

ASLO BULLETIN

American Society of Limnology and Oceanography

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MESSAGE FROM THE PRESIDENT

ASLO PRESENT STATUS AND FUTURE PROSPECTS

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Over the last two years, under the capable leadership of Tom Malone, ASLO has accomplished a great deal. We hired a new editor, moved the editorial office, and revamped a number of important arrangements for publishing *Limnology and Oceanogra-*

phy; all of these changes have turned out very well. We also hired a new executive director and converted the executive director's position from part-time to full-time. The new executive director has an office in Washington, D.C., in space that is leased from AIBS. Establishment of an office in Washington, D.C., allows us to interact much more closely with other professional societies, many of which have offices in Washington, and to pursue an agenda in public policy, which will be one of the tasks for the new executive director. In addition, the board worked out over Tom's two years as president a solution to some nagging financial problems that led into three successive years of deficit. We raised dues modestly and raised institutional subscriptions (mainly

The ASLO Bulletin is published 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:

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TARGET DATES:

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

ADVERTISING:

Send inquiries to Helen Schneider-Lemay, Business Manager, ASLO Business Office at the address below.

MOVING?:

Send your change of address to the ASLO Business Office, 5400 Bosque Blvd., Suite 680, Waco, TX 76710-4446, USA, (800) 929-ASLO (U.S., Canada, and Caribbean) or (254) 399-9635 Voice, (254) 776-3767 Fax, business@aslo.org E-mail

accounted for by libraries) substantially (from \$175 per year to \$350 per year). We took a bit of a risk in doing this, in that we had little idea whether or not we would cause an abrupt decline in subscriptions. Library subscriptions remained essentially steady through the increase in rates; thus we have balanced our budget and have a small surplus to help us with inflation and new costs over the next few years.

Although we brought closure to a number of important issues over the last two years, others could not be put to rest with any single decision and will continue to be on the board's agenda for at least the next two years. These include decisions about our new efforts in the field of public policy, decisions that relate to electronic publishing, and formulation of appropriate responses to questions that we are receiving from the organizers of the new European Society for Limnology and Oceanography (ESLO). The board discussed each of these items during its meeting in Washington, D.C., on 15-16 July.

ASLO in the past made several commitments to a program in public policy, but until the July board meeting, had not made final decisions on specific elements of this program. By vote of the membership, ASLO changed its Articles of Incorporation in June 1998 to include public issues ("link knowledge...to the identification and solution of problems generated by human interactions with the environment"). Also, the board had public policy in mind when it decided that there was a need for the new executive director to establish a Washington, D.C., office. Finally, the board explicitly searched for an executive director who would be interested in and experienced with public policy. Jonathan Phinney fits this requirement very nicely. As Jonathan had been working for several months by the time of the July board meeting, and had completed most of the logistical arrangements of setting up his office, it was clear that the board needed to make commitments to specific activities related to public policy.

The board had an extensive discussion of the scope of public policy as it relates to a professional society. Board members seemed to agree that public policy for ASLO will stop short of lobbying or direct attempts to influence legislation (in any event, these activities are prohibited by the Articles of Incorporation), but certainly will include the dissemination of information in forms that can be used by the general public, the media, educators, and administrators or politicians, all of whom may find themselves without adequate information on technical subjects in our field. With these goals in mind, we might consider renaming our program to emphasize information rather than legislation, as the term "public policy" might suggest. The board welcomes ideas on this topic.

I asked David Karl, chair of ASLO's ad hoc committee on public policy, to attend the board meeting and to make a presentation containing recommendations from his committee and to give his own views on ASLO's public policy initiative. Following Dave's excellent presentation, which provoked a good deal of discussion, the board made several decisions related to the public policy initiative. The board voted to reconstitute the public policy committee under Dave Karl (the committee's term had expired), and to ask the committee to

advise the board and the executive director on implementation of several specific tasks under consideration by the board. The board also voted to ask the executive director to begin creating a directory of professional expertise, searchable by topic, to be made available for public use, and through which the society could advise those external to it how to locate specific types of expertise for purposes related to education or public welfare. As expected, it was agreed that any such directory would exclude members who do not wish to be listed. The board believes that the directory will prove useful not only in external affairs, but also within ASLO. Finally, the board voted to ask that the executive director begin the creation of an information transfer network composed of ASLO members, each of whom consents to be involved in the network. Members of the network will be committed to making personal contact with a geographically-matched public office or agency that could be expected to use or require information in the fields of limnology and oceanography. Congressional home offices are an initial starting point, but the board is anxious to extend beyond this to administrative offices, international agencies, and possibly others as well. The success of this effort will depend largely on the degree of interest among the membership. The board will be considering other types of public policy initiatives in the future, including especially a publicly available repository of information on limnology and oceanography that would be useful for reference on specific topics or for educational purposes at several different levels.

The board also discussed electronic publishing at length. The issues here are sufficiently complex that they deserve their own space in a later issue of the Bulletin. In capsule, at issue is the degree to which the society can distribute *Limnology and Oceanography* by electronic means that might involve some loss of control over distribution. While we are functioning at or very near the state-of-the-art with respect to internal distribution, and perceive no great hazard in continuing this effort, loss of control over distribution, while potentially enhancing information transfer, could threaten the financial basis of the society and therefore must be considered carefully.

Another major item discussed by the board in July was the formation of ESLO. In responding to requests from ESLO organizers for close cooperation, the board has been anxious to assure the organizers that there is no feeling of competition or disappointment concerning the formation of ESLO. At the same time, however, the board feels uneasy making final decisions at this point on formal liaisons between the two organizations, given that ESLO is still an exploratory concept in Europe. The organizers seem to understand our position; they will undoubtedly stay in touch with us and will probably make a number of specific requests of the ASLO board in the future.

Even absent a description of other items considered by the board in July, it is clear that the ASLO board could continue over the next two years to fill its time with items that are already on its agenda. It is also clear, however, that ASLO, with its balanced budget and excellent staff, has the capacity to expand its work over the next two years. Through its actions at

the July meeting, the board showed its willingness to move ahead rapidly with the public policy agenda. Because this type of work is new to the society, there will be numerous course corrections and dead-ends, but there are many ideas in the air and some of them certainly will work well. Beyond developing the public policy initiative into something that has form and substance, I have recommended to the board that it consider other kinds of work as well, specifically in the fields of education and publishing.

The public policy interests of ASLO often have been mentioned in combination with education. Certainly some aspects of public policy are virtually indistinguishable from those of education, at least the extent that work in public policy for a professional society might involve attempts to convert information from specialized disciplines into a form palatable to members of the public. There is a long-standing interest in other aspects of education, however, that we need to consider somewhat separately from public policy. For example, the board has discussed over the last ten years on numerous occasions what some members believe to be a decline in the vigor or effectiveness of limnology (Challenges Report, 1995). At the urging of ASLO members, especially Gene Likens, the National Research Council formed a committee, which was chaired by Pat Brezonik, an ASLO member, to consider this issue. The resulting NRC report (1996. *Freshwater Ecosystems. Revitalizing Educational Programs in Limnology.* National Academy Press.) focused its attention on education, which the NRC committee members believed to lie at the root of some degree of senescence in limnology. Should we respond to this report by acting on some of its recommendations, or at least devising a plan of our own that is inspired by the report and previous work of ASLO committees (Challenges Committee, Future of ASLO Committee)? If not, are there other actions that we should be taking that relate to education, as delivered through institutions of learning at any level, in limnology and oceanography?

A final issue is publication. ASLO enjoys status as a premier society in its discipline, and its claims to this status are due largely to its professional meetings and its journal. The board and the membership have adapted meetings extensively over the years to the expectations of members, with the intent of maximizing participation and quality. *Limnology and Oceanography* has expanded greatly in volume, but we have not been willing to tamper with its fundamentals because it is so successful. Assuming that we continue in our desire to preserve the general intent, format, and content of *L&O*, is there more that we can or should do by way of publication? My personal view is that this is one of our greatest frontiers. The high reputation of *Limnology and Oceanography* gives us a head start in mounting one or more complementary publications. Furthermore, *Limnology and Oceanography* is a financial pillar of our society. While new journals are not profitable initially, and some may not be profitable at all, one could surely make a case that ASLO's best prospect for significant, sustained increase in revenue is through publication. Furthermore, one or more additional publication efforts

could enliven the society by diversifying its work in the field of scientific communication.

Specific possibilities for additional efforts in the field of publication are numerous. My personal bias is that the *Bulletin* should be a more ambitious publication with more extensive and diverse content than it has now. Beyond this, I believe that we could easily justify at least one additional journal. New journals are appearing all the time, and some see this proliferation in large part as a nuisance. But we cannot stop the creation of new journals, particularly through commercial outlets, and I see little argument for standing outside the fray and commenting critically while we could and should be involved in innovation and quality control, as we have been through *Limnology and Oceanography*.

The essence of this report is that I believe us to be now at a threshold. From here we can cruise along comfortably with our current agenda, but more exciting would be to expand selectively but aggressively along lines that are likely to build ASLO's strength. As the board seems to share these opinions, I hope to give you news of major new events in future issues of the *Bulletin*. In the meantime, I hope to hear opinions and suggestions from members through email (lewis@spot.colorado.edu), or through the ASLO web site messaging system.



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ASLO 1999 FINANCIAL STATEMENT

REVENUE

Society

Dues	\$245,480.00
Sustaining Members	1,500.00
Interest	4,726.39
Investment Income (Nations Bank)	25,701.28
Meetings – Santa Fe	109,576.48
General Endowment	4,645.00
Student Travel	2,290.00
Mailing List Rentals	5,167.25
Bulletin Advertising	6,957.50
Miscellaneous	<u>2,634.58</u>
	\$408,678.48

Journal

Subscriptions	\$261,842.00
Reprints	69,874.60
Miscellaneous	
Author Alterations	18,981.26
Color Plates	10,580.00
Page Charges	26,802.03
Copyright Release	513.63
Non-Member Publication	2,899.42
Back Issues	1,216.25
Web Job Postings	<u>50.00</u>
	\$392,759.19

Grant – Special Issue	\$ 35,010.72
Gain on Sale of Investment	2,850.10

TOTAL REVENUE **\$839,298.49**

EXPENSES

Society

Audit & Tax Preparation	\$ 2,850.00
Charge Card Bank Fees	5,364.11
CD ROM Project	18,414.42
Depreciation	3,576.20
Dues	2,145.00
General Travel & Meetings	18,612.28
Gifts and Awards	3,938.32
Insurance	691.00
Interest	498.42
Inventory Storage	1,807.06
Investment Fees	1,815.22
Mailing List Rentals	3,258.57
Misc. & General Administration	9,059.78
Miscellaneous Postage	13,561.40
Miscellaneous Printing	9,994.01
Newsletter – Printing & Postage	25,675.51
Student Travel Awards	10,000.00
Telephone	4,394.34
Web Services	<u>20,537.50</u>
	\$156,193.14

Expenses (cont'd)

Executive Director's Office

Salary	\$ 46,760.00
Benefits	14,029.00
Secretary Salary	10,026.00
Secretary Benefits	3,007.00
Indirect Expenses	5,678.00
Operating Expenditures	7,500.00
Travel & Miscellaneous	<u>3,742.89</u>
	\$ 90,742.89

Business Office

Contracted Services	\$ 60,940.00
New Members	4,069.13
Travel & Meetings	<u>2,208.16</u>
	\$ 67,217.29

Board Member Travel & Misc.

President	\$ 5,500.70
Secretary	3,637.62
Treasurer	<u>3,886.22</u>
	\$ 13,024.54

Journal

Publishing (9)	\$328,659.29
Publishing Special Issue	5,035.80
Reprints/Postage	26,813.84
Back Issues	<u>3,845.24</u>
	\$364,354.17

Editorial Office

Seattle Office Closing	\$ 38,473.85
Rent	3,840.00
Editor-In-Chief	25,000.00
Journal's Manager	39,999.92
Office Supplies	2,306.06
Equipment Rental	1,657.37
Phone Lines	1,767.19
Offsite Back-up	162.43
Storage	233.87
Travel & Meetings	4,757.91
Copyediting	32,057.73
Postage	<u>7,727.52</u>
	\$157,983.85

Congressional Fellow	\$ 10,315.00
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TOTAL EXPENSES **\$859,830.88**

*Excess Revenue over Expenses/
(Expenses over Revenue)* **(\$20,532.39)**

ASLO NEWS

MESSAGE FROM THE EXECUTIVE DIRECTOR



Jonathan T. Phinney, 1444 Eye Street, NW, #200, Washington, D.C. 20005
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jphinney@aslo.org

The grace period allotted at the beginning of any new endeavor has seen the implementation of several new features and changes regarding the ED's role. As always, I greatly

appreciate any comments on the society.

Science Funding and Jobs: Two new features from the ED's office have commenced since April. This office surveys the myriad of on-line government and private sector list serves and resources each week and posts any funding opportunities on the ASLO website - under the "links to other sites" section on the opening page. These sources are published periodically, so send your e-mail address to the ED's office, and a list serve will be created to alert members when funding opportunities arise. (Only ASLO members can be on the list serve). The ED's office also receives job announcements which we post on the "Jobs" page of the website.

Bulletin: Needed-New Editor-in-Chief. With the move of the executive director's office to Washington, D.C., the ASLO board decided that the ED can no longer act as editor-in-chief of the *Bulletin* as well as manage the duties of the society, and develop an outreach and public policy program. The board agreed at the annual July board meeting to replace the ED with a volunteer editor-in-chief. The individual will have editorial control over the *Bulletin* content and be able to develop his/her ideas on how to make the publication more useful and relevant to ASLO members. (See advertisement on Page 6 for more details.) After three very productive years, **Ray Gerber** has stepped down as education editor to devote more time to other scientific and education efforts. During his tenure, Ray managed to cajole three articles per issue and greatly enhance the content of the *Bulletin*. His presence will be sorely missed.

Needed International Articles and Website Links. With nearly 25% of ASLO members from outside North America, the *Bulletin* needs to have articles that are relevant to the international community and to educate all members. I would greatly appreciate articles as well as international website links to funding and jobs that can be placed on the ASLO website.

Public Affairs: Developing a public affairs program at ASLO was a central reason for moving the ED's office to Washington, D.C. There is no dearth of issues that need better scientific engagement, and the public affairs committee is being revitalized under the leadership of Dave Karl. The issue is how to make an effective and relevant program amongst a society that is a grassroots by choice and international in scope. As a scientific society, ASLO needs to maintain the position as an independent broker of information and not ally itself with

any political agenda. However, as individual scientists and constituents of government representatives, ASLO members have an enormous amount of influence. It is at the local level, where elected officials are responsible to constituents (and votes), that scientists should spend a lot of time. The public affairs committee will be developing a more cohesive strategy over the next few months. In the meantime, the ED's office is developing a list of scientific expertise for inquires from the public including government agencies and non-government organizations. For example, the most recent inquiry before the *Bulletin* went to press was from the U.S. National Oceanographic and Atmospheric Administration (NOAA) requesting technical assistance on marine protected areas. Other inquiries include technical assistance on water quality issues on a local water body in Indiana, USA. With the help of the public affairs committee, I hope to refine the information needs for the list. (See the President's Message for more information).

