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MESSAGE FROM THE PRESIDENT

SCIENCE AND SCIENCE POLICY: MAKING A DIFFERENCE

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At the beginning of October, Bruce Babbitt, the Secretary of the Interior in the US, came to the University of Colorado campus and gave a forceful talk about Global Climate Change. His message was clear, that the Clinton administration was on the "road to Kyoto" and was planning to agree to targets and timetables for the reduction of carbon dioxide emissions. He explained a general plan of using a regional, emission permit and trading approach, and

expressed an optimism that development of new technology would contribute to achieving emission reductions. He spoke of the need to "educate the marketplace of ideas" on the issue of climate change and of the massive advertising campaign being waged by industrial interests to convince the American public that mitigation steps would destroy the economy. He appealed to the college students in the audience for their help in bringing the issues forward, arguing that it is their future that is at stake.

I was intrigued by this talk for several reasons. First of all, considering the major implications of an international agreement on carbon dioxide emissions, it was remarkable that the speech received little media coverage in the Denver area, or even in the environmentally aware newspapers of Boulder, Colorado. The concern that this issue has not been taken up by the "marketplace of ideas" may be justified.

Secondly, I was struck by the appeal to the college stu-

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dents to bring the issue forward. The University of Colorado is a major research university with strong ties to prominent research labs in Boulder which study the earth's climate, such as NCAR (National Center for Atmospheric Research) and NOAA (National Oceanic and Atmospheric Administration). Babbitt did not appeal to the atmospheric and environmental scientists in the audience to educate the marketplace. Does this task fall to college students by default of the scientific community? Or, has the scientific community fulfilled its responsibility by educating the college students, conducting the research (i.e. developing new and better global and mesoscale climate models), and detecting the trends in sea surface temperature, glacial retreat, and so on, publishing the results in scientific journals, and organizing panels and workshops sponsored by government agencies?

More specifically to ASLO, we have held a symposium on freshwater ecosystems and climate change with the North American Benthological Society (NABS), conscientiously published a special issue of our journal, *Limnology and Oceanography*, and of the journal *Hydrologic Processes* as well, and worked to ensure that the results of these papers were included in the most recent report by the IPCC (Intergovernmental Panel on Climate Change). Nonetheless, in his review of the consequences of climate change, Babbitt mentioned melting glaciers and future rises in sea level, but neglected the potential changes in hydrologic regime, water quality and aquatic ecosystems which were examined in the reports from the ASLO/NABS symposium. Furthermore, in the ongoing application of economic models to assess the costs and benefits of reducing carbon dioxide emissions, the

effects on freshwaters as strategic, necessary resources are apparently not being considered (New York Times, Oct. 6, 1997).

Thus, the steps we have taken are commendable and did not put at risk the good name or financial resources of the Society, but have yet to have an influence beyond our own scientific community. Our previous symposia have certainly had some influence, but in the current climate of discussion we may need to be more proactive to be heard. Bringing potential consequences for freshwater resources into the broader marketplace of ideas may require venturing further -- into the largely uncharted territory of congressional briefings or press releases.

In their report, the 1996 Future of ASLO Committee made several recommendations towards establishing a voice/presence beyond the aquatic science community (see box). The ASLO Board will be considering and developing these recommendations at our upcoming meetings this winter and summer. I am confident that the ASLO Board will proceed in a careful manner. I encourage you to let us know your ideas and suggestions related to the recommendations in the ASLO Future report.

The issues for which ASLO can provide critical scientific information are of long-term importance. Although the conclusions from the ASLO/NABS symposium may not get as far as the marketplace in the current discussion leading to the Kyoto summit, I am optimistic that in the future ASLO will establish an appropriate route for informing our global community as the discussion continues on climate change and other issues involving aquatic ecosystems.

EXTRACT

THE FUTURE OF ASLO: 1996 REPORT AND RECOMMENDATIONS

full report available at <http://aslo.org/> or *ASLO Bulletin* 6(1): 6-8

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

- Hold special symposia, sessions at meetings, and workshops and publish special issues of L&O that deal with problems relevant to humans and their interactions with the environment.
- Recognize by an annual award the contribution by an ASLO member to the links between basic science and environmental problems of society, either directly or indirectly (i.e., a paper can present results with important implications for applied research, but not itself contain much applied content).
- Establish a Congressional Fellowship and extend the concept to the international arena.
- Solicit and publish papers that link science and environmental problems in *Limnology and Oceanography*.
- Publicize ASLO's efforts to link basic science and environmental problems in the ASLO bulletin, web page, and other communications to members and the public-at-large.
- Hire a person to represent the society in Washington, D.C. The board should evaluate innovative ways of carrying this out; this person should be a highly qualified and politically experienced scientist.

ASLO NEWS

LINK YOUR UNIVERSITY OR COLLEGE'S WEB ADDRESS TO THE ASLO HOME PAGE

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

Each year, ASLO receives approximately 1200 written requests from students interested in undergraduate and graduate courses in limnology and oceanography. And, every day more students are drawn to the ASLO web page.

My goal is to link every academic institution with an ASLO member to the ASLO home page—so students can access those programs closest to them, and compare offerings around the world.

This goal is seriously limited by time available to “surf” the web for addresses. Please help by sending me the **web address for your institution**, and if available, the **web address for the department or section most active in aquatic science**. Please do not send personal web pages, as these are subject to all-too-frequent change and ASLO doesn't have the resources to keep these up-to-date.

ELECTRONIC PUBLICATION OF *LIMNOLOGY AND OCEANOGRAPHY*

Hal Batchelder, U.S. GLOBEC Office, Department of Integrative Biology, University of California, Berkeley, CA 94720-3140 (Tel: 510-642-7452; Fax : 510-643-1142; halbatch@socrates.berkeley.edu)

It is recognized that one of ASLO's most important activities, some would say *the* most important activity, is the publication of our society journal, *Limnology and Oceanography*, which is a leading journal in the field. Because of its value, size and long history, it occupies many linear feet of bookshelf space in most member's offices.

For the past year discussions have occurred to explore ways to make L&O available electronically, but for the most part these discussions were informal. At their summer meeting, the ASLO Board discussed mechanisms for providing electronic access to both back and future issues of L&O. One important development in scientific publishing is the capability to make journals available electronically, either “online” or in a CD-ROM format. The ASLO Board would like to enter the arena of electronic publishing by first making the past issues of the journal available to the ASLO membership in an electronic format.

The ASLO Board has the goal of publishing electronically the complete articles in back issues in a searchable format. It is intention of the ASLO Board that the electronic version of the journal attain comparable publication standards as the hard copy journals. The ASLO Board recognizes that scanning of the back issues is a major initial task to be accomplished for electronic publication in either a CD-ROM or WWW format.

Toward that end, the Board has charged the Electronic Publishing Committee with several tasks: 1) develop specific recommendations for electronic publication of back issues of

L&O, including specification of formats, search engine capabilities, cost estimates, suggested vendors, and projected marketability of the final electronic product; 2) develop plans for providing updates to the electronic publication (for future issues); and, 3) conduct a survey of the membership to assess the marketability and demand for a fully indexed, searchable electronic product containing the first 40+ years of *Limnology and Oceanography*.

The Electronic Publishing Committee members are Hal Batchelder, chair; Paul Kemp, David Kirchman, John Melack and Susan Weiler. In the next several months we will prepare a short survey (probably 5-10 questions) which will be distributed in a future *ASLO Bulletin* mailing. We would appreciate member feedback on the society's foray into electronic publishing. The surveys will be available as well at the ASLO booth at the February 9-13, 1998 Ocean Sciences meeting in San Diego. We encourage members to stop by and complete a survey. Just think, a product on a single CD ROM that will free up much-needed bookshelf space (ca. seven linear feet in the case of my 1977-present collection), and be fully searchable.

ASLO STUDENT E-MAIL LIST: SIGN UP NOW!

*Karla Heidelberg, ASLO Student Representative, Horn Point Laboratory, University of Maryland, Cambridge, MD 21613 (karla@hpl.umces.edu and **Cristina Takacs**, ASLO Student Representative, Biology Department, Montana State University, Bozeman, MT 59717 (takacs@montana.edu)*

Contribute to ASLO's Future!! Contact your student representatives, Karla Heidelberg and Cristina Takacs, with your comments, concerns, or ideas. **Subscribe to the student mailing list** so that we may contact you for your input regarding upcoming issues to be presented to the ASLO Board of Directors.

To subscribe to the mailing list, send an e-mail message to: listserv@listserv.montana.edu. On the first (and only) line of the message, type:

SUBSCRIBE ASLOSTUD firstname lastname.

Do not include any other text in the message. If you have an email signature, it must be suppressed or deleted. If you have any problems, contact Cristina Takacs at aslorep@gemini.oscs.montana.edu.

We look forward to hearing from you!

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<http://aslo.org/dialog2a.html>

See p. 4 for details

LIMNOLOGY AND OCEANOGRAPHY EDITOR-IN-CHIEF: AN OPPORTUNITY TO CONTRIBUTE

Thomas C. Malone, L&O Editor Search Committee Chair, Horn Point Laboratory, University of Maryland Center for Environmental Science, Cambridge, MD 21613 (malone@hpl.umces.edu)

The American Society of Limnology and Oceanography has established *Limnology and Oceanography* in response to a need felt by its members for a common outlet for the publication of scientific papers on all aspects—physical, chemical, geological and biological—of the phenomena exhibited by natural bodies of water..... *Limnology and Oceanography* is offered now to all those concerned with aquatic science, both in this country and abroad, in the faith that it will serve a useful purpose by providing a common medium for technical papers on the varied specialties which unite to increase our understanding of the aquatic environment.

