



SIL news

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The International Association of Theoretical and Applied Limnology (Societas Internationalis Limnologiae, SIL) promotes and communicates new and emerging knowledge among limnologists to advance the understanding of inland aquatic ecosystems and their management.

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A piedmont reach of the Salto stream, which is low in nutrients.

Stream Research in Costa Rica: Linking Freshwater Research Programs to Environmental Outreach.

by

*Catherine Pringle, Frank J. Triska, David Genereux, Alonso Ramirez,
Elizabeth Anderson and Douglas Parsons.*

Material for future issues should be sent to the Editor:

Dr. R.D. Robarts, or
Ms. Clara Fabbro,
Editorial Assistant,
GEMS/Water Collaborating Centre,
Environment Canada,
11 Innovation Blvd., Saskatoon, SK
S7N 3H5 CANADA
Email: clara.fabbro@ec.gc.ca

Contributions on a PC formatted disk,
in any standard word processor or
DOS (ASCII) text, or as email
attachments, will assist the Editor.

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A major objective of our long-term STREAMS research program in Costa Rica is to understand the link between surface-subsurface water interactions and ecosystem processes in lowland tropical streams. Much of our research support has been provided by the U.S. National Science Foundation.

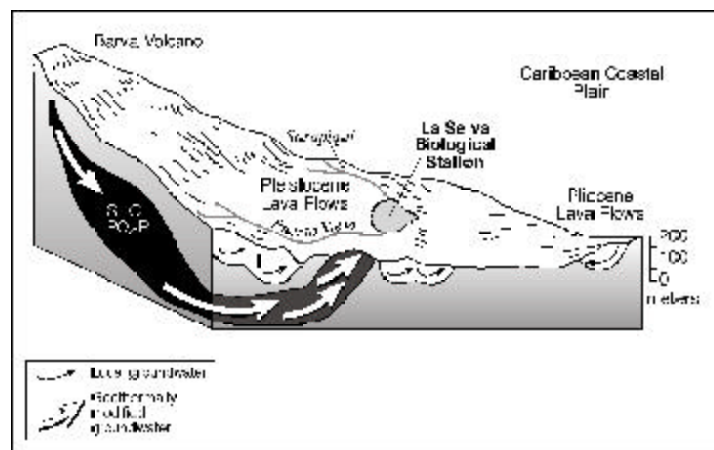


Diagram illustrating the location of La Selva Biological Station with respect to subsurface flow paths of geothermally-modified groundwater rich in phosphorus and other trace elements. Phosphorus-rich groundwater emerges within La Selva which is located at the break in landform where the foothills of the Central Mountains (e.g., Barva Volcano) merge with the Caribbean coastal plain. While some streams draining La Selva receive P-rich groundwater, others do not. La Selva thus provides a natural outdoor laboratory to study ecosystem-level effects of P, given the range of P-levels (below detection – 400 µg/L).

Our research site is La Selva Biological Station, owned and operated by the Organization for Tropical Studies (OTS) and located on Costa Rica's Caribbean slope at the gradient break where the foothills of the Central Mountain Range merge with the coastal plain. Streams of La Selva are affected by a complex pattern of hydrologic connectivity within the landscape, whereby transfers of solute-rich groundwater are occurring through subsurface flow, altering ecosystem-level processes in receiving streams (Pringle and Triska 1991, 2000). This solute-rich groundwater accounts for almost half of the stream discharge and major cations in some streams during the dry season (Genereux and Pringle 1997). Solute-rich groundwater has been geothermally-modified and is associated with underlying volcanic activity which has similarly altered the chemistry of receiving streams

throughout Central America (Pringle *et al.* 1993). Geothermally-modified groundwaters have high levels of phosphorus (up to 400 µg SRP L⁻¹) and other solutes (Ca, Mg, SO₄) but are not elevated in temperature.



Electric fish exclusion fences set up in streams in Costa Rica. A solar powered fence charger is mounted on the tree in the foreground. Wires hook fence chargers to circular (40 cm diameter) electric fences on stream bottom in background. Each circular fence contains 3 tiles. Unelectrified controls and unfenced tiles are also illustrated in the picture.

Process-oriented studies have allowed us to link solute chemistry and transport data to ecosystem-level processes in representative geomorphic sub-features of the landscape. Phosphorus-rich springs (which discharge at the gradient break) have been found to stimulate algal growth (Pringle and Triska 1991), organic matter decomposition rates, microbial respiration, and insect biomass (e.g., Rosemond *et al.*, unpublished data; Ramírez, dissertation in progress). We are also investigating effects of top-down control of stream fishes and shrimps on algal and insect communities (Pringle and Hamazaki 1997, 1998) and the interaction between top-down and bottom-up effects. Ongoing and future research is examining how landscape patterns in stream phosphorus levels (resulting from variation in solute-rich inputs of geothermally-modified groundwater) affect patterns of insect growth and secondary production. One of the hypotheses that we are testing is that landscape-scale variation in insect secondary production is affected by interstream variation in the proportion of phosphorus-rich groundwater: phosphorus-poor streams above the

gradient break will have significantly lower secondary production than solute-rich streams below the gradient break. Further description of this project and dataset can be found on the project web site <http://cro.ots.ac.cr/cm/projects/streams/> and metadata site using the site <http://spathodea.ots.ac.cr/> and searching for Pringle or STREAMS, respectively.

Community-based environmental outreach:

Our research project has stimulated the development of an environmental outreach program, *Water for Life*, that focuses on water quality and quantity issues in lowland Costa Rica (Pringle 1999). This outreach component was stimulated by graduate students from the University of Georgia's Conservation and Sustainable Development Program, in collaboration with the Universidad Nacional de Costa Rica, OTS, and local educators and leaders in the town near La Selva.

Water for Life was developed specifically in response to water resource problems faced by the community of Puerto Viejo de Sarapiquí (population 10,000) which is located ~ 5 km from La Selva. The town has experienced explosive population growth over the last decade as a result of the development of extensive banana plantations. This growth has placed extreme demands on the municipality, and water quality and supply issues promise to become even more significant in the coming years. Local surface and groundwaters have become contaminated by fecal coliforms (introduced by livestock and domestic sewage). Pesticides and herbicides from the banana plantations are also a problem (e.g., Pringle and Scatena 1999; Pringle *et al.* 2000). The town of Puerto Viejo and nearby barrios are becoming increasingly dependent on potable water diverted from geothermally-modified springs that originate at the southern boundary of La Selva. The diversion of these phosphorus-rich waters for potable water supplies may have effects on the structure and function of streams draining La Selva. Moreover, landuse and other hydrological alterations in the landscape have the potential to alter interbasin transfers of geothermally-modified groundwater to La Selva by affecting groundwater recharge.

