unthinkable near-extinction of cod, Canadian fishery managers had access to, and very well understood, the results of several decades of research on the biology and ecology of the cod population, while for the fishery they had excellent catch and effort statistics, but—for reasons not far to seek—were induced to take a sorry series of management options. Look to pressure from politicians and banks for the reasons for their unhappy performance. All this illustrates the most unfortunate truth that politicians and administrators (even those who are ex-scientists) are today much better at shelving a problem by funding a research programme, than at using the results of research to solve a problem.

Funding for major oceanographic programmes has always been justified by reference to a series of issues that have evolved from defence and the needs of navies, through the natural basis of fisheries resources, to our concerns about the role of the oceans in global climate change. There has usually been a rather clear distinction between fundamental research justified in this way, and the applied research required for year-to-year management, yet most of us in this room certainly believe that the latter must be nourished by the former. However, *Science* (17 January 1997) correctly tells us that we can't assume that society will continue to support high-cost fundamental science indefinitely: I don't find it surprising that, by my count, there are only five nations left in global-scale deep-water oceanography. The voices raised to justify fundamental science seem to me curiously muted today, almost as if we thought we knew enough for immediate purposes. Our *ASLO Bulletin* seems to worry about everything else, but not that.

Which brings me full circle. Looking back, I think my research was driven much more by simple curiosity than by a desire to do good to anybody, though that crept in now and then. Maybe it is politically incorrect these days, but I can't help thinking that I was most extraordinarily lucky to live through a period when sufficient resources for fundamental research at sea were a component of numerous national science budgets that was never compromised by more immediate issues. I happen to think the funds were well spent in producing a remarkable level of understanding of physical and biological processes in the ocean. It is self-evident that our politicians and financial institutions are in a much better position to organise the management of the planet - anytime they really have a mind to do so - than if our ships had not gone to sea. And if that's living in an ivory tower, then jolly good luck to it, and may it last your time, too!

NOMINATION DEADLINE

for 1998 Awards:

NOVEMBER 15, 1997

**See 1997 ASLO Handbook/Directory
pp. vi-viii for details
or contact Susan Weiler
weiler@whitman.edu**

ROBERT H. PETERS HONORED WITH ASLO'S CITATION FOR SCIENTIFIC EXCELLENCE

¹Paul del Giorgio, ²Yves Prairie and ¹Michael Pace

¹Institute of Ecosystem Studies, Box AB, Millbrook, NY 12545

²Dépt. des sciences biologiques, Université du Québec à Montréal (UQAM), CP 8888, Succ. Centre Ville, Montréal, Québec Canada H3C 3P8

Robert H. Peters was honored posthumously at the ASLO 1997 Aquatic Science Meeting with ASLO's Citation for Scientific Excellence, for his outstanding contributions to limnology in general and to phosphorus cycling in lakes in particular, and for his leadership in epistemological and philosophical thinking in the ecological sciences. This periodic award was initiated in 1987 to recognize members who could not fulfill their career potential because of early death or disability. Peters' wife, Antonella Cattaneo (photo below), was present to receive the award.

Peters was born in Toronto, Ontario, Canada, on August 2, 1946. He received his Ph.D. in 1972. His doctoral thesis on regeneration of phosphorus by zooplankton-an issue which is still of great topical importance- was supervised by

the late Frank Rigler.

Highlights of his academic career include post-doctoral fellowships in Pallanza (Italy), 1972-1973; in Vienna (Austria), 1973; and in Munich (Germany), 1974. He became Assistant Professor in 1974, Associate

Professor in 1979, and Full Professor in 1986 at McGill University.

For readers of the limnological and ecological literature, Robert Peters is recognized as a major figure, and his contributions have been numerous and far reaching. He has written four books (Peters 1983; 1991; Rigler and Peters 1995; Hakanson and Peters 1995), co-edited one (Peters and de Bernardi 1988), and published over 130 scientific papers, comments and book chapters. There were two main themes in his creative scientific work. First, he endeavored to build empirical relationships that describe general patterns in limnology and ecology. He saw such relationships as exemplary of a new ecology which is oriented towards prediction. His initial focus was on phosphorus dynamics in lakes (Peters and Rigler 1973; Peters and Lean 1973; Peters 1975), and later expanded his interests to a much broader array of topics, including zooplankton behavior (Peters and Downing 1984), material flow in aquatic systems (del Giorgio and Peters 1994), plant ecology (Shippley and Peters 1990 a-b; Marshal and Peters 1988; Duarte et al. 1986), invertebrate ecology (Morin and Peters 1988), fish ecology (MacKenzie et al. 1990; Godbout and Peters 1988), community ecology (Duarte et al. 1987), ecotoxicology (Pawlisz 1993a-b; Mailhot et al. 1989; Mailhot and Peters 1998), and allometric relationships in autoecology (Ahrens and Peters 1991). His most influential work was his first book, *Ecological Implications of Body Size* (1983, Cambridge University Press), which presents a powerful overview of the utility of allomet-

ric relationships for the study of ecological problems and for building ecological theory. In all of these areas, he worked with the same principle, that we must make science more effective in order to address current environmental and social problems.

The second element in his research was the criticism of traditional scientific approaches. The essence of the message conveyed by Peters is this: Ecologists have collected impressive amounts of observations and facts, but they have failed to sufficiently identify and formulate theories that go beyond the facts, theories that can be tested and that can predict. Rob reflected his views in several influential papers dealing with conceptual problems in the ecological science (Peters, 1971, 1976, 1977, 1978, 1986, 1988, 1989, 1990). The culmination of these series was his book "A Critique for Ecology" (Peters, 1991), where he synthesized his views on the problems, and also on the solutions. This book was received with quite contrasting reactions among the scientific community, but nevertheless succeeded in generating a lively debate on the effectiveness of current approaches in ecological and environmental sciences. This was, in all likelihood, Rob's main objective.

As a recognition to his scientific contribution to aquatic ecology, Rob Peters was given the Rigler Award by the Society of Canadian Limnologists in 1992. He was also awarded the Prize in Limnetic Ecology offered by the International Ecology Institute in 1991. This award gave him the opportunity to fulfill a long standing aspiration: to complete a book based on his interpretation of the writings and ideas of the late Frank Rigler, who greatly influenced Rob's approach to science. The result was the book *Science and Limnology* (1995), co-authored by Rigler and Peters, explaining the epistemological views of both outstanding intellectuals and demonstrating the relevance of such views to the day-to-day tasks that confront limnologists and other scientists: teaching, grant applications, peer reviews, identification of appropriate research topics, pursuits of research, and the defense of social and scientific relevance.

Rob also displayed an impressive public activity. Until last year, he was President of the Society of Canadian Limnologists, and was upon his death on the Board of the American Society of Limnology and Oceanography, Director (Central Canada) of the North American Lake Management Society and Associate Editor of the journal *Lake and Reservoir Management*. He was on the editorial board of *Limnology and Oceanography*, *ISIS Reviews*, and *Lake and Reservoir Management*, and regularly sat on provincial (FCAR) and federal (NSERC) grant committees.

The published and public work of Robert Peters, summarized above, is generally well known in the scientific community, but we must emphasize some of his achievements that are less public. Rob supervised in the last 16 years nine postdoctoral researchers, ten Ph.D. theses, and twelve Master's theses at McGill University, and many of his former students and associates now hold positions in science and academia where they continue to be influenced by Rob's ideas. But as professor, advisor, and most importantly, as a

friend, Rob has had a major intellectual influence on the career and scientific development of countless more individuals, at levels ranging from undergraduate students to senior scientists. He was a model for intellectual integrity and profundity, and was a constant source of inspiration and strength to students and colleagues alike. His apparent unbending views on science were in contrast with his own personal modesty. Outside speakers invited to McGill University, familiar with Rob's writing, often expected a tough, unyielding opponent, and what they actually found was a kind and humble man, aware above all of his own limitations. Rob taught with his own example, that we should not fall into scientific self-indulgence, and that criticism starts with oneself.

Robert Henry Peters passed away on June 26, 1996, at the prime of his rich scientific career and personal life. With his death, the scientific community has lost one of its major exponents, and all of us who had the privilege of sharing his friendship are deeply saddened by his departure.

