



# NEWSLETTER

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION

No.10 JULY 1989

— For Better Lake Management —

This Newsletter is also available in Japanese.

## ILEC FIRST GUIDELINE BOOK ON LAKE MANAGEMENT HAS BEEN PUBLISHED.

May 9 was ILEC'S first guideline book published. A series of Guideline books has been planned to present all aspects of lake management. The first volume, entitled Principles of Lake Management, presents the concepts and tools, that everybody dealing with lake management must have in common, independent on whether the approach is from a scientific, engineering, social-economic, management or political view point. The idea behind the Guideline book number one is to give the various approaches so to say a common language to give a better understanding among various experts in lake management. It implies that this guideline book is recommendable to everybody involved in lake management.

The first chapter named introduction gives some general holistic ideas on lake management.

The second chapter is devoted to ecosystem concepts. How is a lake working as an ecosystem? How is its function, structure and processes.

The third chapter lists all the pollution problems related to lake management and the causes of the problems.

Chapter four attempt to assess the problem from a qualitative and partly a quantitative view point. A quantitative assessment requires, however, a mass balance and therefore is chapter five devoted to the assessment of mass balances.

Chapter 6 is named "use of Models" and present the application of this powerful management tool in lake management.

Now when the assessment of the problem is made and maybe even an ecological model developed as management tool, we need to know which remedial techniques, we are able to apply to achieve the management goals. Therefore the next chapter overviews all the available techniques, those based on environmental technology as well as those based on ecotechnology including lake restoration methods.

Chapters 1-7 covers the scientific-engineering

aspects of lake management. However, in the planning phase it is absolutely necessary to consider the social-economic aspects and therefore these aspects are included in chapter 8, named Planning for Sound management of Lake Environments.

Chapters 1-8 forms part A, while parts B consists of three case studies.

Chapter 9 is about Laguna de Bay Region, which illustrates very clearly the conflict in lake management of most developing countries between development and nature and between exploitation and water resources.

Chapter 10 gives an overview of management of reservoirs in Brazil, particularly the problems resulting from the accompanied deforestation, increased soil and water pollution, from the dam construction and the current deterioration of the water quality.

The last case study is Saguling Dam, Indonesia. The chapter focuses on the project impact on the environment and the environmental impacts on the project. It includes a rather detailed discussion on the resettlement of the displaced population - a problem which must not be forgotten in the planning of reservoirs.

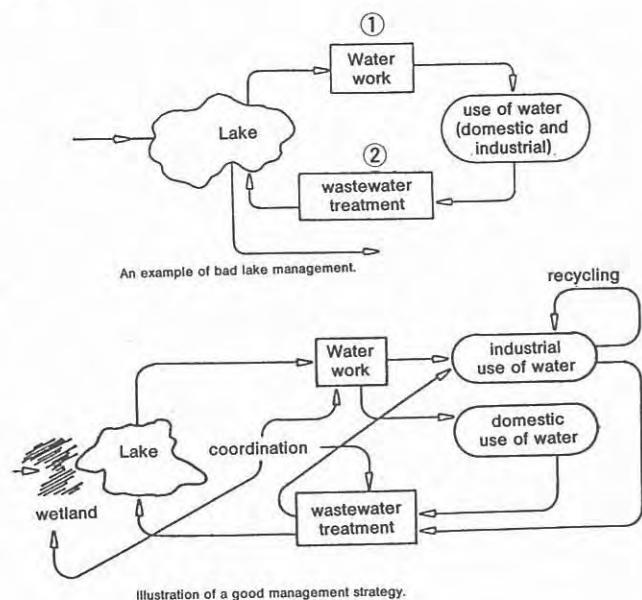
In an appendix is an investigation flow charts, which gives recommendation on what to examine in the first



hand, when a lake management project is started.

The volume is terminated with a rather comprehensive index.

Last but not least: the book has two forewords, one by G.N.Golubev, former assistant executive director of UNEP and T.Kira, chairman of the scientific committee of ILEC.



