



SIL news

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Material for the December 2015 issue should be sent to the Editor by:

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

Editor's Foreword

I must apologize at the outset for some unsolicited delay in the appearance of this summer newsletter. It has two main reasons: first, the protracted delay in receiving most of the manuscripts; second, I needed to mail reminders to the potential authors to send their contributions by 1 April 2015, the deadline date for the manuscript submissions. On this date, I had received only a handful of the manuscripts, and that was for me certainly a worrying thought. My motivation to edit the summer newsletter apparently lacked the push that I needed to inspire me to do the job fast. However, fortuitously, the matter was sorted out as the manuscripts trickled in lots of twos and threes. Thus, although I had enough material at hand, I could not catch up with my deadline for finishing off the work. But here is the *newsletter* despite some glitches.

I received five obituaries in a matter of a few days. From these, I was saddened to note that we lost some world famous limnologists, among which Prof. John W.G. Lund (Ambleside, UK) at the age 102 years, struck me the most. I had met Dr. Lund last at the Windermere Lab almost 25 years ago. I have accepted all the five obituaries and I thank the authors for their reports. This Issue has fewer Announcements than the Reports of scientific activities of the SIL. Yves Prairie, the SIL President, touches on the subject of ecological consequences of some of the major and imminent environmental upheavals. We report two such cases relating to very ancient lakes: both Lake Ohrid in Macedonia and L. Nicaragua, Nicaragua, are threatened by the planned man-made changes in the lakes in very near future. In an Announcement, Roberto Bertoni, Organiser of the 33 SIL Conference, Italy, invites us all to participate in the Congress at Torino, Italy, next year. Tamar Zohary, our SIL Secretary since the last SIL Congress in 2013 at Budapest, Hungary, is very active and is enthusiastically promoting the SIL activities in several ways. For an exercise on Lake

Kinneret Phytoplankton, Tamar has chosen to report for an online pictorial catalogue of the lake phytoplankton. Rios from Chile reflects on status of limnology in Chile. I hope that the young limnologists from other countries will follow suit and provide updates on Limnology in their countries. Last, but not least, I received a brief, invited report from Zhang Xiufeng, a young Chinese scientist (limnologist) from Jinan University, Guangzhou, China. For him the window of Limnology, as it is practised in the USA, goes open as he visits Cornell University and works there on a short-term training fellowship programme, which includes a long cruise on the Great Lakes.

I hope all in all it is a reasonably good Issue and should offer enough food for thought to many a limnologist. Any comments from our readers are welcome.

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Our President Speaks on SIL and Environmental Advocacy

SIL, in its nearly 100 years of existence, has been deeply rooted purely in its science. As an archetypal learned society, SIL was for a long time equated with the nearly obligatory pilgrimage that limnologists did every three years to attend the SIL congresses. Scientific societies today bear little resemblance with this romantic vision of a scientific era past. Not only are we in a time of nearly instantaneous exchanges between scientists, we are also increasingly required by funding agencies, governments and, to some extent, by the public to return



to the those who have funded us the results of our research inquiries. I believe this evolution is in the right direction because it is only fair for those who fund us and because it forces us to articulate better the importance and relevance of what we do. The question is whether this goes far enough?

I remember well a lecture by the twice Nobel laureate Linus Pauling during which he recounted how his advice to graduate students evolved over time. I don't remember the exact wording but it went from 'just concentrate on your PhD' to 'concentrate on completing your PhD first and then you can embrace activism' to 'there is an urgent need for young and energetic scientists to get involved in socially important issues'. It was clear that his message applied to all kind of issues whether they were related to peace, equality or the environment. Until recently, I would have probably favored his earlier vision myself, recognizing that graduate school is a sufficiently challenging period for most people. At the same time, it doesn't take a PhD to realize that the environment in general, and inland waters in particular, are not in the best of shape, locally or globally! Ironically, genuine concerns over environmental degradation are often most loudly voiced by the general public rather than by those actually responsible for making sound environmental policies and who should know more. Politics can be absurd that way.

But what does this state of affairs have to do with SIL? My reasoning is that it should, and a lot. While the concerned public has already access to a plethora of information from the web, it can be very hard to the outsider to distinguish between reliable sources and mere opinion. As such, scientific societies constitute an important body of experts whose voice should serve the general public good just as our publications serve our scientific communities. To this end, SIL will launch through its new website a means by which our community will be able to partake directly in raising awareness and informing public debate on current environmental issues. Examples include the proposed canal linking the Caribbean Sea to the Pacific Ocean through the large L. Nicaragua, a project with potentially enormous effects on the ecology of this important and unique lake (see page 4). Another is the protection of ancient Lake Ohrid in Macedonia, another unique ecosystem threatened by unimpeded developments on its shores (see page 2). If you wish to devote time and energy to these causes or provide your expert opinion on the ecological consequences of such projects, SIL will provide a portal facilitating the dissemination of reliable scientific information and thereby provide support to the local communities who need that information most. If we want the public to support the work and research we do, it is high time that we, as members of SIL, take on this role of advocacy that our inland waters so critically need.



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Lake Ohrid and its Limnology

Ohrid and limnology ought to be a match made in heaven. Nestled on the border between Macedonia and Albania, 693m from sea level in the western Dinaric Alps, this ancient lake has been luxuriating in its microclimate for 2-3 million years, perhaps more, expertly sheltering a uniquely manifold endemism in depths of up to 286m through the ice ages, empires and the entire history of humankind. Amid crystal clear waters, a Darwinian fairytale of global scientific significance has staged an epic tale, but what should be a limnologist's dream is fast becoming a nightmare as a ten-year urbanization plan looks set to crumble the unrivalled freshwater diversity into a deathly tourism monoculture—an environmental cataclysm that could disestablish this fragile ecosystem forever. As such, Ohrid SOS, a local citizens' initiative, is reaching out to the limnological community to play its part in averting an ecological disaster.

Searching deep into the geological past, one first discovers the land that would become Lake Ohrid as a tectonically-motivated, sinking plain amid rising mountains some 5-8 million years in the past. Through a process still not entirely resolved, the sunken plain later filled with water perhaps by way of a pre-existing river, by connection with the Pannonian Basin, or, even, as has been postulated, via a marine channel that may have run from Lake Skadar in northern Albania to the Gulf of Volos in Greece. Either way, a combination of factors such as subduction from ongoing seismic activity, the filtering of springs due to the karstic topography of major water sources from sister Lake Prespa, and its notable depth, Lake Ohrid has avoided death through sedimentation to establish a continuous ecostructure, which, when measured by surface area, arguably supports the greatest diversity of any lake in the world. Over 200 endemic species are harbored in its waters, most notably among gastropoda, ostracoda, ciliophora and tricladida.

Yet this living monument to the magnificence of natural history is to fall victim to the bulldozer. Regional development plans are environmentally brutal yet politically potent: investors and developers are set to concrete over a vital marsh with a tourism complex, waterpark and marina; substitute the reed-bed spawning grounds of the Ohrid carp with artificial sandy beaches; cast out the mute swan from its ecological role as pest-controller and plant-stirrer for other creatures; import picture-friendly palm trees to displace native species; expand roads; and even desecrate a UNESCO-designated biosphere, the adjacent Mount Galicica National Park, with a ski-resort. At one stage, as part of separate—still conjectured—plans, there was even a suggestion that jet-set visitors could arrive on the lake's surface (30x15km) by seaplane to go to new-build casinos. This is Vegas in the Galapagos. If you didn't laugh, you would cry.

