



NEWSLETTER

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION

— For Better Lake Management —

This Newsletter is also available in Japanese.

Symposium on Water Resources Management with the Views of Global and Regional Scales

The Symposium on Water Resources Management with the Views of Global and Regional Scales was held from 18 to 20 November 1991 at Lake Biwa Research Institute located in Otsu, Shiga.

It brought together more than 200 participants, of which some are the advisors to UNEP Executive Director from outside Japan.

Organized by : Shiga Prefectural Government and United Nations Environment Programme (UNEP)

In association with : Ministry of Foreign Affairs, Japanese Environment Agency, United Nations Centre for Regional Development (UNCRD), Japan Society on Water Environment (JSWE), Overseas Environmental Cooperation Center (OECC), International Lake Environment Committee (ILEC), Kansai Economic Federation, Shiga Economic Federation,

International Water Resources Association (IWRA), and Japan Association for Hydrology and Water Resources (JSHWR)

Programme :

November 18

Opening Speech & Welcome Greeting

by S. Yamada (Vice Governor, Shiga Prefectural Government)

H.El-Habr (Programme Officer, UNEP Water Unit)

"A Holistic Approach to Environmental Assessment of Water Development Projects"

by A.K. Biswas (President, IWRA)

"Comprehensive Development of Lake Biwa"

by M. Nakamura (Head Researcher, LBRI)

"The Japanese Contribution to the Promotion of Large Scale Water Resources in Developing Countries"

by H. Hori (President, Japanese National Geographical Committee)

"Ground Water Quality Management; An Overview"

by A. Das Gupta (Professor, Asian Institute of Technology)



"Control of Non-Point Source of Nutrient"
by L. Lijklema (Vice President, IAWPRC)

November 19

"State of Environments of World Lakes"
by T. Kira (Director, Lake Biwa Research Institute)
"Environmental Problems of Large Central Asian Lakes"
by G.N. Golubev (Professor, Moscow State University)
—Video Presentation

"Water Quality Monitoring and Management of the
Ganges"
by M.A. Chitale (Secretary, Ministry of Water Re-
sources, India)

"Concept and Approaches Water Resources Manage-
ment of UNEP"
by H. El-Habr (Programme Officer, UNEP Water Unit)

November 20

Excursion around Lake Biwa

Intrinsic Value of the Symposium

Today, in proportion to increasing population, demand for fresh water is soaring much higher than before, and ensuring provision for fresh water is becoming an urgent issue around the world. I think this symposium proved very significant, because we face such a crisis now.

This symposium emphasized the significance of "Sustainable Development" and "Management of Water Resources in the Scope of Whole Catchment Area." The Symposium discussed the followings matters:

- (A) Positive sides of water resources development projects should be evaluated in EIA. The past experiences of EIA have emphasized too much negative sides of the development projects.
/ by Dr. A.K. Biswas:
- (B) Large development projects have involved changes of community life styles in the concerning areas. Good traditional community should be kept even in the influences of development projects. Japan is successful in introducing new things while keeping good old traditions.
/ by Dr. H. Hori
- (C) Nutrients control for non-point sources are essential parts of water quality protection.
/ by Dr. L. Lijklema
- (D) Ground water quality is also in danger by various contamination sources.
/ by Dr. A.D. Gupta
- (E) Major features of the world lakes environment are siltation, eutrophication, acidification, toxification, and lowering level.
/ by Dr. T. Kira
- (F) Case studies provided important information such as Lake Biwa, the Ganges, Central Asian Lakes.
/ by Dr. M. Nakamura, Dr. M.A. Chitale, and Dr. G.N. Golubev
- (G) The policies of UNEP towards sustainable Develop-
ment of Water Resources.
/ by Dr. H. El-Habr

In 1992, the most significant conference on development and environment, since the Stockholm Conference in 1972, will be held in Rio de Janeiro and should be the concern of people all the world. Our current enthusiasm to solve environment problems should be maintained even after the end of the big convention.