We have developed several environmental outreach products (www.arches.uga.edu/~cpringle/wflproducts.html) that have been disseminated within the local community. These products can be obtained by contacting the authors and include: (1) a volunteer stream monitoring program (i.e., Adopt-a-Stream) that was

implemented in a local high school, accompanied by the development of a manual in Spanish and English which provides details on how to initiate volunteer stream monitoring programs, sampling methodology, and data interpretation (Laidlaw 1996); (2) three posters designed to promote awareness of watershed protection, the importance of riparian buffer zones, and riverine connectivity between stream headwaters and marine ecosystems, respectively (Vargas 1995; Pohlman 1998); and (3) development of teaching materials (study guide) for local high school teachers on stream protection and water quality (Pohlman 1998). Additional projects underway include: the development of an environmental outreach web site on water quality and quantity issues in Costa Rica; an investigation of the location and cumulative effects of 19 hydroprojects (planned and existing) in the Sarapiquí region; and, expansion of *Water for Life* to communities adjacent to other OTS field stations.



High school students that participated in the "Adopt-a-Stream" program in Puerto Viejo de Sarapiquí. Also in the picture is K. Laidlaw, former masters student at UGA who started the program.

The involvement of Costa Rican nationals (two were involved as graduate students) has been key to the success of the program to date. An ongoing challenge to the continuity of the program has been the relatively high turnover of local educators in Puerto Viejo, OTS community outreach staff at La Selva, and graduate students. OTS has provided much needed infrastructural support for the program and now offers fellowship opportunities in environmental outreach for graduate students from OTS member institutions in both Costa Rica and the U.S. (www.ots.duke.edu).

continued on next page

*Catherine Pringle, Institute of Ecology,
University of Georgia, Athens, GA 30606*

*Frank J. Triska, Water Resources Division,
US Geological Survey, Menlo Park, CA 94025*

*David Genereux, Geology Department,
Florida International University, Miami FL 33199*

*Alonso Ramírez, Institute of Ecology,
University of Georgia, Athens, GA 30606*

*Elizabeth Anderson, Institute of Ecology,
University of Georgia, Athens, GA 30606*

*Douglas Parsons, Institute of Ecology,
University of Georgia, Athens, GA 30606*

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Field assistant, Minor Hidalgo, at one of the study sites holding a black turtle.

Announcements

The G. Evelyn Hutchinson Chair

The first endowed chair at the Institute of Ecosystem Studies in Millbrook, New York has been named in honor of the eminent Yale University ecologist–limnologist G. Evelyn Hutchinson. This chair is made possible by major grants for permanent endowment from foundations, plus generous gifts from Hutchinson’s colleagues, friends and admirers.

In April 2000, the Institute’s board of trustees designated Dr. Gene E. Likens as the first to occupy the Hutchinson Chair. Likens, like Hutchinson, never lost his fascination with limnology while pursuing a career that drew in other disciplines. He founded the Institute of Ecosystem Studies in 1983, and it matured swiftly into an internationally recognized centre making significant contributions to ecosystem ecology. Likens currently is an Executive Vice President of SIL.



One of the phosphorus-rich geothermally modified streams in Costa Rica (see story on page one).

DIALOG Program for recent Ph.D. Recipients

The Dissertations Initiative for the Advancement of Limnology and Oceanography (DIALOG) is an international program to promote interdisciplinary understanding across the aquatic sciences. The DIALOG Program is co-sponsored by the American Society of Limnology and Oceanography and has three components:

- Data base. Demographic information is collected to characterize recent graduates for human-resource purposes. Information is collected as part of the Dissertation Registry.
- Ph.D. Dissertation Registry. Dissertation abstracts are collected and made available to the community in a searchable format through the program’s website at www.aslo.org/dialog.html or visit www.aslo.org/ and click on “DIALOG”. The program goal is to have *every* aquatic science Ph.D. dissertation throughout the world registered with the program.
- Symposium for Recent Ph.D. Recipients. An international symposium for 40 recent graduates is held biennially to catalyze cross-disciplinary understanding and collaborations. The DIALOG IV symposium will be held October 14 - 19, 2001 at the Bermuda Biological Station for Research. Individuals completing their last Ph.D. requirement between April 1, 1999 – December 31, 2000 and whose work in biological, chemical, geological or physical science is relevant to biologically oriented limnology and oceanography are eligible for consideration. A committee will select participants based on the application materials submitted and will favor applicants who plan to pursue interdisciplinary aquatic science research. Sponsoring agencies provide support for travel and on-site expenses. Details and application instructions are available at <http://aslo.org/dialog4.html>.

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

Announcements continued

The King Hassan II World Water Memorial Prize

The World Water Council (WWC), the leading non-governmental organization established as an international water policy think-tank, held its first triennial meeting, the First World Water Forum, in Marrakech, Morocco in 1997 under the High Patronage of King Hassan II. The Second World Water Forum was held in The Hague, The Netherlands in March 2000.

The King Hassan II World Water Memorial Prize was established at the Second World Water Forum. WWC president, Dr. Mahmoud Abu Zeid, said "our hope is to establish the equivalent of a Nobel Prize for water in memory of the distinguished reputation His Majesty King Hassan II holds among Heads of State for his efforts in encouraging cooperation among nations and for advocating sound management practices to ensure water sustainability. The prize will give the World Water Council a prestigious instrument through which to stimulate thinking and raise awareness of world water issues".

A Permanent Joint Committee composed of three members nominated by the Council and three members from Morocco will oversee implementation of the prize. An Independent Jury will also be established to select the laureate who will receive a prize of \$100,000 awarded on the occasion of future World Water Forums. Calls for nominations of candidates will be issued in 2001.

Excerpt from: WWC World Water Express, Stockholm 2000 Special Bulletin, August 2000.

For further information, please contact:

The Secretariat

World Water Council
Conseil mondial de l'Eau
Les Docks de la Joliette
13002 Marseille, FRANCE
wwc@worldwatercouncil.org
Phone: +33 (4) 91 99 41 00
Fax: +33 (4) 91 99 41 01
www.worldwatercouncil.org

Brazil Sets Monetary Value of Environment

A new government survey of Brazil's natural resources has found that Brazil accounts for 10 % of the entire environmental heritage of the world.

According to the Brazilian Institute for Environment and Renewable Resources (IBAMA), the national authority responsible for the environment, the monetary value of those resources is US \$2.072 billion. The figure was released following an assessment carried out by the Project on Environmental Accountability, a function of IBAMA. The estimate covered ecosystems that contain the greatest concentration of biodiversity in the country: the Amazonia, Cerrado, Caatinga, and Coastal areas, Mata Atlantica, Mata de Araucarias, Area das Pampas, the giant wetlands of the Pantanal Mato-Grossense, plus other island ecosystems.

Natural resources are increasingly being assigned a monetary value by economists as a way to integrate environmental accounting into traditional accounting systems. With this study, the Brazilian government intends to improve its position in international environmental forums. It is important to allow green accountability to integrate ecology with economic development in a way that balances principles and profits, the survey said.

IBAMA undertook this survey as part of the Compendium initiative to compile a comprehensive and up to date information base of sustainable development indicator initiatives. The Compendium database is being coordinated by the International Institute for Sustainable Development (IISD), the World Bank and the Indicators and Assessment Office of Environment Canada. The Compendium is an online data base of over 200 sustainable development indicator projects worldwide. The online compendium at: <http://iisd.ca/measure/compinfo.htm> aims to be the primary source of information on integrated socioeconomic and environmental performance measurement.