ESLO—European Society of Limnology and Oceanography: An exciting recent development in the society has been the interest expressed by some European scientists to develop a greater regional presence for limnology and oceanography. At the 2000 meeting in Copenhagen, there was an informational meeting of ESLO resulting in a spirited discussion on the purpose and function of such a group. There are many details that need to be worked out, and the final form of ESLO is still being dictated. Nonetheless, the idea of a stronger European presence by scientists is a positive development and will only increase the visibility of aquatic sciences worldwide. For more information, go to the ESLO website: www.eslo.org.

MESSAGE FROM THE BUSINESS MANAGER

Helen Schneider Lemay, ASLO Business Manager, ASLO Business Office, 5400 Bosque Boulevard, Suite 680, Waco, Texas 76710-4446 (Tel: 800-929-ASLO or 254-399-9635; Fax: 254-776-3767), business@aslo.org

It's hard to believe that the summer is over - but hopefully so are our 100 degree temperatures here at the ASLO Business Office in Waco, Texas.

The fall brings lots of wonderful and exciting changes for ASLO and it's members as we begin our renewal process. Here are some of the highlights that you will see when you renew your membership.

- **Renewals can now be done online using the ASLO website.** Check the ASLO home page for special instructions. Of course, you can still renew by mail, and you will receive information so that you can let us know how you would like to renew. We hope online renewing will save you time and be more convenient.
- **New directory will be published.** Be sure that you renew by the November 1st deadline so that you will be included with all the correct information. The directory will also be available online allowing easier and quicker "look up" services for ASLO members.

- Special introductory pricing for the CD-ROM set of volume 1-43!
- Subscription to *Biogeochemistry* at a reduced price.
- Choice of electronic or printed subscription to the *L&O*.
- Reduced registration fees to ASLO meetings and conferences.

ASLO is also beginning its new administrative year, and we look forward to working with a very enthusiastic board. We also hope to initiate electronic voting for future elections thus alleviating the slow mail systems around the world.

And don't forget to register for the ASLO 2001 Aquatic Sciences Meeting to be held February 12-16, 2001, in Albuquerque, New Mexico. Visit the ASLO web site for continued updates and submission forms. The committee has planned special evening outings to enhance your meeting experience including an optional reception at the New Mexico Natural History Museum. **The deadline for abstract submission is October 1, 2000!**

From all of us at your business office, we look forward to continuing to serve you.

OPEN POSITION: EDITOR, ASLO BULLETIN

The ASLO board of directors is seeking a new editor for the *ASLO Bulletin*. The *Bulletin* has been edited by the society's executive director, but the board has decided that it is impractical for the executive director to continue in this capacity while also carrying out the other duties of the society.

The board is also considering changes in the *Bulletin*. While final decisions on this matter have not yet been made, the *Bulletin* could change in format and have more diverse and extensive content in the future. The present issue and one more issue of the *Bulletin* will be published electronically this year while the *Bulletin* is in transition. Final decisions on the mode of publication for the *Bulletin* will be made in the near future by the board, with advice from the publications committee (Sybil Seitzinger, chair).

Any member of ASLO is eligible to apply for the open position of editor-in-chief. The editor will serve without compensation, but ASLO will pay for all expenses related to editorial services, and bear the cost of attendance by the editor for at least one ASLO meeting per year.

The editor of the *ASLO Bulletin* will work closely with the executive director and with the ASLO board in assembling news and announcements to be distributed through the *Bulletin*. In addition, the editor will prepare content for the *Bulletin* that may bear on any aspect of limnology and oceanography of broad interest to members of the society. The ASLO board may appoint associate editors to assist the editor in dealing with specific subjects. The editor is expected to invite or solicit contributions to the *Bulletin* as necessary to maintain diverse and interesting content. As the *Bulletin* is in a transitional state, the editor, in consultation with the ASLO board and publications committee, may have a strong influence on change in content or format of the *ASLO Bulletin*. Publishing and distribution of the *Bulletin* will be conducted through the ASLO business office or through a publishing contractor.

Qualifications, other than membership in ASLO, for the position of editor, *ASLO Bulletin*, include general familiarity with electronic communication, interest in and experience with ASLO, broad professional interests in limnology and oceanography, and a record of publication that reflects experience with the work of editors. Actual editing experience is not necessary, but would be useful. Applications should be sent to Jonathan Phinney, Executive Director of ASLO, 1444 Eye St., NW, Suite 200, Washington, DC 20005, e-mail: jphinney@also.org. Applications should include a CV and a cover letter that explains the applicant's interest in the job as well as any relevant experience.

Applications will remain open until the position is filled, but the selection process may begin at any time after September 20. Members may apply on their own behalf, or make suggestions to the executive director, who will then solicit applications from individuals who are nominated.

DISSERTATION INITIATIVE FOR THE ADVANCEMENT OF LIMNOLOGY AND OCEANOGRAPHY: DIALOG III PROGRAM REPORT

C. Susan Weiler, DIALOG Program Director, Biology Department, Whitman College, Walla Walla, WA 99362 (Tel: 509-527-5948), weiler@whitman.edu; <http://www.aslo.org/dialog.html>

Intro: The Dissertation Initiative for the Advancement of Limnology and Oceanography (DIALOG) is an international program initiated in 1994 to promote understanding and collegial interactions across the aquatic sciences. The program is co-sponsored by the American Society of Limnology and Oceanography and consists of three parts:

- Ph.D. Dissertation Registry. Recent Ph.D. recipients are invited to submit an abstract of their Ph.D. dissertation research for inclusion in the DIALOG Dissertation Registry. Abstracts are placed on the ASLO website in a searchable format, and a two-year compilation of all submitted abstracts is mailed to everyone who submits an abstract.
- Database. Demographic information is collected with the dissertation abstracts in order to characterize recent graduates for human-resource purposes. Results are presented in the ASLO Bulletin.
- Symposium. A symposium is held every other year to enhance interdisciplinary understanding and promote collegial interactions across the aquatic sciences. The fourth DIALOG symposium is scheduled for October 14-19, 2001. Graduates who completed their Ph.D. between April 1, 1999, and December 31, 2000, are eligible to apply. Sponsoring agencies provide support for travel and on-site expenses.

Dissertation Registry: The registry provides a unique introduction to the work of the most recent generation of aquatic scientists. Dissertation abstracts are immediately posted on line in a format that can be searched by year, name, and key words (www.aslo.org/dialog/dcite.html). Each issue of the *ASLO Bulletin* contains dissertation citations and e-mail

TABLE I. Institutions granting Ph.D. degrees to the 166 DIALOG III program participants. Numbers refer to the number of program participants who indicated limnology (lim) or oceanography (oce) as their primary field of interest.

<u>Lim</u>	<u>Oce</u>	<u>U.S. Institutions</u>	<u>Lim</u>	<u>Oce</u>	<u>Institutions Outside the U.S.</u>
1	0	Clemson University	1	0	Aachen University of Technology (Germany)
0	3	College of William and Mary	1	0	Agricultural Univ. of Wageningen (Netherlands)
1	0	Dartmouth College	1	0	Ain Shams University (Egypt)
0	1	Florida State University	0	1	Bar Ilan University (Israel)
0	1	Georgia Institute of Technology	0	4	Dalhousie University (Canada)
0	2	Louisiana State University	2	0	Dresden University of Technology (Germany)
1	0	Michigan Technological University	1	0	Free University of Amsterdam (The Netherlands)
1	0	Northwestern University	0	2	Hokkaido University (Japan)
2	0	Ohio State University	0	1	Kyoto University (Japan)
0	1	Oklahoma State University	0	1	Linkoping University (Sweden)
0	1	Old Dominion University	1	0	M.V. Lomonosov Moscow State University (Russia)
0	1	Oregon State University	0	1	Memorial University of Newfoundland (Canada)
0	1	Rutgers University	1	0	Polish Academy of Sciences (Poland)
0	2	Stanford University	1	0	Punjabi University at Patiala (India)
0	3	State University of New York at Stony Brook	1	0	Queen's University (Canada)
0	5	Texas A & M University	0	1	Southampton University (United Kingdom)
1	0	University of Alabama	0	1	St. Petersburg University (Russia)
1	0	University of Arkansas	0	2	Stockholm University (Sweden)
2	2	University of California at Davis	0	1	Tohoku University (Japan)
0	1	University of California at Irvine	0	1	Tokyo University of Agriculture and Tech. (Japan)
0	1	University of California at San Diego	1	0	Trent University (Canada)
1	3	University of California at Santa Barbara	1	0	Umea University (Sweden)
0	1	University of California at Santa Cruz	0	1	United Graduated School of Ehime (Japan)
0	1	University of Chicago	1	0	Univ. Natl. del Sur, Bahia Blanca (Argentina)
2	0	University of Colorado	0	1	Universida de Federal do Parana (Brazil)
0	1	University of Delaware	1	0	Universitaires Notre-Dame de la Paix (Belgium)
0	1	University of Florida	0	1	Universite de la Mediterranee at Marseille (France)
1	0	University of Georgia	0	1	University of Bordeaux (France)
0	2	University of Hawaii	0	1	University of Aarhus (Denmark)
0	1	University of Houston	1	0	University of Amsterdam (The Netherlands)
0	2	University of Maine	0	1	University of Athens (Greece)
0	8	University of Maryland	0	2	University of Auckland (New Zealand)
0	1	University of Miami	0	3	University of Bremen (Germany)
1	0	University of Michigan	1	3	University of British Columbia (Canada)
1	0	University of Minnesota	0	1	University of Buenos Aires (Argentina)
1	0	University of Mississippi	1	0	University of Chile (Chile)
1	0	University of Nebraska	0	1	University of Essex (United Kingdom)
1	0	University of Nevada at Reno	0	1	University of Helsinki (Finland)
1	0	University of New Mexico	1	0	University of Hull (United Kingdom)
0	1	University of North Carolina at Chapel Hill	0	1	University of Kerala (India)
2	0	University of Notre Dame	0	1	University of Kiel (Germany)
0	1	University of Puerto Rico at Mayaguez	1	0	University of London (United Kingdom)
0	6	University of Rhode Island	1	0	University of Lund (Sweden)
1	0	University of South Carolina	2	0	University of New South Wales (Australia)
0	2	University of Southern California	0	1	University of Perpignan-EPHE (France)
1	1	University of Texas at Austin	0	1	University of Plymouth (United Kingdom)
1	0	University of Virginia	0	1	University of Rostock (Germany)
0	4	University of Washington	0	1	University of Tokyo (Japan)
3	0	University of Wisconsin at Madison	1	0	University of Utrecht (The Netherlands)
1	0	University of Wisconsin at Milwaukee	1	0	University of Vienna (Austria)
0	2	Woods Hole Oceanographic Institution/MIT	0	1	University of Waikato (New Zealand)
29	63	Total, U.S. Institutions	0	1	University of Wales (United Kingdom)
			1	0	University of Warsaw (Poland)
			1	0	University Paris Va de Marne Paris XII (France)
			1	0	University Pierre et Marie Curie (France)
			5	0	Uppsala University (Sweden)
			1	0	Vienna University (Austria)
			33	41	Total, Institutions Outside the U.S.

This report summarizes results from the DIALOG III Program, which targeted individuals completing their Ph.D. dissertations between April 1, 1997, and March 31, 1999.

addresses of those submitting abstracts since the previous *Bulletin* deadline. Program participants are provided with a compilation of abstracts, a directory, and a demographic profile of their colleagues.

Population Characteristics: One of the most exciting aspects of the DIALOG program is the broad international representation. Citizens of 31 countries participated in DIALOG III: Argentina (3); Australia (1); Austria (1); Belgium (1); Brazil (5); Canada (8); Chile (1); China (4); Denmark (1); Egypt (1); Finland (1); France (3); Germany (12); Greece (1); India (2); Indonesia (1); Israel (2); Italy (2); Japan (7); Kenya (1); Korea (1); The Netherlands (4); New Zealand (5); Norway (1); Poland (2); Russia (3); Sweden (9); Switzerland (1); Turkey (1); United Kingdom (3); and the United States (78).

Ninety-two graduates completed degrees at 51 U.S. universities while 88 completed degrees at 57 non-U.S. institutions (Table I). Graduates from U.S. institutions included 76 Americans, two Brazilians, two Canadians, two Chinese, one Dutch, three Germans, one Israeli, one Korean, two Russian, one Swede and one Swiss. Two U.S. citizens completed degrees outside the U.S. (one in Sweden and one in Denmark).

Permanent positions were rare. Perhaps the most concerning result to come out of the DIALOG data is the high proportion of graduates on postdoctoral or other temporary positions (Figure 1). Scarcely 14% of U.S. graduates held permanent positions when they submitted their abstracts. By comparison, the NSF statistical survey of 1998 U.S. graduates (NSF 1999) found 43.1% of all science and engineering doctorates, 32.1% of earth, atmospheric and marine science doctorates, and 24.9% of life science doctorates had definite, non-postdoctoral employment plans at the time they completed the survey (generally shortly after completing their last Ph.D. requirement). While the DIALOG III sample size is admittedly small, there is a suggestion that U.S. limnologists have an easier time getting permanent positions than oceanographers: seven of the 24 U.S. limnologists held permanent positions

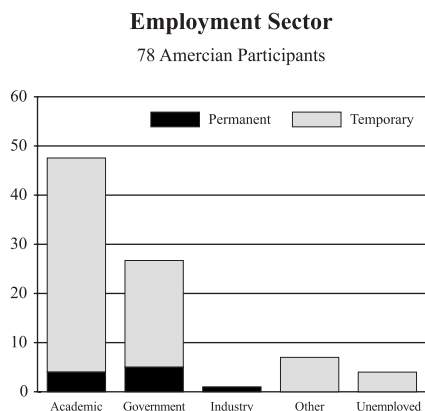


Figure 1. Type of position held by the 78 American DIALOG III participants. Temporary includes postdoctoral positions, while permanent includes tenure-track and other positions with the possibility of permanency.

when they registered, compared with just four of the 54 oceanographers. NSF has a larger database, but it is not possible to isolate limnologists or biological oceanographers for comparison. By the time of the DIALOG III symposium, the 42 symposium participants were seven months to 2.6 years post degree. At that time, only 24% held permanent positions and 44% of those still in postdoctoral positions indicated it was by necessity rather than choice.

Academia was the largest employer of U.S. and other participants. Among the 78 American participants, 67% held positions within academia; 21% within government; 1% within industry; and 7% in “other” sectors; 4% were unemployed (Figure 2). Of the 11 in permanent positions, six were in employed in academia, four in government and one in industry. Among the non-American participants, 67% held positions within academia; 16% within government; 2% within industry; and 10% “other”; 5% were unemployed.

Women were well represented. An encouraging statistic is the high representation of women: 50% among Americans and 34% for citizens of other countries (Table II). By comparison, the NSF survey of 1998 U.S. graduates (NSF 1999) found women accounted for 41.8% of all science and engineering graduates, 27.2% of earth, atmospheric and marine science graduates, and 45.4% of life science graduates. The high percentage of women in the DIALOG program may reflect the proportion going into aquatic science, or it may be that women are simply more likely than men to register for the DIALOG program.