But perhaps tears are the reasonable response: a more ecologically insensitive notion of economic expansion in a less appropriate location is scarcely conceivable. Tourism and its associated recreational activities (even without seaplanes) have long been identified as some of the most pressing threats to the Lake Ohrid ecosystem, while academic papers unsurprisingly cite the tarmac scars of roads as significant environmental inhibitors too. In addition, the lake-shore town of Ohrid has yet to establish effective sewerage for its 40,000 permanent inhabitants and 250,000 annual visitors, a systemic failure which would be exacerbated by a grotesquely misshapen tourism industry. Under these conditions, tearing out the lake's natural filters—some of the last wetlands in Macedonia—sanding natural habitats into bespoke beaches, and ratcheting up the very anthropomorphic stressors well-known to be chronically damaging the ecosystem would appear a folly bordering on mania.



1. Ohrid Panoramska: The view from Mount Galicica, a national park where a ski resort is planned, displays Lake Ohrid (left) and her sister Lake Prespa (right). Photographer: Igor Arsovski.



2. Lake Ohrid: Natural beauty is no match for the artificial kind, according to a ten-year urbanization plan that may disestablish Lake Ohrid's unique ecosystem. Photographer: Ljupco Lepi.



3. Studenchishte Marsh: In the shadows of Samuil's Fortress, an historic symbol of blindness, Studenchishte Marsh will be replaced with a tourism complex. It is the last of the lake's natural filters. Photographer: Elena Nikolovska.

The most frustrating aspect of the whole situation is that it does not have to end this way. Macedonia could have her cake and eat it by following a progressive model of ecotourism that recognizes the individuality of her natural assets and ensures their long-term appreciation. Instead of targeting the mass-tourism market, whose days may be numbered anyway, the country could instead embrace one of the many singular points that defines it, i.e. the breathtaking ecological architecture of its ancient lake.

With a refocus on educative and scientific tourism and the right kind of foresight, Lake Ohrid could potentially become a world-leading center for research, which would in turn spawn related industries such as ecotourism, and, in the long-term, the export of knowledge and expertise to other countries seeking to maintain the integrity of their freshwater environments. Indeed, the economic potential of a healthy Lake Ohrid was perhaps best illustrated by Dr. Tobias Lenz a Group Leader in Evolutionary Immunogenomics at the Max Planck Institute for Evolutionary Biology, who explained his signature on an Ohrid SOS Declaration to the Macedonian government demanding a halt to environmentally insensitive plans with the following comment, "Pristine ecosystems such as Lake Ohrid and Studenchishte Marsh provide a unique opportunity to study the natural history of our planet. They harbor biological diversity that needs to be protected at all costs, not only because it is the basis for life

on earth, but also because it may provide information and cues towards medical therapies and biotechnological innovations of great economic value" Clearly, the scientific road is not an easy option, but it at least has future viability, in contrast to the present model, which fails to recognize that the value of its main draw depends intrinsically on natural heritage.

If the vision of educative and scientific tourism seems far-fetched, it is worth remembering the sheer scale of evolutionary creativity that is taking place in Lake Ohrid, and its value to many fields from geoscience to paleoclimatology. Combined with an emphasis on sustainable nature and cultural tourism from non-experts, ecotourism could be furnished with workshops, lectures and courses with accommodation facilitated by the many disused sites already available in Ohrid Town. Not only would this cover the loss of any aggressive lakeshore development, put Macedonia at the forefront of 21st century ecological thinking, and diversify its economy, but it would also solve the age-old problem of seasonal flux whereby thousands of visitors descend for two months in the summer, but leave the whole lake dry for the rest of the year.

Naturally, a shift to the ecological model would necessitate the experience, knowledge and good-will of the limnological community, which is why Ohrid SOS is calling upon members of the SIL to use the weight of their authority to help avert an environmental catastrophe and support Lake Ohrid on the path to an alternative future. The scientific

world has noted before that meaningful protection of Lake Ohrid can only be achieved through a coordinated international effort, and that has never been truer than now. As such, perhaps it is time for limnologists to help turn the nightmare back to a dream once again and bring the Darwinian fairytale to a happy-ever-after unending.

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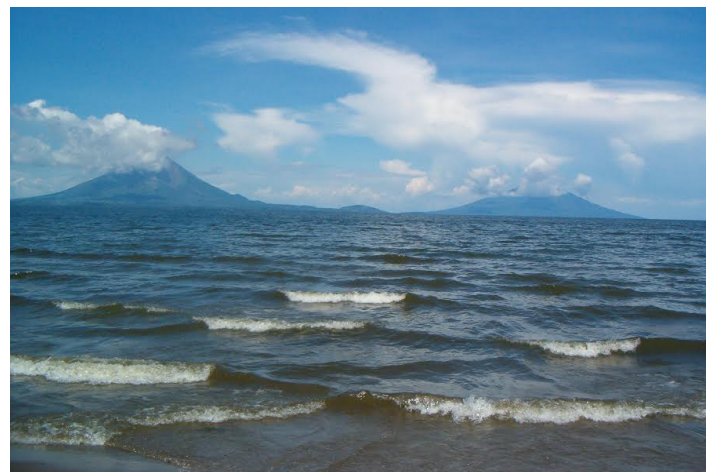
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Ohrid SOS

The potential impacts of the proposed Interoceanic Canal on the ecology and water quality of Lake Nicaragua

China's Hong Kong Nicaragua Canal Development Investment Company (HKND) recently began construction of access roads to build a canal linking the Pacific and Atlantic oceans through Nicaragua. The "Interoceanic Canal" route will include a 105-km swath across Lake Nicaragua (also known as Lago Cocibolca). The canal could severely affect the ecology of the lake system especially due to sediment resuspension as well as sediment disposal into the lake during the construction phase and navigation through the lake. Lake Nicaragua has the largest surface area for a tropical freshwater lake in the Americas and is presently an important source of drinking water and subsistence fisheries, as well as a hotspot of cultural and biological diversity (Huete-Pérez, et al. 2013, Meyer and Huete-Perez 2014). The HKND has commissioned an Environmental Impact Study by the British firm Environmental Resources Management (ERM) on the long-term environmental and social consequences of this project. Neither the HKND nor ERM has released the



View of Mombacho Volcano.



Lake Cocibolca with two Volcanoes. Photo T S Suarez.



Men at work sign at Brito. Photo courtesy: Lara Gelband.

details of this assessment, although work on the canal has already begun (Huete-Pérez, Meyer and Alvarez 2015).

The canal construction phase through Lake Nicaragua would require removal of about 1.2 billion tons of sediment from the lake bottom. Dredging and deep-draft shipping pose a severe threat to water quality and to unique aquatic life as a result of the re-suspension of sediments containing organic matter and nutrients that could induce eutrophication and hypoxia. Therefore, it is critically important to thoroughly characterize the lake sediments, including their vertical compositional

profile, to better understand sediment transport, fate, and the potential impacts of sediment excavation and relocation in Lake Nicaragua. Much more research is necessary to gather sufficient information on sediment characteristics to accurately estimate the amount and types of sediments to be removed by dredging and the most appropriate locations for storing dredged materials as well as their effects on water quality and food web dynamics. Sediment cores taken for scientific investigations from Lake Nicaragua have revealed its sediments are primarily diatomaceous mud mixed with coarse volcanic material (Swain 1966, Slate et al. 2013). This type of sediment would have a profound impact on the ecology of Lake Nicaragua if it were directly disposed of in the lake. Experience from other large, shallow lakes shows that sediment re-suspension can lead to large increases in dissolved nutrients and other solute concentrations in the lake water column; significant changes in the dynamics of solute exchange between the water column and the sediments; and large, and sometimes irreversible changes in the trophic status and dominant primary producers of lakes. These conditions may lead to severe algae blooms, seriously damaging the lake's essential fisheries, and dramatically affecting the lake's vital role as a source of drinking water.