Alfred C. Redfield, ASLO President, 1956

Founded in 1956, *Limnology and Oceanography* (L&O) has established a reputation for excellence and become a leading journal for the publication of research on aquatic systems from rivers and lakes to coastal and oceanic environments. The journal owes its success to many individuals, including its founders who emphasized the importance of interdisciplinary research; its editors who have worked hard to ensure the quality of research contributions published in L&O; and the scientists who continue to make important contributions to the fields of limnology and oceanography.

Since its inception, the journal has increased from 4 issues with 316 pages in 1956 to 8 issues with ca. 2200 pages today (original-size equivalent; the journal expanded to 8.5" x 11" format in 1995). The journal has changed in scope as well as size over the past four decades. In this regard, the ASLO Board has established a committee (chaired by Sybil Seitzinger) to consider how well tuned the journal is to the interests of our membership and how the scope of the journal should change in view of the recommendations of the 1996 Future of ASLO report (*ASLO Bulletin* 6(1):6-8 or <http://aslo.org/>).

ASLO is now seeking a new Editor-in-Chief to guide the next phase of L&O's development; David Kirchman, will complete his term in late 1998. Recent changes in the review and publication of manuscripts have been made that facilitate the work of the Editor-in-Chief. In 1990, a system with a single scientific editor and a managing editor was replaced by a system with an editor-in-chief assisted by a full-time managing editor and a team of associate editors.

The Editor-in-Chief is responsible for the overall content of the journal and oversight of the Associate Editors. Specific duties include recommending candidates for Associate Editors and Selected Topic Editors to the Board; assigning papers to Associate Editors who select reviewers; reviewing manuscripts or decisions when a second opinion is needed; working with the Managing Editor on journal operations; serving as an ex officio, non-voting member of the ASLO Board of Directors; serving on committees related to the journal; reporting to the ASLO Board on the status of the journal and advising the Board on issues relating to the journal.

The Associate Editors select reviewers for the papers, evaluate the reviews, and write the final letters of acceptance

or declination. The Managing Editor, Kevin C. Oliver, is responsible for the processing and tracking of manuscripts, correspondence with authors and reviewers, copy editing, and communications with Allen Press.

The Editor-in-Chief serves a 3-year, renewable term. Expenses, including salary or honorarium, are paid by ASLO. Candidates must be members of ASLO, and we hope David's replacement will be selected in time to allow for some overlap of terms. For more information contact Susan Weiler (Tel: 509-527-5948; weiler@whitman.edu) or visit the ASLO web page (<http://aslo.org/>). Please send applications or nominations Before **1 February, 1998** to:

ASLO Search Committee
Horn Point Laboratory
University of Maryland Center for Environmental Science
P.O. Box 775
Cambridge, MD 21613
(e-mail: malone@hpl.umces.edu)

DIALOG: PLANS FOR THE FUTURE

C. Susan Weiler, Whitman College, Walla Walla, WA 99362 (Tel: 509-527-5948; Fax: 509-527-5961; weiler@whitman.edu)

The DIALOG (Dissertations Initiative for the Advancement of Limnology and Oceanography) program was developed to facilitate the development of collegial ties and catalyze the exchange of knowledge across the aquatic sciences (see *ASLO Bulletins* 3(1) and 6(2)).

The second DIALOG program is ending, while the third is in the planning stage. Based on the success of the first and second programs, ASLO plans to make the collection of Ph.D. dissertation abstracts an ongoing activity. **The DIALOG II program application has been modified, so that individuals may "register" their dissertation citation and abstract on the ASLO web page (<http://aslo.org/>) at any time.** All dissertations registered via the ASLO web page will be published in the following issue of the *ASLO Bulletin*.

In addition, a proposal will be submitted to obtain funding for another symposium, planned for October, 1999. If funded, this would put the symposium on a 2-year cycle. A grant from the European Commission enabled 8 European scholars to participate, while Biospherical Instruments and Turner Designs supported scholars from South America and Africa.

Several ASLO members have pointed out the utility of the dissertation listings. For example, colleagues in departments with open positions have used the DIALOG citation list to identify potential candidates for postdoctoral and permanent positions. This sort of exposure will facilitate the assimilation of these recent Ph.D. recipients through the professional ranks. I hope that all recent aquatic science Ph.D. recipients will take advantage of this opportunity to publicize their work. Please encourage your students and colleagues to:

Register dissertations on the ASLO web page:
<http://aslo.org/dialog2a.html>

1998 AWARD NOMINATIONS

Saran Twombly, ASLO Awards Committee Chair, Dept. Biological Sciences, University of Rhode Island, Kingston, RI 02881-0616 (plb101@uriacc.uri.edu)

Each year, ASLO recognizes its most outstanding scientists with the presentation of three awards:

- **Raymond L. Lindeman Award**, recognizing a young scientist for publication in a peer-reviewed journal;
- **G. Evelyn Hutchinson Award**, recognizing a mid-career scientist who has contributed significantly to the field of aquatic sciences in the preceding 5-10 years; and
- **Lifetime Achievement Award**, recognizing an aquatic scientist who has made extraordinary, long-term contributions to the field.

Nominations for these awards represent one of the easiest, most important and positive ways that members of ASLO can contribute to the Society, to their colleagues, and to scientific excellence in general. Despite all of these positives, and despite the fact that the Society has many members well deserving of these awards, the number of nominations received for each award is typically small. The nomination procedure is neither complex nor lengthy, and your efforts promise a high return. Please consider nominating your most deserving colleague for these awards. Further information can be obtained from Susan Weiler (weiler@whitman.edu) or the subcommittee chairs (see below).

Awards will be presented at the ASLO/ESA meeting in St. Louis, Missouri (June 7-12, 1998).

Please send nominations to:

C. Susan Weiler
ASLO Office
Whitman College
Walla Walla, WA 99362
weiler@whitman.edu

Nomination Deadline: January 15, 1997

Raymond L. Lindeman Award

John Reinfelder, Chair (reinfelder@aesop.rutgers.edu), Ellen Van Donk, Bruce W. Frost, Louis Legendre, Karen F. Wishner, C. Susan Weiler

Eligible papers must deal with aquatic sciences, be written in English by an author who is no older than 35 years in 1996, and must be published in a 1996 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; nomination by close colleagues, including advisors and co-authors, are permitted.

G. Evelyn Hutchinson Award

Saran Twombly, Chair (plb101@uriacc.uri.edu), Sherilyn C. Fritz, Robert E. Heckey, Paul V.R. Snelgrove, Bess B. Ward, Peter H. Wiebe, C. Susan Weiler

Emphasis in selection will be given for work accomplished during the preceding 5-10 years. Each nomination must be supported by a letter (not to exceed two pages) on qualifications. Ideally this letter should include statements that would form the basis of the presentation speech at the ASLO meeting. 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. These may be mailed separately or be included in the nomination package. The supporting letters should indicate the breadth of support for the nominees and the perspectives of different individuals to clearly indicate the breadth of contributions of the nominee.

Lifetime Achievement Award

Everett Fee, Chair (efee@telusplanet.net), Alan R. Longhurst, Oscar M.E. Schofield, Michael J. Vanni, C. Susan Weiler

Emphasis in selection is given for 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. Ideally this letter should include statements that would form the basis of the presentation speech at the ASLO meeting. 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. These may be mailed separately or be included in the nomination package. The supporting letters should indicate the breadth of support for the nominees and the perspectives of different individuals to clearly indicate the breadth of contributions of the nominee.

SEA BIRD AD

NEW TRENDS IN JAPANESE LIMNOLOGY

Michio Kumagai, Lake Biwa Research Institute, 1-10 Uchidehama, Otsu 520, Japan (kumagai@lbri.go.jp)

Limnological studies in Japan have a long history, beginning with the classic work by Dr. Autamaro Tanaka on the bathymetry of Lake Yamanaka (at the foot of Mt. Fuji) in 1898. In 1932, the Japanese Society of Limnology (JSL) was established with 55 inaugural members; today it is the professional society for more than 1,000 limnologists. Next year will be especially important for JSL members as we celebrate the first 100 years of limnology in Japan.

The great change in size of JSL has been accompanied by public concern about the water environment as well as increased scientific interest in our freshwater ecosystems. The Japanese people consider the quality of drinking water to be very important - as reflected by the philosophy of our tea ceremony. It is not an exaggeration to say that water quality is the very spirit of Japanese culture. From the 1970's onwards, water quality has deteriorated while the economy of Japan has been expanding. One index of this change in Japan's freshwater resources is the decrease of dissolved oxygen in the hypolimnion of Lake Biwa over the last few decades (Kumagai et al., 1995). Lake Biwa is Japan's largest lake, and is located at the center of the country, near the ancient capital of Kyoto.

Such deterioration of water quality and in the health of our lake and river ecosystems has made the Japanese people worry about the loss of high-quality water for daily use. It is a matter of taste as well as a matter of life. The national and local organizations started to push the limnologists to solve the problems, and Japanese limnologists were placed under heavy stress to produce tangible results in exchange for generous research funds.