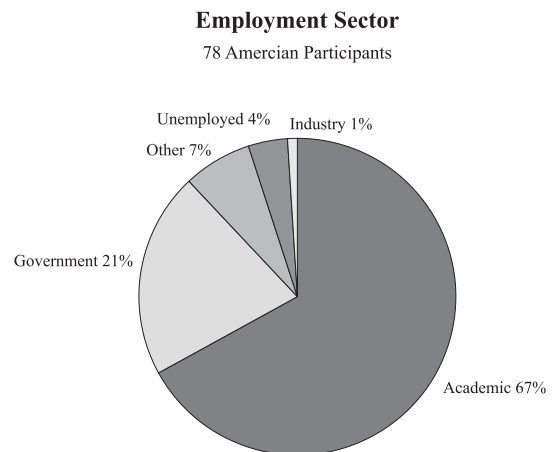


Figure 2. Employment sectors for the 78 American DIALOG III participants.

Minorities were less well represented, with just one African American and five Hispanic Americans submitting abstracts (6.5% of graduates from U.S. institutions). NSF data are similarly discouraging, with American Indians, Blacks and Hispanics accounting for only 6.7% of biological science Ph.D.s and just 4.8% of earth, atmospheric and marine science Ph.D.s awarded to U.S. citizens and permanent visa holders (NSF 1999).

The median age at Ph.D. was 31 years for U.S. citizens and 31.5 years for others (Table II). This is younger than NSF

figures for U.S. life science graduates (32.3 years) and Earth, atmospheric and marine science graduates (33.7 years).

	<u>78 U.S. citizens</u>	<u>88 non-US citizens</u>
Age at Ph.D. (median)	31 years	31.5 years
Gender (female/male)	50%/50%	34%/66%
Underrepresented minorities	6	N/A
Permanent position	14.3%	23.9%
Postdoctoral/ other temporary	81.8%	71.6%
Unemployed	3.9%	4.5%

Table II. Characteristics of the 166 individuals submitting dissertation abstracts through the DIALOG III program. The program includes individuals completing degree requirements between April 1, 1997, and March 31, 1999.

Limnologists were underrepresented, particularly among U.S. participants (Table III). Only 32% of DIALOG III participants receiving degrees in the U.S. listed their primary area of interest as limnology, compared with 44% of other graduates. By comparison, in 1998 43% of all ASLO student members (and 42% of ASLO student members residing in the U.S.) listed limnology as their primary area of interest. The corresponding figure for full members is 46%. The numbers are small but disturbing. Why are fewer limnologists registering? Are there fewer graduating? Are they less familiar with the program? Or are they for some reason less interested in the DIALOG Program?

	<u>Limnology</u>	<u>Oceanography</u>
166 Ph.D.s total	62 (37%)	104 (63%)
92 Ph.D.s from U.S. inst.	29 (32%)	63 (68%)
74 Ph.D.s from non-U.S. inst.	33 (44%)	41 (56%)
78 Ph.D.s by U.S. citizens	24 (31%)	54 (69%)
88 Ph.D.s by non-U.S. citizens	38 (43%)	50 (57%)

Table III. Primary field of interest for the 166 DIALOG participants.

Absolute numbers of limnology and oceanography graduates are difficult to come by. NSF does not use limnology as a degree field, and biological oceanographers are not distinguished from other oceanographers. The Consortium for Oceanographic Research and Education (CORE) has perhaps the best data on oceanography graduates by sub-discipline. CORE reported that 48 biological oceanographers graduated from 22 of the top oceanography institutions in 1997/1998 (CORE 1998). During that same 12-month period, 21 oceanography dissertations from those same 22 institutions were registered with the DIALOG program, and another 11 from other institutions were also registered. Using the CORE institutions as a yardstick, perhaps as many as 30-40% of U.S. biological oceanography graduates are currently registering with the DIALOG program. The percentage of limnologists is not known. There appear to be no comparable statistics available for limnology institutions. The fact that proportional representation was less for the ASLO membership suggests that limnologists may be less well-represented in the DIALOG program. Hopefully more of both groups will participate so that we will have comprehensive representation.

The DIALOG database will become increasingly useful as more graduates participate. It would be terrific if all limnol-

ogists and oceanographers registered their dissertations so that we could have a comprehensive survey of these recent grads. Right now we just have a snapshot, but with time we will be able to distinguish patterns and trends.

DIALOG Symposium: "Dialog was a real eye-opener in terms of how we can approach scientific problems from a multidisciplinary perspective. We hear about such approaches all the time but unless you actually have the time to talk in-depth with a colleague about how they approach these problems you do not understand how you might accomplish this. The earlier in your career such conversations start the better, and DIALOG was a perfect time for me." Jeffrey Jack, DIALOG II Participant

The goal of the DIALOG symposium is to foster cross-disciplinary and international understanding and interactions at an early career stage so that interdisciplinary perspectives and collegial relationships can build over a full professional lifetime. Forty-two recent Ph.D. recipients met October 18-24, 1999, at the Bermuda Biological Station for Research to discuss research and emerging aquatic science issues. Participants came from a variety of institutions, including some of the most innovative and productive aquatic research programs in the world. The international mix provides valuable insight into the research strengths and concerns in different parts of the globe. Unlike so many professional conferences where multiple concurrent sessions force attendance at sessions on select topics, this group was allowed the luxury of listening without distraction to a diverse array of topics and to develop a broader context for their own work. In years to come, the familiarity of this cohort with distant specialties and connections to the top young scientists in diverse fields should positively impact their careers and the development of the aquatic sciences.

The 42 symposium participants included citizens of 13 countries: Austria (1), Canada (1), Chile (1), Germany (5), Greece (1), Israel (1), Italy (1), Japan (1), New Zealand (1), Norway (1), Russia (2), Sweden (1) and the United States (25). Of these, 30 resided in the U.S.

In addition to the scientific presentations, funding agency representatives provided overviews of their programs with suggestions for developing successful collaborative proposals. Participants also met in working groups to discuss similarities and differences between education systems (Weiler and Beaulieu 2000), the conduct of science, as well as development of collaborative research proposals. Informal discussions focused on job-hunting strategies and family/career issues. Overall participants came away with an overview of the work being conducted by their counterparts in different disciplines and countries, the variety of educational systems in which Ph.D.s are developed, science infrastructure and funding issues, and research opportunities in which they might engage over the next few years.

Based on past experiences, these recent graduates hopefully will build on the connections made during the symposium through research collaborations, student exchanges, and other, less tangible, collegial interactions.

DIALOG IV Program: The DIALOG IV program is open to individuals who complete their last Ph.D. requirement between April 1, 1999, and December 31, 2000, and whose work in biological, chemical, geological or physical science is relevant to biologically-oriented limnology or oceanography. Individuals from all nations are eligible. The DIALOG IV symposium will be held in October 14-19, 2001, at the Bermuda Biological Station for Research. Application information and the dissertation registry are located at <http://www.aslo.org/dialog.html>.

The deadline for DIALOG IV symposium applications is May 1, 2001. A committee will select participants based on the application materials submitted. Symposium space is expected to be limited (acceptance rate has been around 50%). Selection will favor those who wish to pursue interdisciplinary aquatic science research. Funds for travel and on-site expenses are provided by the sponsoring agencies.

Acknowledgments: DIALOG is co-sponsored by the American Society of Limnology and Oceanography and Whitman College. Support is provided by the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the National Science Foundation and the Office of Naval Research (ONR N00014-98-1-0590 and NSF DEB 9813932). Symposium participant travel support also is provided by a grant from the European Commission (MAS3 CT98 6386).

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CONGRATULATIONS RECENT PH.D. RECIPIENTS

C. Susan Weiler, *DIALOG Program Director, Biology Department, Whitman College, Walla Walla, WA 99362 (Tel: 509-527-5948), weiler@whitman.edu; <http://www.aslo.org/dialog.html>*

The DIALOG (Dissertations Initiative for the Advancement of Limnology and Oceanography) program was begun in 1993 to facilitate the development of collegial ties and catalyze the exchange of knowledge across the aquatic sciences. It includes collection and analysis of demographic information on recent Ph.D. recipients, compilation and dissemination of dissertation citations and abstracts, and a symposium to bring together 40 recent Ph.D. recipients to foster collegial interactions across the range of aquatic science disciplines.

The DIALOG web site is at www.aslo.org/dialog.html. It contains program information, an online compilation of dissertation abstracts, interactive forms for posting dissertation abstracts, and instructions for applying for the DIALOG symposium.

Below are Ph.D. dissertation citations registered on the ASLO web page since the last *Bulletin* issue. Congratulations and best wishes to the following.

- **Atkins, Michael S.** 2000. Assessment of flagellate diversity at deep-sea hydrothermal vents using the combined approach of culture-dependent and culture-independent methods. Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, 224 pp. (matkins@alum.mit.edu)
- **Boxhorn, Joseph E.** 1999. Laboratory studies of the population dynamics of the rotifer *Brachionus calyciflorus* Pallas. University of Wisconsin-Milwaukee (USA), 231 pp. (jboxhorn@uwm.edu)
- **Donahue, William F.** 2000. The direct and indirect effects of solar ultraviolet radiation in boreal lakes of the Experimental Lakes Area, northwestern Ontario. University of Alberta (Canada), 177 pp. (wfdonahue@powersurfr.com)
- **Eriksson, Peder G.** 2000. Regulation and role of epiphytic nitrification and denitrification in macrophyte-dominated systems. Lund University (Sweden), 90 pp. (peder.eriksson@limnol.lu.se)
- **Jansson, Roland** 2000. Effects of flow regulation and fragmentation by dams on riparian flora in boreal rivers. Ume University, (Sweden) 96 pp. (roland@eg.umu.se)
- **Lopez-Veneroni, Diego G.** 1998. The dynamics of dissolved and particulate nitrogen in the northwest Gulf of Mexico. Texas A&M University (USA), 256 pp. (dglopez@imp.mx)
- **Lundquist, Carolyn J.** 2000. Effects of density dependence and environment on recruitment of coastal invertebrates. University of California at Davis (USA), 162 pp. (cjlundquist@ucdavis.edu)
- **Menounou, Nektaria** 1999. Mercury and other trace elements in sediment cores from a lacustrine and a marine setting: Environmental considerations and effects of early diagenesis. Texas A&M University (USA), 253 pp. (n0m2363@acs.tamu.edu)
- **Niyogi, Dev K.** 1999. Effects of stress from mine drainage on ecosystem functions in Rocky Mountain streams. University of Colorado (USA), 181 pp. (dev.niyogi@stonebow.otago.ac.nz)
- **Osburn, Christopher L.** 2000. Photochemical changes in the dissolved organic matter of temperate lakes: Implications for organic carbon cycling and lake transparency. Lehigh University (USA), 100 pp. (cosburn@ccs.nrl.navy.mil)
- **Quinlan, John A.** 1999. Interpreting and explaining patterns and processes in the oceanic phase of the Atlantic menhaden (*Brevoortia tyrannus*) life history using linked individual-based and hydrodynamic models. University of North Carolina at Chapel Hill (USA), 165 pp. (jaq@whoi.edu)

- **Rettig, Jessica E.** 1999. Interactions in a stage-structured species: impacts of adult bluegill on larval growth and survival. Michigan State University (USA), 144 pp. (rettigj@william.jewell.edu)
- **Robson, Barbara J.** 2000. Hydrodynamics of shallow Mediterranean estuaries, and relevance to some biogeochemical processes affection Nodularia blooms. University of New South Wales (Australia), 262 pp. (robson@cwr.uwa.edu.au)
- **Saros, Jasmine E.** 1999. The role of ionic concentration and composition in determining diatom distributions in saline lakes. Lehigh University (USA), 104 pp. (saros.jasm@uwilax.edu)
- **Shull, David H.** 2000. Mechanistic modeling of particle mixing in marine sediments. University of Massachusetts Boston (USA), 121 pp. (dshull@maine.edu)
- **Sievert, Stefan M.** 1999. Microbial communities at a shallow submarine hydrothermal vent in the Aegean Sea (Milos, Greece). University of Bremen (Germany), 186 pp. (ssievert@mpi-bremen.de)
- **Souza, Marcelo F.L.** 1999. Metabolismo e balanço de massa do estuário do Rio Piauí, Sergipe. Universidade Federal Fluminense (Brazil), 145 pp. (marlandim@hotmail.com)
- **Stepanaukas, Ramunas** 2000. Utilization of terrestrially derived dissolved organic nitrogen by aquatic bacteria. Lund University (Sweden), 118 pp. (ramunas.stepan.uskas@limnol.lu.se)
- **Thomas, Steven A.** 2000. Transport, deposition, and processing of fine organic particles in lotic ecosystems. Idaho State University (USA), 182 pp. (sathomas@vt.edu)
- **Touchette, Brant W.** 1999. Physiological and developmental responses of eelgrass (*Zostera marina* L.) to increases in water-column nitrate and temperature. North Carolina State University (USA), 217 pp. (brant_touchette@ncsu.edu)
- **Weber, Anke** 1999. The importance of info chemicals and clone-specific phenotypic plasticity in *Daphnia* ecology. Netherlands Institute for Ecology (Netherlands) 170 pp. (weber@nioz.nl)
- **Wilhelm, Frank M.** 1999. The ecology of *Gammarus lacustris* (Crustacea: Amphipoda) in lakes of the Canadian Rocky Mountains. University of Alberta (Canada), 162 pp. (frank.wilhelm@stonebow.otago.ac.nz)
- **Zimmerman, Andrew R.** 2000. Organic matter composition of sediments and the history of eutrophication and anoxia in the mesohaline Chesapeake Bay. College of William and Mary (USA), 269 pp. (azimmer@vims.edu)

ELECTIONS AND AWARDS

NEW ELECTRONIC VOTING FOR THE 2001 ELECTIONS

At its meeting in Washington, D.C., on 15-16 July, the ASLO board decided by formal motion to use electronic voting procedures in the next ASLO election. Prior to the election, all members of ASLO will be offered the opportunity to request a mail ballot instead of an electronic ballot if they do not wish to participate in electronic voting. Mail and electronic ballots will be combined by tellers who will report the results of the election. The board has reviewed Section V of the by-laws, which deals with voting, and believes that this change in voting procedures is consistent with the present version of the by-laws, even though electronic voting is not specifically mentioned in the by-laws. The board wishes to amend the by-laws appropriately in the future to be explicitly consistent with electronic voting and will offer amendments regarding electronic voting to the membership the next time the by-laws are revised.

ASLO 2000 ELECTION RESULTS

Based on 701 ballots received, the ASLO board is pleased to announce the following results for the 2000 elections:

President-elect: Peter A. Jumars, University of Maine, jumars@maine.edu

Secretary: Denise Breitburg, Academy of Natural Sciences, ERC, breit@acnatsci.org

Members-at-large:

Carlos M. Duarte, Instituto Mediterráneo de Estudios Avanzados, cduarte@clust.uib.es

Samantha (Mandy) B. Joye, University of Georgia, mjoye@arches.uga.edu

John J. Magnuson, University of Wisconsin, jmagnuson@mhlib.limnology.wisc.edu

Student member: Cynthia Kicklighter, Ph.D. candidate, Georgia Institute of Technology, setae@juno.com

ASLO 2001 BOARD NOMINATIONS NEEDED

Deadline for nominations is November 1, 2000.