References

- Ahrens, M. and R.H. Peters. 1991. Plankton community respiration: Relationships with size distribution and lake trophy. *Hydrobiologia* 224:77-87
- del Giorgio, P.A. and R.H. Peters. 1994. Planktonic P/R ratios in lakes: Influence of lake trophy and dissolved organic carbon. *Limnol. Oceanogr.* 39(4):772-787.
- Duarte, C.M., S. Agusti and R.H. Peters. 1987. The upper limit to the abundance of aquatic organisms. *Oecologia* 74:272-276.
- Duarte, C.M., J. Kalff and R.H. Peters. 1986. Patterns in biomass and cover of aquatic macrophytes in lakes. *Can. J. Fish. Aquat. Sci.* 43:1900-1908.
- Godbout, L. and R.H. Peters. 1988. Potential determinants of stable catch in the brook trout (*Salvelinus fontinalis*) sport fishery in Quebec. *Can. J. Fish. Aquat. Sci.* 45:1771-1778.
- Hakanson, and R.H. Peters. 1996. *Predictive Limnology*. SPB Academic Publishing, Amsterdam. 464 pp.
- MacKenzie, B.R., W.C. Leggett and R.H. Peters. 1990. Estimating larval fish ingestion rates: Can laboratory derived values be reliably extrapolated to the wild? *Mar. Ecol. Prog. Ser.* 67:209-225.
- Mailhot, H. and R.H. Peters. 1988. Empirical relationships between 1-octanol/water partition coefficient and nine physico-chemical properties. *Environ. Sci. Technol.* 22:1479-1488.
- Mailhot, H., R.H. Peters and J.R. Cornett. 1989. The biological half-time of radioactive cesium in poikilothermic and homeothermic animals. *Health Phys.* 56:473-484.
- Marshall, T.M. and R.H. Peters. 1989. General patterns in the seasonal development of chlorophyll-a for temperate lakes. *Limnol. Oceanogr.* 34:856-867.
- Morin, A. and R.H. Peters. 1988. Effect of microhabitat feature, seston quality, and periphyton on abundance of overwintering blackfly larvae in Southern Quebec. *Limnol. Oceanogr.* 33:431-445.
- Pawlisz, A.V. and R.H. Peters. 1993a. A radioactive tracer technique for the study of lethal body burdens of narcotic organic chemicals *Daphnia magna*. *Environ. Sci. Technol.* 26:2795-2800.
- Pawlisz, A.V. and R.H. Peters. 1993b. A test of the equipotency of internal burdens of nine narcotic chemicals using *Daphnia magna*. *Environ. Sci. Technol.* 26:1802-1806.
- Peters, R.H. 1971. Ecology and the world view. *Limnol. Oceanogr.* 16:143-147.
- Peters, R.H. 1975. Phosphorus excretion and the measurement of feeding and assimilation by zooplankton. *Limnol. Oceanogr.* 20:858-859.
- Peters, R.H. 1976. Tautology in evolution and ecology. *Am. Nat.* 110:1-12.
- Peters, R.H. 1977. The unpredictable problems in trophodynamics. *Environ. Biol. Fishes* 2:197-202.
- Peters, R.H. 1978. Predictable problems with tautology in evolution and ecology. *Am. Nat.* 112:759-762.
- Peters, R.H. 1983. *The Ecological Implications of Body Size*. Cambridge

- University Press, Cambridge. 329 pp.
- Peters, R.H. 1986. The role of prediction in limnology. *Limnol. Oceanogr.* 31:1143-1159.
- Peters, R.H. 1988. Some general problems for ecology illustrated by food web theory. *Ecology* 69:1673-1676.
- Peters, R.H. 1989. Pathologies in limnology. *Mem. Ist. Ital. Idrobiol.* 47:175-212.
- Peters, R.H. and R. de Bernardi (eds). 1988. *Daphnia*. Ist. Idrobiol. Pallanza.
- Peters, R.H. and D.R.S. Lean. 1973. The characterization of soluble phosphorus released by zooplankton. *Limnol. Oceanogr.* 18:270-279.
- Peters, R.H. and F.H. Rigler. 1973. Phosphorus release by *Daphnia*. *Limnol. Oceanogr.* 18:821-839.
- Rigler, F.H. and R.H. Peters. 1995. Science and Limnology. Ecology Institute, Germany.
- Shiple, B. and R.H. Peters. 1990a. The allometry of seed weight and seedling relative growth rate. *Func. Ecol.* 4:523-529.
- Shiple, B. and R.H. Peters. 1990b. A test of the Tilman model of plant strategies: Relative growth rate and biomass partitioning. *Am. Nat.* 136:139-153.

**IN MEMORIUM: ROBERT HENRY PETERS
(1946-1996)**

John A. Downing, Iowa State University, Department of Animal Ecology,
124 Science II, Ames, IA 50011-3221, USA

Photo of Rob Peters, taken in the mountains of northern Italy by Antonella Cattaneo, ca. 1988. The sign says "it is absolutely forbidden to pass beyond this limit", which is why I like this photo

There are few scientists who have a clear vision of what science can do, what it must do, and how ecologists can accomplish these goals. Rob Peters had this vision and adopted, as a life quest, the teaching of this vision to other ecologists. That is why when he died recently we lost more than a charming friend, an incisive mind and a skilled advocate or adversary. Many of his friends fear we risk losing direction in ecology and despair at a field without his remarkable, reasonable and critical voice. He was the best friend aquatic ecology had, and, like a good friend, loved the field knowing its faults.

Rob was born into an intense interest in nature. His grandfather came from a lumbering background in rural Ontario, and grew up surrounded by the fascinating diversity of the boreal forest. As a city youth, Rob delved deeply into nature wanting to know all there was to know about the animals that inhabited it. Summers spent at his lake cottage on the Canadian shield bolstered his fascination with aquatic systems. Rob was a member of the Young Naturalist's Club in Toronto, which brought him to study with notable observ-

ers of nature, including Robert Bateman, whose art Rob came to treasure throughout his life. Rob's mother was an ardent supporter of the University of Toronto, thus Rob was almost predestined to study there when he finished secondary school.

At the University of Toronto, Rob met his future friend, Ph.D. supervisor and colleague, Frank Rigler. It must have been a spectacular match, for Rob held him in such high esteem that Rigler, Rigler's lab and Rigler's ideas were always the epitome of excellence, in Rob's view. It is easy for many of us to understand this. Those of us who were fortunate enough to spend some time with Frank before his early death in 1982 sensed the richness of working with him. Those of us fortunate enough to study with Rob hold him in similar esteem. One of the beautiful things about working with a scientist like Rob is that one is taught so well that it is difficult to figure out which favorite tenets are mine, which are Rob's and which are Frank's. Rob would suggest, however, that does not really matter where we get our ideas, it's what we do with them that counts.

When Rob became a graduate student, Frank Rigler was consumed with the analysis of phosphorus cycling in lakes. Some of his students were analyzing uptake of particles by zooplankton, others the fractionation of P in large and small molecular weights, and others, like Rob, were measuring minute rates of excretion by tiny zooplankton. The idea was that if all the components of the lake could be understood, then the lake would be understood. During the same period, Frank was teaching a course in the history and philosophy of science which was one of the favorite courses of students in Biology. He and his graduate students held regular lunch lab meetings, discussing the history and structure of scientific discovery, among other things. As Rob told me the story, one day, during one of these meetings in the late 1960s or very early 1970s, a man who had a cottage on a lake near Toronto knocked on the door looking for the "lake expert". The cottager was ushered into the lab and faced the group with a question. The cottager had noticed that lakes with many cottages on them had green water, and were not as attractive as they had been before. As several new cottages were planned for his little lake, he wondered how many could be built before his lake would turn green. The group had no answer. They could tell him how much P *Daphnia* excreted, how many particles they would clear from the water, how much P got stuck to epiphytes in a lake, but they could not answer this most basic question.

This event convinced Rob that ecologists need to face the most important environmental questions directly, and that there is something wrong with a science that spends years of work collecting the pieces to a puzzle that may never be solved. The lessons of history and philosophy Rigler had been teaching convinced him that we could be more effective scientists by looking for strong patterns in nature, not by trying to rebuild all of nature from its components. Pete Dillon's landmark work on the phosphorus-chlorophyll relationship was a direct result of this revolution in the Rigler lab. Pete told me years afterward that Rigler

graduate students were thought of as “before” or “after” students. Rob was present at the revolution which left an indelible mark. Rob took strongly to the positivist approach, and in 1971 wrote *Ecology and the World View* (*Limnol. Oceanogr.* 16:143-147), followed by *Tautology in Evolution and Ecology* in 1975 (*Am. Nat.* 110:1-12). These articles set the tone for many of his works that sought to improve the scientific quality of ecological research.