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*S.E. Jørgensen (Denmark)*

Secretary, International Society of Ecological Modelling

# International Lake Environment Committee Foundation outline of project plans for 1989 and '90

### 1. Objectives

The objectives of ILEC are to advance international cooperation for conservation of lake environments, to promote environmentally sound management of world lakes through encouraging investigations and research on rational and suitable methods for sustainable development, and to internationally exchange scientific

knowledge on lake environmental management. In order to achieve these objectives, ILEC shall implement the following project plans between 1989 and 1990.

### 2. Project plans

#### (1) Survey of the State of World Lakes

This project consists of collecting and analyzing limnological data (physical geography, physical che-

mistry and hydrobiology) and socio-economic data (resources use, environmental management, and development plans and activities) on lakes.

In this period, data on about 150 lakes will be collected and data-based on the same format; Data-Book (Vol. 2) will be published; Volume 2 of Indepth Studies on selected lakes will be edited and compiled.

#### (2) Training Projects

Workshop/Seminar on regional development and conservation of lake environments in developing countries is being promoted by ILEC, United Nations Centre of Regional Development (UNCRD) and United Nations Environmental Programme (UNEP). This three-year project aims to produce training materials and training modules for practical use.

The next Workshop/Seminar will be held in Otsu, Japan on the subject of River/Lake Basin Approach to Environmentally Sound Management of Water Resources, for about two weeks in the middle of February, 1990. Policy makers, water resource managers and practitioners from case study regions such as Brazil, China, Indonesia, Kenya, Thailand, Philippines, and other Asian, African and Latin American countries will participate in this Workshop/Seminar.

Next, the training course to be held at Irkutsk and Leningrad August 29 to September 10, 1989 by USSR Environmental Protection Committee is supported by ILEC, who will provide resource personnel and training materials. This seminar is planned for providing techniques and know-how on environmentally sound management of lakes for administrative officials from Lake Chad Basin (Chad, The Cameroon, Niger and Nigeria) in Africa.

Dr. L.V.Sokolov, Project co-ordinator, Centre for International projects, USSR State Committee for Environmental Protection and Dr. A.V.Leonov, Senior Scientific Researcher, Institute for Water Problems, USSR Academy of Sciences will travel to the ILEC office in Japan, to discuss the seminar programme in mid July.

#### (3) Guidelines

A series of text books containing basic knowledge for practitioners about environmentally sound management of lakes will be published.

Vol.1 "Principles of Lake Management" (in English) was published in April, 1989, and is available for 1,500 Yen (including delivering costs).

Vol.3 "Shoreline Management of Lakes and Reservoirs", edited by Prof. Jørgensen, Vol.2 "Social-

economic Problems of Lake Environmental Management" edited by Dr. Hashimoto and Vol.4 "Lake Management and Toxic Substances", (tentative) edited by Prof. Matsui are planned to be published around June, 1990.

#### (4) Assistance to International Lake Conference

The International Conference on the Conservation and Management of Lakes is to be held every other year.

The 4th conference will be held at Lake Xi Hu, in Hangzhou, P.R.China. ILEC will provide necessary assistance in planning and preparation of this conference to the sponsoring organizations such as EPA of China, CRAES, EPA of Zhejiang Province and Hangzhou City Government.

#### (5) Information Services and Publications

Information on ILEC activities and project output will be provided for concerned people and organizations. In order to stimulate citizen's concern on lake environmental conservation, ILEC will prepare and make up pamphlets and leaflets on lake environmental problems from time to time. Presently, ILEC Newsletter is published four times a year.

#### (6) Technical assistance to developing countries

This new training course will be designed to provide instruction on the use of lake water quality measurement equipment. It is planned to be held in and around Lake Biwa, for about ten weeks from January to March, 1990. About five or six engineers from Developing Countries will participate in this training.

#### (7) Environmental Education (E.E.)

This pilot project aims to examine the possibilities of teaching methods and techniques integrating environmental science into school curriculum and to produce teaching E.E. materials and curriculum for primary school and/or junior high school pupils. This is presently being investigated by ILEC specialists and school teachers in Denmark and Japan (Shiga Prefecture). After establishing a system of promoting E.E. in the countries concerned and designing a working plan, the pilot project is set to go into effect during the latter half of this year, and will be continued until the end of 1990.