Saburo Matsui

ILEC Scientific Committee Member



1st IAWPRC International Symposium on Hazard Assessment and Control of Environmental Contaminants in Water

"1st IAWPRC International Symposium on Hazard Assessment and Control of Environmental Contaminants in Water" was held by IAWPRC (International Association Water Pollution Research Control) from 25 to 28 November 1991 at Lake Biwa Research Institute located in Otsu, Shiga. It brought together 160 participants and had 47 speakers from 20 countries and more papers were also submitted at poster sessions. The symposium was successfully organized and provided an excellent forum for exchanging new ideas among researchers of many different disciplines. This symposium covered a wide spectra of topics such as:

- 1) Chlorinated Organics
- 2) Pesticides
- 3) Heavy Metal Pollution
- 4) New Methods of Detection and Monitoring
- 5) Detection of Organic Micropollutants
- 6) Mutagens in Environmental Water
- 7) Mutagen in drinking water
- 8) Biological Detoxification of Micropollutants
- 9) Waste Treatment and Bioremediation
- 10) Risk and Impact Assessment
- 11) Regulatory Approach for Control of Micropollutants

Organized by : Kyoto University,
Laboratory for Control of Environmental
Micropollutants (LCEM),
Lake Biwa Research Institute (LBRI),
and
International Association on Water
Pollution Research Control (IAWPRC)

Sponsored by : Ministry of Education, Japan,
Shiga Prefectural Government, and
ILEC

Supported by : Environment Agency, Japan,
The Commemorative Association for
the Japan World Exposition (1970), and
Chemicals Inspection and Testing Institute, Japan

Conservation and Management of Tropical Inland Waters: Problems, Solutions and Prospects

The conference titled "Conservation and Management of Tropical Inland Waters: Problems, Solutions and Prospects" was successfully held from 5 to 9 September 1991 at Hong Kong University. Over 80 delegates from 24 countries took part in this conference sponsored by Societas Internationalis Limnologiae (S.I.L), the Asian Wetland Bureau (A.W.B), and UNESCO/MAB. The International Lake Environmental Committee (ILEC) financially supported delegates with the K.C. Wong Education Foundation, the University of HongKong, and the Beijing — Hong Kong Academic Exchange Centre. Themes discussed at this conference including:

- "Conservation and management of African Inland Waters"
- "Rivers, Ecotones, and Watershed Processes"
- "Environmental Monitoring"
- "Wetlands and Ecotones"
- "Integrated Lake Management"
- "Research, Training, and Ways Ahead"

The following extract is a summary of the presentation given by Mikiyasu Nakayama — advisor to ILEC Secretariat — at this conference.

Application of Satellite Remote Sensing Technologies to estimate Water Quality of Japanese Lakes

Mikiyasu Nakayama

A number of lakes in developing countries are threatened by increased siltation, eutrophication and other human-induced degradation. Nevertheless, few lakes in the developing world have monitoring schemes on water quality. Conventional methodology, namely setting up a monitoring station equipped with a laboratory, is costly and therefore impractical. Application of satellite remote sensing technologies for water quality estimation may be a breakthrough because of its low cost and wide coverage. In the past, attempts had been made to employ such satellites as LANDSAT or SPOT for this purpose. However, these satellites had limited coverage both in terms of area (180 km by 180 km in LANDSAT/TM or MSS) and frequency (once every two weeks or less). NOAA/AVHRR yields even better

estimation of water-quality parameters than LANDSAT despite its large pixel size and fewer visual bands. NOAA/AVHRR can be used to estimate water quality of not only one but several Japanese lakes successfully.

International Conference on Water and the Environment: Development Issues for the 21st Century

The International Conference on Water and the Environment was convened in Dublin, Ireland from 26 to 31 January 1992. The conference was attended by 338 government-designated experts from 113 countries, 13 experts from international Organizations, and 12 participants from Non-governmental Organizations.