David W. Moody

Inter-American Water Resources Network (IWRN)
P.O. Box 717
Alstead, NH 03602 USA
dwmoody@beaverwood.com
Phone: (603) 835-7900
Fax: (603) 835-6279
<http://www.iwrn.net>

Our Water-Our Management

Much effort has gone into the improvement of water and sanitation facilities in rural Africa. This concerted effort has put into place thousands of shallow wells fitted with hand pumps, boreholes, gravity schemes and improved sanitation. However, the investment has not yielded the expected benefits due to rapid population growth and a high rate of breakdown of the improved facilities. Community (user) management is seen and advocated as a suitable alternative to address the problem of quick deterioration and misuse of the improved facilities.

Yet the alternative of community management has not been sufficiently documented and understood. Community management usually occurs after the handing over when others have long left the project area. The Network for Water and Sanitation International (NETWAS) in collaboration with the International Water and Sanitation Centre (IRC) identified that there was a need to look into this after the implementation phase of the project cycle. This identified need was formulated as Participatory Action Research (PAR) to be carried out in partnership with local communities.

The Participatory Action Research was funded by the Netherlands Agency for International Development (NEDA) (formerly Directorate General for International Cooperation, Netherlands Ministry of Foreign Affairs [DGIS]) with the objective of contributing to sustainable management of improved water programmes in developing countries. This project "The Role of Community in the Management of Improved Water Programmes in Developing Countries" was to identify and document factors that enhance and/or hinder the management of improved facilities by the communities (Users).

Out of this study several products are being developed namely:

- Establishment of an Information Focal Point (IFP) on community management. This is being established at NETWAS.
- Development of an electronic information discussion group.
- Production of a video on community management: Our Water-Our Management. This video is intended primarily as a training tool aimed at raising issues for discussion and dissemination, and provides some highlights of the inherent problems facing communities in the management of improved water systems. It is also aimed at starting a

discussion on community management of rural water supply systems. This video can be obtained from NETWAS at a fee of US \$30.

- Training on Community Management.

For more information, please contact:

Pauline Ikumi

Network for Water and Sanitation International
Magadi Road

Off Langata Road

P.O. Box 15614

Nairobi, Kenya

netwas@nbnet.co.ke

Phone: 254-2-890555/6-8

Fax: 254-2-890554/60

www.nbnet.co.ke/netwas

Lake Baikal in the Past

The new book edited by O.M. Kazhova and L.R. Izmet'seva on Lake Baikal - Evolution and Diversity (reviewed in SILnews 31) recalled the production of an obscure collection of early historical notes on pioneering limnological studies on Lake Baikal. I call to the attention of interested limnologists the compilation of the history of the development of a permanent research institution on Lake Baikal in the early 20th century by Vitaliy Dorogostaisky. This account was composed by his daughter, with pictures, and assembled by Herman S. Forest of the University of New York College at Geneseo, entitled: **How It Was: Prehistory of the Limnological Institute of the Academy of Sciences U.S.S.R. at Lake Baikal.** (65 pp.) by Eugenia Vitalyevna Dorogostaiskaya with supplementary writings edited by Herman S. Forest. The difficulties of establishing an institute during these times of political turmoil, war, and marginal funding support are poignantly evident.

I have a couple of copies and am quite willing to loan them to interested colleagues. A copy will be placed in the permanent Archives of SIL in Plön, Germany.

Please contact me at rwetzel@biology.as.ua.edu if you would like to borrow a copy.

Robert G. Wetzel

SIL General Secretary-Treasurer

Announcements continued

The World of Copepods The C.B. Wilson Copepod Library and Web Page

The C.B. Wilson Copepod Library (WCL) and Database are housed in the Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A. The WCL presently holds over 11,000 books and reprints on copepod and branchiuran crustaceans, including many original and now rare taxonomic works, as well as articles on all aspects of the biology of copepods. Most of the works are catalogued by author and species in a card file.

The WCL Web Page: <http://www.nmnh.si.edu/iz/copepod> has been on-line since June 1999. It contains five databases:

1. A bibliography of all known literature on Copepoda and Branchiura includes over 39,000 titles. It can be searched by names of author(s) and by key-words in the titles.
2. A taxonomic list of genera and species. There are approximately 209 families, 2,280 genera, and more than 14,000 described species of copepods. There is 1 family and 4 genera of branchiurans. The list includes all combinations of genus and species names.
3. A world list of researchers, including postal and e-mail addresses.
4. A database of type specimens of Copepoda and Branchiura held at the National Museum of Natural History.
5. A list of genera, with synonymies, of Copepoda and Branchiura. This list indicates which genera are currently considered valid, and which have been synonymized with other genera.

There is also a section on techniques used in processing copepod specimens for taxonomic study.

The WCL was founded in 1941 through a gift from Dr. Charles Branch Wilson, Professor of Biology at the Massachusetts State Teachers College, and for many years Collaborator at the U.S. National Museum (now the

National Museum of Natural History). Most of the Museum's collection of copepods was entrusted to him for study, and the results of much of his research were published in the Proceedings and Bulletin of the Museum. Wilson bequeathed to the Museum his extensive library of copepod and branchiuran literature, together with his card files. Since 1941 the WCL has steadily grown, augmented partly by other collections such as those of C. Dwight Marsh, Mildred S. Wilson, Robert W. Pennak, and Arthur Humes, and by donations of reprints from many sources.

The WCL Database was initially derived from the text-file prepared by Dr. Willem Vervoort (Vervoort, 1986-1988). The database has been extended by references from the Monoculus Copepod-Library in Germany, and is being continually updated from other sources.

We obtain publications mainly through donations from authors. We also welcome copies of theses, dissertations, and gray-literature reports of limited distribution. Although most of the operations of the WCL are on a volunteer basis, limited numbers of photocopies of difficult-to-obtain references can be supplied for the cost of the photocopies, or free of charge if duplicates are already available. Visitors to the Museum are welcome to avail themselves of the facilities.

For further information, please contact:

T. Chad Walter at (202) 786-2126 or by e-mail at: walter.chad@nmnh.si.edu

Frank Ferrari at (301) 238-3797 or by e-mail at: ferrarif@simsc.si.edu

Janet W. Reid at (202) 357-4674 or by e-mail at: reid.janet@nmnh.si.edu

Reference:

Vervoort, W., 1986-1988. Bibliography of Copepoda. Parts I-III. Crustaceana Supplements 10-12.