The professional societies in Japan are strictly separated, and it is not so easy to work across disciplines. The limnologists in Japan have similar restrictions placed upon them by their individual institutes and organizations. This kind of sectionalism sometimes prevents the researchers from solving the environmental problems by way of effective research collaboration - of course, natural environments are highly complex and require broad inter-disciplinary expertise across all sciences.

In 1982, the Lake Biwa Research Institute (LBRI) was established by Shiga Prefectural Government to elucidate the mechanism of eutrophication in Lake Biwa and to find an effective solution to stop environmental deterioration. Although LBRI is not a big research institute by some standards, with 15 research scientists from different backgrounds including social and natural sciences, it allows its staff to work together with researchers from outside the institute. This new, more open system has worked very effectively, resulting in many fruitful contributions to science and society.

In 1993 many limnologists in Japan took part in an inter-

national joint research program, BITEX '93, sponsored by the Lake Biwa Research Institute (Japan) and the Centre for Water Research (Australia), with organizational support from Laval University and National Hydrology Research Institute (Canada). BITEX '93 is the acronym for "Biwako Transport Experiment" and it was the first large international experiment in Lake Biwa. This program was financially supported by the Science Technology Agency in Japan, and took place from 21 August to 16 September, 1993. This experiment involved a total of 177 participants from Australia, Canada, China, Israel, Japan, Spain and USA (Kumagai and Robarts, 1996). It focused on understanding how typhoon events influence the hydrodynamic, biogeochemical and food web processes of Lake Biwa.

BITEX '93 produced a huge amount of field data and many new insights into physical-biotic coupling in Lake Biwa and, perhaps, lakes elsewhere. It has so far resulted in more than 30 scientific papers and several theses. Moreover, it marked a turning point of limnological studies in Japan. Several large, interdisciplinary research programs have been implemented subsequent to BITEX '93. The Lake Biwa Research Institute is now running ABEE (Akanoi Bay Enclosure Experiment, 1995-1997) and BEST (Biwako Enhanced Sediment Treatment, 1997-2000). The Center for Ecological Research of Kyoto University is also running several large research projects such as an IGBP-related program on Lake Biwa.

The surrounding research environment in the Lake Biwa region has further evolved with the opening of the University of Shiga Prefecture and the Lake Biwa Museum in 1996. These new research organizations have provided new positions to limnologists from both within and outside Japan. This expanding interest in limnological research has also encouraged other universities to work more actively in the aquatic sciences and in collaboration with each other.

Limnology in Japan changed after BITEX '93. Japanese limnologists have started to become more open to other disciplines and to collaboration. The Japanese Society of Limnology recently decided to open the "Japanese Journal of Limnology" to non-members and is now calling for the contributions from outside Japan as well as inside. The international symposium, ANSWER'97, was sponsored jointly by Chinese and Japanese limnologists at Nanjing in July, 1997 and a joint declaration was presented. In this statement, the formation of Asian Society of Aquatic Sciences (ASAS) was put forward to exchange information, ideas and technology on the protection and restoration of lakes, reservoirs and rivers in Asia. I realize that this is only the beginning of change, but any process of this sort needs a starting point. BITEX'93 played an important role in catalyzing that beginning.

Some of the researchers who were earlier involved in BITEX '93 are now planning a new international joint research program named CRAB (Cyanobacterial Risk As-

assessment for Biwako). This new program has a more direct focus towards a serious environmental problem in lakes of Japan and elsewhere; specifically, noxious algal blooms.

We have learned much since 1993. However, the world is changing from the 20th to 21st century and our environments are still deteriorating. This new trend of multi-disciplinary collaboration at Lake Biwa is helping limnologists throughout Japan meet the challenge of improved water quality. This process will continue to benefit from contributions from elsewhere in the world, and we look forward to a continuing exchange of science and culture with our colleagues from the American Society of Limnology and Oceanography.

References

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AAAS MASS MEDIA FELLOWSHIPS: EXPERIENCES OF TWO ASLO MEMBERS

Thomas Hayden, *Newsweek Magazine*, 251 W. 57th St., New York, NY 19919 (Tel: 212-445-4586; thayde@nwnet.newsweek.com) and *Lynn M.L. Lauerman*, *Scripps Institution of Oceanography*, La Jolla, CA 92093-0202 (Tel: 619-534-4858; lml@ucsd.edu)

We spent last summer investigating science, but not in the way you might expect. Tom Hayden took a break from biological oceanography and Lynn Lauerman put deep-sea ecology on the back burner for 10 weeks this summer to participate in the 22nd year of the American Association for the Advancement of Science (AAAS) Science and Engineering Mass Media Fellowship.

The media is becoming more interested in covering science and science issues and journalists are joining the ranks of science educators. But most journalists have little or no science education, let alone experience with the day to day joys and frustrations of being a scientist. And many scientists are not terribly comfortable with, or adept at, dealing with journalists.

The Mass Media Fellowship, a part of the AAAS's Public Understanding of Science program, is like an introduction service, opening up communication between the scientific community and the journalists who cover its efforts by placing graduate students at media organizations for a summer. It ends up being a cultural exchange, with each group gaining an appreciation for the rituals, habits and folkways of the other.

The program starts with an intensive three-day orientation at AAAS headquarters in Washington, D.C. The participants then head out across the country to work at television and radio stations, newspapers, and magazines, where they do everything from fact checking and research to writing articles and producing shows. While the Mass Media Fellows usually return to their labs at the end of the summer, about half of the program participants eventually end up working as science writers and journalists. Those who do return to careers in science also benefit, taking their newfound media savvy and communication skills with them.

The AAAS has been funding the fellowship from the beginning, but in recent years has started inviting its professional societies to help pay for participants from their own disciplines. The fellowship is open to all science, mathematics and engineering graduate students, at any point in their programs. This year's participants — 14 in all — included mathematicians, physicists, chemists and geologists, several of whom were sponsored by their academic societies. Both ASLO members were supported by the AAAS this year.

Lynn: I applied for the fellowship because I was interested in science writing and learning how to be an effective liaison between scientists and the public. This summer, I worked as a staff reporter for the Health & Science section of the Richmond Times-Dispatch in Richmond, VA. Like many of the AAAS fellows, I was treated as one of the staff from the very beginning. On my second day, I was asked to write a story about forensic analysis and had my first byline the next morning. I went on from there to write about topics ranging from asteroids in outer space to health care issues to deep-sea worms. Trying to come up with good story ideas, talk to a variety of sources, write an interesting and understandable article, and be completely accurate is very challenging, but also very worthwhile. I am back in the lab in La Jolla now finishing my doctorate, but I miss the excitement of the news room and the fun of writing about such a diversity of scientific topics and issues.

Tom: I first started getting ideas about science writing and journalism when I realized that I enjoyed writing papers and editing grant proposals a lot more than 'normal' people do. That led me to the AAAS fellowship, and on to *Newsweek* magazine in New York City for the summer, where I discovered that writing about other people's work can be just as fun and satisfying as doing the science. I'm still at *Newsweek*, and while I miss going to sea, I haven't left oceanography behind. As well as reporting and writing stories about Southern Ocean ecology and toxic dinoflagellate blooms, I've found that there's no shortage of work for the only oceanographer in the building during an El Niño year.

The AAAS Mass Media Science and Engineering Fellowship runs from June through mid-August each year, and is open to graduate students in mathematics, engineering and science. The fellowship provides a stipend and transportation to and from the fellow's media site. Applications forms, due January 15th, 1998, can be obtained from the AAAS offices at 1200 New York Ave., NW, Washington, D.C. 20005, or from the program's coordinator, Amie King, at aking@aaas.org or 202-326-6760.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION'S SCIENCE ADVISORY BOARD

Kerry D. Bolognese, Assistant Director, National Association of State Universities and Land-Grant Colleges, One Dupont Circle #710, Washington DC 20036 (bolognek@nasulgc.nche.edu)

In 1994, the National Oceanic and Atmospheric Administration (NOAA), led by the Chief Scientist's Office and this nation's research universities, led by the National Association of State Universities and Land-Grant Colleges

(NASULGC), organized a partnership to leverage university resources to accomplish the NOAA mission more effectively in an era of declining budgets. NOAA's defined mission is: 1) Promoting global environmental stewardship in order to conserve and wisely manage the Nation's marine and coastal resources; and 2) Describing, monitoring, and predicting changes in the Earth's environment in order to ensure and enhance sustainable economic opportunities.

Founded in 1887, NASULGC is the nation's oldest higher education association. Its overriding mission is to support high-quality public education through efforts that enhance the capacity of member institutions to perform their traditional teaching, research, and public service roles. A voluntary association of public universities, all the land-grant institutions, and many of the nation's public university systems, NASULGC has approximately 192 members and campuses in all 50 states and the U.S. territories.

While the NOAA/NASULGC partnership took some time to evolve, over the past year significant gains have been made in areas deemed important to NOAA and the universities. NOAA's grants management has become more efficient. Universities have played a critical role in NOAA's strategic planning process through joint workshops and other mechanisms. The Partnership has also set up a Subcommittee on Education and Human Resources to explore areas where NOAA could improve its outreach to minority communities. The Subcommittee has written a draft action plan calling for an office of Education and Human Resource Affairs with a dedicated budget to develop and implement outreach programs.