Since Rob had done undergraduate and graduate degrees at the University of Toronto, he viewed his postdoc as a chance to try something completely different. He secured a postdoctoral post at the Istituto Italiano di Idrobiologia, as well as briefer postdoctoral visits in Munich and Vienna. Italy became his second home, both because of the fruitful interactions he found with the many young scientists at the Istituto, and because he admired one of them in particular, Antonella Cattaneo, both as a scientist and later as his wife and life-long partner. Nella has told me that she first dated Rob at the urging of her brother-in-law who wanted the Canadian to teach him how to catch trout! Nella and Rob were married in Italy, traveled to Africa to study African lakes, and moved to Montréal in 1974, where Rob had been offered a post at McGill University. In spite of his career in Canada, Rob felt tightly bound to Italy. When I first spoke to him on the telephone in 1975, he proudly explained to me that he was soon off to visit his family in Italy. I believe that toward the end of his life he was more comfortable in Italy than Montréal. He seemed more relaxed, at ease and at peace around the beautiful mountain lakes near Corconio and Pallanza.

Back in Canada, Rob went quickly to work building a strong limnological research group with Jaap Kalff and Bill Leggett. The group worked hard to seek strong empirical patterns in nature, centering specific studies on Lake Memphremagog, but students and professors ranged far afield in the literature, nearly single-handedly building the field of comparative limnology. This work was frequently based on the philosophical approaches advocated by Rob, strengthened by the technical expertise, inquisitive and supportive nature of Kalff, and the down-to-earth practicality of Leggett. They built an incredibly exciting research group where students pushed each other to examine the underpinnings of their science while doing technically elegant research.

Rob told me that in the late 1970s Rigler began to feel too complacent, “too worried about the colour of his curtains,” so joined Rob with the McGill group. For a short but brilliant time, both Peters and Rigler were working independently and together in this research group. Our seminar series was a terror. Students would study philosophy by night to try to catch up with Peters, Rigler, Kalff and Leggett, who would often sit serenely through seminars while students ripped into invited speakers. “What is science?” “What is theory?” “What is cause?” “What have you shown us that wasn’t known before?” “You’ve said what you think, but what do you know?” Rob taught us all to relentlessly seek pattern in nature, that theory is the prime objective of science, that prediction is the prime objective of theory, that empirical theories need to precede explanatory ones, and that

if we do our job well enough, someone will go to the trouble of showing that we were wrong! The challenge was not to prove that we were right, but to see how much we could learn. Doing science with Rob was so much fun; the rules of the game were set and clear and everyone was encouraged to play.

Rob felt that we should start, like physics, to seek broad-scale theories, and that this should be done by identifying characteristics of organisms that allow us to make predictions about them. Inspired by early physiological ecologists, he settled on body-mass. He began to compile data on body-mass and how it relates to virtually every characteristic of an organism’s life. Although he had many philosophical arguments to convince others that this was the best way to theory, he decided that it would be better to demonstrate the primacy of empirical theory by his own example. In 1983, he published his most successful book, *The Ecological Implications of Body Size*, which is responsible for around half of his lifetime citations. This work, along with the empirical theories of many new ecologists, forms the core of the emerging field that Rob saw as our future: Predictive Ecology.

(No article about Rob Peters should be published without at least one graph, so Fig. 1 shows the evolution (sorry Rob) of his publication record, considering only articles for which he was first author.)

By latest count, Rob has authored nearly 120 refereed publications and citations surpassed 200/year in 1995. These appeared at a rate of 2-3 per year between 1971 and 1981, accelerating to >6 per year after the appearance of *Ecological Implications*. This count does not include the >100 articles published by members of his lab with his support, that generously do not carry his name. His refereed publications are very diverse, concentrating on many aspects of phospho-

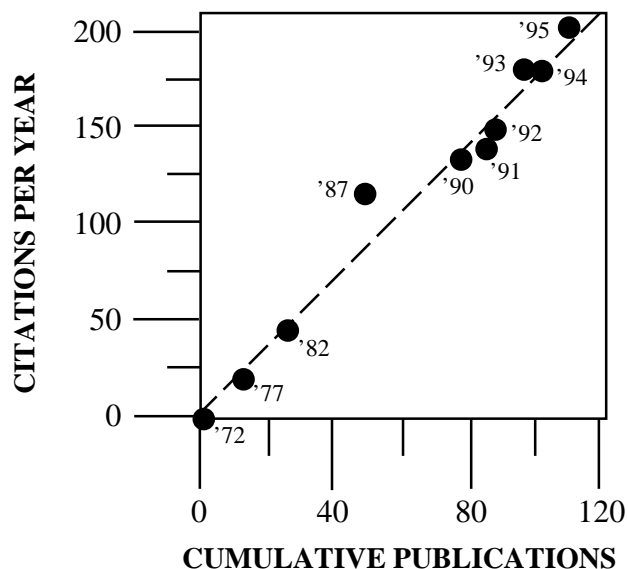


Fig. 1. Relationship between the cumulative number of refereed publications listing Robert H. Peters as an author (x), and the annual number of citations of publications listing him as first author (y). Numbers by data points refer to years. Citation data are taken from the Science Citation Index. The dashed line is the least squares regression (of course); $y = 2.68 + 1.85x$, $r^2 = 0.97$.

rus cycling in lakes and other systems, trophodynamics, zooplankton ecology, lake management models, aquatic toxicology, allometry of many diverse plant and animal taxa, benthic ecology, marine ecology, fish yield models, radio-nuclides in the environment, sampling theory, macrophyte ecology, phytoplankton ecology, and science policy.

Robert Peters has had a great impact on the way we do and the way we think about ecology. In recent years, he is increasingly cited for his criticisms of the way in which ecologists do science, especially for his book, *Critique for Ecology*. The fact that this book touched a raw nerve is amply illustrated by the sometimes personal vehemence of a few of the published reviews of it. If Rob had been wrong, his error could have been demonstrated coldly and empirically. Rob must have found this vehemence peculiar as he warmly welcomed all points of view in hopes that he could learn something new from them. Rob's intention has been to help ecologists see clearer paths to powerful theory. The utility of his close critique of the field he loved is clear from the number of graduate seminars around the world that have used this book to fuel their own examination of the science of ecology.

Rob's warmth and caring extended through all aspects of his life. When I think of Rob, I think of a man who blended a highly productive career with a warm family life, and an ever extending circle of friends. Reading manuscripts while playing with Julian and Elisa. Never preoccupied or too busy to have a child climb up on his lap and talk about nonsense. Talking about science while cooking in a kitchen in Canada or Italy. Propped against the wall locked in intense conversation and equally intense enjoyment of his beloved Italian wines. Rob enjoyed the richness and diversity of all of life. He relentlessly sought the outliers that make both life and science interesting.

Rob Peters was the scientist that we all should strive to be. His mind was always open to new ideas and new ways of solving problems. He toiled unselfishly toward the advancement of limnology and ecology, the fields his professional life was completely dedicated to. As critical as he was of non-predictive science, he was equally warm and inquisitive toward people of all scientific backgrounds. I believe that he felt that all scientists pursue the course that they sincerely believe in, for I never heard him say an unkind word about anyone. In addition to being a productive and incisive scientist, he was a loving and kind husband, father and friend. Whether they knew Robert Peters or not, all limnologists and ecologists have lost a close ally.

POLLY A. PENHALE RECEIVES ASLO'S DISTINGUISHED SERVICE AWARD

Polly A. Penhale was honored with ASLO's Distinguished Service Award for her valuable ideas, insights and advice concerning society operations and programs, for fostering collaborations with other societies, and especially for developing annual and other meetings to bring together the full range of aquatic sciences. This award was initiated in 1993, to recognize members who have displayed exceptional

Through the use of electronic mail and occasional telephone calls, Polly has been able to keep up with ASLO responsibilities despite extended periods in the antarctic.

efforts that support the professional goals and enhance the stature of ASLO.

Dr. Penhale was born in St. Louis, Missouri, and received a B.S. in Biology from Earlham College. She received her M.S. (1972, feeding ecology of arctic sticklebacks) and Ph.D. (1976, primary productivity and nutrient transport in seagrass-epiphyte system) degrees from North Carolina State University, followed by postdoctoral research at the University of Miami's Rosenstiel School of Marine Science (1976-1977) and the Kellogg Biological Station (1977-1979). She joined the faculty of the College of William and Mary's Virginia Institute of Marine Science in 1979, and spent 2 1/2 years as a Visiting Scientist at the National Science Foundation (1982-1985). In 1986, she returned to the National Science Foundation as Program Manager for the Polar Biology and Medicine Program (Office of Polar Programs).

Penhale was elected to the position of ASLO Secretary in 1985, and will complete her fourth and final term this July. With her dedication to building strong aquatic science programs, Penhale has distinguished herself through work with ASLO, as a member of the U.S. Delegation to the Committee on Conservation of Antarctic Marine Living Resources, and her service on various academic, governmental, and non-governmental working groups.