The assumed water balance of the canal project may be wrong. It is anticipated that the canal will require an average of 60 m³/s to operate the locks, and that this hydraulic demand will be met by diverting the flow of a Punta Gorda river into the canal system. This river's watershed has a surface area of 8,400 km², a mean annual precipitation of 3.2 m yr⁻¹, and relative evapotranspiration of 2.2 m yr⁻¹, thus the resulting hydrology indicates an average annual runoff of 90 m³/s. Given these estimates, the canal will not have sufficient flows to operate the locks during dry years and this shortfall would be especially critical during multi-year droughts. Previous extreme conditions during periods of drought and hurricane-generated floods demonstrate the risk of predicting future water budgets based only on very short-term historic data. More attention to long-term climate forecasts is needed to provide management alternatives under climate-change scenarios. If the river cannot meet the hydraulic demands for the locks, water from Lake Nicaragua would be used to operate them instead. If Lake Nicaragua were the sole source of water for the locks, there would be a 0.24 m drawdown in lake level per year (assuming a lake surface area of 8,000 km²). This drawdown would affect the flows of the San Juan River along the Costa Rica border. If drought periods in the river and Lake Nicaragua watersheds were to coincide (for example, during an El Niño year), a much more dramatic decline in Lake Nicaragua water levels would result and it might be necessary to regulate the lake water flow to the San Juan. As the only outlet of Lake Nicaragua, water restriction could have profound effects on the Rio San Juan watershed and migratory species that sustain the lake's high levels of biodiversity.

Lake Nicaragua and the associated crater lakes provide essential habitats that serve as a unique natural experiment where 13 endemic species of cichlid fishes are derived from the source population from Lake Nicaragua have been described so far (Recknagel et al. 2013) and have originated via sympatric species (Barluenga et al. 2006) sometimes within less than 1-2 thousand years (Elmer et al. 2010). This source population is also economically the most important species of fish in Nicaragua and will likely be threatened by dredging the channel through the lake and additions of invasive, non-native species. It is essential to better understand the life history of migratory and endemic fishes to thoroughly evaluate future impacts to the population dynamics and to protect existing fisheries resources within the lake. The impact to the

fishery for large migratory fish could be substantial. Currently, knowledge of the biodiversity and productivity of lower trophic levels is also very incomplete. Although phytoplankton and zooplankton have apparently been collected, no analysis of these data is available. ERM's sampling of benthic invertebrates in the lake is also very sparse. Benthos provide the food base for the important fisheries of the lake as well as critical components of ecosystem processes that sustain water quality. Anecdotal evidence suggests benthic invertebrates (especially Chironomids) play a very important role and probably dominate secondary production in Lake Nicaragua. However, almost no field data are available for this group.

Well-established international best practices require that environmental assessments be completed, vetted, and published before work begins (Jay et al. 2007). The very short period provided by HKND for ERM's environmental study was insufficient given the magnitude of the proposed projects associated with the canal construction. A much more complete analysis of alternatives is essential before a scientifically robust evaluation can be completed. Considering the irreversible damage that could be done to Lake Nicaragua, we call on the Nicaraguan government to carry out the additional studies outlined in this review before a final decision is made on this project.

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Obituaries

John Lund; Distinguished Microbial Ecologist whose methods were emulated by three generations of scientists passed away at the age of 102 years

John Walter Guerrier Lund of Ambleside was acclaimed for his work on microalgae and, especially, the ecology of the planktonic diatom, *Asterionella*, that continues to dominate the algal “bloom” almost every spring in the waters of Windermere. The alga occurs in many other temperate lakes, where, despite its microscopic size (cells barely 0.1 mm in length), popular familiarity with its beautiful star-shaped colonies owes in no small way to the work of Lund, his late wife, Hilda, and the research group he founded at the Windermere Laboratory of the Freshwater Biological Association. Dr Lund sadly passed away at his home in Ambleside on Saturday, 21st March 2015 at the age of 102.

John Walter Guerrier Lund, CBE, D.Sc., FRS, FIBiol, FCIWEM, was born in Manchester on 27 November 1912. He attended Sedbergh School in Yorkshire before starting the next stage of his studies at Manchester University, where he obtained his B.Sc. and M.Sc. degrees. He was attracted initially to zoology but changed to botany acquiring the only first class honours of the 1934 year class, despite having no science education at school. In 1935 he moved to University College, London to work on benthic algae under Professor F. E. Fritsch, then one of the country's leading phycologists, and gained his Ph.D. in 1939. He then worked at the West Midlands Forensic Science Laboratory in Birmingham, for several years as a forensic botanist. However, in 1944, he joined the staff of The Freshwater Biological Association (FBA) as an algologist. He began his work on the ecology of planktonic algae of the English Lake District, initially at Wray Castle and then from 1950 at the Association's famous premises at The Ferry House. He continued in this post until retiring, officially, in 1978, as a Deputy Chief Scientific Officer, although he continued to work several days a week at The Ferry House until 2005.

John Lund's research work on the nature and activity of phytoplankton was always imaginative and thorough and extremely influential. He discovered, described and brought into laboratory culture, many new species of algae, especially of the rarer chrysophytes and xanthophytes. His studies on the distribution, seasonality, population dynamics and ecological requirements of various planktonic species were prolific and often detailed. The accumulated data on *Asterionella* has remained a prime example for the conduct of analytical research. John often devised experiments, of growing scale and ingenuity, to test his hypotheses about the mechanisms controlling algal growth. In the 1960s, he began a series of field experiments employing in situ artificial enclosures of increasing size, realism and complexity: these passed from the cylindrical “bags” deployed in Buttermere, the partitioning of Blelham Tarn with plastic curtains and, ultimately, to the majestic butyl tubes, or mesocosms, placed in that Tarn. They measured 45 m in diameter, extended 11-12 m to the bottom mud and each enclosed some 18,000 m³ of water and became known as the “Lund Tubes”. Using such lake-sized isolates, it became fully possible to investigate and experiment with natural populations of phytoplankton under contrived and manipulated conditions. These “Lund Tubes” continued in use by other scientists from the FBA and elsewhere, until 1984.



John Lund. Photo: The Freshwater Biological Association (FBA) Archives.

During this time, he worked with a fellow scientist, Hilda Canter, whom he later married. Together, they studied the intriguing range of fungal parasites that infect algae, publishing a series of papers on their taxonomy and life-histories which have scarcely been emulated. Rather later on (1995), they published their handsome album of photographs, *Freshwater Algae* – their microscopic world explored (Biopress, Bristol), with Hilda providing the photomicrographs and John the text. This remains an excellent introduction to the remarkable beauty of these organisms, unknown and possibly unimaginable to many people. John was awarded the Prescott prize by the American Phycological Society in 1997.

Another of John's activities concerned the curation of the remarkable Fritsch Collection of Algal Illustrations. This archive of line drawings, copied from the contemporary literature, and started by Professor Fritsch, was given to John and the FBA in 1955; aided by a series of able and dedicated assistants, it was curated, catalogued and progressively expanded at The Ferry House, into a quite unique world resource, supporting the identification and taxonomy of freshwater algae.