The results of the pilot project will be summarized and distributed to International Organizations and National Agencies in charge of E.E.

#### (8) Management and Business administration

The General Meeting of ILEC Foundation is planned to be held in late February, 1990.

## BUREAU MEETING OF ILEC SCIENTIFIC COMMITTEE IN NAIROBI

The Bureau Meeting of ILEC Scientific Committee which had been suspended since January was held at

Hilton Hotel in Nairobi, on May 16-17. Four Bureau Members (C.E. Bauer, T.N. Khoshoo, S.E. Jørgensen

and S. Matsui) and UNEP observers (H. Sakimura, J. Balek and M. Nakayama) attended and discussed the following agenda:

1. PROGRESS IN 1988/89
2. NEW ILEC SCIENTIFIC COMMITTEE MEMBERS
3. ENVIRONMENTAL EDUCATION PROJECT
4. 4TH WORLD LAKE CONFERENCE IN CHINA 'HANGZHOU '90'
5. 5TH WORLD LAKE CONFERENCE
6. COOPERATION WITH W.M.O.
7. COOPERATION WITH UNEP AFTER 1991
8. USSR TRAINING COURSE FOR SPECIALISTS OF LAKE CHAD BASIN
9. PROPOSALS FROM PROF. TUNDISI.

Secretariat reported that a 10-week technical training course aimed at enhancing the capabilities of engineers to maintain water-quality measurement facilities was scheduled for 1990 in Japan, in addition to ongoing ILEC/UNCRD/UNEP joint workshops which focus on policy aspects of lake management.

Prof. Jørgensen reported the completion of Vol.1 "Principles of Lake Management". The need for advancing the publication schedule of subsequent volumes (Vol.2 "Principles of Lake Management: Socio-economic aspects"), Vol.3 "Lakeshore management", Vol.4 "Toxic Substances") was stressed.

Prof. Tundisi's proposals that: a) ILEC support the organization of a Workshop/Symposium in April 1990 in S. Carlos under the general theme of Reservoirs of La Plata Basin: Ecology and Management for Multiple Uses, and b) ILEC supports the organization of a SIL meeting in Brazil in 1992 or 1995, were accepted.

After the meeting, bureau members and secretariat staff met with UNEP/GEMS Unit, UNEP/Water Unit, Chinese and USSR delegates, FAO/Water Resources Development, UNESCO/IHP, and UNESCO/Environment-

tal Education, to explore future cooperation with them. Among proposed draft ideas were: Survey of the State of World Lakes (Phase II), application of remote sensing to inland water monitoring and management, post-graduate courses, hydrological and water management aspects of African Lakes, and lake environmental education.

#### TRAINING COURSE ON LAKE MANAGEMENT FOR SPECIALISTS FROM LAKE CHAD BASIN.

Lake Chad is in a state of deterioration, and manpower development will be needed to improve the lake regime. This fact has attracted considerable attention, and present activity of UNEP EMINWA project is focused on the lake.

In view of the situation, UNEP and USSR State Committee for Environment Protection, in association with the USSR Academy of Sciences and International Lake Environment Committee (ILEC), plan a training course on lake management for specialists from Lake Chad Basin. The course will be held in Irkutsk and Leningrad from 29 August to 10 September for mid to high level water resources management specialists from countries situated in the Lake Chad Basin.

This two-week training course is basically based on the experience of the Institute of Limnology, USSR Academy of Sciences in Leningrad, Lake Sevan National Park in Armenia, and Limnological Institute at Lake Baikal.

ILEC is expected to cooperate in this course by sending two lecturers (e.g. a lecture on "Peculiarities and problems of African Lakes in Comparative Analysis with Other Lakes"), and providing materials produced through ILEC/UNCRD/UNEP joint Expert Group Workshops.

## THE 15TH SESSION OF UNEP'S GOVERNING COUNCIL

In one of the most important environmental meetings in years the United Nations Environment Programme's 15th governing Council was held at UNEP's Headquarters in Nairobi from 15 to 26 May, to assess the state of the world environmental community's efforts to prevent mounting environmental degradation.