PERSPECTIVES ON ASLO: Acceptance Speech by Polly Penhale

Polly A. Penhale, Office of Polar Programs, National Science Foundation, 4201 Wilson Blvd., Arlington, VA 22230 (ppenhale@nsf.gov)

I am greatly honored to be recognized by my colleagues in ASLO for service to the society as secretary and board member over the past twelve years. I grew up in a family where volunteer work was part of life and where the rewards were very internal and private. I'm overwhelmed to stand before so many friends and colleagues to accept this award and I thank you. When first approached by the Nominations Committee to be a candidate for the secretary's position, I was reluctant to run for office. I had not served on the board, I wasn't an ASLO insider, and I wasn't sure what I could contribute to the society. Over the years, I've found a group

of dedicated colleagues on the board and an organization which encourages and listens to volunteers who step forward to advise and serve the society.

When Diane McKnight called to say that I'd receive this award, she asked if I could comment on changes in the society that I've observed over the past twelve years [1985-1997]. I'm happy to note that some things have stayed the same. ASLO continues to be known for its excellent journal, *Limnology and Oceanography*, and continues to hold excellent meetings. Since 1986 the society has grown from about 3300 members to 3800 members. Meeting attendance has grown from about 400 to 600 attendees in the early 1980's to ca. 1500 attendees in 1997. The number of pages of *Limnology and Oceanography* published annually have increased from 1,400 in 1985 to 2,200 in 1997. ASLO has often held two meetings a year and has more frequently joined with other societies to co-sponsor meetings. Member services have increased.

The membership and the Board have worked together to bring improvements for the Society and its members. As a member of ASLO, Ben Cuker came to the Board with an idea which led to the establishment of the Committee on Under-Represented Minorities in Limnology and Oceanography. As President, Trevor Platt encouraged a focus on international membership. As a Board member, Diane McKnight's concern with ethical matters led to the establishment of the Ethics Committee, which produced an ethics statement for the society. A main focus of Nancy Marcus's Presidency was the development of education workshops.

Some of the increases in member services have come from creating an infrastructure which reduces the burden to volunteers. The executive director, Susan Weiler, has written proposals for the external funds which have supported several education workshops, the DIALOG program, and student poster awards. The *ASLO Bulletin*, which is produced by Sue, has developed into a good means for communicating information and commentary to members. The Business Office, now led by Helen Schneider, has taken more of a role in meeting organization, data management, and in budget activities over the past years twelve years.

As secretary, I devoted much of my time in the area of meetings development. One goal was to work with other societies, such as the American Geophysical Union, to co-sponsor interdisciplinary meetings such as the Ocean Sciences Meeting. Another goal was to find ways to reduce the administrative burden to a meeting's program committee volunteers so that they could devote their talents and energies to the intellectual content of the meeting. Some of the changes in meeting organization are perhaps not apparent to members. In the past, universities and institutions were able to donate significant support for meetings, including staffing and services such as meeting rooms and audio-visual equipment without charge. Today we face a very different world of cost-accounting where institutions have much less ability to contribute to the financial support of meetings. Meeting budgets have evolved to a finely tuned financial venture where small errors could have serious effects on the society's

treasury. Professional meeting organizers are often required to assist the volunteer efforts. The secretary, treasurer, executive director and business manager have all worked together to effect changes in meeting management with minimal impact to the membership.

My final comment is that I see ASLO's strength in its membership having diverse interests in all areas of aquatic sciences. As I step down as secretary, I hope our meetings, such as this Aquatic Sciences Meeting and meetings co-sponsored with other societies, will continue to foster productive interactions across the fields of limnology and oceanography.

1997 OUTSTANDING STUDENT POSTER AWARD RECIPIENTS

Six awards were made for outstanding student posters presented at the ASLO 1997 Aquatic Sciences meeting in Santa Fe, New Mexico. The 111 posters under consideration were judged on the basis of innovation/scientific insight, quality of experimental design/methods, and clarity/effectiveness of presentation. We thank the U.S. Office of Naval Research for contributing \$500 cash prizes for each award recipient. Each awardee also received a pot made by the local pueblo indians. We thank Steven Widder, concierge at the La Fonda Hotel, for offering a beautiful selection of pots from his own collection. The committee of judges included Thomas A. Malone (ASLO President Elect and judging committee co-chair), Thomas Sibley (judging committee co-chair), David Burdige, Arthur S. Brooks, James E. Cloern, Paula G. Coble, Gregory A. Cutter, Erica J.H. Head, Joel Kostka, Steven E. Lohrenz, George Matsumoto, Douglas C. Miller, Heidi M. Nepf, Jonathan R. Pennock, Lawrence P. Sanford, Oscar M.E. Schofield, Linda P. Shapiro, Peter G. Verity, Cathleen Wigand, and Peter J. LeB Williams.

The tradition of ASLO's student poster awards was begun at the 1988 meeting in Boulder, Colorado when meeting organizers Diane M. McKnight and James Lebaugh decided to make the first poster awards. It was such a good idea that every meeting since has followed their example. The "tradition" became formalized in 1992, when ONR was approached and agreed to support the awards with the \$500 prizes. The process seemed to come full circle this year, as now-president Diane McKnight made the award presentations to the 6 recipients. Diane noted that it is not necessary to be an officer or even Board member to make a difference in ASLO!

Awards were presented to:

Irena F. Creed for Creed, I.F. and L.E. Band, "Role of spatial organization of water and nitrogen contributing source areas on nitrogen export from catchments". Irena received her B.S. in 1985 and M.S. in 1989, both in biology, from the University of Toronto. During this time, her primary interests were in aquatic ecology and toxicology. During her M.Sc. program, she investigated the role of primary producers on the in vitro transformation of arsenic and elucidated the unstable nature of arsenic in freshwaters. Prior to the start of her doctoral program, she was an envi-

ronmental consultant and participated in an international development project in north China. It was during this time that Irena became interested in landscape controls on catchment nutrient dynamics. Supported by Natural Science & Engineering Research Council of Canada and Eco-Research Doctoral Fellowships, her doctoral research interests are to evaluate the impact of environmental perturbations on the character of water and solute export to waterways. In the ASLO 1997 poster, Irena described the importance of the characteristics of the distribution of contributing nitrogen source areas on nitrogen export from forest catchments. The uniqueness of her approach is that (1) it provides a method that will enable us to state, a priori, whether two catchments will exhibit similar behavior in the export of nutrients, and provides a physical basis for interpretation of observed differences in behavior; and (2) it predicts the distribution of nutrient sink and source areas within the catchment, that has theoretical relevance to the design of field experiments and practical relevance to the design of forest management plans. Upon completion of her degree at the University of Toronto this summer, Irena will start an assistant professor position at the University of Victoria in Canada.

Yu (Alice) Gau for Gao, Y., G.J. Smith and R.S. Alberte, "Temperature dependence of nitrate reductase (NR) activity in marine phytoplankton: Ecological implications". Alice received a B.S. in botany in 1982 from the Nanjing University and M.S. in marine biology in 1985 from the Institute of Oceanography, Academia Sinica, China. Her Master's thesis work focused on the taxonomy and ecology of marine nanoplankton. She came to the United State in 1988 to pursue a Ph.D. at the University of Southern California with Dr. Dale Kiefer. Two years later, she started working with Drs. Randy S. Alberte and G. Jason Smith at the Hopkins Marine Station of Stanford University. Her research interests focus on the cellular and molecular regulatory mechanisms that govern the growth and productivity of marine autotrophs, as well as the application of molecular techniques (both in situ and in vitro) in oceanographic studies. As a result, her doctoral dissertation research examined the biochemistry and regulation of nitrate reductase (NR), a key enzyme in nitrate assimilation in a marine diatom and explored the use of an anti-NR antibody probe for in situ detection of NR in the diatom. She will complete her graduate study in March and will then work with Dr. Thomas Leustek at the Rutgers University to look at the molecular and regulatory aspects of DMSP production in marine autotrophs.

Christian E. Hamm for Hamm, C.E., M. Reigstad and P. Wassmann, "Chemical tracing of *Phaeocystis* sedimentation in the Balsfjord, Northern Norway". While an undergraduate, Christian studied biology and geology in Tuebingen/ Southern Germany, and became interested in the importance of marine organisms for the formation of sedimentary deposits. During a one-year stay at the Rosenstiel School of Marine and Atmospheric Science at the University of Miami he took classes in biological oceanography and sedimentology. This experience inspired him to continue studying biological oceanography and marine geology at the University of



1997 ASLO Outstanding Student Poster Award recipients with ASLO President, Diane McKnight (Front row: Irena F. Creed, Y. Alice Gau, Diane M. McKnight, Stacey L. McLeroy-Etheridge. Back Row: Olaf G. Olson, Rolf D. Vinebrooke (digitally inserted) and Christian E. Hamm.