Perhaps the most tangible achievement of the Partnership, however, has been the establishment of a science advisory board (SAB) for NOAA. NOAA is one of the few agencies conducting a significant amount of science and research which does not have a structured mechanism to review the focus, quality, conduct and relevance to society, business and industry, of its science. NOAA conducts research to develop new technologies, improve operations, and supply the scientific basis for managing natural resources and solving environmental problems. NOAA's comprehensive system for acquiring observations -- from satellites to ships to radars -- provides the quality data and information needed for the safe conduct of daily life and the basic functioning of a modern society. Common end products and services include weather warnings and forecasts, environmental technologies, marine fisheries statistics and regulations, nautical charts, assessments of environmental changes, and hazardous materials response information. These capabilities, products and services support the domestic security and global competitiveness of the United States, and affect the lives of nearly every citizen every day. Clearly, a Science Advisory Board will be indispensable for NOAA to achieve its mission. A Science Advisory Board would add credibility to NOAA's environmental assessment and prediction and its environmental stewardship responsibilities by ensuring it was addressing the most compelling needs.

The struggle for a NOAA SAB overcame many obstacles,

not the least of which was initial Agency resistance. Among other things, NOAA officials were concerned that such a panel could be co-opted by the Department of Commerce (DoC) and politicized through the appointment process. Critical support throughout the process was provided by the Agency's Chief Scientist's office which worked closely with NASULGC's Board on Oceans and Atmosphere (BOA). That Board, chaired by Dr. Leonard Pietrafesa, Head and Professor, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, managed the effort for the universities and facilitated the critical meetings and the necessary paperwork.

The NOAA-University Partnership formed a Committee to develop a Charter for the SAB to propose to NOAA leadership and eventually to the Department of Commerce. The Committee extensively reviewed many other Federal models, such as EPA and NASA, and the possibility of creating the SAB through the National Academy of Sciences structure. Ultimately a hybrid of several models was adopted.

The next chief obstacle was getting DoC to approve the SAB. The Partnership agreed that for the SAB to be a truly long-lived and effective entity -- able to give NOAA the advice envisioned -- it would need a FACA Charter (Federal Advisory Committee Act). Briefly FACA is a Federal Statute that governs the way agencies seek advice and conduct business with outside groups to guard against favoritism and secrecy. Over the years, FACA-authorized committees had proliferated. The Clinton Administration promised to significantly reduce their number, and did. The university argued that an SAB might save taxpayer's money by reducing poor-quality research. Secretary Daley approved of the SAB in August.

To understand more about the SAB's functions and structure, it is important to appreciate the context in which it was created -- the NOAA-University Partnership -- as well as its vision. The mission of the SAB is to advance on broad knowledge-based, long-range strategies for research, education and application for science and resource management in both NOAA and the universities to advance pursuit of NOAA's vision. Unqualified excellence in every endeavor and careful sequencing of annual priorities to adjust to fiscal realities will be hallmarks of this strategy.

Through its panel structure, the SAB will interact with the NOAA Strategic Teams and Line and Program Offices, coordinated through the Office of the Chief Scientist. SAB meetings and activities will be timed to meet NOAA's budget and planning cycles. Staffing will be by the Office of the Chief Scientist. The SAB will consist of 15 members, with 3-year rotating terms. Members will be appointed by the NOAA Administrator from suggestions by appropriate constituencies (e.g. AGU, AMS, ASLO, CORE, CSO, NAML, NASULGC, NRC, SGA, TOS, YOD, UCAR....). The NOAA Administrator, in consultation with the SAB, will determine the appropriate operating procedure for the Board.

The SAB members will be nationally recognized pre-

eminent scientists, engineers, educators and science policy experts who can come from government (including NOAA), the private sector, academia, and non-government organizations, who will represent their views as scientists and not as representatives of their respective organizations. Strict conflict of interest and ethical standards will apply.

The NOAA-University partnership has an exciting challenge and opportunity to exercise a decisive influence on the progress towards a dynamic and creative interaction among science, technology, and society. Knowledge, broadly construed and properly framed, holds the key to successful pursuit of a sustainable, equitable and technologically advanced vision of society. The potential for the NOAA-University partnership to contribute to that pursuit arises from the unique community of interests between NOAA's mission and that of universities. Mutual commitment to such knowledge is the common denominator of the partnership and the *raison d'être* for the SAB.

MARY SEARS REMEMBERED

Taken from a Woods Hole Oceanographic Institution Press Release

The Woods Hole Oceanographic Institution announced with great sorrow the death, on September 2, 1997, of Scientist Emeritus Mary Sears, one of the first staff members of the Institution and a guiding force in its development. Mary was also a long-standing member of ASLO. She passed away at her home in Woods Hole at age 92 after a brief illness.

Mary Sears was born July 18, 1905 and raised in Wayland, MA. She graduated from the Winsor School in Boston in 1923, and lived with the Beale family in Cambridge while attending Radcliffe College, from which she received a bachelor's degree in 1927, a master's degree in 1929 and a Ph.D. in zoology in 1933. While a graduate student she worked at Harvard University with Dr. Henry Bigelow, a founder and the first Director of the Woods Hole Oceanographic Institution.

She began working summers as a planktonologist at WHOI in 1932, one of the first 10 research assistants to be appointed to the staff at the institution. Mary worked summers as a planktonologist from 1932 to 1943, as WHOI was a mostly summer-only operation through the 1930s, and as a junior biologist in 1939 prior to her appointment in 1940 as a planktonologist on a year-round basis. During this time she also served as a research assistant at Harvard from 1933 to 1949, as a tutor at Radcliffe from 1934 to 1940, and as an instructor at Wellesley College from 1938 to 1943. In 1941 she served at Pisco Bay in Peru as Grant and Faculty Fellow for Wellesley College's Committee on Inter-American Cultural and Artistic Relations.

Her long association with the U.S. Navy began soon after her return from Peru. She was commissioned a Lieutenant Junior Grade in the WAVES in 1943 and called to Washington, D.C., where she organized and headed the new Oceanographic Unit of the Navy Hydrographic Office, working with Roger Revelle and others until June 1946. Revelle, former Director of the Scripps Institution of Oceanography and

founder of the University of California at San Diego, said in 1980 that "because the Federal Government has very little memory, it is generally forgotten that the first Oceanographer of the Navy in modern times was a short, rather shy and prim WAVE Lieutenant, jg. They underestimated the powerful natural force that is Mary Sears. That tiny Oceanographic Unit soon became a Division, and finally the entire Hydrographic Office evolved into the Naval Oceanographic Office, headed by an admiral with the proud title of Oceanographer of the Navy."

After the war Mary spent a year in Copenhagen, where she held a Rask-Orsted Foundation grant and received the Johannes Schmidt medal in 1946 for her many contributions to marine research and Navy oceanography during the war. In 1947 she returned to Woods Hole, transferring to the Navy Reserves and retiring as a Commander in the U.S. Naval Reserve in 1963.

Following mostly summer appointments at WHOI in the 1930s, she served on the scientific staff as a planktonologist from 1940 to 1963, when a new department structure was organized under Director Paul Fye and she was named a Senior Scientist in the Biology Department, a position she held until her retirement in 1970.

Since women were not permitted to go to sea until many years later, Mary Sears made her mark in marine science by editing the journals and books in which oceanographers published their results and by helping to establish the journals *Deep-Sea Research* and *Progress in Oceanography*. She was a founding editor of *Deep-Sea Research*, serving as editor from 1953 to 1974. She also edited several books that are considered milestones on documenting the history of marine science. *Oceanography*, considered by many as the benchmark against which future research was evaluated, was published by the American Association for the Advancement of Science in 1961. *Oceanography: The Past* was co-edited with Daniel Merriman as part of the Third International Congress on the History of Oceanography, held at Woods Hole in September 1980 in celebration of the Institution's fiftieth anniversary. Long-time friend and colleague Roger Revelle described Mary Sears in a paper he presented at that Congress as "the conscience of oceanography who initiated and maintained an uncompromising standard of excellence in scientific publications about the oceans. She played a major role in creating the present world community of oceanographers from numerous countries and almost as many specialties."

Mary Sears chaired and helped to establish the First International Congress on Oceanography, held at the United Nations in New York in 1959. She also served on the Joint Committee on Oceanography of the International Council of Scientific Unions from 1958 to 1960. She was a Fellow of the American Association for the Advancement of Science and was a member of numerous other professional societies and organizations, including the American Academy of Arts and Sciences, American Geophysical Union, American Society of Limnology and Oceanography, Sigma Xi, and the Society of Women Geographers.

OCEAN ECOLOGY: UNDERSTANDING AND VISION FOR RESEARCH (OEUVRE)

Peter A. Jumars, University of Washington (jumars@ocean.washington.edu) and Mark E. Hay, University of North Carolina at Chapel Hill (seaweed@email.unc.edu)

We are pleased to announce the beginnings of a project sponsored by the Biological Oceanography Program at the National Science Foundation. It is an assessment of our field and an attempt to provide a vision of what it could become over the next few decades. This process comprises a celebration of recent advances and deliberate planning of directions and infrastructure for the future. This future is yours, so we ask for your help in defining it.

An overall assessment of this type has never happened before in the Biological Oceanography Program. This new effort is not an attempt to define specific new programs to follow JGOFS or GLOBEC; rather, it is an effort to overview our field and assess broad intellectual, infrastructural or training needs that limit future advancement.