The Conference's main focus was on the development, utilization and management of water resources in harmony with environmental conservation and the concept of sustainability. The latter concept needs to promote:

- (a) the synthesis of economic, social and environmental considerations;
- (b) processes which compare and evaluate alternatives which do not deplete the resource base and thus the present and future generations;
- (c) the greatest possible efficiency in the use of water and energy, including appropriate and safe reuse, recycling, and conservation of all water resources;
- (d) reduction of pollutants and pathogens in water and aquatic ecosystems and;
- (e) the quality of human life and the protection of the biosphere.

6 Main Topics and Themes of Each Working Group

- A Group. Integrated Water Resources Development and Management
- B Group. Water Resources Assessment and Impacts of Climate Change on Water Resources
- C Group. Protection of Water Resources, Water Quality and Aquatic Ecosystems
- D Group. Water and Sustainable Urban Development and Drinking Water Supply and Sanitation in the Urban Context
- E Group. Water for Sustainable Food Production and Rural Development and for Drinking Water Supply and Sanitation in the Rural Context
- F Group. Mechanisms for Implementation and Coordination at International, National, and Local Levels

The General Conference Programme

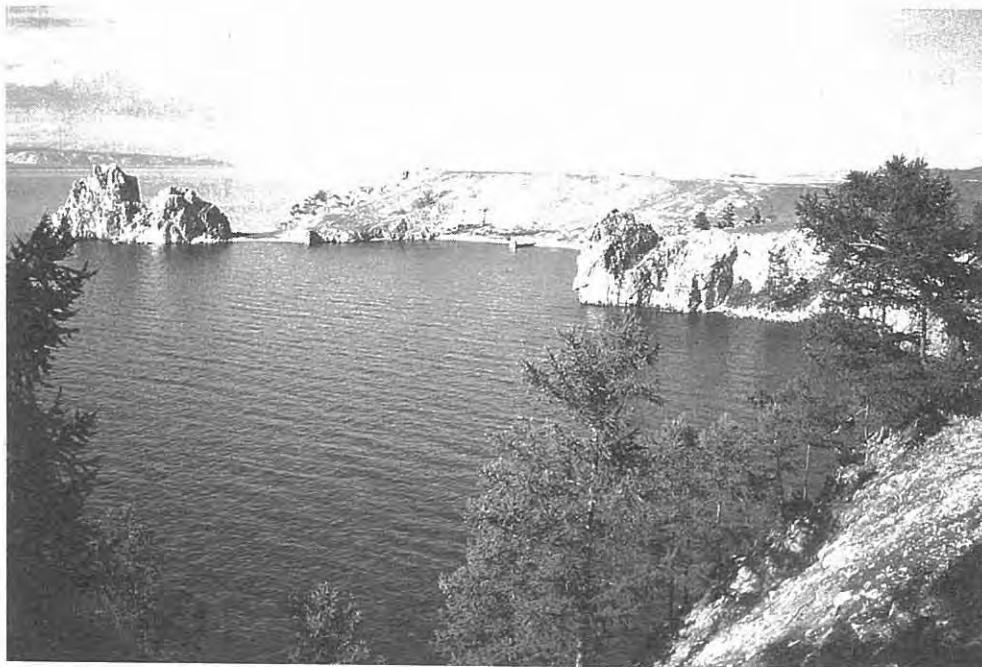
26 January	Participants' Registration Press Conference Opening Ceremony and Cultural Programme
27 January	Opening Remarks by the Minister for the Environment Election of Chairpersons and Rapporteurs Plenary Sessions
28 January	Working Group Sessions
29 January	Working Group Sessions Exhibition at Dublin Castle until 1 February Poster Sessions at Dublin Castle
30 January	Working Group of the whole Lunch Working Group of the whole Excursions
31 January	Adoption of Conference Report and Dublin Statement Closing Ceremony & Press Conference

4 participants (Dr. Joergensen, Dr. Ayibotele, Dr. Golubev, and Dr. Bruce) attended this conference from the ILEC Scientific Committee. All the participants to the Conference have recognized the need for fundamental new approaches to development and management which can only be brought about through political commitment and involvement at the highest levels of government to the smallest comments. The participants, through the world leaders assembled at the Earth Summit in Rio de Janeiro in June, urge all governments to study and means of implementation recommended in the body of this report, and to translate its recommendations into urgent programmes for sustainable development.