Janet W. Reid

Research Associate/Volunteer
Department of Invertebrate Zoology
National Museum of Natural History
Smithsonian Institution
Washington, DC 20560-0163

The World Water Vision

Water is one of the most precious substances on Earth, however, it is often not treated that way. We know that the future will not look like the past with changes in growing populations, urbanization, income growth, and the associated demand for more food and water. It will put more pressure on our limited water supplies. The need for action is critical and a project titled, “A Long Term Vision for Water, Life and the Environment” or World Water Vision has been developed. The project is sponsored by the World Water Council, the World Bank and all the principal UN agencies involved with water including FAO, UNDP, UNEP, UNESCO, UNU, WMO, WHO, UNICEF. It is guided by the World Commission on Water for the 21st Century, composed of many outstanding thinkers and opinion leaders and is chaired by Ismail Serageldin, Vice President of the World Bank. It was set up to influence decision-makers to put water on the agenda as a key political issue at global as well as regional levels through a significant increase in public awareness of water issues. The World Water Vision seeks to involve all stakeholders through extensive consultations. Therefore, participation is the force driving the Vision exercise. The consultations are intended to give the largest possible number of individuals at the “grass-roots” level a chance to decide on the kind of future that they want for themselves and for future generations.

The overall project objectives are to develop a widely shared vision on the actions required to achieve a common set of water-related goals and to commit stakeholders to carry out these actions by 1) increasing awareness of water issues among the general population and decision-makers so as to foster the political will necessary to tackle water issues seriously; 2) develop a water management vision for 2025 that is shared by water professionals, policy makers and civil society; and 3) provide suggestions for investment priorities, with concrete steps to turn a vision into action.

Please visit <http://watervision.org> for more information about the Vision exercise.

Letters to the Editor

W. Thomas Edmondson

As I have been mentioned twice in Hairston’s necrology of the late Dr. Edmondson I wish to add two points about this exceptional personality: Tommy’s door was not only always open to his colleagues and students so well described by Hairston but he was very generous with his original data that he freely made available for further elaboration by others, including myself (cf. e.g. my Fig. 9 in Vollenweider: The scientific knowledge of lake pollution, EWPC Proceedings, Rome, 1985). Regarding his musical interests he was a profound connoisseur of organ music and organs throughout Europe. He did not miss whatever occasion presented itself to visit little known churches, listen to their organs, and, besides collecting all kinds of organ music records he also promoted new recordings. We both shared enthusiasm for limnology but also the love for the beauty of baroque music. Tommy and Yvette, more than anyone else I met, felt both that art is a necessary complement to science to enhance appreciation of both.

Sincerely yours,

Dr. Richard A. Vollenweider
Burlington, Ontario
Canada

Announcements continued

Water for People: A Shared Vision for Hygiene, Sanitation and Water Supply

VISION 21 is an initiative to end a global crisis. Despite enormous achievement over the past two decades, an estimated one billion of the earth's citizens still lack safe drinking water while almost three billion have no adequate sanitation. More than two million children die each year from sanitation-related diseases. These factors compound the suffering of more than a quarter of the developing world's people who now demand a healthy environment for living. VISION 21 was developed by the partners in the Water Supply & Sanitation Collaborative Council, and is directed to achieving a world by 2025 in which each person knows the importance of hygiene, and enjoys safe and adequate water and sanitation.

VISION 21's Framework for Action places community and country action at the centre – to prepare their own Vision and develop an action programme to achieve it. The Framework aims to assist people at community, country, regional and global levels to identify areas for action. This includes enlisting the commitment of national governments and their partners to take up the challenge; to mobilise the global community to support the development of national Visions and their subsequent achievement; and, to provide supporting tools.

The Collaborative Council will prepare an international advocacy plan for action through its members in more than 130 countries. Together they will help generate the necessary human, technological and financial resources and appeal to an inescapable international responsibility through collaboration and solidarity.

The four components which determine the VISION 21 approach are:

- **Holistic approach**, acknowledging hygiene, water and sanitation as a human right, and relating it to human development, the elimination of poverty, environmental sustainability and the integrated management of water resources.
 - **Committed and compassionate leadership and good governance**, changing long-accustomed roles, leading to new responsibilities of authorities and institutions to support households and communities in the management of their hygiene, water and sanitation, and in being accountable to users as clients.
 - **Synergy among all partners**, encouraging shared commitment among users, politicians and professionals; requiring professionals within the water and sanitation sector to combine technical expertise with an ability to work with users and politicians and with the sectors of health, education, environment, community development and food.
- For more information, please contact:
- Secretariat for the
Water Supply and Sanitation Collaborative Council
c/o World Health Organization
CH-1211 Geneva 27
Switzerland
wsscc@who.ch
Phone: +41 22 791 3544
Fax: +41 22 791 4847*
- **Building on people's energy and creativity at all levels**, requiring empowerment and building the capacity of people in households and communities to take action, and applying technologies that respond to actual needs.

Report
on
the International Symposium
on
High Mountain Lakes and Streams

High mountains and their ecosystems, especially lakes and streams, are increasingly being recognized as indicators of a changing world. Long appreciated for their natural beauty and as physical challenges, mountains of the world cover about one fifth of the land surface, are home to one tenth of the world's human population; and provide freshwater; and, recreation for a far larger number. They offer to scientists environments with extreme conditions and ecosystems sensitive to anthropogenic impacts.

The International Symposium on High Mountain Lakes and Streams had as its motto: "To study them, to enjoy them and to keep them for future generations". The symposium was held in Innsbruck, Austria, during the first week of September 2000. Roland Psenner and Ruben Sommaruga chaired the organizing committee. Approximately 200 participants from 25 countries in North and South America, Europe and Asia attended. Six plenary lectures complemented 75 oral talks and 74 posters. In addition to numerous presentations on alpine ecosystems, Arctic and Antarctic lakes and streams were amply represented. Research on microbes, phytoplankton, zooplankton, biota of lotic systems, hydrochemistry, exotic pollutants and paleoecology constituted the majority of the presentations. A portion of the papers presented are being peer-reviewed for publication in special issues of Arctic, Antarctic and Alpine Research or Water, Air and Soil Pollution.

The influence of the encouragement by the European Union of comparative, multinational research organized around research themes was quite evident. This contrasted with the more independent studies being conducted in North America; one outgrowth of the symposium is likely to be more formal interactions among North Americans. Another transatlantic difference seemed to be the greater emphasis on catchment studies with detailed hydrological components in North America than Europe, at least in the high elevation systems. In general, experimental manipulations were seldom reported, no doubt because of the remoteness of most of the sites.

Superb opportunities for informal conversations in outstanding venues were offered throughout the symposium. The opening reception at Ambras Castle, with a unique "water music" concert and buffet in the hall of knights set a fine historical tone for the week of scientific discourse. Four expertly organized and executed mid-congress excursions offered cultural, technical and scientific value all in spectacular settings.

The final morning of the symposium was devoted to a series of short talks and panel discussions concerning the value of high mountain lakes and streams from the perspectives of scientists, economists, business leaders, and NGOs. The exchanges were polite and informative, but did not confront the challenge of resolving the problems caused by human impacts for which there is really no mitigation. For example, the conversion of the famous

International Biological Programme (IBP) site at Finstertalersee (Austria) to a pump storage reservoir for a hydroelectric power station is difficult to reconcile. As local and distant human activities continue to impact high mountain lakes and streams, increasing interactions among all the stakeholders and experts is essential.