A feature of John's work was the close working collaborations he formed with colleagues. These included Dr Jack Talling FRS, the ecophysicist whose work on algal photosynthesis revealed the great importance to productivity of the scale and extent of the variability in underwater light conditions. He collaborated extensively with chemists, John Mackereth and Jack Heron, and zoologist-turned-physicist Clifford Mortimer FRS. He also encouraged a series of assistants and students to develop special interests and talents, in various specialisms – culturing algae, algal bioassays, sediment accumulation and stratigraphy, eutrophication (artificial enrichment of waters with fertilisers and sewage effluents). In doing so, he promoted the continuing ability of freshwater science to cultivate the good biological management of lakes, reservoirs and rivers that is so often threatened by ignorance and inexpert supposition.

John was an admirable colleague. Apart from his sharp intellect, he had an acute memory. He was still able to supply clear details of people and events occurring through his career, even up to and slightly beyond his 100th birthday! His sense of humour was legendary. His laughter, robust and hearty, penetrated the corridors and stair wells of The Ferry House. He – assisted frequently by John Mackereth – would sometimes devise elaborate,

convincing practical jokes, often directed towards his colleague Clifford Mortimer.

John travelled extensively, contributing at scientific meetings or advising on projects overseas. He learned to read and speak Russian, quite fluently and wrote at least one paper in Russian on the suspension of another, common but perplexingly heavy, planktonic diatom, *Melosira* (later renamed *Aulacoseira*). It is said, though with little factual accuracy, that John was minded to learn Russian so as to be able to translate the mammoth volume on algal taxonomy by Korshikov, only then to discover that it was written not in Russian but in Ukrainian!

At home, John collected many accolades, including election as a Fellow (for a time Chairman) of the Royal Society in 1963, the award of a C.B.E. in 1965; and President of the British Phycological Society. He remained loyal to the FBA, championed its work ethic and, indeed, its very existence. He despaired over its contraction in the face of Government-inspired reorganisations of its science base and the dissipation of its expertise. Throughout, John nevertheless remained as many of us had come to know him: charming and unassuming, warm, friendly and caring, with this wonderful sense of humour. He will be greatly missed. Our condolences extend to his son and to his daughter and their families.

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Obituary: Dr. David Wynne (1946-2014)

“When you part from your friend, you grieve not; For that which you love most in him may be clearer in his absence, as the mountain to the climber is clearer from the plain.”

Kahlil Gibran, *The Prophet*

However, we do grieve and miss David who was our friend and part of our scientific life for more than three decades at the Israel Oceanographic and Limnological Research, The Kinneret Limnological Laboratory.

David Wynne was born in London, England on 5th April 1946, where he achieved a B.Sc. degree in Chemistry from the University of Surrey. He immigrated to Israel in 1968, at the age of 22 and continued his studies at The Technion, Haifa where he got his M.Sc. in Biochemistry. He obtained his Ph.D. in Biochemistry/Cell Biology from The Weizmann Institute of Science, Rehovot, submitting the thesis: “Studies on the Mitogenic Site of Lymphocytes”.

Joining Israel Oceanographic and Limnological Research, the Kinneret Limnological Laboratory in 1975, David changed his field of interests from lymphocytes to algal physiology; nutrient supply and recycling; biochemistry of aquatic micro-organisms and aquatic toxicology. His main studies focused on the metabolism of Lake Kinneret phytoplankton, in particular, those relating to phosphorus utilization by the freshwater dinoflagellate, *Peridinium gatunense*, that formed massive blooms in the lake nearly every spring. He found that the intracellular “surplus” P pool, and the activity of the enzyme alkaline phosphatase gave *Peridinium* an advantage to cope with low concentrations of available phosphorus in the Kinneret epilimnion. Those findings resulted in scientific collaboration with Prof. E. Carpena from the University of Bologna, Italy, Prof. A. J. H. Pieterse, The University of the Orange Free State, South Africa and Prof. G-Yull Rhee, New York State Department of Health and SUNY/Albany.

In addition to phosphorus, David examined the nitrogen metabolism of algal species isolated from Lake Kinneret. During this work, he developed

a new assay to measure algal nitrate reductase (NR) activities. He was involved in studying nitrogen cycling in the Kinneret ecosystem using stable isotopes (¹⁵N, ¹³C) as a tracers, in collaboration with Prof. J. J. McCarthy, Harvard University and Prof. Mark Altabet then at Dept. of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution in the USA. His algal studies were and are of prime importance in understanding the complex chemical and biological interactions in Lake Kinneret, as well as in formulating future water quality and lake management policies.

His contribution to applied research was in aquatic toxicology; pesticide residue monitoring aimed at assessing the potential threat of these chemicals and their breakdown products to the Lake Kinneret ecosystem. The expertise that he acquired from this project resulted in the funding of several projects by the United Nations Environmental Programme, Mediterranean Action Plan (UNEP/MAP).

He had supervised many short- and long-term research students, who came to learn some of the chemical and biochemical techniques that had been developed by David.

His presented his work at many international meetings and published scientific papers in highly regarded international journals. One of his papers was among the three papers nominated for the prestigious Provasoli award given by the Phycological Society of America for the best phycological paper of 1997.

David, who passed away on 4th April 2014, was devoted to his family, his wife Cynthia and their four children. We cannot speak about David without talking about his love for dogs, which were part of his and his family life.

“For life and death are one, even as the river and the sea are one
In the depth of your hopes and desires lies your silent knowledge of the beyond”

“And what is it to cease breathing but to free the breath from its restless tides”
Kahlil Gibran, *The Prophet*

Dr. Ora Hadas

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Dr Rosemary H. Lowe-McConnell 1921-2014



Ro McConnell in Kigezi 1967.

Many long-standing members of SIL will remember meeting Ro McConnell at a number of congresses, particularly the 1995 SIL Congress in Sao Paulo, Brazil where she was awarded the SIL Nauman-Thienemann Founders medal for 'outstanding research into tropical fish ecology and initiatives for conservation'. By then she had also contributed to at least two of the *Mitteilungen** published by the Society.

She was, indeed, an internationally well-known fish biologist who started her career at the Freshwater Biological Association, on Lake Windermere, just after she graduated from Liverpool University in 1942.

E.B. Worthington was still the Director and many other well-known limnologists were already working there. Her first research work was on eels in the waters of the Lake District but she already had strong ambitions to go to Africa and be an "explorer".

It was Worthington who arranged with the UK's Colonial Office that Rosemary Lowe should go to Lake Nyasa (now Malawi) and advised her on all the equipment she would need to take with her. She was also sent to be trained in Aberdeen and in London to learn how to sample and identify fishes. It was at the Natural History Museum that she first met Ethelwynn Trewavas. In 1945, as the war was ending, she set off alone on a ship to South Africa and then travelled by train to Southern Rhodesia (now called Zimbabwe) and on by road to Nyasaland. Her job was to study the commercial fish species in the lake, particularly tilapia (now *Oreochromis*), following on from an earlier survey carried out by Bertram, Borley & Trewavas (1942). Ro's work concentrated on the six tilapia species (all but one endemic to the lake) the systematics and growth rates of the different species, their life histories and the ecology of their habitats. All this involved travelling to different parts of that huge lake, taking samples and talking to fishermen. Initially she only had a bicycle but did eventually acquire a small car.

Ro left Nyasaland in 1947 and travelled home via Uganda and then down the Nile. While in Uganda, she met a number of colonial scientists and visited the site at Jinja, where the laboratory was being built to house the East African Fisheries Research Organisation. She was recruited to their staff before continuing on to the UK where she spent several months writing the report of her work on Lake Nyasa. She returned to Uganda in November 1948 and worked at EAFRO until 1953. Working with a team of colleagues was very different from her isolation in Nyasaland and Ro made many life-long friends. It was also here that she met Richard McConnell, a senior geologist, and when they got married in Jinja in December 1953 Ro had to give up her job at EAFRO because married women, believe it or not, were still not allowed to work for the UK's Overseas Research Service.