ASLO is a member-driven scientific society, governed by a board of directors which includes the president-elect, president, past president, secretary and treasurer, seven members-at-large (one for every 500 members of the society), and two student representatives. Terms are for three years beginning July 1 except for those in the presidential succession and student members who serve two years in each position.

In 2001, two members-at-large, John Cullen and Heidi Nepf, as well as one student member, Maggie Squires, will rotate off the board so new members are sought to fill these three and two-year terms, respectively. Please nominate your colleagues or yourself for the member-at-large positions and include a brief resume (two pages). Nominations for student representative need to include the following additional information:

1. Brief resume (two pages maximum) that includes: name and contact information (address, email, phone and fax numbers); institutional affiliation including month/year of entering and expected graduation from school; area of study and major professor(s).

2. Statement of interest and relevant experience (one page).

3. Two letters (not e-mails) of recommendation from an advisor and another individual.

The nominations committee will develop the slate of candidates to bring before the membership in Spring 2001. Send nominations and all correspondences to the executive director at: 1444 Eye St., NW, #200, Washington, DC 20005 USA. jphinney@aslo.org.

ASLO 2001 AWARD NOMINATIONS

Michael J. Vanni, 2000 Awards Committee Chair, Zoology Department, Miami University, Oxford, OH, 45056, vannimj@muohio.edu

Nomination Deadline: November 1, 2000

Here is your chance to show your peers that their efforts are appreciated! All ASLO members have been directly influenced by one or more of the leaders in aquatic sciences, and are inspired by exciting new work being conducted by younger scientists. A great way to recognize these individuals and their accomplishments is by nominating them for one of ASLO's awards. Please take the time to nominate your colleagues!

The 2001 awards will be presented at the ASLO Aquatic Sciences Meeting in Albuquerque, New Mexico, in February 2001. Awards and previous awardees include (in chronological order):

Raymond L. Lindeman Award: James W. Ammerman, Marlon R. Lewis, Cabell S. Davis III, James J. Elser, Bart T. De Stasio, Jr., Sherry L. Schiff, John R. Reinfelder, David C. Smith, Ulf Riebesell, Deborah A. Bronk, Christopher Freeman, Kathleen R. Laird, Carla E. Cáceres, and Dennis McGillicuddy;

G. Evelyn Hutchinson Award: Gene E. Likens, John E. Hobbie, Richard W. Eppley, David W. Schindler, Eville Gorham, Lawrence R. Pomeroy, Trevor Platt, Daniel A. Livingstone, W. Thomas Edmondson, Richard C. Dugdale, Robert G. Wetzel, Timothy R. Parsons, Peter A. Jumars, Farooq Azam, Robert E. Hecky, Bess B. Ward, David M. Karl, Stephen R. Carpenter, and Paul Falkowski;

Lifetime Achievement Award: Kenneth H. Mann, Clifford H. Mortimer, Ruth Patrick, Alan R. Longhurst, Karl Banse, Charles Yentsch, and Ramon Margalef;

Ruth Patrick Award: Edward D. Goldberg.

ASLO 2001 AWARDS: NOMINATION INSTRUCTIONS

ASLO recognizes its most outstanding scientists with the following awards:

Raymond L. Lindeman Award, recognizing an outstanding paper first-authored by a young aquatic scientist;

G. Evelyn Hutchinson Award, recognizing a mid-career aquatic scientist who has contributed significantly to the field of aquatic sciences in the preceding 5-10 years;

Lifetime Achievement Award, recognizing an aquatic scientist who has made extraordinary, long-term contributions in the fields of limnology and oceanography, including research, education and service to the community and society;

Ruth Patrick Award for environmental problem solving in the aquatic sciences, recognizing outstanding research by a scientist in the application of basic principles of aquatic science to the identification, analysis, and/or solution of important environmental problems.

Awards will be presented at ASLO's Aquatic Sciences Meeting in Albuquerque, New Mexico (February 12-16, 2001).

Please send nominations to:

Jonathan Phinney, ASLO Executive Director
1444 Eye Street, NW, #200, Washington, DC 20005
jphinney@aslo.org

Raymond L. Lindeman Award

Eligible papers must deal with aquatic sciences, be written in English by an author who is no older than 35 years in 2000, and must be published in a 2000 volume of a peer-reviewed journal. Nominations should include a copy of the paper and a brief letter describing the impact of the paper on the field. The nominee must be first author if there is more than one; nominees by close colleagues, including advisors and co-authors, are permitted.

G. Evelyn Hutchinson Award

This award recognizes work accomplished during the preceding 5-10 years. Each nomination must be supported by a letter (not to exceed two pages) on qualifications. The nomination package may also include a list of important publications and other pertinent information, not to exceed 3 pages. The nomination should also be supported by 3 letters of endorsement of no more than 1 page each. The supporting letters should indicate the breadth of support for the nominees and clearly indicate the extent of contributions made by the nominee.

Lifetime Achievement Award

This award recognizes contributions of any aquatic scientist whose work continues to be recognized for its importance and long-term influence. Each nomination must be supported by a letter (not to exceed two pages) on qualifications. The nomination package may also include a list of important publications and other pertinent information, not to exceed 3 pages. The nomination should also be supported by 3 letters of endorsement of no more than 1 page each. The supporting letters should indicate the breadth of support for the nominees and clearly indicate the extent of contributions made by the nominee.

Ruth Patrick Award

This award recognizes an individual who has made a sustained contribution to environmental problem solving or one who has made a single, but critical, study of a very important

environmental problem. The award will be offered every two years; nominations are accepted at any time. Each nomination must be supported by a letter (not to exceed two pages) on qualifications. The nomination package may also include a list of important publications and other pertinent information, but in total this package shall be no more than 3 pages. The nomination should also be supported by 3 letters of endorsement of no more than 1 page each. The supporting letters should indicate the breadth of support for the nominees and clearly indicate the extent of contributions made by the nominee.

Details are published at www.aslo.org/awards.html

ASLO 2000 AWARDS

It was with great pleasure that the ASLO board presented this year's awards at the meeting in Copenhagen, Denmark, on June 5. The recipients were Ramon Margalef for the Lifetime Achievement Award, Paul Falkowski for the Evelyn Hutchinson Award, and Dennis J. McGillicuddy for the Lindeman Award. Following are their acceptance speeches.

Lifetime Achievement Award: Ramon Margalef

This award comes to me as a surprise. I feel much indebted to my friends on both sides of the Atlantic who have been influential in my nomination. However, I regret that by reason of my age (I am 81 now.) I must miss this opportunity to meet old friends and perhaps to make new friends in the "now-active" generation.

The usual role of old scientists is to reminisce. Rarely, are we able to make suggestions with enough constructive power to impact current scientific events. So, I will cast my eyes back over the years.

As with so many ecologists, I had an early interest in studying microscopic aquatic life. Several years of miserable living through the Spanish "uncivil" war and through the time following World War II convinced me that science could offer some consolation. Also, because of my interest, since my youth, in nature and especially in aquatic life, ecology seemed the right pursuit for me.

I was fortunate enough to start regular studies at the University of Barcelona. A bit later, as a young researcher, I had a chance to spend some time in Naples, towards the end of the Dohrn dynasty and also, to attend a Congress of Limnology in Switzerland where I met Thieneman. I was much impressed by him. Soon after that time I was granted many facilities by the Tonollis, the efficient souls of the Instituto Italiano de Limnologia in Pallanza. There also, I met in repeated visits, very clever people, among them Buzzati, Cavalli, Hutchinson and the Edmondsons. I should remember also a short, but extremely inspiring stay in Plymouth. There, I was very much impressed by Harvey. Since then I have always "believed in" phosphorus as the main limiting element on the planet. Also, during my stay there, I became inspired by Mary Parke and her love for her plankton cultures.

Later, opportunities to pursue science developed fast and haphazardly. In Barcelona, Professor Garcia del Cid was charged with the development of an Institute of Fisheries and Marine Science. This new laboratory provided a "niche" for me, and soon, through him, I contacted Sidney Galler, from the U.S. Office of Naval Research (ONR). He and ONR were immensely helpful in providing travel funds to the United States of America. Then, through Marc Steyaert, from Belgium, we (at this time we were already a small team at "Pesqueras") were able to obtain ship time to work in the Western Mediterranean. My close friend and coworker, Juan Herrera, worked closely with me during this period on the Western Mediterranean. I must confess that since then, I have never believed in Deep Water formation in the Gulf of Lyon by surface cooling, nor in any limiting "nutrient" other than phosphorus in the Mediterranean Sea.

Soon, I became a professor at the University of Barcelona and my work at sea was greatly reduced. At this stage, I ask forgiveness from the people that perhaps I have unwittingly misled. I have enjoyed my life. Most of my opinions relating to ecology can be found in my last book, "Our Biosphere", published, absolutely without censorship, in 1997 by the Ecology Institute, Oldendorf/Luhe, Germany.

Now it remains to me only to say, thank you to everyone for bestowing this award on me. I am most grateful.

Hutchinson Award: Paul Falkowski

First, I thank Ed Laws for his extremely kind words of introduction, and I would like to express my deepest thanks and appreciation to Ed, the selection committee, and the members of ASLO for this extraordinary honor.

I am not often at a loss of words, but I find it difficult to convey both the joy and, in some cases, discomfort, that I feel. I am very fortunate to have had many friends and mentors throughout the years, and hope that I have been a friend and mentor to many here. My life has been blessed by several fortuitous circumstances, to which I owe a lot.

My father was my solid guide through my childhood. When my father was my age, I was not yet born, and I did not fully appreciate the wisdom of his age until I became an adult.



Although he never went beyond 8th grade before going into the coal mines of Pennsylvania at the age of 14, he taught himself Latin and Greek, and was, in the classical sense, the most learned man I ever knew. Like Evelyn Hutchinson, whom I also knew, my father was a scholar, and from him, I learned the importance of scholarship. Unfortunately I do not

have his discipline, but this is only a mid-career award.

In university, I was blessed with many great teachers and professors, two of which stand out.

Dr. Irani taught me epistemology and inductive reasoning - skills which I have found extremely useful in my career (although some of my friends might say I didn't learn these well). Tom Malone was my undergraduate advisor and later my teacher for plankton ecology. He gave me my first appre-

ciation for phytoplankton and later, after graduate school, helped engineer my first position at Brookhaven National Laboratory.

My Ph.D. mentor, F.J. R. (Max) Taylor, and my post-doctoral advisor, Ted Smayda, taught me an appreciation for ocean ecology. From them I learned the importance of evolution and physical /biological interactions, long before these two themes became fashionable in oceanography. As a graduate student and ever since, many of my ideas and concepts were stimulated by the work of Dick Epply and Jack Myers, two titans in phytoplankton physiology. I spent as much time as I dared talking with both of these great scientists, and tried to understand how they came to be who they were. It was one of my greatest pleasures to be able to honor Dick by dedicating the 1990 BNL Symposium in Biology to him. I learned about the relationship between photosynthetic oxygen evolution and fluorescence from Jack, who had thought about these topics over 30 years ago.

At Brookhaven National Laboratory, where I spent 23 years, I was extremely fortunate to meet many great scientists and human beings. Two stand out. One as a great friend, and when my father died, his silent replacement - that is the late Bill Siegelman. Bill taught me that it is important to take long views of science, not to get caught up in a little cul-de-sac forever, but to look out in life and research. I had lunch with Bill almost every day for 15 years. His philosophy could be summarized in statements like, "Every paper is a preprint." or "You did your Ph.D. once - its time to do something else!". The other person who strongly influenced me at BNL was John Walsh. John and I often had difficult times, but from him I learned the rudiments of systems ecology and scholarship. John's leadership in the Oceanographic Science Division and his early support of my research was critical to my growth as a scientist.

There are many more friends and colleagues to thank: David Mauzerall, Zvy Dubinsky, Paul Bienfang, Charlie Yensch, Ian Morris, Linda Mantel, George Saunders, Tom Owens, Zbigniew Kolber, John Raven, Ed Laws, Victor Smetacek, Andre Morel, Marlon Lewis, Peter Hochachka, and Dick Barber - the list could go on. To each of these and many more that I have not named, I have learned much, both scientifically and personally.

My point is that each of us is blessed by chance encounters and circumstances, and I truly wonder how such good fortune could have befallen me. The award you present to me today is shared with these colleagues and friends, for it is their work, council, and mentoring that has been the basis of my own.

Finally, I would like to thank my wife, Sari, and my two daughters, Sasha and Mirit, for their love and support down the years. Without them, I would be lost. Thank you all for the great honor and hope that I can fulfill the expectations that the award represents.

Lindeman Award: Dennis McGillicuddy

I am deeply grateful for this award that ASLO has bestowed upon me. I feel so very lucky to be able to devote my professional life to an activity which brings me such fulfillment. Without question, there is nothing that I would rather do with my creative energies than pursue the inner workings of the ocean.



Henry Stommel once remarked, "Most human history has not afforded men much chance to pursue their curiosity, except as a hobby of the rich or within the refuge of a monastery. We can count ourselves fortunate to live in a society and at a time when we are actually paid to explore the universe." I could not agree with

Stommel more on this point.

It has also been said, "even the worst day fishing is better than the best day at the office." Well, I consider myself lucky to be in the small minority of fishermen who would disagree with that sentiment. Those of you who know how much I love to fish may be a little shocked to hear that— but it is absolutely true. In fact, the two activities are strikingly similar many ways. Most important to me is the inherent sense of adventure and discovery that I feel as a curious observer of the natural environment. Never knowing when or where the ocean might reveal the most subtle clue about her inner workings leads me to strive to stay alert and in tune with the environment at all times. Is the next big fish right around the corner, or a ways off in the distance? Will today's trip to the office be the one that leads to a new insight? I find the suspense of it all to be tremendously exciting.

There are several people whom I wish to thank in connection with the paper for which I am being given this award. This work was a collaborative effort, which integrated a diverse set of models and observations. Such synthesis would not have been possible without the many important contributions of the outstanding collection of investigators who participated in this endeavor. I thank my co-authors for collaborating with me on this project: Tommy Dickey, Hans Jannasch, Rod Johnson, Tony Knap, Joe McNeil, Tony Michaels, Allan Robinson and David Siegel. In addition, I wish to thank Jim McCarthy, Bill Jenkins and Joel Goldman for educating me on various aspects of the problem of new production in the oligotrophic gyres of the open ocean.

Last April, I journeyed into the dark recesses of the MBL library in which older journals are housed. After retrieving the volume of *Ecology* that contains Raymond Lindeman's seminal paper of 1942. I read through this magnificent work and savored every word of it. In the solitude of this quiet corner of the library, it felt as though Lindeman were speaking to me personally. This experience led me to a deeper appreciation for the intellectual foundations of aquatic science that were established by great minds such as Raymond Lindeman.

As so-called “interdisciplinary science” seems to be in favor in recent years, it is interesting to note that the pioneers of our field may have considered that descriptor somewhat of an oxymoron. Early aquatic scientists such as Henry Bigelow, Harald Sverdrup, and Raymond Lindeman recognized from the outset the fundamental interconnection between the physics, biology and chemistry of aquatic systems. Lindeman wrote, “the ecosystem may be formally defined as the system composed of physical-chemical-biological processes active within a space-time unit of any magnitude, i.e. the biotic community plus its abiotic environment. The concept of the ecosystem is believed by the writer [that is, Lindeman] to be of fundamental importance in interpreting the data of dynamic ecology.” I find it fascinating that in many ways the integrated approaches taken by the pioneers of our field are being rediscovered today. Nothing attests to this fact better than the very theme for this week’s Aquatic Sciences meeting: “Research Across Boundaries.” I am sure this will be a very exciting week as we bear witness to the tremendous diversity of research questions that are now tractable when approached from an interdisciplinary point of view.