Recommendations from this overview are not intended to favor either "big" or "little" science, but to identify our most promising opportunities and most pressing needs. Biological oceanography and marine ecology are fortunate in this context to be able to draw on preceding and parallel efforts in the other oceanography programs. We encourage you to visit the following web sites to get a flavor of the process, not the least because ecology by definition includes these abiotic aspects of the environment:

- <http://www.joi-odp.org/FUMAGES/FUMAGES.html> shows the product of the review in Marine Geology and Geophysics, which acted as the guinea pig;

- http://www.joss.ucar.edu/joss_psg/project/oce_workshop/apropos/ describes progress in physical oceanography;

- http://www.joss.ucar.edu/joss_psg/project/oce_workshop/focus/ demonstrates the substantial community input in Chemical Oceanography, which plans its workshop for December, 1998.

We plan several milestones beginning with the posting of white papers on about 15 January and culminating in an intense workshop of about 40 people from 1-6 March. A score of community representatives has been asked to write white papers treating particular subsets of our field. Their summaries of exciting accomplishments and new directions will appear at

- http://www.joss.ucar.edu/joss_psg/project/oce_workshop/oeuvre/ on about 15 January. Feedback will be posted at the web site as it arrives. The papers are very much working documents intended to stimulate individual thought and community discussion, and the timing is apt. We hope to hear the issues being widely discussed at Ocean Sciences in San Diego. At any point, but particularly after the white-paper posting, we invite comment to one of us or to one of the other workshop participants, who are identified on the web site. Feel free to reach us through that web site or by letter. Please do make your opinions about exciting accomplishments and promising directions known, especially if you do not find them well represented in the ongoing

exchanges. All the inputs will be funneled into the workshop, whose purpose is to digest the white papers and community reactions and render a coherent document about our status and future.

NEW NATO PROGRAM: Science for Peace Initiative

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NATO has recently announced a new program, Science for Peace (SfP), to encourage cooperation between existing NATO countries and partners from Central and Eastern Europe and Central Asia. The program will support projects of 3-5 year duration at an average level of 10 - 12 Million BEF (\$300,000 US).

Funding will support experts, equipment, computers, software, travel, training and consumables, but not salaries, overhead or office equipment. Preliminary proposals are simply a four-page form describing the cooperating parties, the work, milestones, deliverables and funding requirements.

The program's funding level, project duration and simple proposal submission procedures are attractive enough to warrant serious attention. Deadlines are 30th September 1997 (already passed), 15th January 1998, and 15th May 1998. Full details are available electronically from: <http://www.nato.int/science>. You can also get the longer version of the above summary from my newsletter: <http://www.ehis.navy.mil/awnews26.htm> or go to the main home page (above).

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The National Ocean Sciences Accelerator Mass Spectrometry Facility (NOSAMS)

has developed a new schedule of lower rates for its standard precision of $\pm 4\%$ and is soliciting proposals for innovative research bearing on all aspects of global change. For details, scheduling, continuing updates, and information on submissions, please see our web site.

<http://ams245.whoj.edu>

NOSAMS is supported at the Woods Hole Oceanographic Institution by the NSF Section for Oceanographic Centers and Facilities, Division of Ocean Sciences.



TURNER DESIGNS AD
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HYDROLAB AD
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EDUCATION

WANTED: ARTICLES ABOUT AQUATIC SCIENCE EDUCATION

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The contributions to this education column have been excellent as has been the feedback. It is clear that ASLO members view this new column as important and significant to their own professional growth. There is certainly the desire and need to share our education initiatives and experiences. To assure that this success continues we must continue to receive your articles. So please take the time to share your activities and thoughts by sending them to me. As space is limited, try to keep the length under one page single spaced, and no more than 1.5 pages. We strongly encourage articles that can provide new insight and methods in teaching aquatic sciences to K-12 and college students, that provide the rationale for existing programs and that indicate perceived future changes needed to attract students to the field. These are just suggestions, so, please feel free to contact Sue Weiler or me with your ideas for an article.

HOW THE NATIONAL CALL FOR INQUIRY-BASED SCIENCE EDUCATION TRANSFORMED MY LIFE (or, a dedicated researcher discovers education)

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For quite some years I have been a soft-money research scientist, quite content to leave teaching and committee duties to those unenlightened faculty who didn't realize the good deal I had (unlimited time for play at sea or in the lab). But last year I was transformed by talking to a few school administrators in our town about the new science "kits" they were considering for use in my daughter's classroom. The answers have led to activities so rewarding, and, I believe, far reaching in their effects that I invite you to consider some of the same.

The local public school educators explained that U.S. national initiatives (e.g. 1996 National Science Standards and the AAAS Project 2021) were driving them to consider creating a K-8 science curriculum (where there had been none) and buy new materials for science teaching.

The new standards promote the idea that children (in fact, all learners) learn best when they construct their own knowledge through asking questions, experimenting, developing theories, and communicating their ideas. This sounded like something I could identify with (as dedicated questioner/experimenter!) It might even be a good idea.

Next, these savvy educators loaned me 2 "kits" (STC Microworlds and STC Ecosystems) they were considering to replace textbooks. The kits contained a 12-week curriculum and materials centered on selected scientific concepts. I tried them out with my 10-year old and I haven't had so much fun

in years. After all, when I went to school no one let me take apart a microscope and fiddle with the lenses, putting them back in the wrong places to see what difference it made. No one asked me to think about what properties of an object made it magnify and then gave me an array of Plexiglas spheres, cubes, cylinders, water drops etc. to look at objects through.

The ecosystems kit also struck a chord with my own experience. In grade 6, students will now be using model aquatic ecosystems (aquaria) connected to the outflow of a model terrestrial ecosystem (terraria) to see what happens to life and chemistry in the water when a contaminant (e.g. vinegar) is introduced to the "land". These children will begin to learn what it took post graduate work in "mesocosms" to instill in me: that compartmentalized instruction of biology, physics, chemistry, plankton, benthos etc. can hamper one's real understanding of ecology. For these children the idea of watersheds might even become real. Maybe as adults they will be citizens who could participate intelligently in land use planning for their towns and states!

After seeing these kits I was convinced this was an effort worthy of lending a hand (or at least seeing what students really did learn from the kits). So I offered to participate in training sessions for teachers, as a volunteer. The action hasn't let up since. Our local effort in RI involves 5 school districts and will eventually train 520 teachers of 10,782 K-8 children in 29 Rhode Island Schools. Some of my scientific colleagues and graduate students have also joined in and so far, all have been as enthusiastic as I. Even physics professors who normally teach only graduate level courses have appreciated a chance to repeat those childhood activities (like figuring out how to balance a pencil on its point) that helped them develop their physical intuitions and creativity.

The job of the scientists in this program was not to be experts! It was to model the "inquiry process" with their own natural curiosity and investigative approach. Most elementary school teachers have had little exposure to the process of science, were fearful of leaving scientific facts behind and distressed when experiments didn't work out "right". We (the scientists) all learned how hard it is NOT to be the expert and give out easy answers but instead to ask probing questions that turn minds on, not off. Fortunately we found out about some excellent workshops available for scientists to teach us how to be most effective in elementary education reform efforts (see APS and SYFEST references below). And we have been into classrooms to see incredible progress in both teachers' enthusiasm for science and children's knowledge.

Now we are grant writing: will we succeed in getting funds from NSF and other sources to sustain the reform of science education that has begun in RI? Other school districts around the country find it really takes 5 years to effect a lasting reform in local schools.

There is one last but important piece to this story. NSF sponsored a workshop at the 1997 Santa Fe ASLO meeting at which they introduced the audience to a document called *Shaping the Future, New Expectations for Undergraduate Education in Science, Mathematics, Engineering and Technology*. It contains the very same words that had begun the reforms in K-8 education but here directed toward SME&T faculty: a call to "...build inquiry, a sense of wonder and excitement of discovery, plus communication and teamwork... into learning experiences"; to "...work collaboratively with departments of education, the K-12 sector to improve preparation of teachers...provide for graduate students opportunities for developing pedagogical skills." And to University administrators: to "change the reward structure to support innovative teaching."

My familiarity with the K-12 education reform movement made it much easier to approach colleagues at my own graduate-level university department to inspire some reform of undergraduate education. We now have faculty and administrators cooperating to design courses for undergraduates, involving graduate students and centered on experiments/inquiry at specialized research facilities here. And of course, applying for some of that NSF money. We are even hoping the university will look more favorably on returning a greater portion of overhead for our research facilities....

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- National Science Foundation, 1996. *Shaping the Future, New Expectations for Undergraduate Education in Science, Mathematics, Engineering and Technology. A Report on its Review of Undergraduate Education by the Advisory Committee to the NSF Directorate for Education and Human Resources*.
- 1997. *Undergraduate Education Program Announcement NSF 97-29*.
- 1997. *Elementary Secondary and Informal Education Program Announcement and Guidelines NSF 97-20*.

Workshops:

- American Geophysical Union report on conference on Earth System Science Education. "Spheres of Influence: Shaping the future of Earth Systems Education"
- Schoolyard Ecology for Elementary School Teachers, Workshop for Lead Teachers and Ecologists. Institute for Ecosystems Studies, Box R, Millbrook NY 12545-0178.
- Teacher-scientist Alliance Institute. The American Physical Society. Contact Kevin Aylesworth, Education and Outreach 301-209-3245, 1 Physics Ellipse, College Park, MD 20740.