John Melack
(Member of the Scientific Committee for the Symposium)
Bren School of Environmental Science and Management
University of California
Santa Barbara, CA 93106 USA
melack@lifesci.ucsb.edu
Phone: (805) 893-3879
Fax: (805) 893-4724

The deadline for articles
for the next volume of SILnews
is
February 28, 2001
to
clara.fabbro@ec.gc.ca
or
fax (306) 975-5143



Professor Milan Straškraba, December 1998 at Ceske Budejovice
(Photo taken by S. Ryzanžin).

Professor Milan Straškraba 25 July 1931 - 26 July 2000

Sad news came from Ceske Budejovice: outstanding limnologist, gentleman, bright and wonderful person Professor Milan Straškraba left us suddenly, one day after his 69th birthday.

Milan graduated in zoology (hydrobiology) in 1955 from Charles University, Prague, where he was awarded his Ph.D. in hydrobiology in 1961. He was a full professor at the University of South Bohemia (Ceske Budejovice) where he also was vice-rector (since 1995), and for almost 20 years the head of the Biomathematical Laboratory of the Czech Academy of Sciences.

Milan knew six European languages and was a widely educated scientist with an encyclopedic knowledge and viewpoint. Having graduated as a hydrobiologist he was closely familiar with entomology, ecology, chemistry, meteorology, climatology, hydrophysics, statistical methods, and cybernetics, etc. He was the author of more than 200 scientific articles, monographs, proceedings and chapters, many of which have become classic in their field. In his early years, he studied the taxonomy of *Crustacea*, plankton ecology, and productivity processes in litoral regions of ponds and reservoirs. He published his first scientific article on the

distribution of *Gammarus* (*Crustacea, Amphipoda*) in Czechoslovakia in 1953 while a student. Later he focused his interests on a study of long-term variability and eutrophication of lakes and reservoirs; relationships between physical and biological variables within the framework of IBP (International Biological Program); and, introduction of statistical and mathematical methods in limnology. As a result, in 1980 Milan published his famous work, *The Effects of Physical Variables on Freshwater Production: Analyses Based on Models* where he established some fundamental latitudinal relationships between physical and biological characteristics of world lakes, using statistical approaches and that now have become classical. In 1980, Milan pioneered the application of methods and approaches of cybernetics to lake and reservoir modelling and management in a set of articles. It was summarized jointly with Professor A. Gnauck in the book, 'Aquatic Ecosystems: Modelling and Simulation'. It appeared in three languages (German-1983, English-1985 and Russian-1987). In 1990, Milan's scientific activity was directed to ecological modelling of lakes and reservoirs; studying mechanisms of phytoplankton photoinhibition; supporting the development of GIS WORLDAKE for "limnologically studied" world lakes (Ryzanžin and Straškraba 1999); lake and reservoir management; and, many others. One of his latest (1999) monographs published by the International Lake Environment Committee (ILEC) jointly with Professor J. Tundisi was *Reservoir Water Quality Management*.

Being a brilliant and productive investigator, Milan also was an excellent lecturer and teacher. His lectures on general limnology, mathematical modelling of aquatic systems; reservoir limnology and ecotechnology, environmental management; and, others, attracted many students and scientists at both the Charles and Southern Bohemia universities and in many universities and research centers around the world.

He devoted his life to administrative and management work. Milan was the vice-president of the Czechoslovak (Czech) Academy of Sciences (1991-93); president of the Czech Limnological Society (1994-97); member of the Committee for Science and University Education of the Czech Parliament (1993-96); Chairman of the National Committee for doctoral (Dr.Sc.) dissertations on hydrobiology, entomology and parasitology (since 1998); the Corresponding Member of the Sachisian Academy of Sciences at Leipzig (class of mathematical and natural sciences); member of the Board

of ILEC (since 1994); the coeditor of the *Internationale Revue der gesamten Hydrobiologie*, now *Intern. Review of Hydrobiology* (since 1988; since 1971 a member of the editorial board); editorial board member of *Aquatic Botany* (1975-1980); *Marine Environmental Research* (1977-1981); *Ecological Modelling* (since 1980); and, *Ecological Engineering* (since the start of the journal in 1992).

Milan indicated “sports, particularly skiing, backpacking, swimming and biking” as hobbies in his CV. However, he had no time for these. Despite his health problems and an operation several years ago, Milan worked extremely hard and intensively. Every day he came to his laboratory early in the morning and left in the late evening. Since he was very open to new ideas and discussions, was very friendly to colleagues, and simply a very lovely and jolly person, Milan attracted people. His laboratory was full with visiting scientists from all over the world. Those of us who had the privilege to meet him and work with him will remember an excellent and outstanding limnologist and a great man - Milan Straškraba.

A lot of Milan’s friends and colleagues from around the world sent their deep condolences to Milan’s widow
Dr. Vera Straškrabová and family.

Sergei Ryanzhin
Institute of Limnology
Russian Academy of Sciences
St. Petersburg

Selected Publications of Professor Milan Straškraba:

Han, B.-P. and Straškraba, M. 1998. Size dependence of biomass spectra and population density. I. The effects of size scales and size intervals. *J. Theor. Biol.* **191**:259-265.

Han, B.-P., Virtanen, M., Koponen, J. and Straškraba, M. 2000. Effect of photo-inhibition on algal photosynthesis: A dynamic model. *J. Plankton Res.* **22**:865-885.

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Straškraba, M. 1998. Coupling of hydrobiology and hydrodynamics: Lakes and reservoirs. *Coastal and Estuarine Studies* **288**: 601-622.

Straškraba, M. and Gnauck, A. 1985. *Aquatic ecosystems. Modelling and simulation*. Elsevier, Amsterdam, 309 p.

Straškraba, M. and Tundisi, J.G. 1999. *Reservoir Water Quality Management, Guidelines of Lake Management Ser., Vol. 9*, ILEC Publ., Kusatsu City, Japan, 230 p.

Reports on Working Groups

Seventh International Conference on Salt Lakes

The Seventh International Conference on Salt Lakes was held in Death Valley National Park, California, USA, in September 1999. It was sponsored by the International Society for Salt Lake Research, Societas Internationalis Limnologiae, and the University of California-Santa Barbara. Since 1979 a series of international symposia on inland saline waters have served to strengthen and expand the scope of limnological research on salt lakes. The seventh conference continued this tradition with a set of plenary talks and oral and poster sessions. The sessions focused on promising research directions including the ecology of microbial communities; the influence of habitat geochemistry on biogeography of flora and fauna; physical and geochemical processes; and, the conservation of inland saline waters. Sixty participants from eleven countries participated. The venue of the conference in Death Valley encouraged informal interactions in a striking landscape rich in saline environments. A post conference tour visited a wide variety of saline ecosystems located on the western edge of the North American Great Basin, a region noted for its remarkable ecological diversity and striking beauty. Major stops included Owens, Mono, Walker, and Pyramid lakes.

Manuscripts derived from the conference are being peer reviewed and will be published as a special issue of *Hydrobiologia* and distributed as a book in the series, *Developments in Hydrobiology*.