Bremen, Germany. Subsequently, he completed his Masters thesis in 1994, working with Victor Smetacek and Ulf Riebesell at the Alfred Wegener Institute for Polar and Marine Research on the effects of fine lithogenic particles on formation and properties of marine snow. Since then, he has been working at the Alfred Wegener Institute for a Ph.D. concerning the structure, composition and fate of the cosmopolitan, bloom-forming colonial microalga *Phaeocystis*. The poster presented at the ASLO 1997 meeting in Santa Fe illustrates the sedimentation of *Phaeocystis*-derived material, showing for the first time that a contribution of *Phaeocystis* to organic carbon sedimentation via krill fecal strings exists and can be revealed by sterol analysis. After completing his Ph.D. early next year, Christian hopes to continue working in the field of biological oceanography and geology, preferably studying links between the production and fate of biogenic material.

Stacey L. McLeroy-Etheridge for McLeroy-Etheridge, S.L. and G.B. McManus, "Effect of copepod feeding on ingested phytoplankton pigments". Stacey received her B.S. in biology in 1994 from the University of Alabama, where she did undergraduate research in aquatic entomology. She became interested in marine science after participating in an extensive summer course at the Dauphin Island Sea Lab on Alabama's Gulf Coast. Stacey began graduate work at the University of South Alabama studying plankton ecology and marine microbiology, examining the relationship between *Vibrio vulnificus* bacteria and their phages in gulf coast oysters and other estuarine habitats. She moved to the University of Connecticut with her advisor, Dr. George McManus, in the fall of 1995. Her thesis research concerns the fate of phytoplankton accessory pigments during copepod feeding. She plans to begin working on her doctorate this fall studying zooplankton-toxic algae interactions.

Olaf G. Olson for Olson, O.G. and S.C. Fritz, "Mechanisms of long-term change in periphytic diatom community structure in Glacier Bay, AK". Olaf received his B.S. in biology from the University of Minnesota in 1994. As an undergraduate Olaf worked on a paleolimnological study

using the trace metal concentrations and oxygen and carbon isotope signatures of ostracod shells to infer past climates in the Northern Great Plains under Drs. Dan Engstrom and Sheri Fritz. He also conducted research on long-term changes in zooplankton community structure in Glacier Bay, AK, under Dan Engstrom. Following graduation Olaf was a research assistant for Dr Sandy Milner in Glacier Bay studying invertebrate succession in streams. His current research combines his interests in paleolimnology and modern ecology. The chronosequence of lakes in Glacier Bay provides excellent sites to conduct experiments on long-term community development. The work presented at ASLO in 1997 is intended to serve as a process-based model for the interpretation of stratigraphic diatom sequences in boreal lakes.

Rolf D. Vinebrooke for Vinebrooke, R.D. And P.R. Leavitt, "Ecological significance of allochthonous dissolved organic matter in an alpine lake." Rolf received his B.S. (Biology) from the University of Toronto in 1991. There he also completed a M.S. (Botany) in 1994 under the supervision of Johann Hellebust. The focus of this research was on the abiotic and biotic regulation of periphyton in recovering acidified Canadian Shield lakes. Rolf's interest in littoral ecology has lead him to examine shallow-water foodwebs in Canadian Rocky Mountain lakes. Presently, he is conducting his doctoral research with Dr. Peter Leavitt at the University of Regina, and is investigating the importance of allochthonous DOM, NP, UV radiation, and herbivory in littoral foodwebs of remote mountain lakes located near David Schindler's base camp in Banff National Park.

1997 ASLO STUDENT TRAVEL AWARD RECIPIENTS

Each year, ASLO provides awards to students making oral or poster presents at ASLO meetings, to defray their travel costs. Awards are based on need, as described by the applicant when they register for the meeting. Previous awardees are not eligible. This year the Board of Directors provided \$10,000 for 25 awards of \$400 each. Recipients were: **Zainal Arifin**, Simon Fraser University (Canada); **Stefan Bertilsson**, Linkoping University (Sweden); **Elizabeth W. Boyer**, University of Virginia; **David J. Detlor**, University of Connecticut; **William F. Donahue**, University of Alberta (Canada); **Lisa A. Drake**, Old Dominion University; **Peter J. Jacobson**, Virginia Polytechnic Institute and State University; **Jessica Kastler**, Louisiana State University; **Isabelle Laurion**, University of Laval (Canada); **Aishao Li**, University of Maryland; **Ee Lin Lim**, Woods Hole Oceanographic Institution; **Michael C. Murrell**, University of California at Santa Cruz; **Cleber C. Ouverney**, University of Southern California; **Silvio Pantoja**, State University of New York at Stony Brook; **Amanda Plante**, University of Saskatchewan (Canada); **Jennifer Putland**, Memorial University of Newfoundland (Canada); **Moon Bo Shim**, Inha University (Korea); **Brenda Simmers**, University of Toledo (Canada); **Catherine Stevens**, Dalhousie University (Canada); **Kam W. Tang**, University of Connecticut; **Gaspar Taroncher-Oldenburg**, Woods Hole Oceanographic Institution; **Michael Twardowski**, University of Rhode Island; **Eric van Gool**, Nederlands Instituut voor Oecologisch Onderzoek (Netherlands); **Rolf Vinebrooke**, University of Regina (Canada); and **Peder M. Yurista**, University of Michigan.

Hydrolab ad

SAN FRANCISCO BAY: THE ECOSYSTEM

*Timothy J. Hollibaugh, Tiburon Center, San Francisco State University,
P.O. Box 855, Tiburon, CA 94920*

Alien invasions, droughts, floods, toxic pollution and water use conflicts - these were the headlines for San Francisco Bay in the 80's and 90's. While they are eye-catching, they provided the reader with only a very narrow perspective of the news of the Bay during this period. The deeper story concerns the dramatic advances in our understanding of the Bay as an ecosystem during this period - an understanding both driven by and underscored by these headlines.

Almost 20 years ago, Dr. T.J. Conomos organized a symposium on San Francisco Bay for the 20th annual meeting of the Pacific Division of the American Association for the Advancement of Science. The product of that symposium, "San Francisco Bay: The Urbanized Estuary" (edited by Dr. Conomos and published in 1979 by the Pacific Division AAAS), was the first comprehensive collection of papers on San Francisco Bay. This immensely popular volume rapidly became the "bible" of research scientists, consultants, environmental lawyers, managers and others concerned with San Francisco Bay. Although the collection was updated in a 1985 issue of *Hydrobiologia* that focused on a detailed study of the Bay conducted in 1980 (Cloern, J.E. and F.H. Nichols, eds, "Temporal Dynamics of an Estuary: San Francisco Bay"), "The Urbanized Estuary" remains a primary reference on San Francisco Bay.

On both political and scientific fronts, the nearly two decades between publication of "The Urbanized Estuary" and the present have hosted a number of significant events. A series of hearings to determine water allocations to protect Bay aquatic resources focused the attentions of managers and the general public alike on the Bay during the later half of the 1980's. Their attention was sharpened by what at the time appeared to be an unending series of drought years, possibly attributable to broad-scale climate change brought on by anthropogenic carbon dioxide emissions. These fears were erased, at least temporarily, by torrential storms and record floods during the winters of 1993 and 1995.

At the height of the drought an exotic species, the Asiatic clam *Potamocorbula amurensis*, was introduced to northern San Francisco Bay. Unlike many of its predecessors, the establishment of this organism had devastating consequences for the Bay. In slightly over 1 year following its introduction in 1986, it became established throughout the Bay. Its populations became so large in some areas, notably Suisun Bay, that the standing crops of phytoplankton were decimated and primary production plummeted to approximately 20% of its previous value. In addition to competing directly with zooplankton for what appeared to be limited phytoplankton food resources, the clam was found to impact zooplankton populations directly by capturing juvenile stages of some species. Because these zooplankton were key food items for the larvae of some species of fish, this posed

the prospect of a cascading series of indirect negative impacts on the already beleaguered fish populations of the Bay.

This series of events spurred new research and analysis of historical data focused on elucidating the relationship between freshwater inflows and ecological processes in San Francisco Bay and on understanding the Bay as an ecosystem. This scrutiny raised many questions about our conceptual models of how the Bay functions as an ecosystem. What are the sources of organic matter fueling Bay productivity? What is the relationship between estuarine physics and biology or chemistry? What are the links between the Bay and the Sacramento-San Joaquin Rivers and Delta? How important is freshwater flow versus fresh water quality? How does the Bay function physically and what controls exchange with the ocean or circulation in the northern reach? It also focused more process-oriented research on the North Bay, where environmental research previously had been dominated by mandated monitoring programs.