STUDENT-ACTIVE TEACHING AND LEARNING IN UNDERGRADUATE COURSES

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Introductory science courses are challenging to teach, especially if they include majors plus non majors. In addition, these classes can be large and include students with a diversity of backgrounds and interests. This note is aimed at college and university professors and their graduate students who teach introductory courses and wish to incorporate "student-active learning", which I define as investigative; often collaborative; helps students learn skills, facts, and attitudes concurrently; and comes from working on complex and often real-world problems (McNeal & D'Avanzo, 1997). To illustrate student-active teaching, I will describe three approaches for classes of different size. These descriptions show how students in these courses learn through a much broader range of experiences compared to more traditional classrooms.

Although many professors cite "improving critical thinking" as an important course goal, lecture-based science courses, especially at the introductory level, are poorly designed to foster cognitive skills such as analysis, synthesis and evaluation. I think this is because we pay far more attention to what we teach than how we teach. So I emphasize what may seem like an obvious point: Begin your planning by deciding what you would like the students to know and be able to do, and then genuinely teach towards these goals. In any introductory course, I not only want the students to learn the subject matter but also to 1) better understand the distinction between observations and possible explanations/hypotheses, 2) be more comfortable with and skilled at data interpretation, 3) learn and teach collaboratively in groups and learn alone, and 4) gain confidence in their ability to "do" science. These goals match those in numerous reports on science education reform (e.g. National Research Council 1977). The examples below specifically meet these goals and are based on collaborative approaches that have been thoroughly evaluated as effective for most students.

Classes of under 20 students or so lend themselves beautifully to student-active approaches. My freshmen-level class in aquatic ecology is an entirely investigative-based course, focusing on scientific inquiry. During the semester the students write three papers in the format of primary literature using data they collect. Some investigations students have done are: effects of wrack on zonation of salt marsh plants, heavy metal concentrations in mussels up and downstream of an urban area on the Connecticut River, possible role of aquaculture effluent on eutrophication of a river embayment, changes in inorganic N species over a diel cycle in a "solar algae pond", and effects of nitrite on Tilapia fry. This approach gives students a far better understanding of what science is all about compared to the cookbook lab exercises of most introductory courses. To learn more about this type of course structure please contact me for published articles (e.g. D'Avanzo 1977).

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One approach that is effective in small and in medium sized classes(40-50 students) is Problem-Based Learning (PBL), a method borrowed from medical schools (see University of Delaware web sites: [HTTP://www.udel.edu/pbl/](http://www.udel.edu/pbl/)). Students in PBL courses learn content plus skills such as working effectively in groups, problem solving, analytical thinking, reading literature, and writing by working on problems in teams. In PBL courses, all class time is devoted to students working on the problem in groups of 4-5. The teacher's role is to provide reference material, data or references they request, and give impromptu lectures as needed. After several weeks the outcome will be group or individual papers in which students explain and defend their conclusions using references, personal communications, data, and explanations of dead ends.

For an introductory Oceanography course, a problem that would help students understand subject matter related to respiration and decomposition, stratification, and nutrient loading, might be: Your grandfather, a longtime commercial fisherman on Long Island Sound, tells you that the patterns of fish density and types in his trawls have changed in ways he does not understand. One of his favorite spots used to be the eastern narrows but now the fishing is almost always poor there in the summer. On other locations in western areas of the Sound, both the variety and abundance in his tows are very variable from place to place during summer. He remembers 1987 as especially bad year. Considering all the information, What has happened?

The students would start working on the Long Island problem in their groups by making lists of what they know, possible hypotheses and explanations, plus what they need to know. They might first focus on toxins and ask for data. I would give them data I've synthesized from the literature indicating that contaminants in the western sound are high but the bioeffect patterns do not seem to match those in the fishing problem. Through background readings on anoxia, the students might then request data on oxygen. I would then give them bottom dissolved oxygen (DO) levels for the target areas. The students would feel more confident that they are on the right track and ask for more reference material including the articles from which I culled oxygen data. This approach puts the students in charge of their learning while teaching them problem solving strategies used by scientists.

An effective approach in large classes (100-300 students) is called "turn to your neighbor." Here students work collaboratively with their nearest neighbors several times during the lecture. For example, the subject under discussion might be the decline of striped bass in the Chesapeake Bay and the hypothesis that striped bass declines in the Bay were related to nutrient loading. The instructor might first lecture for 10 to 15 minutes about historical striped bass declines showing catch data, fish pictures, angler's accounts, and a 30 year record of oxygen data from the deep channel waters of the Bay. A question requiring interpretation of the oxygen data would be posed and the students would be asked to turn to their neighbors to discuss the data and the question for

several minutes. Whole group discussion would follow with students answering the instructor's questions and each other's questions. To insure all class participation students would be called at random using binoculars to read student's names which are hung around their necks.

This strategy could be repeated several times during the lecture session with additional data (chlorophyll, nutrient time series, etc.) and mini lectures about topics such as BOD and the limiting-nutrient concept. Most challenging would be how to stimulate an informed discussion about alternative hypotheses to explain striped bass loss. One idea would be to show and discuss data on over-fishing. Another might be to give a few students the e-mail addresses of scientists who work on the Chesapeake (and who of course agreed to this ahead of time!) These students could present the scientists' opinions about the hypothesis plus their own opinions of what the scientists said.

All of these approaches take class and lab time. In courses where subject coverage is a main goal, lectures can be supplemented with some alternative approaches. Advocates of student-active teaching are not asking faculty to stop lecturing altogether. Instead, they are offering more variety for the professor's toolbox. And, they are asking science faculty in particular to view their own classrooms as laboratories where they ask and then address questions about how students learn science best.

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ACADEMICIANS LINK YOUR INSTITUTION'S WEB ADDRESS TO THE ASLO HOME PAGE

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

Each year, ASLO receives approximately 1200 written requests from students interested in undergraduate and graduate courses in limnology and oceanography. And, every day more students are drawn to the ASLO web page.

ASLO hopes to link its web page to as many institutions as possible, to advertise the availability of aquatic science courses and programs.

This effort needs your help: Please send the **web address for your institution**, and if available, the **web address for the department or section most active in aquatic science**. Please do not send personal web pages, as these are subject to all-too-frequent change and ASLO doesn't have the resources to keep these up-to-date..

Send addresses to:

weiler@whitman.edu

OPPORTUNITIES IN TROPICAL LAKE STUDIES FOR HIGH-SCHOOL TEACHERS

The Nyanza Project is a new summer research training program, sponsored by the International Decade of East African Lakes (IDEAL) and funded by the National Science Foundation and the Lake Tanganyika Biodiversity Project. The primary target trainees for this program are U.S. and African undergraduates. However, one slot in the program each year is being reserved for a high school teacher of any nationality, currently teaching at a school within the United States or its territories. Applicants should have a strong interest in any aspect of aquatic sciences (limnology, ecology and evolutionary biology, conservation biology, geolimnology and paleolimnology). This is a tremendous opportunity for teachers who are looking to further their own

scientific interests and find new aspects of the aquatic sciences to explore in their classroom. Students and teachers who are members of under-represented minority groups are particularly encouraged to apply. The program will take place at Kigoma, Tanzania to take advantage of world class research opportunities at Lake Tanganyika. Accepted applicants to the program will have their airfare, room and board and research expenses paid by the project and will be given a stipend. Applications for the 1998 program (Jun 1-July 10) will be accepted until Jan. 1, 1998. For further information please contact: The Nyanza Project, Department of Geosciences, University of Arizona, Tucson, AZ 85721 (Tel. 520-626-7312; Fax 520-621-2672; nyanza@geo.arizona.edu; <http://www.geo.arizona.edu/nyanza>)

JOBS

ASSISTANT PROFESSOR OF BIOLOGY (LIMNOLOGY), HILLSDALE COLLEGE, MICHIGAN

Tenure track position opens Fall, 1998. Requires team participation in a freshmen science course, courses in area of specialty, occasional seminar leadership, directing research leading to senior theses, and advising students. Ph.D. required and firm commitment to enthusiastic teaching at small liberal arts college. Send letter of application, three letters of reference, curriculum vitae, and a list of references by December 15, 1997 to Dr. Donald Toczek, Chair, Biology Department, Hillsdale College, Hillsdale, MI 49242. Hillsdale College is an independent, traditional college of liberal arts and especially committed to the preservation and transmission of modern man's intellectual and spiritual inheritance from the Judeo-Christian faith and Greco-Roman culture. EOE.

GRADUATE FELLOWSHIP IN MOLECULAR BIOLOGY/BIOGEOCHEMISTRY, SKIDAWAY INSTITUTE OF OCEANOGRAPHY

Ph.D. student sought for research in nitrate utilization by bacteria and phytoplankton using molecular approaches at the Skidaway Institute of Oceanography in Savannah, GA. Fellowship includes 12,000/yr stipend + tuition. Minority student applicants are especially encouraged. Interested students should contact Marc Frischer or Peter Verity at 912-598-2453 or frischer@skio.peachnet.edu.

MARINE INVERTEBRATE ECOLOGICAL PHYSIOLOGIST, UNIVERSITY OF FLORIDA

Applications are invited for a 12-month, tenure-track faculty position at the Assistant Professor level. A Ph.D. in a biological discipline and expertise in benthic marine invertebrates is required. The successful applicant will be expected to develop a vigorous research program dealing with nearshore marine benthic invertebrates, with special emphasis on coastal processes that affect natural and/or cultured populations. He/she will also be expected to teach a graduate level course in the field. Send a letter of application, curriculum vitae and the names, addresses and telephone numbers of five references by January 3, 1997, to: Invertebrate Position, Department Fisheries and Aquatic Science, University of Florida, 7922 NW 71st Street, Gainesville, FL 32653.