Inland saline waters are threatened worldwide by diversion and pollution of their inflows, introductions of exotic species and economic development of these saline habitats. Several sessions at the conference concerned anthropogenic impacts and conservation with special attention paid to Walker Lake, Nevada (USA), the Salton Sea, Mono and Owens lakes and Death Valley, California (USA), Siberian salt lakes and salinization in Australia. Continued local, national and international efforts are required to inform the public and decision makers about the ecological problems faced by saline waters.

The Conservation Committee of SIL intends to build on the information presented at the salt lake conference to develop materials appropriate for fostering the conservation of saline waters. By linking with on-going activities and encouraging initiation of similar efforts at new sites, the Conservation Committee hopes to energize its effectiveness in the conservation of inland waters.

For further information about the conference on salt lakes, the International Society for Salt Lake Research, or the activities of the Conservation Committee of SIL, please contact:

John Melack

Bren School of Environmental Science and Management
University of California
Santa Barbara, CA 93106 USA
melack@lifesci.ucsb.edu
Phone: (805) 893-3879, Fax: (805) 893-4724

Limnology job and studentship notices

Notices on the availability of limnologically-oriented jobs and graduate student opportunities are now accepted for publication in *SILnews* and displayed on the SIL web site at www.limnology.org. There is no charge for the service at this time, which is available to SIL members and non-members.

Persons submitting notices should note the 4 month lead-time for the print edition of *SILnews*; those advertisements with short deadlines should be directed to the web site only.

Submissions should include: 1) a short title describing the position (job or studentship), 2) location and duration of the position, 3) closing date for applications, 4) a short paragraph describing the position, including any citizenship, educational or employment prerequisites; and, 5) information on where potential applicants may obtain further information, including names of contact persons, telephone numbers, fax numbers, e-mail addresses, and web site addresses, where appropriate.

Submissions may be edited for length and clarity. Those deemed inappropriate to the SIL mandate will be rejected at the discretion of the *SILnews* Editor or the Webmaster. Submissions for the print edition of *SILnews* should be sent to the editor at the address on the cover of this issue.

Submissions for the SIL web site should be sent by e-mail to webmaster@limnology.org or by fax to +1 (204) 474-7650, attention: *Gordon Goldsborough*.

Book Reviews

Guides to the Identification of the Microinvertebrates of the Continental Waters of the World Volume 14: Copepoda: Cyclopoida Genera *Paracyclops*, *Ochridacyclops* and Key to the Eucyclopinæ

Süphan Karaytug
224 pp., 1999
Backhuys Publishers, Leiden, The Netherlands
ISBN 90-5782-030-7
Softbound. Price \$70.00 US/Dutch Guilders 140.00

The science of description and discrimination of species of freshwater copepod crustaceans has passed through three general phases. In the early, exploratory phase, specialists such as Schmeil (1892) and Gurney (1931-1933) described nearly the entire body of the animal, including fine details of the mouthparts. In a subsequent reductive phase, taxonomists adopted a standard format for differential descriptions, involving morphological and morphometric comparisons of only those structures thought to be most taxonomically significant (e.g., Kiefer, 1960; Dussart, 1984). It is only during the past 20 years or so that taxonomists have begun to recognize that more than one taxon may have become subsumed under such general descriptions, and have begun to apply a combination of tools including examination of minute morphological detail, analysis of variation, genetic characters including allozymes and DNA/RNA, crossbreeding, and a healthy skepticism of previous work in their re-analyses. This evolution has led to considerable confusion and frustration, as it has become more and more difficult to assign specimens to a particular taxon with any confidence.

Fortunately there are still talented individuals who have taken up the challenge of revising one group after another, even in view of the notoriously problematic prospects for employment and funding for taxonomic work. Süphan Karaytug succeeded in revising most of the ubiquitous genus *Paracyclops* plus the small allied genus *Ochridacyclops*, and we now enjoy an abridged version of his several years' labours in Volume 14 of the "Guides" series. Introductory sections firmly ground interested readers in the history of the systematics of the family Cyclopidae, briefly explain methods, and explain the specialized terminology. A succinct key to the subfamily Eucyclopinæ is followed by efficient reviews

of the composition, distribution, zoogeography, and biology of members of *Paracyclops* and *Ochridacyclops*. There are keys to adult females and males of *Paracyclops*, and to females of *Ochridacyclops* (the author had no material of males of the latter genus available). These keys permit the user to arrive at a species name relatively easily, with only a few glitches (for instance, couplet 12 in the key to females refers to "three setae" when apparently "three inner setae" is meant). However, the great value of the book is in the copious and fully detailed illustrations of most species (those for which Karaytug was able to examine actual specimens). The written descriptions indicate the best discriminative characters and their variability, and the extensive evaluations of the history of each taxon alert the user to potential problems and help avoid at least some of the pitfalls.

It is educational to compare Karaytug's own illustrations with the reproductions of earlier figures, which provide a good indication of how much remains to be done, even in this not particularly species-rich group. At least this book will help non-taxonomists to determine in most cases whether they are working with a named species, and what that species is, which is all we can ask of a guide. The price is rather high, but is a consequence of the copious illustrations and text, well printed on resistant paper.

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Janet W. Reid
Smithsonian Institution
Washington, D.C.

Pêche du sambaza au filet maillant dans
le lac Kivu
Rapport final du projet
ONG/219/92/Zaire

B. Kaningini, J. Cl. Micha, J. Vandenhoute, J.-P. Platteau,
H. Watongoka, C. Mélard, M. K. Wilondja, and
M. Isumbisho
188 pp., 1999
Presses universitaires de Namur
Rampart de la Vierge, 8, B-5000 Namur, Belgium
ISBN 2-87037-287-6
Price - Belgian Francs 1000/Euros 24.79

Lake Kivu has a depauperate fish fauna of about 24 indigenous species, 15 of them being endemic *Haplochromis* species. Fish were of little importance to the local people until the introduction of the clupeid *Limnothrissa miodon* ("Sambaza") from Lake Tanganyika. These sardines are captured at night in lift-nets, using light attraction but this book describes an alternative approach, using small-meshed (10-11 mm) gill nets. It is of some interest to people involved in African fisheries although the situation and methods described in it are unique to Lake Kivu. The report gives limnological data – some old and some contemporary – that would be of interest to anyone unfamiliar with the lake. Although treated rather superficially, these data still demonstrate how little is known of Kivu's limnology compared to that of other Great Lakes. This is followed by an account of the Sambaza introduction, the development of the fishery, and the rationale and history of this project.

The biology of *Limnothrissa*, is discussed in some detail but the indigenous haplochromines (about 80% of the catch) are dealt with cursorily. They are small fishes (< 12.5 cm) largely restricted to littoral waters – a restricted habitat in Lake Kivu where most shores are steep – and probably not very abundant. I couldn't help wondering what the awesome destructive power of small-meshed monofilament gillnets would do to these fishes. Elsewhere in Africa, *Limnothrissa* can withstand high levels of exploitation, but the decline in the catch per unit effort from 1.8 to 0.43 kg/100 m² between 1992 and 1998 described here suggests that local depletion had occurred, which could affect its recruitment since it breeds inshore. The impact of these nets on the other species was unclear but I would expect it to be even more severe.