ILEC Activities in 1991

Jan 24 -Mar 26	The first Group Training Course in Lake Water Quality Management in Otsu (ILEC/JICA)		Sound Management of Reservoirs in La-Plata River Basin organized by ILEC in Sao-Paulo, Brazil and Buenos Aires, Argentina. (co-organized by UNCRD, UNEP, and Regional Office for Latin America and the Caribbean)
Feb 25	Discussion on cooperation between ILEC and GEMS/WATER with Dr. Ongley (CCIW) in Otsu	Aug 9 - 10	Overnight Field Trip on Lake Biwa by a boat for a Survey on Water Quality for Environmental Education
Mar 4	Discussion on cooperation between ILEC and GRID in Geneva	Sep 5 - 9	Participation in The Conference on Conservation and Management of Tropical Inland Waters in Hong Kong.
Mar 6	Pilot Classes on "Acid Rain" at Ritto Nishi Jr. High School and Daihoh Elementary School in Otsu	Sep 8	Liaison Meeting of collaborating institutions on ILEC's Remote Sensing Project in Hong Kong
Mar 7 - 11	ILEC/CIP Collaboration Meeting in Otsu	Sep 19	Planning Committee Meeting on ILEC/JICA Group Training Course in Lake Water Quality Management in Otsu ('92)
Mar 15 - 19	"Denmark - Brazil - Japan Environmental Education Exhibition" in Hikone, Shiga	Sep	Publication of ILEC Guideline Book Vol. 2 "Socio - Economic Aspects of Lake Reservoir Management"
End of Mar	Data Book Vol. 3 was published	Sep	Newsletter No. 16 was published
Apr 6	Memorandum of Understanding with Prince of Songkhla University on Remote Sensing	Sep	Mission to Malaysia for the Regional Seminar on Better Understanding of Tropical Eco System
May 13 - 16	The 4th ILEC General Meeting and Working Group Meeting in Pallanza, Italy	Oct 1 - 5	Visit of Prof. de Bernardi at Otsu to prepare for the 5th World Lake Conference
May 13 - 18	Organization of ILEC Session in the IWRA 7th Congress Meeting in Rabat, Morocco	Oct 9 - 10	Cooperation to "The Symposium on Water Resources Management with the Views of Global and Regional Scales" by UNEP/Shiga Prefectural Government in Otsu
May 20 - 31	Participation in the "UNEP 16th Governing Council" in Nairobi, Kenya	Nov 18 - 20	"International Lake Environmental Education Exhibition" was held in Otsu
May 28 - Jun 2	Participation in the "Eco - Life Fair" in Tokyo	Nov 18 - 20	Request for a cooperative function to UNEP/International Environment Technology Center by Shiga Prefecture Governor
Jun 17 - 28	Participation in The 3rd Meeting for Saving Aral Sea at Alma-Ata, Kazakhstan	Nov 19	Cooperation to IAWPRC Symposium on "Hazard Assessment and Control of Environmental Contaminants in Water" in Otsu
Jun 28	Pilot Classes on "Eutrophication" at Kohoku Jr. High School and Odani Elementary School in Otsu	Nov 25 - 28	Visit of Dr. Beim to Otsu to discuss about Lake Baikal
Jul 11	The Symposium entitled "Wise Use of Wetlands/Lakes" held jointly by ILEC/Ramsar Center in Tokyo	Dec 3	Planning Committee Meeting on ILEC/JICA Group Training Course in Lake Water Quality Management ('92)
Jul 11	Discussion on cooperation between ILEC and IUCN with Dr. Dugan (IUCN) in Otsu	Dec 6	Mission to Thailand for the meeting on Remote Sensing
Jul 23 - 30	Compilation Meeting on The Survey of the State of World Lakes at Petrozavodsk, former USSR.	Dec 25 -	
End of Jul	"5 Years Tracks of ILEC" was published		
Aug 2	Cooperation to the 9th "Lake Biwa Water Festival"		
Aug 5 - 16	Workshop on The Environmental		