Given the determined efforts to understand the Bay in the nearly 2 decades since the symposium on which "The Urbanized Estuary" was based, it seemed appropriate convene a similar symposium with the intent of producing a companion volume to update "The Urbanized Estuary" and present the emerging new paradigms. The 75th Annual Meeting of the Pacific Division, AAAS, held in San Francisco in 1994, provided the opportunity. The result is a 1996 volume, "San Francisco Bay: The Ecosystem", which complements "The Urbanized Estuary". "San Francisco Bay: The Ecosystem", is a 550 page, cloth-bound book edited by myself and published by the Pacific Division, American Association for the Advancement of Science. Orders may be sent to: Pacific Division, AAAS, California Academy of Sciences, Golden Gate Park, San Francisco CA 94118 (\$45.00 per copy. Add \$3.25 for postage and handling of one book, and \$1.25 for each additional book ordered at the same time and mailed to the same address. California residents must also add \$3.71 (8.25%) sales tax per book).

NSF GEOSCIENCES TOWN MEETINGS

Vanessa Richardson, Director of Operations and Analysis, GEO, National Science Foundation 4201 Wilson Blvd., Room 705, Arlington, VA 22230

Since October 1996, the Directorate for Geosciences (GEO) of the National Science Foundation (NSF) has been convening a series of "town meetings" at the major geosciences meetings. The town meetings were intended to provide a forum for the community to discuss with NSF/GEO staff issues related to the health of the geosciences. At the ASLO Aquatic Sciences Meeting in Santa Fe, NM, the NSF/GEO Town Meeting was held on Thursday evening, February 13, 1997. Dr. Robert Corell, Assistant Director for Geosciences, led the formal discussion around the following topics: Scientific Opportunities and Infrastructure, Education and Diversity, Proposal Evaluation and Review, and Stresses on the System. Other members of the panel included: Dr.

Jarvis Moyers, Division of Atmospheric Sciences; Dr. Leonard Johnson, Division of Earth Sciences; Dr. Michael Reeve, Division of Ocean Sciences; Dr. Polly Penhale, Office of Polar Programs; Ms. Cheryl Dybas, Office of Legislative and Public Affairs; Ms. Vanessa Richardson, Office of the Assistant Director for Geosciences; and Dr. William Bishop, Advisory Committee for Geosciences.

During the informal, open discussions, meeting participants raised many important issues that included: budget allocations, priority setting and long-range planning within the Directorate for Geosciences; the outlook for Federal support of research and development; problems facing non-tenured faculty who are involved in educational activities; NSF diversity programs including the need mentors and the importance of visibility within the scientific community and the general public; eligibility requirements of the NSF Graduate Fellowships Program; implementation of the new merit review criteria; and trends in interagency collaborations and individual investigators versus multi-investigator research.

Following the formal agenda of the meeting, Dr. Corell gave a brief overview of Japan's new Science and Technology Basic Law, and more specifically, Japan's Global Change Prediction Program. He outlined the planning between Japan and the U.S. Government for participation of U.S. researchers in this Japanese initiative.

Summaries of the NSF/GEO Town Meetings are on the GEO HomePage (<http://www.geo.nsf.gov>). The Directorate for Geosciences has also established an e-mail address (geo@nsf.gov) for comments and suggestions on GEO programs and activities.

REFERENCE BIBLIOGRAPHY: EFFECTS OF FISH ON LAKES

Field surveys and experiments conducted over several decades have shown that fish can directly or indirectly affect virtually all biological and chemical components of lake ecosystems. Despite the publication of several excellent reviews and books on aspects of fish effects, a comprehensive bibliography has not been available. Dr. Ray W. Drenner, a professor of biology at Texas Christian University, has recently compiled and installed a 1500-reference bibliography on the effects of fish on lakes on his home page (<http://www.bio.tcu.edu/bio/drenner.html>). The bibliography covers a wide range of topics including: (a) feeding behavior and selectivity of freshwater fish, (b) factors controlling prey availability and fish feeding rates, (c) niche partitioning and competition, (d) effects of fish removal for renovation of fish communities, (e) fish polyculture, (f) effects of species introductions, (g) biomanipulation, and (h) direct and indirect effects of fish on physical, chemical and biological components of lake systems. The bibliography is organized by year of publication and then by author to give users a sense of how the field has developed and changed through time. Fig. 1 shows the number of papers published each year on this ecologically important topic. It was prepared in December of 1996 when some papers for that year were not yet published.

**Have you voted yet?
Candidate bios start on p. 9**

EDUCATION

RAYMOND P. GERBER APPOINTED EDUCATION SECTION EDITOR FOR *ASLO BULLETIN*

C. Susan Weiler, Bulletin Editor (weiler@whitman.edu)

It is with great pleasure that I announce a new education section for the *ASLO Bulletin*. ASLO member Raymond P. Gerber (Department of Biology, Saint Joseph's College, Standish, ME 04084-5263 (Tel: 207-893-7906; Fax: 207-893-7861; rgerber@sjcme.edu)) has agreed to serve as "section editor", to ensure

that we have articles relevant to education in every issue. We hope that by setting up this named section, those of you interested in education will contribute more articles and more often. Contributions may be submitted to me or to Ray. We look forward to your input!

PREPARING SUCCESSFUL GRANT PROPOSALS TO FUND AQUATIC SCIENCE EDUCATION PROJECTS: WORKSHOP SUMMARY

Ray P. Gerber, Biology Dept., Saint Joseph's College, Standish, ME 04084-5263 (Tel: 207-893-7906; Fax: 207-893-7861; rgerber@sjcme.edu)

NSF continues to expand and support science education projects. In keeping with ASLO's commitment to education a grant writing workshop for aquatic science education projects was held at the Aquatic Sciences Meeting in Santa Fe (Monday, February 10, 1997). David W. Mogk, Montana State University (formerly NSF) assisted by Joan Mitchell, National Science Foundation did a superb job of describing the science education programs at NSF and the details of how to prepare successful grant proposals. NSF funding for science education has greatly increased in recent years and will continue to do so in the future. Both David and Joan stressed the need for aquatic scientists to take a more active role in undergraduate as well as K-12 science education. Programs directed at teacher preparation are given highest priority. NSF recognizes that science and technology literacy needs to be extended throughout the curriculum, including majors and non-majors.

The workshop focused on the goals and priorities mainly

within the Division of Undergraduate Education (DUE); including course and curriculum development, undergraduate faculty enhancement and instrumentation and laboratory improvement. Information was also presented on programs for K-12 curricula and teacher preparation. The characteristics of what makes outstanding proposals and the criteria and procedures used by NSF to evaluate the proposals were discussed. Actual comments from proposal reviewers that describe the strengths and weaknesses of proposals was very informative. Other important but often missed aspects of proposals was covered, such as the plan for dissemination and evaluation.

The capstone of the workshop was when the participants evaluated and discussed actual funded proposals. Small groups were each given a different proposal to evaluate and were instructed to base the evaluations on the criteria used by NSF. There were about five different proposals and therefore five different groups. After about a half-hour one member from each group presented the strengths and weaknesses of the proposal to the workshop as a whole. As each proposal was discussed it became clear what features characterize successful proposals.

The overwhelming feeling of the participants was that this workshop was outstanding! David Mogk did a fantastic job and thoroughly covered all aspects of grant writing and evaluation. Joan Mitchell provided important insight and commentary. This type of program is significant to the growing ASLO education program. It is clear from the feedback of the workshop participants and from those who wanted to attend but could not, that this workshop should be offered at least twice during the ASLO Meeting, and at all future ASLO Meetings.

ENVIRONMENTAL OUTREACH SLIDE SHOWS AVAILABLE

C. M. Pringle, Institute of Ecology, University of Georgia, Athens, GA 30602 (pringle@sparrow.ecology.uga.edu)

Three environmental outreach slide shows are available on aquatic systems. These slide shows are made available at cost through the University of Georgia. Prices quoted below include cost of slide duplication, xeroxing and mailing. If overseas, please add an additional \$9.

A. 'The Living Stream' (80 slides plus script), PRICE: \$50.

This slide show, designed by Bert Cushing, explains how streams function by describing the various physical, chemical and biological characteristics that work together to shape a particular stream reach. Changes in these characteristics along the river continuum are subsequently explored, along with patterns of biological characteristics and energy patterns from headwaters to mouth.

B. 'How the Benthic Biologist Can Have an Impact Upon Instream Flow Assessments Through Hydro-Relicensing' (43 slides plus script), PRICE \$29.