The book concludes with a discussion of the socio-economic aspects of the project and one has to ask if it is sustainable without continuing donor assistance. This and other issues could have been discussed in greater depth but the authors worked in an atmosphere of general insecurity following the Rwandan massacres. The fact that they produced a report at all is most commendable.

Brian Marshall
University of Zimbabwe
Harare

Peixes do Pantanal
Manual de Identificacao

H.A. Britski, Z.K. de S. de Silimon & B.S. Lopes
184 pp., 1999
Publisher: Embrapa-Serviço de Produção de Informação,
SAIN Parque Rural, Final Av. W3N, Caixa Postal 040315,
70770-901 Brasilia, DF, Brazil
In Portuguese
ISBN 85-7383-053-0
Price - R\$70.00 (approximately \$36.85 US)

A recent paper on South American freshwater fishes expressed the need for identification manuals - very difficult to prepare as the fish fauna is so rich and complex and so much basic taxonomic work is needed. Identification keys are now available for the fishes of the Pantanal Mato-Grosso waters in West central Brazil in this beautifully produced book with its lavish colour plates of the fishes. An area of great beauty, as shown by the colour photographs, this vast (~ 150,000 km²) Pantanal waterland is much visited for the spectacular flocks of birds which come here as the seasonal floods subside. Initial chapters describe the characteristics of the area and the history of taxonomic studies of its fishes, of which some 263 species are now known, predominantly Characiformes and Siluriformes, with cichlids, gymnotiform electric fishes, cyprinodontoids and representatives of other groups including the lungfish *Lepidosiren* and stingrays. Many specialists have collaborated in the preparation of this book, which has a useful bibliography and drawings to assist with identifications. It is designed for laboratory rather than field use, with a heavy binding and large format (33 X 26 cm).

Rosemary H. Lowe-McConnell
United Kingdom

Die Haplopoda und Cladocera (ohne Bosminidae) Mitteleuropas

Dietrich Flössner
XII + 428 pp., 2000
Backhuys Publishers, Leiden
ISBN 90-5782-057-9
Hardbound (Text in German)
Dutch Guilders 264.00/\$132.00 US

If you can read German and you are interested in the Cladocera, you will wish to have this book. It is an update of Flössner's 1972 Branchiopoda book in Tierwelt Deutschlands (but not including the so-called "big branchiopods" and, as stated in the title, the bosminids), which I have used as a vademecum for many years. Only in the 1980s, when the winds of change started shaking the old beliefs about cladocerans, did I turn to other, more recent sources.

The "new Flössner" provides a snapshot in time of the current taxonomic situation within a group of organisms (actually representing four distinct orders) which, today more than ever before, is in a state of flux. What appears fairly established today may be totally obsolete tomorrow. Clearly, Flössner has made a commendable effort to bring his treatment of the genus *Daphnia* up to date with modern (molecular) standards, and provides ample illustrations of most species, as well as a key to hybrids. However, things in this domain move so quickly that on page 380 a number of amendments to statements on species made elsewhere had to be inserted. It is to be expected that such changes will continue for a while.

The treatment of the non-daphniids has remained rather traditional, and Flössner seems reluctant to adopt Geoffrey Fryer's four-order system, widely accepted by most authors. It is particularly regrettable that Ilyocryptiinae are still treated as a subfamily (they clearly are a family!) of the Macrothricidae, with which they have little in common! The recent subdivision of the anomopod cladocerans in two main groups, the radopods and the non-radopods, has not yet made it to this text either (although the reference to it is cited in the "additional references"). Likewise, the resurrection of the chydorid genus *Paralona* (to contain *Chydorus piger*) is referenced, but not implemented in the text.

Flössner acknowledges D.G. Frey as the great innovator of cladoceran taxonomy. However, we are way past this stage now. The new names in town are Kotov, Sinev, Elias, Silva-Briano, Brancelj, and Hudec!

Although I will use this book, I wonder what geographic area it applies to: does Central Europe extend to France (the home of *Alona phreatica*) and to Italy (home to several endemic *Alona* species), or not? This is said nowhere in the text ...

H. Dumont
University of Ghent
Belgium



Rivers draining dormant volcanoes of Braulio Carrillo National Park located to the south of La Selva Biological Station in Costa Rica (see story on page one).

Water Pollution

Methods and criteria to rank, model and remediate chemical threats to aquatic ecosystems

by Lars Håkanson
277 pp., 1999, Backhuys Publishers, Leiden
ISBN 90-5782-024-2
Dutch Guilders 180.00/ US \$100.00 (hardbound)

This book addresses the empirical and dynamic modelling of water pollution and focuses on three examples: acidification, eutrophication and contamination by mercury and radiocesium. The data are drawn from Swedish lakes and coastal areas of the Baltic, where the author has a great deal of first-hand experience since the 1970s.

The book is organized into seven chapters including references and appendices that provide the details of the models with equations and suppositions. Chapter One outlines the Potential Ecological Risk (PER) approach for ranking chemical threats at the ecosystem level. The PER includes three basic indices: 1) the effect variable or the degree of ecosystem level effects, 2) the areal or geographic extent of the problem; and, 3) the duration of the problem. Interestingly, Håkanson concludes that acidification remains the largest chemical threat to Swedish ecosystems overall, followed by coastal and lake eutrophication, mercury contamination and finally radiocesium contamination.

Chapter 2 introduces the basic elements of Effect Load Sensitivity (ELS) models and is more technical in explaining the statistical considerations for predictive success. Coastal eutrophication is modelled here with “target effect variables” such as oxygen saturation of deep waters, “load variables” such as nutrients and “sensitivity variables” related to coastal morphometry. Chapter 3 addresses the difference between traditional mass-balance models (or dynamical models) and statistical empirical models and how they can be linked. The dynamic radiocesium and mercury models presented could serve as a template for most chemical substances in aquatic ecosystems. As Håkanson states, it is ironic that the Chernobyl accident has been perhaps the “most important factor behind the revolution in predictive ecosystem modelling ... the decrease in the uncertainty factor from 10 to 0.25-0.5”. How these models can be used to assess various remedial measures is illustrated in the last chapter.

For the most part the book is quite readable with informative figures and tables. However, it is not particularly well edited as there are more than the odd typographical and referencing mistakes. There is some overlap in content between this book and the text *Predictive Limnology* that Håkanson co-authored with the late Rob Peters in 1995. But in *Water Pollution*, Håkanson also tackles coastal marine systems with the same elegant and ultimately successful approach. *Water Pollution* is probably a better choice as a graduate textbook than the lengthier and more expensive *Predictive Limnology*. For teaching purposes, it would be most useful if the author developed a website where some of the models could be accessed directly.

In summary, this book provides clear directions for the development of practical ecosystem models. I highly recommend this book to limnologists, coastal oceanographers, environmental engineers and ecotoxicologists alike.