An Equal Opportunity/Affirmative Action Institution.

STUDENTS

Subscribe to the student mailing list (see p. 3).

To subscribe to the mailing list, send an e-mail message to:
listserv@listserv.montana.edu

On the first (and only) line of the message, type:
SUBSCRIBE ASLOSTUD **firstname lastname**
Do not include any other text in the message. If you have an email signature, it must be suppressed or deleted.

For more information or if you have problems, contact
Cristina Takacs (takacs@montana.edu)

LIMNOLOGY AND OCEANOGRAPHY EDITOR-IN-CHIEF POSITION OPEN

See P. 4 for details

ASLO MEETINGS

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

Cathy Pringle, Institute of Ecology, University of Georgia, Athens, GA 30602-2602 (Tel: 706-542-4289; pringle@sparrow.ecology.uga.edu) and *Mary Barber*, Ecological Society of America, 2010 Massachusetts Ave. Suite 400, Washington, DC 20036 (Tel: 202-833-8773; mary@esa.org)

The ASLO/ESA Call for Paper has been published, and is also available, with interactive forms for electronic registration and submission of abstracts, on the ASLO web page (<http://aslo.org/>). We hope you will all take advantage of this convenient registration mechanism, and please remember the

deadline for abstract submissions: January 5, 1998.

The meeting will be held June 8-13 in St. Louis, Missouri, as a joint meeting with the Ecological Society of America (ESA). This meeting will focus on science (basic and applied) at the land-water interface of both fresh- and salt-water systems. The meeting will include daily plenaries, invited and contributed oral and poster presentations, and roundtable discussion and synthesis. As always, papers on any aquatic science topic are welcome. However, due to the limited number of concurrent sessions, there will be greater opportunities for poster presentations.

We are particularly excited about our stellar cast of plenary speakers which include **Joanne Burkholder**, **Theo Colburn** (author of 'Our Stolen Future'), **Jane Lubchenco**, **Robert Naiman**, **David Pimentel**, **Sandra Postel** (author of 'Last Oasis'), **Garth Redfield** and **Ivan Valiela**.

Special sessions include:

- Aquatic ecosystems in the urban landscape: Into the foreseeable future
- Arctic contamination: levels, transport, and human and ecological impacts
- Autotrophic and heterotrophic bases for freshwater and marine food webs
- Carbon cycling in boreal ecosystems
- Coastal habitat restoration for sustainable ecosystems
- Contemporary issues concerning watershed and estuarine degradation and restoration in Chesapeake and San Francisco Bays
- Ecological indicators in ecosystem assessment and environmental monitoring
- Ecosystem impacts from harmful algal blooms
- Fisheries ecology: From lakes to oceans
- Global scale effects of hydrological alterations: What we know and what we need to know
- Limitation of primary production across ecosystems
- Linkages between ecosystems: The South Florida hydroscape
- Linking coastal ecosystems and watershed health: the Mississippi River Basin and hypoxia in the Gulf of Mexico.
- Linking non-linear and non-stationary time-series in ecology to climatic forcing on terrestrial and aquatic

- processes, population and community ecology
- Resource ratio approaches to understanding ecological processes in freshwater, marine, and terrestrial ecosystems
- Science-management connections at the land-water interface
- Temporary aquatic habitats: constraints and opportunities
- Vascular plants as littoral links

We look forward to seeing you in St. Louis!

STUDENT POSTER AWARDS: JUDGES NEEDED

If you haven't already served as an ASLO student poster award judge, you are missing a real treat! It's an educational experience that gives you a chance to learn about work on the cutting edge, within and outside your primary area of expertise. You will be asked to judge no more than 10 posters. Posters are judged on their scientific significance and innovation, quality of the experimental design and methods, and visual quality and impact.

Please join the fun by contacting either of this year's committee co-chairs:

Samantha B. Joye (mjoye@ocean.tamu.edu) or
Deborah A. Bronk (dbronk@uga.cc.uga.edu).

ASLO 1999 AQUATIC SCIENCES MEETING: Join us in Santa Fe

John A. Downing, ASLO '99 Co-Chair, Iowa State University (Tel: 515-294-2734; downing@iastate.edu) and *Karen F. Wishner*, ASLO '99 Co-Chair, University of Rhode Island (Tel: 401-874-6402; kwishner@gsosun1.gso.uri.edu)

The ASLO 99 Aquatic Sciences Meeting is scheduled for **Feb. 1 - 5, 1999** in Santa Fe. This is ASLO's closest scheduled meeting to the year 2000 and is also the 51st year of ASLO, so a celebration of ASLO and a discussion about where we have been and what the future holds for limnology and oceanography is in order. The co-chairs John Downing (Iowa State) and Karen Wishner (University of Rhode Island), along with an active and enthusiastic Meeting Committee (Stephen B. Brandt (NOAA—Great Lakes); Carlos M. Duarte (Centro de Estudios Avanzados de Blanes, Spain); Mary I. Scranton (SUNY, Stony Brook); Val H. Smith (University of Kansas), Amelia K. Ward (University of Alabama); and Bess B. Ward (University of California at Santa Cruz) are pleased to announce the theme of the meeting will be: **Limnology and Oceanography: Navigating Into the Next Century**, and to invite you to participate.

The formal call for papers will occur in spring 1998, with an abstract deadline in mid-September 1998. The meeting will be centered in the Hilton and Eldorado Hotels and the Sweeney Center. These 3 venues are no farther apart than a large convention center, allowing us to move smoothly among sessions. The new ASLO Business Manager, Helen Schneider-Lemay, will handle all the logistics, including registration, accommodations, and meeting facilities. We hope everyone will come!

The Committee is planning an introductory plenary session, in which several speakers will provide their perspectives on the past, present, and future of aquatic science. We will also be arranging a special historical plenary session during which some of those at the center of important developments in aquatic science in the last 50 years will give their personal story of how these came about.

Other topics for special sessions being considered include: • 50 years of Aquatic Science: Where have we been and where are we going? • Changes in the “Waterscape” Ahead • Flexible Approaches to a Rapidly Changing World • Climate Variability Advances in and from Remote Sensing • 25 Years of the Microbial Loop • Linking Ecological Theories and Societal Needs • Biodiversity, Conservation, and Restoration • Exotic Species • Ecological Consequences of Episodic Events • Toxic Blooms and Water-Associated Health Risks • Physical / Biological Interactions • Suboxic and Anoxic Environments • Ecological Stoichiometry and Biochemistry • Nutrients, Food Webs, and Ecotoxicology • Environmental Biogeochemistry • Extreme and Unusual Environments • Spatial Patterns and Processes • Long-Term and Historical Analyses: View to the Future.

We will be seeking chairs and leaders for sessions in these areas, as well as other areas of interest to ASLO members. **We encourage those with ideas for special sessions to contact the special session coordinator, Bess Ward (bbw@cats.ucsc.edu). Please submit a title and a brief (100 words or less) description by February 20, 1998 at the latest;** earlier submissions will be much appreciated.

The Committee is also working on developing special workshops. These may include workshops dealing with education and outreach, hands-on instruction in the use of new equipment, the federal agency outlook, and career workshops. People with ideas for workshops should contact the workshop coordinator, Steve Brandt (brandt@glerl.noaa.gov). We also hope to have several unique special events to add some southwest flavor to the meeting. The ski van will also be in operation again.

Members of the Committee and their special responsibilities are: **John A. Downing** (Co-Chair, Iowa State Univ., downing@iastate.edu) **Karen F. Wishner** (Co-Chair, Univ. of Rhode Island, kwishner@gsosun1.gso.uri.edu); **Stephen B. Brandt** (Workshop Coordinator, NOAA—Great Lakes, brandt@glerl.noaa.gov); **Carlos M. Duarte** (International Coordinator, CEAB, Spain, duarte@ceab.es); **Mary I. Scranton** (Contributed Session Coordinator, SUNY, Stony Brook, msranton@notes.cc.sunysb.edu), **Val H. Smith** (Historical/Breakthrough Session Coordinator, Univ. of Kansas, valsmith@falcon.cc.ukans.edu), **Amelia K. Ward** (Special Sessions Co-Coordinator, Univ. of Alabama, award@biology.as.ua.edu), **Bess B. Ward** (Special Sessions Co-Coordinator and point of contact for special sessions, Univ. of Calif., Santa Cruz, bbw@cats.ucsc.edu),

Ex-officio members are: **Asit Mazumder** (ASLO Secretary, Univ. Montreal, mazumdea@ere.umontreal.ca); **Helen Schneider-Lemay** (ASLO Business Manager, sgmeet@mail.airmail.net), **C. Susan Weiler** (ASLO Executive Director, Whitman College, weiler@whitman.edu).