From then on Ro was always a "free-lance" researcher. After their marriage, and a trip home to England, Ro and Richard went out to Bechuanaland (now Botswana) where Richard had a new job at the Geological Survey Base in Lobatsi. They explored the Kalahari Desert and the Okavango Delta and Ro collected fish whenever she could. She also returned to Jinja to finish her papers on the work she had done there. She then drove back to Bechuanaland (C. 5000 km) in her cloth-topped Land Rover, picking up an

African servant en route. This was typical of the invincible Ro.

In 1957 the UK Overseas Geological Survey moved Richard to British Guiana (now Guyana) in South America. Ro found this move to a new continent "immensely stimulating" and became attached to (but not employed by) the Fisheries Division of the Department of Agriculture and was allocated some laboratory working space. While they lived in Georgetown she researched the fish species of the mainly riverine freshwaters and also became a biologist on a research ship exploring the marine fish on the continental shelf. She was fascinated by the huge numbers of different South American species she found and the differences in their taxonomy and evolution from the species she had studied in Africa. Ro wrote an account of her time in Guyana in her book *Land of Waters: Explorations in the Natural History of Guyana, South America* (2000) published by The Book Guild, Lewes, Sussex.

When Richard retired in 1962 they moved back to Britain and settled in the village of Streat in Sussex, just inland from the south coast. Ro became an associate of the Natural History Museum in London until 2004 with her base in the Fish Section. There she was back with Ethelwynn Trewavas and also Humphry Greenwood, who had been at Jinja while she was there, and other former colleagues. Fish researchers from all over the world were visiting the museum and all her collections were there too so her research and writing continued.

Ro never actually retired. Her international contacts led to her participation in many conferences, consultations and overseas projects. She had the time and freedom to become involved in many different organisations and projects all over the world. Over the years she was appointed to the UN Special Fund Mission to Ghana in connection with research on Lake Volta in 1964, and became a member of a team working on problems connected with the Kaianji Dam on the River Niger in 1965. She assisted editing papers for an FAO World Symposium on Warm Water Fish Culture in Rome (1966) and was involved in many other projects, including the Anglo-Brazilian project on the Matto Grosso in central Brazil, 1968) and being a member of the Committee governing the British International Biological Programme project on Lake George in Uganda, which is where I first met her. She was co-editor, with E.D. LeCren of *The functioning of freshwater ecosystems*. IBP no. 22, CUP, 1980.

Richard died in 1986 and, in her book *The Tilapia Trail – the life story of a fish biologist*, (2006), Ro describes how, being free to attend the 1987 SIL Congress in New Zealand she found herself "... 'volunteered' to be Convenor of the newly formed African Great Lakes Group" "which involved many overseas conferences and revisiting these lakes ..", as she described in *Freshwater Forum* 20, 2003 (published by the FBA).

Ro wrote and/or edited more than 80 significant publications including a number of books and conference proceedings as well as her own research papers. The books with her as sole author include: *Fish Communities in tropical freshwaters: their distribution*,



Ro McConnell on her 90th birthday party.

ecology and evolution, published by Longman in 1975; *The Amazon. Rivers of the World*, Wayland Publishers Ltd., 1978; *Ecological Studies in tropical fish communities*, Cambridge University Press, 1978 (which was also translated into Portuguese in 1992).

Ro's scientific work was acknowledged not only by SIL but also by her election as a Vice-President of the Linnean Society of London in 1976 and the award of their Gold Medal in 1997. She also received a silver medal from the Fisheries Society of the British Isles. She became a Founder Member of the Association for Tropical Biology and an Honorary Member of the FBA and the British Ecological Society. Two species (a catfish, *Bathyclarias loweae*, and a mayfly, *Afroptilum loweae*) have been named after her. Sadly, Ro died on 22 December 2014, aged 93.

*Lowe-McConnell R.H., R.C.M. Crul & F.C. Roest, 1992. Symposium on resource use and conservation of the African Great Lakes, Bujumbura, 1989. *Mitt. Internat. Verein. Limnol.* 23: 1-128.

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Mary Burgis

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Obituary: Dr. Bohdan Matvienko, Brazil

The chemist Bohdan Matvienko was a retired professor from São Paulo University at São Carlos when in 1997 he accepted an invitation to measure methane (CH₄) and carbon dioxide (CO₂) emissions from Curuá-Una Reservoir, located 70 km southeast of the junction of the Tapajós and Amazon rivers. He built a rugged chromatograph and a wooden trunk – it was named the *caixão* [coffin] – to pack the chromatograph in for the trip north. Into the *caixão* also went calcium carbonate to make the CO₂ gas standard; sodium acetate and sodium hydroxide to produce the CH₄ gas standard; glassware for gas-standard preparation and gas emission sample storage; and over-the-counter syringes to inject the samples into the chromatograph. This was the first of dozens of surveys, until his last one in July 2013. He invented equipment and created procedures to measure gas profiles in the water column, dissolved gas in water, methane generation in the water column, and to quantify carbon (C) flows.

How much C was actually being buried in the reservoir sediment during the days (typically five) in which the survey was being carried out? To answer this question he devised and taught his co-workers a method using silicon as a C burial tracer. Consequently, we not only discovered that about 10% of the total C settling on the sediment would eventually escape decomposition, but also that C burial rates ranged between 4 and 188 (median 28 mg C m⁻² d⁻¹) in the sampled reservoirs between latitudes 13.8°S and 22.5°S.

Bohdan spent thousands of hours working on rivers and reservoirs all over Brazil. He worked on the clean waters of the Amazon as well as on the foul waters of the Pinheiros River in São Paulo City. An aficionado of astronomy, in April 2008 Bohdan used the Big Dipper to steer his mates back to Marabá City: the boatman had lost his bearings after taking the wrong turn at *Bico do Papagaio* [Parrot Beak junction] at latitude 5.2°S, where the Araguaia joins the Tocantins River. From a boat on the Xingu River, Bohdan photographed a sloth adrift being hoisted to safety by boatman Tenório. When boatman Baía stopped the boat on a bank of the Tucuruí Reservoir near the rainforest, Bohdan summoned his urban-dweller co-workers to disembark, and experience a midday stroll in the rainforest.



Bohdan Matvienko. October 12, 2012.

He pointed out how little direct sunlight reaches the ground and how the dense vegetation was actually meters above our heads. On the São Salvador Reservoir Bohdan filmed a jaguar swimming by, island bound. When the boat with Bohdan and boatman Zé Antonio hit a rock and capsized on the São Marcos River in 2011, Bohdan, a swimmer since his youth, considered going after the suitcase containing his logbook, camera and sampling tools. But that would jeopardize the boat, Zé Antonio's sole means of livelihood. Bohdan did not swim after his own gear; it floated away. He stayed and helped fix the boat.

Bohdan was born on March 13, 1933 in Tighina, Ukraine. He was living in Austria when he immigrated to Brazil in 1950. He liked new words and created an amusing collection of proto-words. Mountain climbing was Bohdan's lifelong hobby. He drew and painted very well and had at one time considered being an artist. Flying his *asa delta caseira* [home-made hang glider] in 1978, Bohdan was the champion hang-glider pilot of São Paulo State. He died in a fall in the French Alps on September 7, 2013.