This slide show, designed by Todd Folsom, focuses on how aquatic ecologists can improve in-stream flow below

dams by getting involved in the hydro- relicensing process. The presentation outlines major steps in the federal relicensing process and points out the opportunities for benthologists to be heard. It also illustrates how a power company analyzes instream flow alternatives and develops its position.

C. 'Riparian Environments: Values, Threats, Management and Restoration' (80 slides plus script) PRICE: \$50.

The educational outreach slide show on the conservation of riparian zones will be available for purchase beginning 30 April. The slide show was designed by Ron Bjorkland, Charles Shreves and Cathy Pringle. It is a visually oriented educational tool designed to facilitate the understanding and appreciation of the ecological, economic, and societal roles and values of riparian environments. The 80-slide presentation incorporates slides from most regions of the U.S. and addresses five themes: (1) definition of riparian zones; (2) ecological, social and economic importance; (3) major threats; (4) current federal policies and other tools for protection; and (5) examples of recent restoration efforts. Each slide is referenced in a 35-page booklet which addresses the aforementioned themes, and documents the sources of information. The slide show can be used for a variety of audiences, from high-school to undergraduate-college levels to community organizations.

Ordering Information: Prices are quoted above; there is an additional \$9 fee for overseas shipments. Deliveries will be made 2-6 wks after orders are received. Please make check out to the University of Georgia and send check to: C. M. Pringle, Institute of Ecology, University of Georgia, Athens, GA 30602

SYNTHESIS AND MODELING PROJECT OF THE U.S. JOINT GLOBAL OCEAN FLUX STUDY

The Division of Ocean Sciences of the National Science Foundation (NSF) and the Earth Observing System Interdisciplinary Science and Biological Oceanography Programs of the National Aeronautical and Space Administration (NASA) solicit research proposals to participate in the Synthesis and Modeling Project (SMP) of the U.S. Joint Global Ocean Flux study (U.S.JGOFS). As the last major activity of U.S.JGOFS, the SMP is open to U.S. scientists without past involvement in U.S.JGOFS as well as past and present U.S.JGOFS investigators.

The expected funding for the initial activities in the SMP is approximately \$2.5 million per year for up to three years. The agencies expect that up to 20 awards will be made commencing in fiscal year 1998. The deadline for proposals is **June 6, 1997**. Preliminary award decisions will be made not later than October 15, 1997, which is the earliest possible start date.

The agencies anticipate a second call for proposals in early 1998, with start dates as early as October 15, 1998.

Details of the scientific and implementation framework for the SMP are given in the *U.S.JGOFS Science Plan for Synthesis and Modeling*, which is available from the U.S.JGOFS Planning and Implementation Office, Woods Hole Oceanographic Institution, Woods Hole, MA 02543. The *Plan* is also available on the U.S.JGOFS Office homepage (<http://www1.whoi.edu/jgofs.html>).

ASLO MEETINGS

UPCOMING ASLO MEETINGS

Jonathan J. Cole, ASLO Meetings Committee Chair (Jonathan_J_Cole@compuserve.com)

The ASLO 1997 Aquatic Sciences meeting in Santa Fe, New Mexico was an outstanding success due to the hard work of meeting convenors James T. Hollibaugh and Jonathan J. Cole and Planning Committee members Kenneth E. Bencala, Nina F.M. Caraco, James E. Clorn, Edna Graneli, Susan S. Kilham and Polly A. Penhale and C. Susan Weiler. We received a lot of positive feedback, such as this from Roberta L. Marinelli: "I want to express my appreciation for your incredible efforts towards organizing the Santa Fe meeting. It is one of the best meetings I have attended, from the quality of presentations and the venue to the special activities, etc.... The science was invigorating, as were the opportunities to escape brain saturation, provided by the numerous diversions both within and outside the city. Certainly, some things were less than optimal (e.g. the distance between the Convention Center and other meeting rooms, cold coffee). But these were trivial in the overall scheme of things." Putting a meeting together is truly a team effort, and thanks go to all those who contributed to the meeting with their presentations, ideas, and organizational skills.

We had hoped to have a good idea of whether or not to return to Santa Fe by the end of the '97 meeting. However, feelings are decidedly mixed. While everyone seems to think Santa Fe is an incredibly exciting destination, some felt the facilities were just too small for ASLO. Others felt it was too difficult to access or that costs were too high. More than half, like Roberta, felt the positives more than made up for the problems. The Board, with input from the ASLO Meetings Committee, is still wrestling with the question of where to hold the next aquatic sciences meeting, scheduled for winter, 1999.

The ASLO '97 meeting in Santa Fe is barely a memory, yet planning for meetings in 1998 and 1999 is well under way:

1998 ASLO/AGU Ocean Sciences Meeting will be held February 9-13 in San Diego, California. Linda Duguay (lduguay@nsf.gov) will serve as the ASLO co-chair for the meeting. All ASLO members will receive mailings for the meeting. You may also check the ASLO home page (<http://aslo.org>) for meeting details.

1998 ASLO/ESA Meeting will be held June 8-13 in St. Louis, Missouri. ASLO Board member Catherine A. Pringle (pringle@sparrow.ecology.uga.edu) and Ecological Society of America Strategic Biosphere Initiative Director Mary Barber will serve as co-chairs for the meeting. Please see the next article for details.

1999 ASLO Aquatic Sciences Meeting will be held in late January or February, at a location that has not yet been confirmed. ASLO Board member Karen F. Wishner will serve as one of the co-chairs for the meeting. As in the past, this meeting will cover the full range of aquatic sciences, emphasizing similarities and differences across freshwater

and marine systems. If you are interested in organizing a special session, please contact Karen (kwishner@gsosun1.gso.uri.edu).

2000 ASLO/AGU Ocean Sciences Meeting will be held January 23-28 in San Antonio, Texas.

2000 ASLO annual meeting and beyond are still in the planning stages. Watch this space for details.

1998 JOINT ASLO/ESA MEETING: THE LAND-WATER INTERFACE: SCIENCE FOR A SUSTAINABLE BIOSPHERE

The ASLO 1998 summer meeting will be held June 8-13 in St. Louis, Missouri, as a joint meeting with the Ecological Society of America (ESA). ASLO Board member Catherine M. Pringle (pringle@sparrow.ecology.uga.edu) and Ecological Society of America Strategic Biosphere Initiative Director Mary Barber will serve as co-chairs for the meeting. Other members of the planning committee include Elizabeth Blood, Deborah A. Bronk, Katherine Fowler, Thomas M. Frost, Marjorie M. Holland, Samantha B. (Mandy) Joye, Garth W. Redfield, Helen Schneider LeMay, and C. Susan Weiler. ASLO's Business Office will handle registration, the Call for Papers and Program printing, hotels, and other non-scientific meeting arrangements. ASLO and ESA members will receive the Call for Papers and other mailings.

This meeting will focus on science (basic and applied) at the land-water interface of both fresh- and salt-water systems. The meeting will include daily plenaries, invited and contributed oral and poster presentations, and roundtable discussion and synthesis.

The meeting will be in the heart of the down town, near the banks of the Mississippi River and the dramatic Gateway Arch, a memorial to Thomas Jefferson. Founded as a French colonial village in 1764, St. Louis has grown into an exciting, colorful community full of beautiful reminders of the past. The Museum of Westward Expansion tells the story of America's western growth. Countless historic homes and Victorian townhouses are available for public viewing as well as Forest Park, site of the famous 1904 World's Fair. The city offers outstanding museums and exhibits, such as the Saint Louis Museum, the Missouri History Museum, the St. Louis Zoo, the Missouri Botanical Garden, and the St. Louis Science Center. Numerous rhythm & blues and jazz spots are within strolling distance from the ASLO meeting.

Confirmed plenary speakers to date include: **Sandra Postel** (Worldwatch Institute, author of *The Last Oasis*) will speak on water resources and sustainability; **Theo Colburn** (World Wildlife Fund, author of *Our Stolen Future*), will speak on hormonal mimics/endocrine disruptors: Aquatic systems as canaries in the coal mine; **David Pimentel** (Cornel University) will speak on water resources, agriculture, and ecological systems; and **Robert Naiman** (University of Washington) will speak on The Freshwater Imperative's history, present and future.

Special Session themes include: integrating ecosystem concepts in freshwater, marine, and terrestrial systems; pulsing and temporal-spatial scales; limiting factors, food webs and carbon flow across systems; disturbance and recovery; nutrient stoichiometry; coastal eutrophication; hydrological modifications; ecosystem restoration; fisheries; and research connections to management. There will be no more than 6 concurrent oral sessions. Space has been reserved to enable all poster presentations to be on view throughout the meeting, with formal poster sessions at times with no concurrent oral sessions.