Once again, I wish to thank ASLO for this award. I will do my very best to uphold the honor which it represents.

Finally, I’d like to end on a very personal note. I wish to thank my dear wife, Lise, who has accompanied me here today. Her love and support are what have made this adventure possible.

Outstanding Student Poster Awards at the June 2000 ASLO Meeting in Copenhagen, Denmark

The 2000 meeting organizing committee is pleased to announce the following students as winners of ASLO 2000 Student Poster Awards. Congratulations to all.

Ballard, Victoria D., Savannah State University, USA - The use of the vital stain and probe method (USP) to determine the physiological activity of bacteria in the marine environment

Broglia, Elisabeth F., Inst. de Ciencias del Mar, CSIC, Spain - Differences in swimming behaviour between two planktonic ciliates affect the risk of predation by the copepod *Acartia clausi*

Erhard, Daniela, University of Konstanz, Germany - Allelopathic interaction of submerged macrophytes with epiphytes: case studies on *Elodea Nuttallii* and *Najas marina*

Hammer, Astrid, University of Rostock, Germany - A winter cryptoflagellate bloom in an eutrophic estuary-survival during periods of very low light intensities due to ice covering

Honeywill, Claire, University of St. Andrews, UK - The relationship between microphytobenthic biomass and pulse modulated minimum fluorescence

Long, Richard A., University of California, USA - quinolinol antibiotic produced by a marine alteromonad and its affects, physiology and metabolism of other marine bacteria

Petrusek, Adam, Faculty of Natural Sciences, Czech Rep. - Using allozymes in *Moina* taxonomy - will we break the species again?

Ptacnik, Robert, Institut für Meereskunde - Effects of mixing depth on succession and composition of phytoplankton communities

Pålsson, Carina, Lund University, Sweden - Nutrient limitation of autotrophic and potentially mixotrophic phytoplankton in tropical lagoons differing in humic content

Raateoja, Mika, The Finnish Inst. of Marine Research, Finland - Pelagic phytoplankton in situ primary productivity approached by ¹⁴C-technique and fast repetition rate fluorometry (FRRF) in the Baltic Sea: a comparison

Rost, Björn, Alfred Wegener Inst. for Polar and Marine Research, Germany - Effects of CO₂ concentration, growth rate and light conditions on carbon isotope fractionation in the coccoithopod *Emiliania huxley*

Russel, Kristina M., University of Virginia, USA - Characterization of particulate atmospheric nitrogen and implications for coastal deposition.

Scherwass, Anja, University of Cologne, Germany - Structure and development of the ciliate fauna in the potamoplanton of the river Rhine

Short, Steven, M., University of British Columbia, Canada - Algal rivers community structure revealed by denaturing gradient gel electrophoresis

Strömberg, Niklas, Göteborg University, Sweden - A pH independent fluorosensor for ammonium based on the principles of coextraction

Sutton, Tracey, University of South Florida, USA - A towed array for high-resolution plankton studies

Tönnesson, Kajsa, Göteborg University, Sweden - Grazing impact of appendicularians versus copepods during an autumn phytoplankton bloom

Vreca, Polona, Jozef Stefan Institute, Slovenia - A seasonal carbon isotope study in the sediment and pore waters of an eutrophic high mountain lake in NW Slovenia

Wanner, Susanne C., Institute of Freshwater Ecology and Inland Fisheries, Canada - Estimation of the retention efficiency for fine particulate organic matter in a lowland river using fluorescently labelled *Lycopodium* spores as tracer particles

Welker, Martin, Tech. Univ. Berlin, Max-Volmer-Inst., Germany - Temporal dynamic and spatial distribution of toxic cyanobacteria in a shallow lake

Xu, Yan, Department of Biology, Hong Kong Univ., China. - Influence of metal concentration in phytoplankton on metal assimilation and regeneration in marine copepods

Zah, Rainer, EAWAG/ETH, Switzerland - Pathways of allochthonous organic matter in a glacial floodplain system

ASLO 2000 MEETING

Overview of ASLO 2000 in Copenhagen, Denmark, and a Brief Summary of the Annual Business Meeting

The first ASLO annual meeting outside of North America was a great success largely in part due to the capable hands of the organizing committee, the event planner (DIS) and especially the overall leadership of Morton Sondergaard and Bo Riemann. Nearly 1500 participants from 49 countries attended, making the conference one of the largest for ASLO and demonstrating the interest level in having ASLO meetings in Europe. (See table.)

The ASLO business meeting was called to order at 1700 on Tuesday, June 6, 2000, at the Belle Center in Copenhagen. Approximately 60 people attended the public meeting to review the business of the society as required in the by-laws. President Tom Malone welcomed everyone to a very lively meeting and thanked the membership for a stimulating and rewarding two years as president. (See President's Message in the Spring 2000 *ASLO Bulletin*. Treasurer Russ Moll cautiously reported that the financial difficulties of the society are a past issue due to the increase subscription rates. Everett Fee, Editor-in-Chief of *Limnology and Oceanography*, provided an overview of the journal, highlighting that the time between manuscript submission and final publication is approximately four months. Secretary Asit Mazumder gave an overview of the society membership including institutional subscriptions. He also led the meeting in a moment of silence for the five ASLO members who died in 1999. Paul Kemp provided an overview of the ASLO website (see Spring 2000 *Bulletin*). The new executive director, Jonathan Phinney, was introduced to the membership, and he highlighted some of the changes with the move to Washington, D.C. including listing funding opportunities and job announcements on the ASLO website. The meeting was adjourned at 1830.

<u>Country</u>	<u>Participants</u>	<u>Country</u>	<u>Participants</u>
Argentina	1	Lithuania	4
Australia	28	LOC/Staff	18
Belarus	1	Luxemburg	1
Belgium	13	Mexico	3
Botswana	2	Monaco	2
Brazil	7	New Zealand	3
Canada	86	Norway	23
China	10	Poland	3
Chile	2	Portugal	9
Croatia	1	Puerto Rico	12
Czech Republic	9	Romania	1
Denmark	192	Russia	12
Egypt	1	Singapore	1
Estonia	3	Slovenia	6
Finland	55	South Africa	1
France	47	Spain	49
Germany	169	Sweden	118
Greece	5	Switzerland	28
Ireland	1	The Netherlands	53
Israel	13	Turkey	1
Italy	12	Uganda	1
Japan	20	Ukraine	3
Korea	5	United Kingdom	57
Latvia	2	USA	392
		Total Participants	1492

ASLO FORUM

“GOOD SCIENCE AND GOOD LUCK” - A EULOGY TO W.T. (TOMMY) EDMONDSON (1916-2000)

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In January 2000, W. T. (Tommy) Edmondson finally succumbed to injuries and paralysis resulting from an automobile accident months earlier. His passing deprives us of one of the most thoughtful minds which created a modern synthesis in limnology by blending the field with ecological and evolutionary theory. His gifts of methods, scientific ideas and careful studies have indelibly imprinted the scientific discipline which he loved.

“The job of a scientist is to find things out and tell people about them. And have them printed somewhere.” (personal communication, 1996) Characteristically succinct, direct and unpretentious is how Tommy assessed his societal role. During

his career he succeeded brilliantly, publishing concise and thought-provoking analyses, and sharing his invention of methods that would revolutionize the study of zooplankton population dynamics. Buoyant and perpetually youthful in spirit, he found everything in his world interesting

Edmondson's academic gestation traced to a time when science was the province of individual scholars drawn by the magnet of natural mystery and its corresponding beauty. Organisms held a special charisma for him, so much so that when he no longer led field trips on Lake Washington, he insisted on receiving a live net collection the instant that the crew set foot back in the lab. He poured each new sample with earnest anticipation, and exclamations of pure joy greeted each diminutive but familiar representative in the dish. “If I took you through high school, college and graduate school I would tell you that always the center of the universe was the room with the microscopes and right next to it was the library.” (Edmondson 1989, p. 3)

Tommy Edmondson's memory is irrevocably linked with the story of Lake Washington that he so faithfully documented for half a century. It might seem surprising, therefore, to learn that in his own mind he did not count the work he did with that lake among his most cherished contributions. Tommy said that he reckoned himself lucky because he had had three good ideas in his life. First and foremost, he relished the spark of inspiration that guided him in placing time markers of carmine and charcoal on the tubes of *Floscularia* because of the revelations they unfolded (Edmondson 1945). Those experiments were in fact the conceptual springboard to the Egg Ratio Method (Edmondson 1960, 1965)—his second “good idea” and the one that became Tommy's greatest intellectual gift to zooplankton ecology. Third was his introduction of a graphical method for tracking reproductive schedules of plankton in an elegantly simple and direct analog of matrix algebra (Edmondson 1968). These creative stirrings from the inside of one's own head, occasionally called the “Eureka experience,” are the most meaningful rewards of a life in science.

Poised against these highpoints of personal illumination was the work that earned Edmondson the Cottrell Award for Environmental Quality in 1973, and his election the following day, his birthday, to the National Academy of Sciences. When asked more than 20 years after the fact about the circumstances of that election, against the backdrop of Egg Ratios and plankton ecology, Tommy quickly shrugged “Oh, that was all about Lake Washington, of course.”

The truth is that Edmondson the scientist and environmentalist was not forged by his Lake Washington experience, but the events in that lake served to focus attention on his intellectual breadth and wisdom. What made him an exemplary figure was his ability to function within a political process without becoming politicized. He marshaled facts and reasoning, presented them without exaggeration, and placed his trust in the democratic political process. Through tireless lectures, public interviews, and letters he contributed mightily to scientific literacy in one of the greatest single examples of mass public education about the scientific principles behind environmental issues.

Good ideas include more than sparks of creative inspiration. Scientists know that the path to those few prized moments of elated energy and insight is often barred by limitation of intellect, resources, opportunity, or temperament. Tommy was blessedly free of those mundane impediments and so good fortune favored him. Of Lake Washington, he would say that he was in the right place at the right time. But that is too hastily dismissive of his deeper mark on science. It is not possible to know what would have happened if Edmondson had not been on the scene in Seattle when the transformational events in the life of its lake began, but it is safe to say that the scientific documentation of the events would not have been nearly so thorough and complete. A final accounting will reveal that Edmondson's greatest legacy to ecological and environmental science is the long-term record that he amassed

for Lake Washington. The wisdom, planning, and perseverance enshrined in that record are surely the product and seeds of a great many other good ideas. Tommy was also blessed with the convivial spirit that attracted and retained a legendary staff of competent and committed “technologists,” by whose hands the remarkable data collection was assembled.

Tommy claimed that one of the key lessons he learned from Evelyn Hutchinson was the importance of matching the right lake to the principles under investigation. Thus Soap Lake and Lake Lenore were superbly suited to studies of chemical ecology and related food web issues. Lake Washington became a classic study because it was the right lake in which to test ideas about nutrient control of productivity, and about food web effects on water quality. A few years ago I came across the original “model” that Tommy used circa 1960 to predict the temporal response of Lake Washington to a step change in nutrient loading. It was a piece of semi-logarithmic graph paper marked with phosphate concentrations and lines corresponding to hydrologic flushing. It reminded me of the quote in Sigma Xi's *A New Agenda for Science*: “Real genius begins with paper, a pencil, and time to understand the problem.”

It takes time and concentrated mental energy to solve any problem of nature's complex creation. Compared to the generation that has succeeded him, Edmondson deferred from the sorts of conspicuous activism and disciplinary promotion that is now a fixture of the “business” of science and science budgets. That, too, has its foundation in a time when science was strictly the passion of scholars. Tommy Edmondson had the great good fortune of spending a lifetime immersed in his passion, and true passion leaves little time or inclination for diversion. Tommy's account of his first encounter with the Rotatoria at age twelve (personal communication, 1996) aptly captured his life's unrelenting motivation in compellingly simple terms:

“I looked at some water from my backyard aquarium and saw a rotifer. I didn't know anything about them. It just swam through the field of the microscope. Some things are engraved on your mind forever.”

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Editor's note: This article is an excerpt from *Hydrobiologia*.

**SPECIAL FORUM ON
SCHOLARLY PUBLICATIONS:
SCIENTIFIC SOCIETY PUBLICATIONS AMONGST
COMMERCIAL PUBLISHERS**

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SPARC - The Scholarly Publishing and Academic Resources Coalition is a consortium of over 200 libraries committed to low-cost dissemination of scholarly research.

The world of journal publishing — a key means of communicating advances for scientists — is a useful vehicle for examining the dilemma facing scholarly communication today. As popular acceptance of web publishing has grown, opportunities to reengineer the value chain between author and reader (who ironically are often one and the same) have become apparent. Societies, academic institutions, commercial organizations, and government agencies are jockeying to claim their place in a transformed scholarly communication system. To survive, each institution must rediscover its role in offering the community of scientists and scholars a better way to do their job and attain recognition.

This discussion focuses on the situation of scientific societies and their journals in the reengineered system of web publishing. Professional societies are critical because of their traditional central relationship to the all-important source of supply: the author. **Individual scientists can make a difference in this quest to change the publishing status quo.**

How We Got Here. For over 300 years—since 1665, when the Royal Society of London published the first modern journal, *Philosophical Transactions*—societies satisfied the need for scholars to communicate among themselves and so maintained their role as the principal scholarly publishers. Research articles were “gifted” to societies by authors and returned to the community in low-cost journals. But the economic foundation for scholarly communication began a profound shift after World War II. Research funding expanded greatly, and with it, the volume of research to be published exploded.

Commercial publishers found there was money to be made publishing the overflow of articles that couldn't be accommodated in society journals and that demand for journals was remarkably inelastic. Many scholars in need of promotion and tenure were only too happy to be published in these commercial journals—especially when the alternative was not being published at all—and gave their research papers away to journals for free. And since they were trying to maximize profit,

commercial publishers did the rational thing—they raised institutional prices of journals dramatically and relentlessly to exploit the elasticity curve. Institutional subscribers (libraries), accounting for the lion's share of the revenue supporting publication of journals in most fields and have paid the high prices because their users (scientists) demanded access.

With this foot in the door, commercial publishers built substantial portfolios of journals, aided by a trend of societies to outsource their journal publishing to commercial firms. The high corporate profits from these journals have funded aggressive programs of internal development and wave upon wave of acquisitions and consolidation among commercial publishers.

Present Pricing Structure of Scholarly Journals. The price difference between a commercial journal and a society journal is significant. **As society publishing increasingly gave way to commercial publishing, the cost of scholarly journals, especially those in the science, technology and medical (STM) fields, skyrocketed - limiting public access to research and threatening to diminish scientific progress.** Overall, society journals managed to balance high quality with reasonable cost. This is true in the aquatic journals market as well. For example, the two most expensive journals, *Marine Chemistry* (\$.93 per page) and *Estuarine Coastal & Shelf Science* (\$.82 per page), are published by commercial firms, Elsevier and Academic Press, respectively (Table I). The next-two highest priced journals, *Aquatic Geochemistry* (\$.70) and *Freshwater Biology* (\$.64) are also products of commercial publishers, Kluwer and Blackwell Science.