It came on the heels of several important governmental achievements within the UNEP framework - the March 22 signing by 43 countries of the Basle Convention on the transboundary movement and dispersal of hazardous wastes; commitments by the signatories of the Montreal Protocol and the Vienna Convention to take more concerted and effective action in the fight to prevent further depletion of the ozone layer; and new measures to address the threat of climatic change.

"The two years since the 14th session of the

Governing Council have seen a dramatic increase in concern for the environment which has become a major issue for people and policy makers at all levels", said Dr. Mostafa K. Tolba, UNEP's Executive Director in his report to the Governing Council.

The Executive Director's 1989 Report characterized the nature of UNEP's role in promoting international environmental action in terms of four Cs: Conceptualization, Co-ordination, Catalysis and Codification. UNEP identifies environmental problems; develops action plans to address them; coordinates the work of UN agencies and governments, encouraging them to take action to protect the environment; and assists them to develop the forums and agreements to deal with them. An important aspect of this work is UNEP's efforts to spur technical co-operation with developing countries on

environmental issues.

The Council considered focusing its future environmental programme on a certain number of key issues:

- atmosphere and climatic change, essentially global warming and climatic change, ozone layer depletion and acid rain;
- fresh water-supply and quantity;
- oceans and coastal areas - pollution and coastal zone management;
- land degradation, including desertification;
- improvement of biological diversity, addressing the issue of deforestation, particularly of tropical forests, and
- hazardous wastes and toxic chemicals.

Looking to the future of the world environmental movement, the Council submitted its views on the objectives, content and scope of the proposed United Nations conference on Environment and Development expected to be held in 1992. Dr. Tolba emphasized that "the conference should produce significant results" and it is important "to state concretely what the world community is actually going to commit itself to do within the next decade."

#### A STATEMENT GIVEN BY CONRADO BAUER (EXERPTS)

Representing ILEC, Ing. Bauer gave a statement at the Committee of the Whole of the Governing Council:

I would like to point out, in the first place, how pleased we are with the declaration made yesterday by Dr. Tolba, the Executive Director of UNEP. He has pointed out that "pollution and shortage of freshwater resources" constitute one of the six priority areas in which the project activities of UNEP will be concentrated. We are in complete agreement with this decision which gives priority to the formulation and execution of plans and projects for the better understanding, protection, conservation of resources for the sustenance of life, human health and the ecological equilibrium of our

planet. This is precisely the reason why our committee exists, particularly concerning water in lakes, which constitute the principal usable reserve of freshwater.

With this objective in mind ILEC is at present developing following four central programs(see ILEC projects in 1989-1990):

1. The Survey of the State of World Lakes
2. Guideline Books
3. Expert Group Wprkshops
4. School Project for Environmental Education on Lakes

Apart from the four programs mentioned ILEC carries out several other actions. Among these we would state two which have continuity and regularity: a) The "World Conferences on Conservation and Management of Lakes" which take place every two years since the conference held in the City of Otsu (Lake Biwa-1984). Two further conferences have been held after that one in 1986 in Mackinac Island (Lake Huron, Michigan, USA), and in 1988 in Keszhely, on the shores Lake Balaton in Hungary. At present the fourth conference is being organized, to be held in Hangzhou (People's Republic of China) in September, 1990, for which we invite all of you who are present to participate and to spread this invitation; b) the publication of a Newsletter of which 2,000 copies are distributed every three months throughout the world.

Finally, I would like to refer to EMINWA program, in which we entirely concur in regards to its formulation and its objectives. ILEC is a firm supporter of its implementation and the extention of its application because we consider that it is a right and practical approach, which involves complete basins and that it will allow for effective action to be carried out in favor of the preservation of the quality and the quantity of water and its better utilization. We state our definite wish that, in view of the priorities indicated by Dr. Tolba, This program should receive increasing support and that it should expand to other countries.

## REQUEST FOR COLLABORATION

There is a consensus among ILEC members that it would be very worthwhile to establish close relationships with institutions which offer various kinds of lake related training, with an eye towards future collaboration. As a first step for developing collaboration, we are in need of collecting information about such training opportunities.