Elizabeth Matvienko Sikar

Obituary to Hofrat Prof. Tzt. Dr. Werner Kohl

Former Director of the Federal Institute of Water Quality,
Honorary President of the Austrian Committee of the International
Association for Danube Research (IAD)



On September 23, 2014 our highly respected colleague Prof. Werner Kohl died in his 87th year of age after enduring a long and serious illness.

Prof. Kohl was born in Vienna, April 14, 1928. He completed his studies at the University of Veterinary Medicine in Vienna in 1961. Affiliated to the same institution, Prof. Kohl started his professional career as Scientific Assistant at the Institute of Bacteriology and Animal Hygiene in 1962.

By 1964 Prof. Kohl got employed at the Federal Institute of Water Quality in Vienna due to the initiative of Prof. Reinhard Liepolt, the founder of IAD, with the mission of establishing and managing bacteriology as a major branch in the institute. The implementation of easily applicable procedures

for bacteriological water monitoring and assessment are among Prof. Kohl's remarkable merits. His demand of not restricting the sampling to water alone, but take samples of sediments, fishes, aquatic plants and biofilms, too, when investigating surface waters, highly improved the bacteriological classification of water bodies. Already in the 1960s he emphasized the significance of animals (e. g. water birds, grazing animals, dogs) as a reservoir for Salmonella and other pathogenic bacteria. He also added knowledge on the hazard potential of using contaminated waters for humans. Numerous scientific papers and lectures supported his efforts. These developments added to his merits on the monitoring of recreational and bathing waters. His foresighted intentions were affirmed by the adoption of a European Directive concerning the management of bathing water quality, fresh water as well as marine, by the European Union. In 1983 Prof. Kohl was appointed Director of the Federal Institute of Water Quality, in Austria. With restless activity he promoted the extension of the subject-specific fields in his institute to accelerate the interdisciplinarity of the monitoring and quality assessment of water bodies.

For his activities in lecturing at the University of Vienna he was highly esteemed. In 1976 he finished his habilitation thesis "About the importance of bacteriological monitoring for the assessment of running waters, by example of the Austrian Danube River" (Arch. Hydrobiol., Suppl. 44, 4, 392-461, in German), which can be considered as pioneering achievement. In the same year he received the *Venia Docendi* for "Physiology and Ecology of Water Bacteria". During his scientific activities he supervised many diploma and doctoral students. In 1985 he was appointed Associate Professor at the University of Vienna.

In 1983 Prof. Kohl was elected as president of the Austrian Committee of the International Association for Danube Research, carrying this function more than ten years until 1996. During his presidency more than 30 scientific projects and more than 10 scientific events had been organised successfully. The Reinhard Liepolt Award for Danube Research created by Prof. Kohl still supports scientific projects in the Danube catchment area. In 2013 Prof. Kohl was awarded "Honorary President of the ÖK-IAD" due to his outstanding merits for the association.

Besides his large scientific knowledge Prof. Kohl had excellent human skills. Establishing an atmosphere of mutual trust between collaborators was his profound basis for successful cooperation. At any time he was open for the problems of colleagues, staff members and students. Prof. Kohl's personality will always serve as an example for us.

By the end of 1993 Prof. Kohl retired as director of his institution in his 66th year of age. With great engagement he then focused his interest on the historic development of waste disposal and water protection.

In the announcement of his death his family members wrote: "His life was characterized by the concern for his family, professional engagement, scientific interest and the passion for his garden."

All those who have known Prof. Kohl will treasure his memory.

With gratitude

Gerhard Kavka

gerhard.kavka@baw.at and gerhard.kavka@aon.at

Announcements

The Meeting of the SIL Plankton Ecology Group — PEG 2015

(First announcement)

Guangzhou, China, November 20-24, 2015

ORGANIZER

Jinan University
Ecological Society of China

Co-organization with
Nanjing Institute of Geography and Limnology, Chinese Academy of Sciences
Institute of Hydrobiology, Chinese Academy of Sciences

Supported by

Chinese National foundation of Sciences (NSFC)
Water Resource Department of Guangdong Province
National Basic Research Program of China (No: 2012CB956100)

SCIENTIFIC FOCUS

PEG 2015 will focus on a topic drawing wide attention: Chicken or Egg- Unraveling the role of plankton diversity in bloom dynamics. Phytoplankton blooms are on the rise worldwide nowadays, especially in developing countries, adding urgency to the need to understand how

blooms form. In this five days meeting we want to bring together a broad spectrum of plankton ecologists and discuss the role and change of plankton diversity in bloom dynamics. In this interactive meeting, the discussion is centered on five focal points covering from ecological theory and management:

1. How to define a bloom?
2. Grazers and blooms
3. Bloom dynamics across different climatic zones
4. Plankton diversity and community organization in blooms
5. Monitoring, modeling, early warning and management of blooms

GENERAL SCHEDULE

November 20, 2015: registration and ceremony in evening
November 21, 2015: Academic presentation and poster
November 22, 2015: Academic presentation and poster
November 23, 2015: a field excursion
November 24, 2015: Academic presentation and conclusion in the afternoon.

REGISTRATION

The registration fee a short field excursion is 600 Euro, and 300 Euro for students. The registration fee is free for all members of the scientific and organization committees. The invited speakers are fully supported by the organizer. The certifications with award will be given to two best oral

presentation and three best posters will be selected for students by the scientific committee of PEG 2015.

ABSTRACT SUBMISSION

All participants are welcome to submit an abstract of 300 words. For the invited lectures, the abstract can be longer up to 400 words. The invited lecture is 40 minutes and each oral presentation is 20 minutes. Students are encouraged to give oral presentation and posters. The detailed information will be online.

DEADLINES

The deadline for registration is September 1, 2015. Applicants will be notified before October 1, 2015.

ORGANIZATION COMMITTEE

Dr. Bo-Ping Han (Institute of Hydrobiology, Jinan University, Guangzhou 510632, China. Email: tbphan@126.com)

Dr. Daogui Deng (School of Life Science, Anhui Key Laboratory of Resource and Plant Biology, Huaibei Normal University, Huaibei 235000, China)

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Dr. Yang Jun (Key Laboratory of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen 361021, China)

Dr. Yonghong Bi (Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan, China)

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WELCOME MESSAGE

Dear Participants of PEG 2015,

We are very pleased to invite you to participate in the Meeting of the SIL Plankton Ecology Group—PEG 2015, which will be held in Guangzhou, China, during 20-24 November, 2015. PEG 2015 will be organized by Jinan University. Following the tradition of Plankton Ecology Group in SIL, PEG 2015 will bring together freshwater ecologists working on different aspects of freshwater plankton ecology and offer an open platform for deep discussion and exchange of ideas between plankton ecologists from diverse waters and regions. As usual, PEG 2015 will be organized around invited lectures linking to each of the different themes, and oral and poster presentations. Each day is centered around a different theme linked to bloom development.

The plenary discussion will be specially organized to transfer state-of-the-art information to young scientists and students. We also offer a platform for students to present orals and posters, where they will get feedback on their scientific research and presentation skills from senior scientists. For each theme, we invite two speakers to give plenary presentations. Apart from themes on ecological theory relating to bloom development, we will highlight a theme on monitoring, modeling, early warning and management of freshwater blooms, where we will try to bring ecological theory and methods to practical application in mitigation and management of blooms. To encourage then future generation of ecologists, the two best oral student presentation and three best student posters will be highlighted by the scientific committee. A selection of the meeting papers reflecting the different themes of the meeting will be published as a special issue in an international journal.