Table I: A COMPARISON OF AQUATIC JOURNAL SUBSCRIPTIONS

Journal Title	Publisher	#Issues	Pgs/Yr	Cost/Yr.	Cost/Pg.
Aquatic Ecology	NVE/Kluwer	4	400	\$232	.58
Aquatic Geochemistry	Kluwer	4	400	\$279	.70
Ecology	ESA	16	3540	\$425	.12
Environmental Science & Technology	ACS	12	3700	\$1031	.28
Environmental Toxicology & Chemistry	SETAC	12	3000	\$670	.22
Estuaries	ERF	6	900	\$320	.36
Estuarine Coastal & Shelf Science	Academic Press	12	1800	\$1481	.82
Freshwater Biology	Blackwell Science	12	2650	\$1696	.64
Journal of Geophysical Research Oceans	AGU	12	4650	\$1870	.40
Journal North American Benthological Society	NABS	4	560	\$85	.15
Limnology & Oceanography	ASLO	8	2000	\$350	.18
Marine Chemistry	Elsevier	20	1675	\$1565	.93
Marine Ecology Progress Series	Inter-research	16	4960	\$2580	.52
N. American Journal of Fisheries Management	AFS	4	500	\$156	.31
Water Resources Research	AGU	12	3200	\$877	.27
Wetlands	SWS	4	880	\$200	.23

Abbreviations:

NVE – Netherlands Institute of Ecology
 ACS – American Chemical Society
 ERF – Estuarine Research Foundation
 NABS – North American Benthological Society
 SWS – Society of Wetland Scientists
 ESA – Ecological Society of America
 SETAC – Society of Environmental Toxicology & Chemistry
 AGU – American Geophysical Union
 AFS – American Fisheries Society

**Pages/Year numbers were obtained through communication with the journal editor or from average pages per issue in recent years.*

Prepared by Krista Garrah, ASLO Project Coordinator

On the other end of the scale, the *Journal of North American Benthological Society* (\$.15 per page), *Limnology & Oceanography* (\$.18), *Ecology* (\$.12) and *Wetlands* (\$.23) are all published by societies - NABS, ASLO, ESA and SWS (Table I). This is not a coincidence, but the result of a strategy on the societies' part that prioritizes access to research over profit.

The authors who choose to publish in society journals play a leadership role in keeping these journals competitive and viable.

What if the status quo is maintained? It is easy to track the future of scholarly communication in an era of commercial dominance. Members of North America's Association of Research Libraries (ARL), for example, subscribed to six percent fewer journals in 1999 than they did in 1986—but they were spending 170 percent more to subscribe¹. This trend is sure to continue unless scientists recognize the crisis in scholarly communication and their role in creating a new marketplace for research.

At a Crossroads in Publishing. The advent of the Internet offers the potential to revitalize scholarly publishing and to break down old patterns of communication. Most scholarly communication stakeholders have begun to recognize that the path forward is not through continued price increases on existing journals, but through development of new economic models, new markets, new products, new value added services, and new enhancements to productivity. To achieve this requires that stakeholders develop new, dynamic relationships among themselves.

One attractive strategy is for societies such as ASLO to reassert their leadership, leveraging the key factors that differentiate them from commercial publishers and retake the initiative. The fact that the society—not the commercial publisher—is the focal point of a community is a key differentiating factor and advantage. A society's non-profit orientation is a value that should be emphasized in this context.

Important roles also exist for academic institutions, university presses, government agencies, and other non-profit institutions. However, a case can be made that the scholarly communication system must be built around communities of scholars. While the Internet offers a tool for anyone to convene a virtual community, societies are the strongest and most enduring embodiment of the participants' common interest.

But if societies are to challenge the growing power of commercial publishers, they must have a means of answering the commercial publisher's advantage in access to capital. Hence, societies must look to partner with organizations that share their core values. In such a scenario, money that libraries are already spending on journals from commercial and other sources might be re-deployed in ways that better serve them, ways that strengthen the non-profit scholarly publishing sector as a competitive alternative to commercial publishing of scholarship.

Some societies have challenged the efficacy of this strategy, citing examples of societies imitating commercial publishers' pricing strategies. A few societies have found such practices irresistible, rationalizing that it is necessary if they are to compete and build a future. But, on the whole, a growing body of data demonstrates that society journals do offer far more impact and better value than commercial titles. For example, a study released in the summer of 1999 by the University of Wisconsin shows that in terms of average price, cost per thousand characters, and cost/impact ratio, non-profit journals in physics, economics, and neuroscience are far more cost effective than commercial titles². A Cornell University study released in November 1998 had similar findings in the area of agriculture³. An abbreviated list of aquatic journals demonstrates generally higher ranking and impact factor within particular categories for societal publications (Table II).

Partnering of Societies and Libraries for Change. SPARC (Scholarly Publishing and Academic Resources Coalition)⁴ is one vehicle through which libraries and research institutions channel their support for change in scholarly communication. In 1998, after years of mounting frustration with high and fast-rising commercial journal prices, a group of libraries formally launched SPARC to promote competition in the scholarly publishing marketplace. The idea was to use the buying power of libraries to nurture the creation of high-quality, low-priced publication outlets for peer-reviewed scientific, technical, and medical research. Through library subscriptions to SPARC partner journals, SPARC reduces the risk to publisher-partners inherent when entering the online marketplace. SPARC also provides scientists with prestigious and responsive alternatives to commercial publishing vehicles. Additionally, SPARC helps its partners enter the market at lower cost by generating support for SPARC projects through its broad public communications and marketing programs and providing advisory services that help ensure an attractive market offering.

SPARC endorses publications from university presses, independent publishing initiatives, and societies and gives libraries and scientists choices that allow them to decide where their limited funds are best spent. SPARC's almost 200 member libraries pledge support for SPARC publisher-partners, helping their top-quality print and electronic journals achieve viability

Table II: Ranking and Impact Factor

Title & Publisher	Ranking	Category	Impact Factor	Total cites in 98	Source items in 98
<i>Ecology</i> , ESA	5 out of 88	Ecology	3.460	20693	245
<i>Estuarine Coastal & Shelf Science</i> , Academic Press	36 out of 68 20 out of 41	Marine & Freshwater Biology Oceanography	.938	2438	140
<i>Journal of the North American Benthological Society</i> , NABS	26 out of 88 8 out of 68	Ecology Marine & Freshwater Biology	1.773	1160	28
<i>Limnology & Oceanography</i> ASLO/Allen Press	1 out of 12 2 out of 41	Limnology Oceanography	2.849	11968	204
<i>Marine Chemistry</i> , Elsevier	18 out of 126 4 out of 41	Chemistry Oceanography	1.967	2808	73

from the start. One effort of SPARC in this regard is BioOne⁵ - an electronic aggregation of bioscience journals.

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- ¹ ARL Statistics, 1997-98, Washington, DC, Association of Research Libraries, 1999, p. 9. Relevant chart is available at www.arl.org/stats/arlstat/1999t2.html.
- ² "Measuring the Cost Effectiveness of Journals: The Wisconsin Experience," ARL Bimonthly Report, 205 (August 1999), pp. 1-6. Also available at www.library.wisc.edu/projects/glsdo/cost.html.
- ³ "Journal Price Study of Core Agricultural and Biological Journals," Faculty Taskforce, College of Agriculture and Life Sciences, Division of Biological Sciences, Albert R. Mann Library, Cornell University, November 1998. Available at <http://jan.mannlib.cornell.edu/jps/jps.htm>.
- ⁴ The SPARC web site is located at www.arl.org/sparc.
- ⁵ The BioOne web site is located at www.BioOne.org

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THE PEER-REVIEW SYSTEM

The peer-review process is critically important and often an under appreciated portion of scientific publishing. A number of leading editors and experienced reviewers have recently started an open exchange of opinions in the Theme Section of the journal *Marine Ecology Progress Series* (MEPS): "The peer-review system: time for re-assessment?" (Idea and

Coordination: Hans Ulrik Riisgård; MEPS, Volume 192, page 305-313, 2000, see also http://www.int-res.com/forum/peer_review.html.) The MEPS Discussion Forum expands issues raised by previous contributors.

The "publish or perish syndrome," identified as a core problem challenging the peer-review system, should be replaced with a "contribute or perish philosophy." Submission of manuscripts to the peer-review system is a professional request for colleagues to donate their time. But some authors expect their manuscripts to be "cleaned-up" by the peer-review process. There is a substantial imbalance between positive and negative consequences of submitting a manuscript. For authors, manuscript submission and re-submission always have the potential for improvement and publication and relatively little risk of negative consequences. If manuscripts of low quality carried a greater risk of negative consequences for the authors, it would discourage re-submission and yield a considerable savings in time with little cost in lost value to the scientific community.

Referees are the backbone of quality control. **Acting as a referee and serving on editorial boards should be recognized as essential contributions, and appropriate professional advancement should be given.** You are invited to express your opinion. Please send your text (as brief and concise as possible) to the MEPS Forum Editor, Hans Ulrik Riisgård, Odense University, Hindsholmsvej 11, DK-5300 Kerteminde, Denmark, Fax: +45 6532 1433, E-mail: hur@biology.ou.dk.

EDUCATION

PERSPECTIVES ON GRADUATE EDUCATION EXPERIENCES IN AQUATIC SCIENCE

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Introduction: The Dissertations Initiative for the Advancement of Limnology and Oceanography (DIALOG) Program was initiated to foster interdisciplinary understanding and collegial interactions across the aquatic sciences (<http://www.aslo.org/dialog.html>). The program includes collection of Ph.D. dissertation abstracts to showcase the work of the most recent generation of aquatic science researchers, collection of demographic information from these new graduates for human resource purposes, and a symposium to bring together a group

of recent aquatic science Ph.D. recipients with the goal of fostering interdisciplinary understanding and collaborations.

The third DIALOG symposium (DIALOG III) was held October 18-22, 1999, at the Bermuda Biological Station for Research. The 42 participants received their Ph.D.s from 34 institutions in 10 countries (Canada, Chile, Germany, Greece, Japan, the Netherlands, Russia, Sweden, United Kingdom, and the U.S.) Many sub-disciplines of aquatic sciences (mostly biological) were represented, ranging from molecular biology to community ecology and biogeochemical cycles.

As part of this symposium, participants divided into four working groups for discussion of their graduate school experiences. Each working group included both limnologists and oceanographers graduating from different-sized institutions and representatives from at least three countries including the U.S. Each working group was asked to collect some data to structure the discussions (faculty size and number of students entering in the same year). Other than that, discussions were open. After the breakout sessions, participants met together to exchange information. A survey was sent out after the symposium to gather additional data. Finally, drafts of this article were circulated for comment. Overall recommendations from these four groups, collected by topic, are summarized below.

Academic Program Size: Students compared faculty and student cohort sizes based on memories from their time as

graduate students at the 34 institutions where their Ph.D.s were completed. The size of graduate programs in limnology, indicated by the number of hard-money faculty positions and number of aquatic science students beginning the same year, differed from that of oceanography programs. The median number of aquatic-science faculty at institutions graduating limnology participants was 6.5 (range 4-25), compared with 20 (range 2-82) for oceanography. The largest limnology program represented was Lomonosov Moscow State University (Russia) and the largest oceanography program represented was Scripps Institution of Oceanography (U.S.). Median and ranges for limnology and oceanography faculty at U.S. schools were 5.5 (4-13) and 20.5 (2-82), respectively.

Participants compared cohort size, defined as the number of aquatic scientists entering graduate school the same year. The median number for cohort size was 3.5 for the limnologists (range 1 - 14) and 5.5 for the oceanographers (range 1-30).

The group noted the differences in faculty size and student cohort size between limnologists and oceanographers but did not get into a discussion of reasons or impacts, and no recommendations were made. (A discussion of size based on the above numbers may be misleading because many limnologists are from large biology departments, which might have only a few limnologists.) In contrast, the biological oceanographers were in interdisciplinary departments or institutions where they interacted with physical, chemical, and geological oceanographers through joint courses, seminars, cruises and the like.

Coursework and Exams: Graduate programs and requirements varied across institutions. The major difference between limnologists and oceanographers was in the amount of coursework required during the first year or two of graduate school. Oceanographers tended to have more physical science requirements (for example, physical, chemical, and geological oceanography) in addition to biology courses. They agreed these courses were necessary because oceanography is too interdisciplinary to ignore a basic understanding of all four disciplines. The broader course requirements in oceanography programs provide additional opportunities to connect with peers from other disciplines.

Overall Recommendations

- No more than one year of courses should be required. Coursework and plans should be designed to fit individual needs. A committee should meet with the student at the beginning of the program to consider the student's background and plans. It should identify weaknesses and suggest courses that would be pertinent to the proposed thesis topic and improve the quality of the thesis program.
- While graduate students in oceanography need a broad spectrum of core courses due to the interdisciplinary nature of the field, departments should establish guidelines that allow students to be exempted from the core courses if they have taken them elsewhere.
- Some courses in ethics and philosophy of science should be offered.
- A comprehensive exam should not be required after the first year of coursework. Such exams place undue stress on the first year and are particularly difficult for those who

are non-native speakers. More importantly, the faculty committee should monitor and advise the student's progress on an ongoing basis.

- An exam that involves broad-scale questions regarding the thesis area and a thesis proposal defense should be held during the first two years.

Student Support: Wages for graduate students varied dramatically (\$100 to \$43,000 per year), and almost all DIALOG III participants utilized more than one source of support during their graduate years. Participants received support from the following sources while graduate students: research assistant (RA; 76%); teaching assistant (TA; 64%); external fellowships (42%); institutional support (36%); and "other" (18%). Nine percent received no support for one or two years. The "other" support included a spouse, the military, a full-time technical position, a university position, a nine-month position as a visiting professor, and a full-time position as PI on a grant.

For U.S. participants, the median wage earned during the final year was \$14,000 (range \$5,000 - \$32,000). The two highest were for a nine-month teaching position at a near-by institution and for a situation in which the student was allowed to develop and serve as PI on a grant. Among participants studying outside the U.S. the median wage was \$10,600 with a range of \$100 - \$30,000. The highest was for a full-time technical position that allowed degree work. The wages at the lower end demonstrate the difficulty many scientists face in developing countries and the former Soviet Union. With wages of \$100 per year, even student membership in a professional society such as ASLO is out of reach.

Among the RAs, some were paid to work on their thesis research while others were expected to work on a different project. Each system had advantages. Working on a different project provided a more diverse research experience, but concentrating on one's own research generally resulted in a faster time to completion. Among those who worked as RAs, 59% reported they had spent time working on a project other than their dissertation topic (median was 15 hours on a non-thesis topic). Time was definitely an issue for this group; the median time spent as graduate students was six years (range 4-12), and participants were around 31.5 years old when they completed their degree (range 25.5 - 42.0). At the time of the symposium most were still in postdoctoral positions with uncertain futures.

Overall Recommendations

- Funding should be stable so students do not lose valuable time hunting for support each year.
- At some point, all graduate students should be required to develop proposals for research funding to the National Science Foundation, the European Commission, or its equivalent to gain familiarity with the process.
- Some work as a TA should be required.
- The department should provide funds for students to attend at least one meeting during their tenure as students. Some participants thought that students should have funds to attend one meeting per year once they begin work on their thesis research.