Because environmentally sound lake management requires integration of expertise in diverse fields such as limnology, water resources engineering, environmental

planning and management etc., this questionnaire attempts to collect information on the current state of training opportunities in as varied a set of fields as possible. ILEC intends to consolidate your responses into a list and publish it in the Newsletter as a good reference for potential participants as well as for ILEC itself.

If you are interested in participating, kindly complete this questionnaire and return it to us.

# QUESTIONNAIRE FOR LAKE MANAGEMENT TRAINING OPPORTUNITIES

1. Name of Institute/Dept.:

Address of the institute:

Associated with (Univ., Acad., Private, Others):

2. Specification of activity:

(theoretical limnology, applied limnology, civil engineering, environmental planning, etc.)

3. Teaching activity:

Name/topic of the course:

Frequency:

/ / once every year, / / twice, / / irregular

Duration:

Targets:

/ / local students, / / others. / / developing countries

Carrying capacity:

/ / 1–10, / / 11–20, / / 21–30, / / more students

Level:

/ / students, / / postgraduates, / / decision-makers, / / Others

4. Experience in developing countries:

Names of countries:

Teaching only:

/ / yes    / / no

Other activities:

5. Indicate other limnological institutes in your country with facilities for courses, especially for developing countries.

6. Should you have other information relevant to the aim of this questionnaire, please let us know.

7. Your name \_\_\_\_\_

Your address \_\_\_\_\_

Professional background \_\_\_\_\_

Position/ function/ occupation \_\_\_\_\_

Government agency/ organization/ institution \_\_\_\_\_

ILEC would like to thank you for completing the questionnaire.

Please airmail to:

Secretary-General  
International Lake Environment Committee  
Shiga-Kaikan Bldg.  
3-4-22 Kyomachi,  
Otsu, Shiga, 520 Japan

# LAKES OF THE WORLD

## LAKE KINNERET



Lake Kinneret (the Biblical Sea of Galilee) is a warm monomictic lake located at the northern end of the Afro-Syrian Rift Valley in northern Israel. The lake has a surface area of a 170 km<sup>2</sup>, a maximum depth of about 45 meters and a mean depth of 24 meters. The climate is hot in summer, with winter rains from November through April. There is intensive agriculture in the catchment area especially in the Hula Valley (cotton, alfalfa, fish, ponds) and around the lake shores (bananas, dates, cotton). Lake Kinneret serves as the major reservoir for Israel's National Water Carrier System and supplies more than a quarter of the country's annual water requirements (400-450 million m<sup>3</sup>). It is also an important tourist and vacation area, famous for antiquities and historical sites especially those associated with the New Testament accounts of Jesus and his disciples. As in Biblical Times, there is a significant commercial fishery on the lake with annual yields of 1,500-2,000 tons. The most valuable fish is the cichlid, *Sarotherodon galilaeus* (St. Peter's fish) although the greatest tonnage taken is that of the bleak, *Mirogrex terrasanctae*.

Because of its unique status as the only large freshwater lake in Israel and the multiple demands upon this natural resource, concern about the possible impact upon the water quality of numerous developments in the watershed shore areas led to the establishment of the Kinneret Limnological Laboratory in 1968. For the past twenty years the Laboratory has been the centre for extensive numerous limnological studies. These investigations have been focused at achieving an overall understanding of the lake ecosystem in order to best advise those directly responsible for development and management of Lake Kinneret and its watershed.

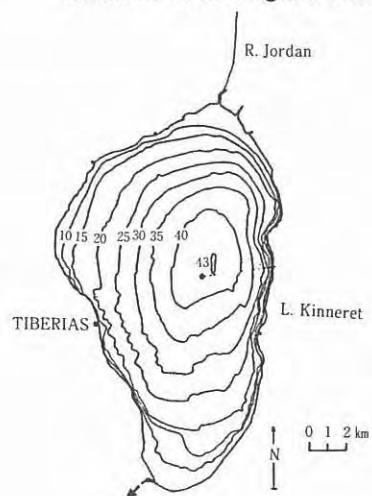
What is a present state of water quality in the lake after the ecological pressures of the past fifty or sixty years of intense development and after almost twenty years of concerted effort to alleviate those pressures? First, much credit must be given to the resilience of the lake ecosystem itself, possibly mainly due to the relatively high pH and calcium content of the water. Thus, much of the potential pollution from phosphorus inputs is diminished because of the formation of non-biologically available calcium phosphate precipitates. Also, active denitrification in the anaerobic hypolimnion has proved an extremely effective "safety valve" to compensate for the impact of increased watershed inputs of nitrates