LAKES OF THE WORLD



Lake Baikal (Russia, CIS)

Lake Baikal is famous as the world's deepest (1,637 m) and largest volume (23,000m³) lake. Baikal's water are also exceptionally clear (maximum transparency > 40m). However, few people know that transparencies greater than 40 m in Baikal occur less than two weeks a year. During the warmer seasons, the waters shallower than 60 m generally exhibit transparencies less than 10 m, although the deeper water maintains greater transparency throughout the year.

Lake Baikal is located in the southern part of Eastern Siberia (51.5° to 56° N, 104° to 110° E) in the center of the active intracontinental Baikal Rift Zone. The latest phase of rifting began about 30 to 35 million years ago. Presently, the width and depth of the lake are increasing by 2 cm and 6 mm, respectively, each year. The bottom sediments (up to 6 km thick) bear the records of central asian paleoclimates over the last 25 million years. Lake Baikal is one of the oldest lakes in the world. Baikal has a length of 639 km from the southwest to the north. The maximum width, 80 km, is just north of Olikhon, the largest island. The water surface is 468 m above sea level. Baikal's surface area is 46,000 km² and the

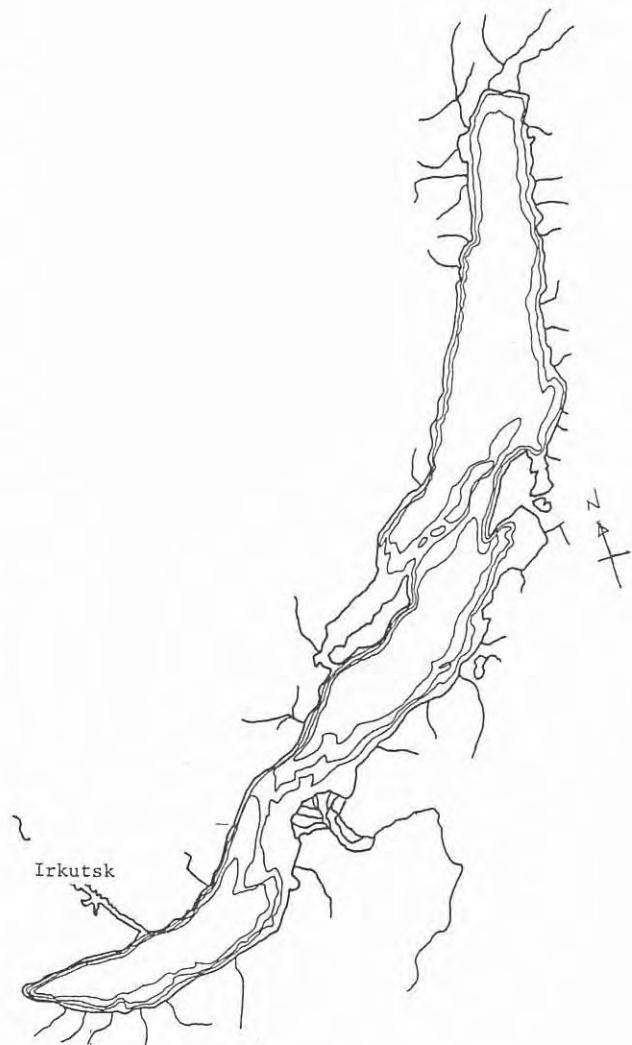
catchment area is 556,000 km², a little less than 1.5 times the area of Japan. The 333 rivers in the catchment provide 57.8 km³/y, water while direct precipitation and ground water inflow add 9.3km³/y and 3.1 km³/y, respectively. The only surface outflow is 60.9 km³/y via the River Angara and evaporation is estimated at 9.3km³/y (1901-1955. Afanasyev 1960). Weiss et al.(1991) recently evaluated the physics of mixing based on profiles of chlorofluorocarbons (CFCs) and dissolved oxygen. Unlike other large lakes in the temperate zone, Baikal's deep waters tend to be much more than one year old and their age changes with depth. More remarkably, the near-bottom waters are significantly younger (8 years old) than those at intermediate depths (14-16 years old).