ASLO '98 Special Session topics invited

If you are interested in organizing a special oral or poster session, please send your proposed session title and description to Susan Weiler (Weiler@Whitman.cdu) by July 1, 1997. Topics related to the above meeting themes will have highest priority for oral sessions.

JOBS

UNIVERSITY OF WASHINGTON Applied Limnologist

Assistant Professor position within the Environmental Engineering & Science Program in the Department of Civil Engineering, University of Washington, Seattle, WA 98195-2700. For further information, contact Professor H. David Stensel, Box 352700. FAX: (206) 543-9358, Email: stensel@u.washington.edu.

UNIVERSITY OF FLORIDA Wetlands and Water Quality

Assistant Professor in Wetlands and Water Quality - Tenure-track, 12-month faculty position, 60% extension and 40% research. Responsible for developing programs in wetlands with emphasis on surface water quality, wetland delineation, and ecology. The extension and research programs must provide linkage among the various extension/research programs in the department's thrust areas in wetlands and pedology. Must have a Ph.D. in Soil and Water Science or related, along with broad experience and understanding of soil, water, and ecological resources as they occur in the landscape. Experience in wetland soils and wetland ecology is highly desirable. Submit a complete file

of information consisting of: 1) a curriculum vitae and letter of application; 2) transcripts of all college of university work, sent directly from institution(s) to the Search Committee Chair; 3) five (5) letters of reference, sent directly from referees to the Search Committee Chair, addressing the candidate's qualifications and suitability for this position by JUNE 1, 1997. Dr. K. Ramesh Reddy, Search Committee Chair, Soil and Water Science Department, 106 Newell Hall, PO Box 110510, University of Florida, Gainesville, FL 32611-0510, Phone: (352) 392-1803, Fax: (352) 392-3399, E-mail: krr@gnv.ifas.ufl.edu.

UNIVERSITY OF FLORIDA Everglades and Education Center

The Everglades Research and Education Center of the University of Florida has a graduate assistantship for a M.S. (2 year) or Ph.D. (3 year) student beginning Fall of 1997. Research will involve evaluating the wildlife relations of farm lands in the Everglades Agricultural Area and their potential role in the restoration of the Greater Everglades/South Florida ecosystem. Contact Frank J. Mazzotti, Dept. of Wildlife Ecology and Conservation, Everglades Research and Education Center, 3200 E. Palm Beach Rd, POB 8003, Belle Glade, FL 33430-8003. (Tel: 561-996-3062).

CALENDAR OF EVENTS

Meetings and events submitted since the last issue of the ASLO Bulletin are presented below.

See the ASLO website, <http://aslo.org/> for a more complete listing

Walt Dineen Society First Annual Meeting

Dates: May 22-24, 1997

Location: North Miami, Florida

Topics: Informal forum for the communication of scientific information on the ecosystems of South Florida among scientists and policy makers. Researchers and students in the natural, physical, and social sciences are encouraged to participate.

Contacts: Dan Childers (Tel: 305-348-3101; childers@fiu.edu or Frank Mazzotti (Tel: 954-370-3725; fjma@gnv.ifas.ufl.edu; <http://www.fiu.edu/~glades/everglades/dineen>).

Biogeochemistry of Wetlands

Dates: September 16-19, 1997

Location: University of London, England

Topics: Functional assessment of wetland ecosystems; Nutrient cycling in saltmarshes; plant-soil interactions of wetlands; Modelling of wetland biogeochemical processes; Toxic chemicals in wetlands; European wetlands; Tropical wetland ecosystems; Water quality; Freshwa-

ter biogeochemistry; The effects of climate change on wetlands; The role of wetlands in global nutrient cycles; carbon dynamics; Land-use and wetland conflicts; Wetland biodiversity.

Contact: Royal Holloway Institute for Environmental Research, University of London; (fax: +44 (0)1784 477427; Email at rhier@rhnc.ac.uk)

Summer Course in Coastal Oceanography and Marine Field Methods

Dates: June 23 - August 15, 1997

Location: Skidaway Inst Oceanography, Savannah Georgia

Description: An intensive 8-week course which comprises lectures in coastal oceanographic processes, laboratory and field studies, and nearshore and offshore cruises on Skidaway's R/V Bluefin.

Contact: Roberta L. Marinelli (Tel: 912-598-2307; roberta@skio.peachnet.edu). Application forms are available on Skidaway's home page (<http://www.skio.peachnet.edu>).

8th Deep-Sea Biology Symposium

Dates: September 22-27, 1997

Location: Monterey, California

Topics include but are not limited to: Diversity, adaptation, and evolution of deep-sea biota; pattern and function of deep-sea populations and communities; source and utilization of carbon inputs in deep-sea systems; metabolic or physiological studies of deep-sea biota; microbial processes in deep-sea habitats; deep-sea pelagic community studies; sedimentation and diagenesis in deep ocean habitats; reproduction in the deep-sea; interdisciplinary studies in deep ocean settings (JGOFS etc.); studies of specialized habitats (seeps, vents, oxygen minimum zone).

Contact: Jim Barry, Monterey Bay Aquarium Res. Inst. Box 628, Moss Landing CA 95039 (barry@mbari.org) or <http://www.mbari.org>.

Estuarine Research Federation 14th International Conference

Dates: October 12-16, 1997

Location: Providence, Rhode Island

Topics: "The State of Our Estuaries" addressed through thematic sessions, oral and poster presentations, and workshops. Topics include the consequence of human development in the coastal zone; the physical and ecological responses of systems to changes in freshwater flow; the recovery of bays and estuaries; the consequence of habitat changes on estuarine systems; the effects of sea level rise on our estuaries; and phytoremediation.

Contact: <http://cbl.cees.edu/erf/erf97.html>.

17th International Symposium of the North American Lake Management Society

Dates: December 3-6, 1997

Location: Houston, Texas

Topics: The US:Mexico border - NAFTA and beyond; stochastic events; restoring healthy littoral zones; management of rivers and reservoirs; maintaining the health of our estuaries; wetlands for water quality; ecosystem health—what does it mean?; urban stormwater management; biomanipulation techniques; eutrophication—water quality; public education; kills, spills, and other thrills; using GIS in management; invasive species.

Contact: Robert Doyle, Lewisville Aquatic Ecosystem Research Facility, RR#3, Box 446, Lewisville, TX 75056 (Tel: 972-436-2215; Fax: 972-436-1402; rddoyle@gte.net)

International Conference: New Methods in Copepod Taxonomy

Dates: May 4 - 8, 1998

Location: St. Petersburg, Russia

Topics: Meeting will bring together researchers dealing specifically with morphology as it relates to taxonomy in various groups of Copepods, in order to better delineate species. New and rarely used methods are of particular interest: DNA analysis, chromosome analysis (chromosome diminution especially), enzyme analysis, DNA hybridization using closely related species, larval sign analysis, etc. Other topics include analysis of variability and taxonomic weight of signs now used in describing copepods to validate new species described in the last decades using morphological details only. Two workshops are planned: Chromosome diminution, and hybridization techniques using the Fischer's Cyclopoid species. This conference is dedicated to the memory of Dr. Ulrich Einsle.

Contact: Victor R. Alekseev, Zoological Institute, Russian Academy of Sciences, 199034, St. Petersburg, Russia (Fax: 7-812-114-0444; avr@zisp.spb.su). E-mail contact is preferred.

ASLO/ESA Joint Meeting The Land-Water Interface: Science for a Sustainable Biosphere

Dates: June 8-13, 1998

Location: St. Louis, Missouri

Topics: This joint meeting between ASLO and the Ecological Society of America (ESA) will focus on science at the land-water interface of both fresh- and salt-water systems. The meeting will include daily plenaries, invited and contributed presentations, and roundtable syntheses. Themes include integrating ecosystem concepts in freshwater, marine, and terrestrial systems; pulsing and temporal-spatial scales; limiting factors, food webs and carbon flow across systems; disturbance and recovery, nutrient stoichiometry, coastal eutrophication, hydrological modifications, ecosystem restoration, fisheries, and research connections to management. There will be no more than 6 concurrent oral sessions. Space has been reserved to enable all poster presentations to be on view throughout the meeting, with formal poster sessions at times with no concurrent oral sessions. See pp. 33-35 for details.

Contacts: Catherine M. Pringle, Institute of Ecology, University of Georgia, Athens, GA 30602 (pringle@sparrow.ecology.uga.edu); C. Susan Weiler (weiler@whitman.edu); Registration will be handled by the ASLO Business Office, 5400 Bosque Blvd. Suite 680, Waco, TX 76710-4446 (Tel: 800-929-ASLO or 817-399-9635; Fax: 817-776-3767; business@aslo.org).