from agricultural areas. Secondly, since 1974, a governmental Agency, the Kinneret Commission (established by the Israel Water Commissioner) has been responsible for monitoring developments in the Kinneret area and for coordinating and encouraging activities to decrease pollution pressures. The Kinneret Commission was instrumental in bringing about new drainage and agricultural policies in the northern Kinneret watershed which have significantly diminished inflows of heavily polluted water into the Jordan River and thence into Lake Kinneret. New regulations concerning agricultural crop spraying practices were introduced and have led to reduction of pesticide concentrations as monitored in the watershed streams and in fish tissue. Bathing beaches have been provided with adequate sanitary facilities resulting in a drop in the numbers of pathogenic bacterial tracers found in lake water.

Nevertheless, because of the large projected expansion of tourism around the lake and in the watershed, there will be a need to expand and diversify measures to protect the environment. Furthermore, there are some projected developments which may have even greater detrimental impact on water quality. A large pump-storage hydroelectric plant, which would use the lake as a lower reservoir, is presently under prefeasibility scrutiny. Also very extensive changes in the stream flows to and from the lake are now being considered, which would reduce the amount of Jordan water flowing into the Kinneret by about 25 to 33 % and would divert this volume directly into the canals of the National Water Carrier.

Whatever the fate of these proposals, because of greater demands for water it is projected that, on average, future lake levels in the summer and fall will be lower. How these changes will affect the lake and how to maintain or even improve present water quality remains a major challenge to Israel's limnologists and water engineers. Fundamental limnological research to elucidate the functioning of this ecosystem will be indispensable in order to provide a basis for future management and planning strategies.

Thomas Berman —  
Kinneret Limnological Laboratory, Israel.



## FORTHCOMING MEETINGS

### UNCRD/EWC Workshop on Water Use Conflicts in Asian Metropolises

The objectives of the workshop are :

- 1) to review the state of the art of water resources management in some selected Asian metropolises with focus on the tradeoffs between types of water use as well as between water quantity and quality
- 2) to examine relevant concepts and approaches to deal with the problem of water use conflict in the context of metropolitan water resources management
- 3) to work out an operational research framework for case studies in Asian metropolises

1 - 4 September 1989

Lake Biwa Research Institute  
Uchidehama 1-10, Otsu, Shiga Pref. 520

### International Symposium and Seminar

### Integrated Water Management and Conservations in Urban Areas

The objectives of the IHP Conference are:

- 1) to exchange information on integrated water management and conservation in urban areas
- 2) to compare modalities of water management in urban areas of countries on an international level
- 3) to improve the water management and conservation strategies through discussion of the above items

28 August - 5 September 1989

International Conference Hall Aichi Prefectural Trade Center Marunouchi 2-4-7, Naka-ku Nagoya 460

### INTERNATIONAL CONFERENCE

### BIOMANIPULATION TOOL FOR WATER MANAGEMENT

The aim of the conference is to enhance the discussion between aquatic ecologists studying trophic interactions and people working in the field of water and fish management.

Date : 8-11 August 1989

place : Artis Zoo, Amsterdam, The Netherlands

Secretariat : Convention Bureau Van Namen & Westerlaken, P.O.Box 15586501 BN Nijmegen, The Netherlands,  
Tel.080-234471 (from abroad 31 80 234471)

## ANNOUNCEMENT

ILEC Secretariat Office has moved to Shiga-Kaikan Building opposite the previous Shiga Prefectural Government Building. Our new address is:

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Shiga - Kaikan Bldg.  
3 - 4 -22 Kyomachi,  
Otsu, Shiga, 520  
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### CALL FOR ARTICLES

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



**INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION**

Secretariat —

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