BIOSPHERICAL INSTRUMENTS AD

CALENDAR OF EVENTS

Meetings and events submitted since the last issue of the ASLO Bulletin are presented below.
See the ASLO website, <http://aslo.org/> for a more complete listing

Goal Setting and Success: Criteria for Habitat Restoration

Dates: January 13 - 15, 1998

Location: Charleston, South Carolina

Topics: Hosted by The National Oceanic and Atmospheric Administration, National Marine Fisheries Service Restoration Center, and Coastal Services Center. Success in habitat restoration and creation means different things to members of the regulatory, scientific, environmental, and legal communities. This conference brings together these diverse professionals to discuss their different perspectives. From this conference, a series of position papers will be issued which will help managers set restoration goals that reflect the needs of the project partners and establish criteria for measuring progress towards those goals. Agenda items: Goal Setting; Success Criteria; Adaptive Management; Improving the Practice of Coastal Habitat Restoration.

Contact: Pace Wilber, NOAA Coastal Services Center, 2234 S. Hobson Ave, Charleston, SC 29405 (Tel: 803-974-6235; pwilber@csc.noaa.gov; <http://www.csc.noaa.gov/lcr/text/restcon.html>)

ASLO/AGU 1998 Ocean Sciences Meeting

Dates: February 9 - 13, 1998

Location: San Diego, California

Topics: This meeting is designed specifically to meet the needs of oceanographers, limnologists, meteorologists, and scientists working in related areas. Subdisciplines included are atmospheric sciences, hydrology, estuarine sciences, limnology, oceanography, and ocean technology.

Contact: Program Co-Chair Linda Duguay (lduguay@nsf.gov) or AGU Meetings Department, 2000 Florida Ave. NW, Washington, DC 20009 (Tel: 800-966-2481 or 202-462-6900; Fax: 202-328-0566; meetingsinfo@kosmos.agu.org (subject: 1998 Ocean Sciences Meeting) or see the ASLO Web page (<http://aslo.org/>).

Oceanology International 98: The Global Ocean

Dates: March 10 - 13, 1998

Location: Brighton, United Kingdom

Topics: Billed as the world's largest marine science and ocean technology event, including an unprecedented array of equipment, systems, technologies and scientific research services for application worldwide. Key topics include access to information; acoustics (propagation/imaging); AUVs/UUVs; coastal zone management; disposal of waste at sea; littoral oceanography; ecosystems - micro and macro; key enabling technologies; marine biology/biotechnology; rapid environmental assessment.

Contact: Angela Pederzoli, Conference Executive, Oceanology International 98, Ocean House, 50 Kingston Road, New Malden, Surrey KT3 3LZ, UK (Tel: +44(0)181-949-9222; Fax: +44(0)181 949-8186; angela@spearhead.co.uk; <http://www.spearhead.co.uk>).

Fourth Marine and Estuarine Shallow Water Conference - Users and Regulators Seeking Consensus

Dates: March 15 - 19, 1998

Location: Atlantic City, New Jersey

Topics: This conference will continue the dialogue of previous conferences on the conflicts between and pursuing consensus among the varied users and regulators of the shallow water zone - the zone of maximum interaction between human activities and biological resources: the intertidal zone to four meters below mean low water. Objectives: continuing public education about the importance of shallow water habits, balance between human activities and biological resources, and in-depth discussions about management practices. Representatives from user, regulatory, and scientific sectors are invited to submit abstracts (for oral and/or poster presentation).

Contact: Ralph Spagnolo (3EP30) or Edward Ambrogio (3EP10), U.S. Environmental Protection Agency, Region III, 841 Chestnut Street, Philadelphia, PA 19107 (Tel: 215-566-2718; spagnolo.ralph@epamail.epa.gov or ambrogio.edward@epamail.epa.gov).

International Conference - Concepts and Controversies in Tidal Marsh Ecology

Dates: April 5 - 9, 1998

Location: Vineland, New Jersey

Topics: This conference is sponsored by a variety of agencies and organizations including the Academy of Natural Sciences; Marsh Ecology Research Program; the Delaware, Maryland, National, New Jersey, and Rhode Island Sea Grants; and the Public Service Electric and Gas Company. The theme is to review the status of salt marsh research and revisit the existing paradigm(s) for marsh function (especially the nexus between primary and secondary production). The meeting will be of great interest to anyone involved with marshes and wetlands, including scientists, managers, restoration groups, conservation groups and regulatory personnel. The conference will consist of contributed poster presentations and invited oral presentations over three full days. The first two days will be devoted to tidal marsh ecology, with an emphasis on functional relationships. The third day will be devoted to ecological engineering and restoration concepts, addressing state-of-the-art methodology and specific case histories. The final half day will consist of field trips in southern New Jersey to natural and restoration salt marshes, the Pinelands, and LEO-15.

Contact: Michael P. Weinstein, New Jersey Sea Grant (Tel: 908-872-1300x21; Fax: 908-291-4483; mweinst999@aol.com) or Daniel A. Kreeger, Academy of Natural Sciences (Tel: 215-299-1184; Fax: 215-299-1079; kreeger@acnatsci.org)

Watershed Management: Moving From Theory to Implementation

Dates: May 3 - 6, 1998

Location: Denver, Colorado

Topics: Water Environment Federation (WEF)-sponsored conference on Watershed Management, building on the 1996 conference sponsored together with the U.S. Environmental Protection Agency and 13 other Federal agencies. Attendees will hear the latest information on implementing watershed planning, protection, restoration, and education. Real-life experiences and lessons will be outlined, including issues related to western and arid lands such as water rights, quantity and scarcity, mining, watershed crisis, and water reuse. Abstracts related to Native American issues are encouraged. Particular consideration also will be placed on issues that cross boundaries, including local, regional, state, and national borders. The conference will include oral presentations, interactive discussions, posters, exhibits, and tours. Registration fees are approximately \$450 for full conference, advance registration for WEF members.

Contact: WEF Member Services Center, mse@wef.org.

Co-sponsored by ASLO

6th European Marine Microbiology Symposium

Marine Microbiology: Perspectives for the Sustainable Use of the Oceans in the XXIst Century

Dates: May 17 - 21, 1998

Location: Sitges, Catalonia, Spain

Topics: The purpose of this meeting is to help build the links among scientists from the two areas of basic and applied research to lessen the gap between the acquired knowledge and the application of such knowledge. Topics include: 1) The microbial food web in contrasting marine microbial communities: coastal versus open sea, surface versus deep, cold versus warm waters. 2) Microbial processes affecting the dynamics of volatile gases in the upper layers of the ocean. 3) Mechanisms affecting microbial diversity: introduction and survival of alien organisms, bloom formation and disappearance, strategies for the location/detection and isolation of organisms producing active substances. 4) Use of microorganisms to alleviate eutrophication, pollution, fouling and corrosion. 5) Relationships between production of harvestable organisms and the activities of microbial food webs. 6) Fate, interactions, and survival of microbial pathogens in marine waters. These main topics will be developed through plenary lectures, oral contributions, and poster presentations.

Contact: Dolors Vaque - 6th EMMS, Institut de Ciències del Mar - CSIC, P. Joan de Borbo s/n. E-08039 Barcelona, Spain (Tel: 343-221-6416; Fax: 343-221-7340; emms@icm.csic.es; <http://www.icm.csic.es/bio/emms/welcome.html>).

ASLO/ESA Joint Meeting

The Land-Water Interface: Science for a Sustainable Biosphere

Dates: June 8 - 13, 1998

Location: St. Louis, Missouri

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

Abstract deadline: January 5, 1999

Contacts: Catherine M. Pringle, Institute of Ecology, University of Georgia, Athens, GA 30602 (pringle@sparrow.ecology.uga.edu); ASLO Business Office & Meetings Management, 5400 Bosque Blvd. Suite 680, Waco, TX 76710-4446 (Tel: 800-929-ASLO' 817-399-9635; Fax: 817-776-3767; business@aslo.org) or visit the ASLO web page, <http://aslo.org/>.

XXVII SIL Congress

Dates: August 9 - 15, 1998

Location: Dublin, Ireland

Topics: Conference will include regional limnology, limnology of specific water bodies, catchment studies, biodiversity, fresh and saltwater interactions, estuaries, paleoecology, agriculture & fresh waters, water treatment, limnology in the developing world, biology of aquatic organisms, theoretical limnology & modeling, scales, intermittent water bodies, Wetlands, peats, swamps & Marl lakes, River & canal management, education, and transnational issues.

Contact: XXVII SIL Congress, UCD Environmental Institute, Richview, Clonskeagh, Dublin 14, Ireland (sil98@ucd.ie or <http://nis.rte-tallaght.ie/conferences/sil98.html>).

Kinneret Symposium on Limnology and Lake Management 2000+

Dates: September 6 - 11, 1998

Location: Lake Kinneret, Israel

Topics: This Symposium will mark the 30 years of the Kinneret Limnological Laboratory-(Israel Oceanographic and Limnological Research). Presentations will be focused around: 1) Management driven research and monitoring in limnology: Case studies; 2) Lake-catchment interactions; 3) Operational limnology - New approaches to predictive modeling; 4) Lakes and reservoirs as water supply sources; and 5) New directions in nutrient cycling and food web studies. We anticipate a stimulating meeting bringing together a wide spectrum of practitioners of theoretical and applied limnology and related sciences. Presentations from the meeting will be published (after peer-review) as a special volume in a major journal.

Contact: Tom Berman, Chair, Organizing Committee, Kinneret Limnological Laboratory, P.O.Box 345, Tiberias, 14-102, Israel (Tel: 972-6-6721444; Fax: 972-6-6724627; tberman@inter.net.il or tom_berman@alum.mit.edu).