Frances Pick
University of Ottawa
Canada

Calendar of Events

[North Pacific Salmon and Steelhead Conservation Conference.](#)
11 - 13 May 2001
SunRiver, Oregon, USA
Contact: Xanthippe Augerot, Ph.D.
The Wild Salmon Center
813 SW Alder St., Suite 707
Portland, OR 97215 USA
xaugerot@wildsalmoncenter.org
Phone: (503) 222-1804
Fax: (503) 222-1805

[Management of Northern River Basins.](#)
6 - 8 June 2001
University of Oulu, Finland
Contact: Dr. K. Heikkinen
North Ostrobothnia Regional Environment Centre (NOREC)
P.O. Box 124, 90101 Oulu, Finland
Kaisa.Heikkinen@vyh.fi
Phone: +358 8 3158 374
Fax: +358 8 3158 305
[www.thule.oulu.fi/_nornet\\$/nornet2/noriba/index.htm](http://www.thule.oulu.fi/_nornet$/nornet2/noriba/index.htm)

Third International Conference on Ecosystems and Sustainable Development.

ECOSUD 2001

6 - 8 June 2001

Alicante, Spain

Contact: Conference Secretariat, Susan Hanley
Conference Secretariat ECOSUD 2001

Wessex Institute of Technology

Ashurst Lodge, Ashurst

Southampton, SO40 7AA, United Kingdom
shanley@wessex.ac.uk

Phone: +44 (0) 238 029 3223

Fax: +44 (0) 238 029 2853

[www.wessex.ac.uk/conferences/2001/ecosud01/
and/or](http://www.wessex.ac.uk/conferences/2001/ecosud01/and/or)

www.witpress.com/authors.htm#Conference

Seventh International Polychaete Symposium.

2 - 6 July 2001

Háskólabíó, Reykjavík, Iceland

Contact: Elin Sígvaldadóttir

Icelandic Institute of Natural History
Box 5320

125 Reykjavík, Iceland

elin@ni.is

Phone: ++35 4-5629822 *or*

++35 4-5626611-209

Fax: ++354-5620815

www.nattfs.is/7IPCI/

Second Symposium for European Freshwater Sciences (SEFS-2).

8 - 12 July 2001

Toulouse, France

Contact: Prof. Sovan Lek

CESAC

Université Paul Sabatier Toulouse-III

118 route de Narbonne

F-31062 TOULOUSE cedex 04, France

lek@cict.fr

Phone: +33 5 61 55 86 87

Fax: +33 5 61 55 60 96

<http://quercus.cemes.fr/~sefs>

Ninth International Symposium on Microbial Ecology (ISME-9): Interactions in the Microbial World.

26 - 31 August 2001

Amsterdam, The Netherlands

Contact: ISME-9 Secretariat

Eurocongres Conference Management

Jan van Goyenkade 11

1075 HP Amsterdam

The Netherlands

isme9@eurocongres.com

Phone: +31 20 6793411

Fax: +31 20 6737306

www.eurocongres.com/isme9

ABUDIV2001 - Diversity, complexity, abundance, resemblance, scale dependence: Theories, methods, applications.

28 August - 2 September 2001

Balatonfüred, Hungary

Contact: Dr. Judit Padisák

Institute of Biology

University of Veszprém

H-8200 Veszprém, Egyetem u. 10

padisak@tres.blki.hu

Phone: +36 87 448 244

Fax: +36 87 448 006

www.terra.hu/abudiv

ECORAD 2001- International Congress on the Radioecology-Ecototoxicology of Continental and Estuarine Environments.

3 - 7 September 2001

Aix-en-Provence, France

Contact: ECORAD 2001

IPSN-DPRE - Bât. 02

rue Auguste Lemaire B.N. n°6

92265 Fontenay-aux-Roses

Cedex, France

ecorad.2001@ipsn.fr

Phone: 33 (0) 1 46 54 79 06

Fax: 33 (0) 1 46 54 72 90

www.ipsn.fr/ecorad2001

International Conference on the Impacts of Environmental Factors on Health.

10 - 12 September 2001

Cardiff, United Kingdom

Contact: Susan Hanley, Conference Secretariat

Environmental Health Risk 2001

Wessex Institute of Technology

Ashurst Lodge, Ashurst

Southampton, SO40 7AA, United Kingdom

shanley@wessex.ac.uk

Phone: 44 (0) 238 029 3223

Fax: 44 (0) 238 029 2853

www.wessex.ac.uk

River Basin Management 2001.

11 - 13 September 2001

Cardiff, Wales, UK

Contact: Susan Hanley

Conference Secretariat RBM 2001

Wessex Institute of Technology

Ashurst Lodge, Ashurst

Southampton, SO40 7AA, UK

shanley@wessex.ac.uk

Phone: 44 (0) 238 029 3223

Fax: 44 (0) 238 029 2853

www.wessex.ac.uk/conferences/2001/river01/

Sixth International Conference on Modelling, Measuring and Prediction of Water Pollution.

17 - 19 September 2001

Rhodes, Greece

Contact: Gabriella Cossutta, Conference Secretariat

Water Pollution 2001

Wessex Institute of Technology

Ashurst Lodge, Ashurst

Southampton, SO40 7AA, United Kingdom

gcossutta@wessex.ac.uk

Phone: 44 (0) 23 80 293223

Fax: 44 (0) 23 80 292853

www.wessex.ac.uk

International Conference on Water Resources Management.

24 - 26 September 2001

Halkidiki, Greece

Contact: Sally Walsh, Conference Secretariat

Water Resources 2001

Wessex Institute of Technology

Ashurst Lodge, Ashurst

Southampton, SO40 7AA, United Kingdom

slwalsh@wessex.ac.uk

Phone: 44 (0) 238 029 3223

Fax: 44 (0) 238 029 2853

www.wessex.ac.uk

9th International Conference on the Conservation and Management of Lakes.

11 - 16 November 2001

Shiga, Japan

Contact: Shiga Prefectural Government

Environmental Policy Division

4-1-1 Kyomachi, Shiga, 520-8577, Japan

lake2001@nsl.pref.shiga.jp

Phone: 81-77-528-3466

Fax: 81-77-528-4849

2002

The Fourth International Ecohydraulics Symposium: Environmental Flows for River Systems. An international working conference on assessment and implementation.

3 - 8 March 2002

Cape Town, South Africa

To access the first announcement for this conference,

please visit the website at:

www.southernwaters.co.za. The website contains

an interactive electronic response form for those

wishing to receive the second circular. If you cannot

access the website, please contact the Conference

Organisers by e-mail at:

conference2002@southernwaters.co.za

or by fax at: ++27-21-6503887

The Third International Symposium Speciation in Ancient Lakes (SIAL-2002).

2 - 7 September 2002

Irkutsk, Russia

Contact: Oleg A. Timoshkin

Vice-Chair of the Organizing Committee

Limnological Institute SD RAS

Baikal International Centre for Ecological Research

Ulan-Batorskaya, 3

P.O. Box 4199

664 033, Irkutsk, Russia

tim@lin.irk.ru

Phone: +3952-46-02-18

Fax: +3952-46-04-05

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Great King Street
Dunedin
New Zealand
carolyn.burns@stonebow.otago.ac.nz

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Poland
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The University of Alabama
Tuscaloosa, Alabama 35487-0206
USA
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