Teaching Assistantship (TA) & Training: Overall 60% had TAed at least one course during their graduate-student years. Among participants graduating from U.S. universities, 66% TAed at least one course (median two courses per participant, range 1-5). Of these, 79% TAed at the undergraduate level, 42% at the graduate level, and 21% at both levels. In terms of advisor support for teaching, 57% were encouraged to TA, and 30% were discouraged from doing so; the rest were neutral. Among those receiving degrees outside the U.S., just one-third had TA or equivalent experience. Given the fact that academic positions even at major research institutions include a teaching component, many participants felt that teacher training was not a strong enough part of their graduate training. Only 47% considered the amount of teacher training received as adequate.

Two excellent models are mentioned here. Brian Helmuth described the Pew Foundation's Preparing Future Faculty Program (<http://www.preparing-faculty.org/>). The components vary from site to site, but in general the goal is to prepare graduate students for academic positions and create better college-level teachers. At the University of Washington, the program included a one-quarter class in which students developed course syllabi and exams, role-played student-instructor interactions and, perhaps most importantly, gave lectures in front of a video camera. After completing the course, these scholars were given opportunities to present guest lectures in large university classrooms and at smaller colleges in the area.

Anke Mueller-Solger outlined programs coordinated through the University of California at Davis' Teaching Resources Center (<http://trc.ucdavis.edu/trc/>). A Program in College Teaching fosters close teaching collaborations between graduate students and faculty mentors. Depending on their interests, students can pair up with mentors at the University or at local two-year or four-year colleges. Participants also can carry out teaching-related projects, often in teams. Among other things there is also a peer-advising TA consultant program that offers workshops, consulting, videotaping, and course evaluations. The TA consultants (usually a group of eight to 10 experienced graduate students) are responsible for all parts of this service. They receive further training themselves in the form of weekly seminars/group meetings.

Overall recommendations:

- Training in teaching skills should be part of the graduate experience.
- It is not sufficient to TA a course with no additional training. Opportunities such as those outlined above should be provided.

Ph.D. Advisors: Advisor roles varied considerably, representing the diversity of programs and individual styles, strengths and personalities. Given the number of years spent in study and the important role the advisor plays in a student's experience, all felt it was important to establish a good working relationship with the advisor. Among this group, 40% felt they had an excellent relationship with their advisor. Another 21% considered theirs to be very good, 14% good, 9% fair and 5%

poor. Discussions indicated the tension between the student's need for freedom to develop his or her own research, and the desire for encouragement and some guidance along the way. Professors have various styles and strengths, and students have very individual needs.

Overall Recommendations: While there is no one formula for good advising, the advisor should at least

- Act as a mentor and nurturer;
- Be available to students when needed, and ready to offer advice and constructive criticism;
- Provide training in the review and writing of manuscripts;
- Provide training in the review and development of research proposals; and
- Ensure that students receive financial support during their student tenure.

After Graduate School: A large proportion (76%) of the symposium participants held postdoctoral positions at the time of the symposium, and 44% indicated that this was of necessity rather than choice. During one evening session, participants with tenure-track positions gave their perspectives on interviewing and negotiating. Jobs (or the lack thereof) were a frequent topic of conversation, but the overall mood was positive, and participants were optimistic about finding positions.

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SHIPBOARD RESEARCH EXPERIENCE FOR UNDERGRADUATES: BUILDING SKILLS, SELF-CONFIDENCE, AND LEADERSHIP POTENTIAL

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Talented, aspiring young scientists in the prime of their undergraduate education continuum apply to summer research experience programs in order to get a grip on the reality of scientific careers. In limnology and oceanography, that reality must include significant field-oriented research. In our business, the information of the Information Age must still come in significant part from actual analysis, and students must understand what is involved in collecting the data used in local, regional, and global models.

Funded by the National Science Foundation, Research Experience for Undergraduates (REU) programs in aquatic sciences combine group participation with a planned, science-driven research agenda. Students gain a contributory, fulfilling, and real oceanographic experience using UNOLS* ships. Cruises of several days' duration permit exploration of a range of physical, chemical, and biological habitat conditions as well

as provide for the experience of living in the cramped, communal quarters characteristic of research vessel life. At the Center for Great Lakes Studies of the UW-Milwaukee, we have taken advantage of the proximity of Lake Michigan and Green Bay ecosystems to provide immersion experience for five to seven REU students each year aboard the RV Laurentian. Including both a consistent core program since 1990 and opportunities for student-driven project sampling, this component has received consistently high reviews in exit polls and correlates strongly with subsequent graduate enrollment. This is especially promising in light of the comment by UNOLS Chair Ken Johnson in the Spring 1998 UNOLS Newsletter: "I fear that we are producing a generation of marine scientists that either doesn't know how to go to sea, or doesn't want to." Given our apparent results, I believe that a major shipboard experience should be high on the list of activities at oceanography REU sites and other introductory marine science programs.

Integration of different disciplines is an essential and exciting aspect of field instruction. With the P.I. as chief scientist, students first obtain and analyze an Aerial Very High Resolution Radiometry (AVHRR) surface temperature image of Lake Michigan from the NOAA Coastwatch system. Part of the cruise track is adjusted based on discussion of the three major thermal domains of July in Lake Michigan (warmest Green Bay, warmer coastal zones, and cool central lake water) using descriptive results from previous REU cruises, gradients of interest in physical, chemical, and biological phenomena are identified. Each student chooses responsibility for one of the on-board analytical functions: chlorophyll *a* (fluorescence); silicate (flow injection analysis); microplankton (epifluorescence or phase contrast microscopy); zooplankton and macrobenthos (stereo microscopy); dissolved and particulate chemical analysis (filtration); sediment and pore water chemistry (sectioning, squeezing); others. The students learn their mission, assemble the equipment necessary for 30 stations, and package it for shipping to the port of embarkation. Students are individually guided in the selection and use of materials to accomplish their particular contribution and have their stations set up and operating in the RV Laurentian laboratory prior to departure.

Instruction is most intense during the first day out, when relationships among satellite imagery, hydrographic parameters (8 parameter CTD profiles), water column biology and chemistry, and sediment characteristics are analyzed in real time. Each student attains competency in their area during the first three or four stations on the 100-mile transit from Milwaukee to lower Green Bay. Between stations, on-board analyses are completed and discussed collectively. As students see the relations among physical, chemical, and biological parameters, their confidence in the execution of analyses develops.

Each of the five to seven participating REU's chose a responsibility for on-board work, assembling hardware and technique for analysis of chlorophyll, silicate, zoobenthos, zooplankton, and phytoplankton. Samples are brought home for other nutrients and individual student projects round out the design. After a few stations, students teach each other how to carry out their specific responsibilities and rotate activities.

Combined with real time interpretation of physical-chemical features (CTD), nutrient (silicate) and biomass (chlorophyll) distribution in the water column, and abundance/diversity of benthic animals as related to water column depth, productivity, and sediment characteristics, the students obtained a synoptic picture of Lake Michigan and the estuary of Green Bay. In addition they obtain experience in analytical procedures well outside of their individual areas of expertise and learn to appreciate the intricacies of activities required for different disciplines. During the later stations, each REU performs in the role of "chief scientist-for-a-station" and gains organization and leadership experience in a real-life situation.

At sea, you cannot "call Mom" for a rubber stopper or pair of forceps. When cruises extend beyond a day and encompass stations far from home and repeated from year to year, the significance of adequate preparation, planning, and organization becomes much more pronounced. Because everyone relies upon each other for a successful expedition, the need to focus and accomplish goals becomes very real, not just for the individual but for the group as a whole, and this is both healthy and good training for would-be environmental scientists.

Effectively executed, REU cruises can be much more than "just training exercises." Over the course of nine years of such cruises, we have provided a core of data including very early and very late seasonal changes, a wide variety of habitat types, and one El Nino event. Stations that were once depositional environments now contain abundant fingernail clam populations. Species diversity in the Green Bay benthos has increased consistently since zebra mussel invasion. Superimposed on our other monitoring efforts and synoptic studies, the REU cruises give a temporal continuity on a scale difficult to achieve with local ship time. Student projects also have increased the breadth of the cruises tremendously. Overall, a broad and reliable database is being developed for a significant regional ecosystem. If only I could find the time to write it up.

* UNOLS - University National Oceanographic Laboratory System - www.unols.org

WIRED STUDENTS

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I have taught the introductory, non-science-major's class (EVSC 101, Introduction to Environmental Sciences) every semester for the past three years. It has been my experience that when undergraduate students rely on the Internet as their primary source of material for classroom assignments, the number of different articles selected by the class is low, but when the students are not allowed to use articles from the Internet the diversity is much greater.

EVSC 101 is taught using a holistic approach to understanding the planet earth; the four major spheres—the lithosphere, hydrosphere, atmosphere, and biosphere—are considered as interrelated components in a larger system. The objectives of this course are to familiarize non-science majors with the scientific approach to understanding the interactions among

these four spheres and to provide the background necessary to understand the potential of technological changes to affect the global environment. In partial fulfillment of the course and to promote principles of environmental science in their everyday lives, the students must keep a notebook of current clippings from the news media (newspapers, magazine, or journals) on environmental issues along with a written reaction to the article. Since there is insufficient time during the lectures to cover reasonably both scientific principles and environmental issues, the notebook provides the students with a way to relate the scientific principles to current issues that affect their daily lives. The first semester that the journal was assigned, students were allowed to use any source for their current issues articles, including newspapers, magazines, e.g. *Newsweek*, *Time*, *National Geographic*, *Audubon*, scientific journals, e.g. *BioScience*, *Science*, *Scientific American*, *Nature*, *Environmental Science & Technology*. Internet sources included Environmental Network News (www.ENN.com), and on-line media sources, e.g. www.CNN.com, www.washingtonpost.com and www.nationalgeographic.org.

The assignment has two specific objectives. One is to motivate the students to think about the relationship between environmental science and environmental problems by asking them to relate the material covered in lecture to topics that affect society and, ultimately, each of their daily lives. As a result they were required to select topics that were related to an environmental issue or environmental policy. While there are numerous interesting articles in print about scientific discoveries that aren't necessarily related to environmental topics, these were not considered to be appropriate for this assignment. For example, articles about a new advance in medicine would be outside the boundaries of the assignment. Thus, unless the student could relate topics like discovery of a new planet, a new disease-causing organism, or a frozen carcass of a woolly mammoth to an environmental issue, they were strongly encouraged to select another topic. The second objective was for the students to realize that interpretation of environmental data is rarely straightforward so that management decisions made to address environmental problems often can be difficult and controversial. To achieve this objective the students were required to read articles from a variety of sources. Over the semester, 10 different sources were required for the 12-week assignment to encourage reading a diversity of viewpoints. The articles could be, but were not required, on the same topic (but not from the same source or written by the same author). In fact, several students picked an environmental issue that was currently affecting their hometown and pursued the topic in depth.

The results of this assignment in the first semester were disappointing. There was tremendous overlap among the articles selected by the students. Most of the students used Internet (non-print) sources. Based on qualitative observations, well over 50% of the students selected the same set of articles for their notebooks. For example, nearly all the students selected a *Newsweek* article entitled "Down in the Dead Zone" and a *Scientific American* article entitled "The Human Impact on Climate." These two articles had several things in common:

(i) the magazine in which they were published can be accessed on-line by University of Virginia students and faculty through the university's library system without actually going to the library, (ii) these articles pop-up on the first screen using the library's search engines, and (iii) the copies of the articles included in the student's notebooks were all printed from the Internet.

After reading each article in each student's journal (150-200 students enroll in the class each semester), as well as their written reaction, a conservative estimate of the overlap for the two above articles was greater than 50%. In a class of this size, the high degree of overlap was surprising given the number of magazines and journals in print. This was also disappointing given that an objective of the assignment was for the students to realize that there are a wide variety of sources for information on the environment and environmental issues available to them. Although individual students fulfilled the assignment requirement to use 10 different sources over the 12-week assignment period, it appeared that 90% of the students limited their article choice to the first 10 "hits" that came up on their library search engines and to those sources that the library carries on line. It also appeared that few students were sitting down with a paper copy of more than one source and thumbing through the publications to find articles of specific interest to them.

This raised several questions about the use of Internet sources rather than requiring them to go to the library. Were many of the students taking the same path to finding articles? Were they taking the pathway that they were most familiar with and/or that provided the simplest route to meeting the requirements of the assignment? Furthermore, is that route controlled by search engines, and is it not borne of the student's intellect, interest or initiative?

As a result, I changed the project requirements for the second semester. Notebook clippings were required to come from a paper copy of a printed media source. The results have been encouraging. There was much less overlap between notebook articles and the diversity of sources was vastly improved. Additionally, fewer students relied on newspapers for their articles and more students went to publications like *National Geographic*, *Audubon*, *The Ecologist*, *Discover*, *Scientific American*, *Bioscience*, *Environmental Science and Technology*, and *Science*. I'm not sure why this happened, but perhaps it occurred because once the students were in the library, these publications were as easy to find as newspaper articles. A few students even went to *Estuaries* and *Limnology and Oceanography* for their articles. While the objective of the assignment was not to get the students into the primary scientific literature, it was rewarding to see a few students tackling more rigorous literature and trying to relate the results to a current environmental problem.

The level of student discomfort with the second semester's prohibition of Internet sources was quite remarkable. Many students expressed great frustration about where and how to even begin to find articles if they couldn't use Internet sources. An extreme example was the young man who approached me while I was in the Science and Engineering Library. He was

very distressed because he couldn't find a suitable article and wondered if I could help him. When I asked if he'd tried looking in that day's newspapers, he replied that he didn't have a subscription to a newspaper and didn't know where to find the paper copies of one. Without taking a step, I was able to reach over to the rack of current newspapers in the library's reading room and pull out a copy of that day's *Washington Post*. Within minutes we were able to find two suitable articles in that day's edition. This was not an isolated incident, just the most extreme. Many students approached me for help when they found me working in the library. They simply didn't know where to start looking for potential article sources. (I'm not sure why they were afraid to ask our excellent library staff for help!) I doubt that the greater diversity of articles the students found during the second semester was necessarily an indication the students were putting more effort into looking for articles or that they were actually browsing several magazines or journals before they selected an article. I suspect that the students were still using the first source and the first article they came across, but because of the different paths they took to finding sources, the results of their searches were much more diverse as a group than when they all could point-and-click on the first computer screen that popped-up.

Internet search engines and the database programs that are currently available are exceedingly useful tools for established researchers who are familiar with the large body of information

available to us through a variety of means. However, those students whose exposure to information is limited to whatever they can point-and-click-on in their Internet browser are at a decided disadvantage when it becomes necessary for them to go beyond the results of their Internet browser's search engines. As more and more magazines and journals go online this may not be such an issue. Even so, based on my experiences, I wonder if the emphasis on the Internet for "library" research that seems to be allowed and encouraged in primary and secondary schools and in some lower-level undergraduate courses doesn't do a disservice to the students by limiting their exposure to the diverse body of information available to them. Assignments similar to what I've described here may encourage students to become familiar with a greater variety of sources and as a result expose them to a wider diversity of ideas.

Note: In the upcoming academic year, I will be working with a science library faculty member to quantify how the use of the Internet effects article selection for the EVSC 101 notebook assignment.