The Meeting of the SIL Plankton Ecology Group—PEG 2015 is the first to be organized in China. The organizer—Jinan University is a special university in China. It is the first university established by the state in 1906 by the Qing Government to offer education to overseas Chinese and a long tradition for international exchange. The city—Guangzhou is the biggest one in southern China, modern but at the same time rich in Chinese traditional culture. Only 150 km away from Hong Kong and Macao, Guangzhou is easily connected to the other parts of China and the world.

PEG 2015 in China will be interesting and exciting!

Looking forward to seeing you in Guangzhou,
With kind regards on behalf of PEG 2015 organizer

Boping

Bo-Ping HAN

Department of Ecology

Jinan University, Guangzhou

China

The 33rd SIL Congress in 2016 in Torino, Italy

The engine behind the 33rd SIL Congress of 2016 officially ignited in 2013, at the previous SIL Congress (August 2013) in Budapest (Hungary), when the nomination of Torino, Italy, as hosting town was formally accepted. Since then we took many steps, starting with forming the organizing committee, and the transfer of work for congress organization to a professional company. We also made a budget plan intended to reduce cost of participation in the Congress (see www.sil2016.it). But the main interest of the congress organizers is to promote the scientific relevance of the event. To meet this aim, we formed a broad national organizing and scientific committee, that includes representatives from the various limnological traditions and expertise characterizing our country. The international scientific committee too has an objective to cover both science and geography. Also, and importantly, we made sure that the genders are equally represented both in the national and the international committees.

In addition, we decided to issue a call for special session to give SIL members the opportunity to promote the topics they consider most interesting and timely. The call will open on July 1, 2015 and the organizing committee invites all those interested to submit a session proposal. We are convinced this is the best way to have an interesting congress, since it opens the floor to those issues that SIL members consider most up-to-date and worthy of the society's attention. The scientific committees will carefully consider every submission, merge the overlapping proposals and provide suggestions to improve the scientific sessions. Please consult the SIL Congress website for further details.

We are also trying to get patronage and sponsorship, which will hopefully bear fruits soon. But we did not only work behind the scenes. We have also taken an action to advertise and promote the SIL 2016 Congress that we are hosting. One example: those who attended the most recent ASLO meeting in Granada, Spain, have certainly come across the SIL gazebo, hosted by ASLO (as shown in the photo). On the walls of the stand were two posters, one with the timeline of SIL Congresses since the first one in 1922, and the other illustrated the aims of the next SIL congress in Torino next year. Anyone interested in advertising the SIL 2016 Congress can contact me (r.bertoni@ise.cnr.it) about the pdf of the posters. You are very welcome to use these in forthcoming conferences.

Among the many factors that determine the success of a congress, crucial is the participation of numerous outstanding scientists, both young and the experienced ones but infact those who are eager for discussing, comparing, and sharing our insights and questions. Please help us meet this condition by promoting the widest participation of limnologists to the 2016 SIL in Torino, Italy. Keep up updated by visiting the SIL Congress website (www.sil2016.it)! The next update with the most recent features is scheduled for July 2016.

Arrivederci a Torino!

Roberto Bertoni (r.bertoni@ise.cnr.it)

CNR Institute of Ecosystem Study, Verbania, Italy



The SIL Gazebo at ASLO Meeting in Granada, Spain (22-27 Feb. 2015). Roberto Bertoni, the organizer of SIL in Torino, Italy (2016) is talking with a visitor on the right.



I.S.RIVERS

2nd international conference on Integrative sciences and sustainable development of rivers

22-26 June, 2015 - Lyon, France

(Editor's note: Sorry this Announcement is late for those wanting to attend the Meeting but it provides information that this meeting was just held in Lyon. For more information please contact the organizers).

Register now!

to the I.S.Rivers international conference

Register now

The **I.S.Rivers international conference, taking place from 22-26 June, 2015**, focuses on the sustainable management of the world's natural and human-impacted rivers, especially European ones.

The conference has two objectives:

- **to promote multidisciplinary approaches by identifying and discussing the most recent scientific advances, as well as sharing experiences of research and practices** taking into account the diversity of rivers in terms of functioning, ecological services, stakeholder involvement and management strategies.
- **to engage all stakeholders and to build links** to stimulate European and international collaborations between scientists and river managers.



PROGRAMME:

Check out the programme of the conference

Programme

I.S.Rivers in a few words:

2.5 days of conferences in 4 concurrent sessions including 100 oral presentations, a look at 70 rivers from 37 different countries, 3 specialised workshops, 4 technical tours, a poster exhibition, a photo exhibition and 2 plenary conferences.

> 4 concurrent sessions for 4 complementary themes

From Tuesday afternoon to Thursday 10.30am

History of river uses, river governance, understanding river dynamics and ecological restoration, links between rivers, territories and cities: large rivers are the key subject of this second edition of I.S.Rivers.

Four complementary themes are proposed for an overview of research, experiences and practices within these environments.

4 COMPLEMENTARY THEMES:

- > Trajectories, pressures, adaptation
- > Ecological restoration and ecosystem services
- > River functioning and management issues
- > Rivers and men in interaction

Name: Anne Clémens and Elodie BreLOT, General secretaries of I.S.Rivers

Organisation: GRAIE - ZABR

Email: isrivers@graie.org / **Website:** www.isrivers.org

Reports

An On-Line Pictorial Catalogue of the Phytoplankton of Lake Kinneret



Tamar Zohary and Alla Alster
Israel Oceanographic & Limnological Research Ltd., Y. Alon Kinneret Limnological Laboratory,

The 'Lake Kinneret Phytoplankton catalogue' is an on-line photo-catalogue of the diverse phytoplankton forms present in Lake Kinneret. It is comprised of digital photomicrographs and text, combined in a user-friendly, interactive and searchable format

available on the internet, to ensure maximum academic, professional and educational access. The catalogue is viewable at:

http://kinneret.ocean.org.il/phyt_cat_listView.aspx

At this site the reader will find high-quality digital photos of phytoplankton species that occur in Lake **Kinneret** together with their scientific names, comments about features relevant to their taxonomy, and information about their ecology. Currently the catalogue includes about 200 photographs of 70 phytoplankton genera and 100 phytoplankton species.

This internet catalogue is an on-going project. We foresee expanding the species collection both in depth, to include more information about the species that are already documented in the catalog, and in width, to include additional organisms from the Lake Kinneret and other waterbodies in Israel. In addition, a genetic barcode will be added to each of the species

A few mistakes may have crept into this catalogue. Please do not hesitate to point out any errors and send e-mail to me: tamarz@ocean.org.il.

Lake Kinneret Phytoplankton catalog [אודות הקטלוג](#)

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [R](#) [S](#) [T](#) [U](#)

division: [Bacillariophyta](#) [Chlorophyta](#) [Cryptophyta](#) [Cyanobacteria](#) [Dinophyta](#) [Euglenophyta](#) [Haptophyta](#)
[Prasinophyta](#) [Rodophyta](#)

Colacium vesiculosum
Ehrenberg, 1838

Cosmarium ?

Cosmarium laeve
Rabenhorst, 1868

Crucigeniella rectangularis
(Nagelli) Komarek

Cryptomonas sp. Ehrenberg, 1832

Cyanodictyon imperfectum
Cronberg and Weibull, 1981

Cyclotella meneghiniana
Kützing, 1844

Cyclotella meneghiniana
Kützing, 1844

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An example, searchable page from the Kinneret phytoplankton on-line catalogue.