Major ion concentrations in Baikal change little horizontally and vertically. Average values are 402 (Ca⁺⁺), 126 (Mg⁺⁺), 155 (Na⁺), 24.1(K⁺), 12.3(Cl⁻), 57.4(SO₄) all in μ mol/kg alkalinity (Falkner et al, 1991). Dissolved oxygen decreases with depth, but even near bottom concentrations are more than 75% of air saturated values. The mean rate of deep water oxygen

consumption by in situ respiration is about $4.5 \mu\text{mol/kg/y}$. Annual new production is estimated as about 27 gC/km^2 (Weiss et al., 1991).

Lake Baikal is inhabited by some 2,000 species of freshwater organisms, two thirds of which are endemic (including the Baikal seal). Studies of the mechanisms and chronology of speciation in Baikal are important areas in paleobiogeography.

The Baikal International Center for Ecological Research (BICER) was established as a non-governmental organization - an open institute - in December 1990. BICER is hosted by the Limnological Institute of the Siberian Division of the USSR (Russian) Academy of Science. Since 1989, more than 70 foreign researchers have visited Lake Baikal each year.



Forthcoming Meeting

The 5th International Lake Conference on the Conservation and Management of Lakes

- Stresa '93 -

After the four stimulating and successful Conferences organized by ILEC (Japan, 1984; USA, 1986; Hungary, 1988; P. R. of China, 1990) the 5th International Conference on "The conservation and management of lakes" is planned for spring 1993 in Italy.

Organized by : Istituto Italiano di Idrobiologia (CNR),
Istituto di Ricerca Sulle Acque (CNR),
International Lake Environment Committee Foundation (ILEC), and

International Association Water Pollution Research Control (IAWPRC)

Aim of the Conference :

The aim of the Conference is to focus on some of the major problems related to the protection and use of lake ecosystems considered as a primary resource for economic development.

The conference programme will include invited lectures, offered papers and posters, which will be published in the volume of the Conference proceedings.

Topics

Updating of the scientific basis of lake functioning in

natural, stressed and recovered situations as a management tool.

- Scientific basis for managing eutrophication
- Acid rain and effects on aquatic ecosystems on a global scale
- Water quality in lakes and reservoirs for human uses
- The fate and effects of in-lake micropollutants
- Non-point source control for nutrients

Political and administrative aspects in the management of lakes as a primary resource.

- Scientific findings and their utilization at socio-economic and administrative levels for lake/reservoir management

The role of environmental education involving citizen organizations to support the protection of lakes

- Environmental education
- Citizen Participation

Venue: The Palazzo dei Congressi, Stresa, Lago Maggiore. Stresa has good railway connections with three international airports: Milano - Linate (90 min.), Milano - Malpensa (60 min.), and Geneve (150 min).

Language: English.

Registration fees:

Until Jan 31st '93 / After Jan 31st '93

Participant	Lit. 600.000	Lit. 750.000
Accompanying person	Lit. 250.000	Lit. 300.000

The registration fees will cover:

- reception, admission to sessions
- a special monographic volume on Limnology in Italy
- the abstract volume
- some social events

Cancellation:

- before January 31st, '93 70% refund
- after January 31st, '93 50% refund
- after March 31st, '93 no refund

Commercial Exhibition:

An exhibition of scientific instruments, material, journals, and books will be held simultaneously with the Conference.

Social Activities:

Cultural and social activities will be organized for participants and accompanying persons. Visits to places of historical and naturalistic interests in the surrounding area will be arranged.

Pre and Post Conference Tours:

A series of one-day and three-day tours will be organized to the most important lakes and towns in Northern and Central Italy.

All correspondence should be addressed to:

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CALL FOR ARTICLES

Those who wish to contribute to the ILEC Newsletter are invited to send manuscripts to the secretariat.



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