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ASLO MEETINGS

A SCOR, ASLO, AND ERF CO-SPONSORED SYMPOSIUM - NUTRIENT OVER-ENRICHMENT IN COASTAL WATERS: GLOBAL PATTERNS OF CAUSE AND EFFECT

This symposium will be co-convened by the U.S. National Committee to the Scientific Committee on Oceanic Research (SCOR), the American Society of Limnology and Oceanography (ASLO), and the Estuarine Research Federation (ERF). The Ocean Studies Board of the National Academies will host the symposium with funding from the U.S. Geological Survey, the U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the National Science Foundation, and the Electric Power Research Institute. **The symposium will take place on October 11-13, 2000, at the National Academy of Sciences in Washington, D.C.** Registration fees are \$200 to register at the event (pre-registration ended September 1).

Including invited presentations by distinguished scientists from around the world and a session of contributed poster presentations, this symposium will explore the role of nutrient over-enrichment in the declining environmental quality of the world's coastal regions. Topics to be covered include: (1) nutrient sources and pathways, (2) natural controls on ecosystem response, (3) effects on living resources, (4) economic impacts, (5) technical approaches to monitoring and mitigation, and (6) policy behind monitoring and mitigation. Results of

national and international efforts to assess, understand, and mitigate this increasing problem (e.g., International SCOPE Nitrogen Project, Coastal GOOS, GEOHAB, U.S. Clean Water Action Plan) will be presented in an effort to facilitate the exchange of understanding and experience between scientists and managers working in coastal areas around the world. Following is the most recent agenda:

- Session 1: New Understanding of Nutrient Sources and Pathways
- Session 2: Effects-System Controls on Ecosystem Responses
- Session 3: Effects-Living Resources
- Session 4: Effects-Economic Dimensions of Nutrient Over-enrichment
- Session 5: Managing Nutrient Inputs-Technical Approaches or Natural/Societal Experiments in Reduction
- Session 6: Managing Nutrient Inputs - Policy Considerations and Approaches
- Summary and Synthesis

For more information and registration details, please go to the ASLO website, www.aslo.org or the NAS website, www.nationalacademies.org/osb/nutrient.

MAKING CONNECTIONS IN THE TWENTY-FIRST CENTURY: AQUATIC SCIENCES (ASLO) 2001 MEETING, ALBUQUERQUE, NEW MEXICO, (USA) FEBRUARY 12-16, 2001

Joe Ackerman, ASLO 2001 co-chair, University of Northern British Columbia, Prince George, BC, Canada V2N 4Z9, Tel: 250-960-5839, Fax: 250-960-5539, ackerman@unbc.ca and Saran Twombly, ASLO 2001, co-chair, University of Rhode Island, Kingston, RI, USA 02881-0816, Tel: 401-874-2609, Fax: 401-874-4256, twombly@uri.edu.

Organizing Committee: Marlene Evans (National Hydrology Research Institute, Canada), Paul del Giorgio (Univ. of Maryland, Horn Point Lab, USA), Dian Gifford (Univ. Rhode Island, USA), Paul Harrison (Univ. of British Columbia, Canada), George Jackson (Texas A&M, USA), Thomas Kiørboe (Danish Inst. Fisheries Res., Denmark), Timothy Kratz (Univ. Wisconsin, USA), David Lean (Univ. Ottawa, Canada), Doris Soto (Escuela de Pesquerias, Chile), Shin-ichi Uye (Hiroshima Univ., Japan), Percy Washington (GAIA Northwest Inc., USA), Paul Wassmann (University of Tromsø, Norway). Ex-Officio: Asit Mazumder (Univ. of Victoria, Canada), Jonathan Phinney (ASLO Executive Director), Helen Schneider Lemay (ASLO Business Manager).

The scientific program is quite exciting and involves a number of innovations that have been developed by the organizing committee and the special session chairs. We are facilitating connections among ASLO members by beginning each morning with a plenary address that will be followed by an extended coffee break. The 2001 Aquatic Sciences Meeting will have an exciting program and will strive to be cross-disciplinary and cross-boundary in its nature.

The theme of ASLO 2001: As limnology and oceanography enter the 21st century, there is increasing focus on making connections within and among (1) environmental systems, (2) spatial and temporal scales, (3) disciplinary approaches, and (4) science and society at local, regional and international levels.

(1) Environmental Connections. Sessions will focus on processes and fluxes across interfaces such as air/water, river/ocean, sediments/water, and benthic/pelagic. **Plenary Speaker: Bo Barker Jorgensen, Max Planck Institute for Marine Microbiology, Bremen, Germany**

(2) Temporal/Spatial Connections. Sessions will focus on processes, patterns and predictions from individuals to ecosystems that occur across levels of biological organization and across temporal and spatial scales. **Plenary Speaker: Mary Power, University of California, Berkeley, California, USA**

(3) Disciplinary Connections. Sessions will focus on connections between and among traditional limnological and oceanographic disciplines, with the goal of developing dialogues and fostering collaboration and innovation in order to pursue new solutions to existing and future problems. **Plenary Speaker: Mimi Koehl, University of California, Berkeley, California, USA**

(4) Science and Society Connections. Sessions will focus on impacts on aquatic environments, how such impacts are assessed, their consequences for environmental quality, resources and health and the transfer of this information for the benefit of society. **Plenary Speaker: David Schindler, University of Alberta, Alberta, Canada**

Special Sessions (total of 47): The organizing committee would like to thank everyone who contributed suggestions for special sessions at ASLO Aquatic Sciences 2001. Given the success of the tutorial reviews at the 2000 meeting in Copenhagen, we are encouraging a similar approach in Albuquerque. **The 20-minute tutorials will provide a mini-review of the subject to provide a prospectus for the special session for specialists, non-specialists, and interested parties in general.** Please be sure to note the special session that most closely matches your talk when you register.

Contributed Sessions (total of 38): Sessions planned for Aquatic Sciences 2001 in Albuquerque, New Mexico, are to cover ASLO-related topics that are not included in the special sessions, and therefore represent a wide range of topics. Please be sure to note the contributed session that most closely matches your talk when you register. Note that CS38 (Other) is available for topics that might have been overlooked accidentally.

Poster Presentations: Poster presentations (1.16m by 1.16m) are an integral part of the Aquatic Sciences 2001 meeting, and each poster will be displayed throughout the entire conference, thus providing ample opportunity for exposure and interaction beyond the scheduled session time. Please consider presenting your paper in the form of a poster by selecting this option when you register. ASLO will present several awards for the most outstanding student posters. To be eligible, the student must be an ASLO member and first author on research that has not been presented previously at ASLO or other scientific meetings. Presentations will be judged on the basis of innovation/scientific insight, quality of experimental design/methods, and clarity/effectiveness of presentation. All posters submitted by students will be considered for the student poster awards. There is no need to apply.

Student Activities: Students are reminded of the exciting opportunities available at Aquatic Sciences 2001. **Importantly, the ASLO board has approved a limited number of need-based student travel awards to be awarded to students who make oral or poster presentations at the meeting as a first author (see www.aslo.org).** Also, be sure to join ASLO's Career Link Program in your search for a graduate program and/or a job. This is an extension of services provided by ASLO through their booth located in the exhibit area. A brief student meeting is also planned during the meeting to discuss topics pertinent to ASLO student members.

Workshops: Workshops are important forums for technical communications, and are described in detail in the call for papers and on the ASLO website (www.aslo.org). **A number of pre-conference workshops are planned including: (1) The Committee on Under-Represented Minorities in Limnology and Oceanography (CURMLO); (2) Use of Remote Sensing (SEAwifs) in the Aquatic Environment; (3) Mass Spectrom-**

etry and the Aquatic Environment; and (4) Jane Butel's Cooking School. We expect to have a number of workshops/seminars during the conference as well. Please be sure to register for workshops when you register.

Field Trips: A number of field trips in Albuquerque and environs are available before the conference. These include: Bandelier National Monument; Mountain Biking; Bosque Del Apache; Skiing Santa Fe Ski Basin. Please register for field trips before December 15, 2000.

Special Activities: We have a number of exciting special activities available in Albuquerque and environs that are available before and during the conference. These include: Indians Past and Present; A Day in Santa Fe, Rising Above the Rest, Lunch with the Llamas, and Monday Dinner with a Bird's Eye View. Of special interest are the low-cost, self-guided tours such as the American Indian Cultural Tour, Nature Tour, Science and Technology Tour, Arts Tour, Frontier and Spanish Colonial Tour, Western New Mexico Tour, Mission Ruin Tour, Sandia Mountain Tour, and Jemez Mountain Tour. Please sign up for these activities when you register. For more details, see the call for papers and on the ASLO website (www.aslo.org).

Conference Activities: As usual, we have planned a number of exciting conference activities for your enjoyment. These include: (1) an opening welcome mixer reception on Sunday; (2) an awards presentation on Monday; (3) the annual business meeting on Monday; (3) the optional Wednesday evening reception at the New Mexico Museum of Natural History and Science; (4) plenary addresses each morning (Monday through Thursday) followed by an extended coffee break; (5) poster sessions and receptions on Tuesday, Wednesday, and Thursday evenings, and (6) a dance on Thursday. Be sure to register for the optional events when you register, as tickets may be limited.

Accommodations: Housing arrangements for the 2001 Aquatic Sciences Meeting have been made at a wide variety of hotels ranging from \$60 to \$140 per night. We have also arranged shuttle service and Hospitality rooms that will be set up in the designated conference hotels to provide you with a place to relax, meet with colleagues, and continue conversations with others attending the meeting.

Dining: The convention center is located in beautiful downtown Albuquerque and is close to food courts and restaurants of all types. We are also planning to have shuttle buses to help people connect at dinnertime on Monday and Tuesday nights (remember the museum reception on Wednesday and the Dance on Thursday). These will focus on different Albuquerque local flavors found in Old Town and the University District. More information will be available in the program, on site in Albuquerque, and on the ASLO web (www.aslo.org).

Registration and Abstract Submission: We encourage you to submit your abstract and register for Aquatic Sciences 2001 using the secure form on the ASLO web page. **Remember that a completed registration form and full payment is required when submitting an abstract. The abstract submission deadline is October 1, 2000.**

Visit the web site for more information: <http://www.aslo.org/albuquerque2001>

Registration Fees: before January 10, 2001: \$225.00 US (members), \$300.00 US (non-members) and \$175.00 US (Students). After January 10, 2001: \$275.00 US (members), \$350.00 US (non-members) and \$225.00 US (Students). One-day registrations: \$95 US, Spouse/Guest: \$50.00 US, which includes the Sunday welcome reception, poster receptions, and the dance on Thursday evening.

Student Poster Judges: Please consider volunteering as a judge for the Outstanding Student Poster Award. Please contact the ASLO business office for additional information (business@aslo.org); Tel: 254-399-9635 or 1-800-929-2756 (United States, Canada, and the Caribbean); Fax: 254-776-3767.

We look forward to seeing you on Route 66 in Albuquerque!

UPCOMING ASLO MEETINGS BEYOND 2001

- AGU/ASLO Ocean Sciences Meeting - February 11-15, 2002, Honolulu, Hawaii
- Aquatic Sciences (ASLO) 2002 Meeting - June 10-14, 2002, Victoria, British Columbia, Canada
- Aquatic Sciences (ASLO) 2003 Meeting - February 10-14, 2003, Albuquerque, New Mexico, USA

SPECIAL CONFERENCE ON PHYTOPLANKTON PRODUCTIVITY: AN APPRECIATION OF 50 YEARS OF THE STUDY OF PRODUCTION IN OCEANS & LAKES: UNIVERSITY OF WALES, BANGOR, UK, MARCH 18 - 22, 2002

The Conference: The year 2002 will see the jubilee of the publication of the Steemann Nielsen's seminal paper on the use of $^{14}\text{CO}_2$ to measure planktonic photosynthesis, which transformed post-war development in the areas of biological oceanography and limnology. This major conference will celebrate this seminal paper and reviews the progress in the study of phytoplankton productivity in both marine and freshwaters over the previous 50 years. The conference will host 13 keynote speakers, in addition to oral sessions and posters.

The Book: A book, "Phytoplankton Productivity" will detail the keynote talks. It will be published in time for the conference, and all participants will receive it as part of the conference package. The book will summarize the development, present state and future of contemporary topics in both freshwater and marine plankton productivity. It will be edited by Peter J. le B. Williams*, David N. Thomas* and Colin S. Reynolds** (*School of Ocean Sciences, University of Wales, Bangor, UK, **Institute of Freshwater Ecology, Windermere, UK) and will be published by Blackwell Science. The publisher is offering a 20% discount to all ASLO members.

The Keynote Speakers & Their Book Chapters:

- Morten Søndergaard - Freshwater Biological Laboratory, Univ. Copenhagen, Denmark; Biography of Steemann Nielsen

- Richard T. Barber and Anna Hilting - Duke University Marine Laboratory, Beaufort, N.C., USA; History of the Study of Plankton Productivity
- Richard J. Geider - University of Essex, Colchester, UK; Physiology and Biochemistry of Photosynthesis and Algal Carbon Acquisition
- John Marra - Lamont-Doherty Earth Observatory, Palisades, NY, USA; Approaches to the Measurement of Plankton Production
- Ulf Riebesell and Dieter Wolf-Gladrow - Alfred-Wegener Institute for Polar & Marine Research, Bremerhaven, Germany; Diffusive Supply of Inorganic Nutrients: Theory and Methodology
- Marlon R. Lewis - Dalhousie University, Halifax, Canada; Variability of Plankton and Plankton Processes on the Mesoscale
- Michael J. Behrenfeld - Goddard Space Flight Center, Washington, DC, USA; Assessment of Primary Production on the Global Scale
- Colin S. Reynolds - Institute of Freshwater Ecology, Windermere, UK; Origins and Causes of Interannual Variability of Freshwater Phytoplankton
- David. M. Karl*, Robert Bidigare* and Ricardo Letelier† - University of Hawaii* and Oregon State University†, USA; Interannual Variability of Phytoplankton in Oceanic Systems
- Wilhelm Ripl and Klaus-Dieter Wolter - Technical University, Berlin, Germany; Ecosystem Function and Eutrophication
- Paul G. Falkowski - Rutgers University, New Brunswick, USA; Evolution of the Productivity of the Oceans & the Significance of the Evolution of Specific Groups
- D. Glen George - Institute of Freshwater Ecology, Windermere, UK; Regional-Scale Influences on the Long-Term Dynamics of Lakes
- Victor S. Smetacek - Alfred-Wegener Institute for Polar & Marine Research, Bremerhaven, Germany; Marine Productivity: The Footprint of the Past and Steps into the Future

How to Register and Get More Details: Go to <http://plankton-productivity.org> or www.aslo.org to find summaries of the book chapters and information regarding the N. Wales environment. Click on "Expression of Interest" to access the registration form. You will be e-mailed with further information.

JOBS AND CALENDAR OF EVENTS

For a jobs listing, visit the ASLO jobs page at www.aslo.org/jobs.html. Submit job advertisements via the interactive form at www.aslo.org/forms/jobform.html

For a list of upcoming events, please go to <http://aslo.org/calendar.html>

If you would like to submit an event listing, you can do so directly by using the online form section.



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