History of Limnology in Chile

The limnology in Chile, on an scientific integrative studies began with the classic work “Araucanian lakes” that included Argentinean and Chilean lakes between 39 and 41° S (Thomasson, 1963), nevertheless the first integrative studies in Chilean lakes began in the 1970s (Woelfl et al., 2003), from these first studies until first years of 1990. Hugo Campos (1935-1998) and his co-workers studied with details the lakes located between 39 and 51° S. In the last years of the 1990s, the Laboratory of Limnology of Comahue National University in Bariloche began their studies in Southern Argentinean lakes (Modenutti et al., 1998), and they found many similarities with Chilean lakes, and currently they are called “Patagonian lakes” for lakes located in Argentina and Chile between 39 and 51° S. Since 1978 until 1997 in Chile it was studied with details Riñihue lake that was the most studied lake in Chile at long term (1978-1997; Woelfl et al., 2003).

The limnological studies in Chile before the first years of the 1990s were restricted mainly to lakes between 39 and 51° S. The decease of Hugo Campos generated a discontinuation in limnological studies for approximately five years, but these studies continued in central Chilean rivers (Figueroa et al., 2007). Currently, the limnological studies are few descriptions of saline lakes in northern Chile, reservoirs and rivers in central Chile, advanced ecological topics in Patagonian lakes, and basic descriptions in lakes located in extreme southern Chile.

The inland waters in Chile are very heterogeneous in a latitudinal gradient due the climatic variations. These environmental variations generated different kinds of inland water bodies that require particular studies mainly in local academic institutions, because many of these water bodies have endemic flora and fauna that are important for study evolutive and biogeographical process, and are important water resource for urban and agricultural and industrial purposes.

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Riñihue lake, Chile.

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A dream for clear water is on for a young generation of Chinese freshwater ecologist

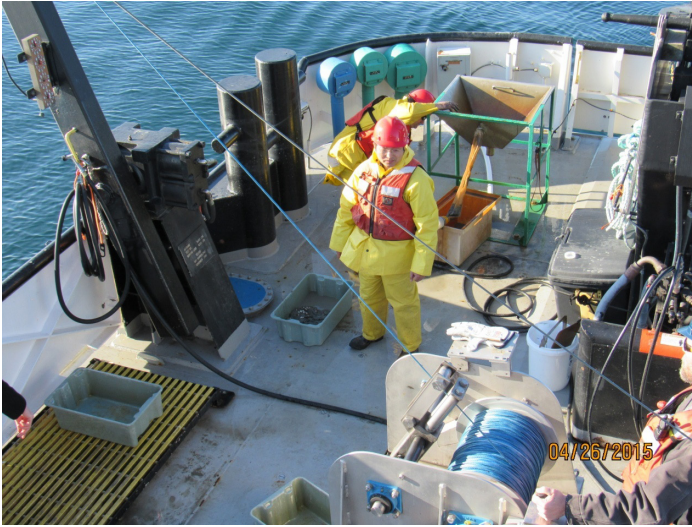
Xiufeng Zhang is among the tens of hundreds of young freshwater ecologists of China! As a young teacher as many others in universities, he has an opportunity teaching and doing research! He works for the national key discipline of hydrobiology and department of ecology in Jinan University, Guangzhou, China, mainly teaching and researching on freshwater ecology.

He was born in 1977 in a small village located beside a shallow river (Guohe) in plain area, Anhui province, China. It was a very clear river mostly with calm water. When he was a young boy, he spent plenty of time in the river, playing, fishing, boating, swimming and even diving into the water collecting clams, fish and tortoises by hand. It was really nice feeling for a boy coming out with aquatic animals, though he did not know why it was cold in the bottom and warm at the surface at that time. Live with the river, he had a very happy childhood and the clear river left him a deep impression!

When he was a young man, he left home and went to universities to finish his degrees. During this period, though he rarely went to the river in summer, the happy childhood in the clear river was still in his mind. Then, in one summer something happened and he found the river was not clear anymore. Water had become green and turbid, fish died, smelt badly, and submerged plants had disappeared. What happened, why? He asked himself for many times without an answer, he began searching for the real reasons.

Luckily, he found a job at the Institute of Hydrobiology in Jinan University after he got his Ph.D. in ecology from the State Key Laboratory of Coast and Estuary Research, East China Normal University, in summer of 2005. In the new position, he knows many famous limnologists from the country and the world, explaining why the water turns turbid from different aspects. It is believed that nutrients, fish, benthic animals, zooplankton, submerged plants, benthic algae, global warming, et al. all play important role in maintaining the regime of an aquatic ecosystem. He tried one by one in mesocosms and found that it really works. It was funny and he was happy!

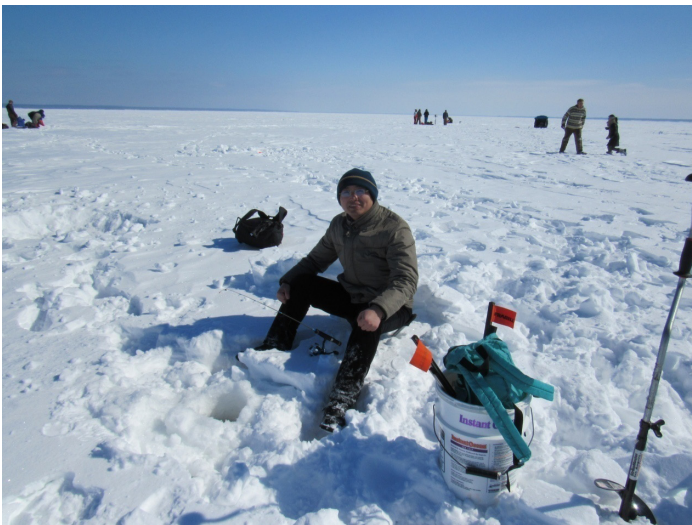
In the new position, he also has opportunities to read books and



Benthic animals sampling in Great lakes.



Mussels sampled in Great lakes.



Ice fishing in Oneida lake, Cornell Biological Field Station, NY, USA.

papers on limnology. One day, he found a book *Regime Shifts in Lake Ecosystems: Pattern and Variation* written by Stephen R. Carpenter. He was excited and read it carefully. He thought that he found the real reasons for the water turning turbid known as regime shift during eutrophication from the book. He was very happy!

After that he begins to think how to turn the water back from turbid to clear water state. It is known that ecological restoration can return the eutrophic shallow lakes clear. He is lucky that he can practice in Professor Zhengwen Liu's lab and lake group and do some work in the restoration of Huizhou West Lake, in South China. In addition, it is known that benthification of mussels is increasing water clarity in many north-temperate lakes. He tried on mussels in aquatic mesocosms, the water really became clearer. He keeps on thinking how mussels can increase water clarity at entire ecosystem level and what the relative mechanisms are. Luckily, he has a chance to study abroad for one year and hosted by professor Lars Rudstam in Cornell University, who has done plenty of work on benthification of mussels in Oneida lake and Great lakes.

At Cornell University, he has time to read more books and papers about effects of mussels on lake ecosystems. In addition, Professor Lars provides him plenty of information by seminars, lab meetings, national and international conference, discussions, ice fishing, field survey, et al. which give him full knowledge on almost all aspects of lake ecosystem. He has a big cultural shock in America by the excellent research topics and special angles in lake ecology given by limnologists, not only on shallow lakes, but also on Great lakes. For example, professor Lars provided him a chance to join the Great Lakes cruise organized by EPA, Cornell and other Universities from April to May, 2015. It could not impress him more for the water clarity with Secchi disc over 20 m and rich mussels sampled in the Great Lakes.

With so much help and support from his family members, friends and even other limnologists he never met from all over the world, he appreciates very much and has no reason not to work hard and do still better research in improving water clarity and water quality in the future!

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