www.limnology.org

SIL news

Volume 72 – June 2018

In This Issue

Material for the December 2018 issue should be sent to the Editor by:

1 October, 2018

Dr. Ramesh D. Gulati N100/Department of Aquatic Ecology Post Box 50
6700 AB Wageningen
The Netherlands
+31640992987
E-mail: gulatird@gmail.com

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

It is both opportune and apt to hold the next (now the biennial) SIL Congress in China, in August 2018. It will be the first SIL Congress in China. Although the country has equally huge water problems, comparing to huge population size the water issues, the studies carried out in China until recently form only a minor fraction of that is both needed and feasible. As Editor of Aquatic Ecology, through first decade of the 21st century, I was both amazed and impressed to learn from the large number of manuscripts received by me from China for publication, about the progress of aquatic scientific studies being carried out in China. I had the privilege of visiting China in 2009 and again in 2011 (to attend an international triennial Shallow Lakes Meeting). I was quite overwhelmed to see the interest in water at various Chinese universities and research institutions. The Chinese are doing some impressive work, in the fields of both fundamental and applied scientific studies on water.

China has geographically a strange situation regarding water availability in different parts of the country. China's agricultural core is in the North but all the major water sources are in the South. In other words, whereas the northern part of the country has severe water shortages, most available water is in the southern part of the country. Here the country also has the most flooding: attempts are already underway to transport water from south to north by a system of canals through routing. Areas where water has already been diverted to are Habei and Schaanxi regions in the north. There are also plans in progress to desalinate sea water by using new technologies. Also, there are glaring examples of unequal spatial distribution of water. According to World Bank criteria, cities like Beijing should be having about 1500 cubic meters of available water per person but Beijing has only 100 cubic meters per person. In brief, water shortages prevailing in China need speedy solutions through sustained efforts before a water born tragedy occurs.

This time we have several announcements in the newsletter relating to SIL in China, the nomination results of new Executive Board, results of Student Winner awards (results of 2nd such Competition); Wetzel Travel Awards to attend the upcoming SIL Congress in China; Announcement of Biennial Conference of World Lakes in Japan later this year and that of SIL WG on Ecohydrology Meeting later in September 2017 in Lodz, Poland. The three Reports on studies concern the pollution in coastal waters of Lake Baikal, Salmonids in Chilean inland waters and on studies in Asia by the WG Chairman Freshwater Ecology in Asia Water.

R.D. Gulati

Editor, SILnewsletter (gulatird@gmail.com)

6 May, 2018

Report from SIL's Nominating Committee

In autumn 2017, the SIL Nominating Committee started an exploration among the SIL National Representatives and Members to identify the best candidates for the highest offices of SIL: the President, three Vice-Presidents, and the General Secretary / Treasurer. This process lasted a few months and resulted in the selection of two candidates who accepted the responsibilities to assume the office of the President, one candidate for the position of General Secretary/Treasurer

and five candidates agreed to take up the positions of Vice-Presidents. Among these five candidates, two were asked to accept the responsibility of coordinating and encouraging limnological activities in developing countries, an important task which characterises SIL's activities since its establishment. All the candidates were selected because of their commitment to the national and international development of Limnological Sciences and for the further development of Limnology.

An electronic ballot was therefore organized to allow all the SIL members to vote and choose one President, two Executive Vice-Presidents for general affairs and one Executive Vice-President for the developing countries. The ballot was opened on February 27, 2018 and lasted until April 15, 2018.

We are, therefore, very happy to inform all the SIL members that according to the results of the ballot the new elected President of our Society is Dr **Thomas Mehner**, Deputy Director, at present working at the Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB) in Berlin, Germany. Others elected are:

- Dr **Martin Kainz**, researcher at the Inter-university Center for Aquatic Ecosystem Research - WasserCluster – Biological Station of Lunz, Austria, Dr **Jeremy Piggott**, Assistant Professor in Aquatic Biology at the Trinity College Dublin, Ireland, are the new Executive Vice-Presidents.
- Dr **Inés O'Farrell**, Principal Researcher at the National Council of Scientific and Technological Research of Argentina (CONICET) and Vice-director of the Institute of Ecology, Genetics and Evolution of Buenos Aires, Argentina, was elected as Executive Vice-President for the developing countries.
- Dr **Tamar Zohary**, Senior Researcher at the Yigal Alon Kinneret Limnological Laboratory of the Israel Oceanographic and Limnological Research (IOLR), Israel, was reconfirmed in her present role as General Secretary/Treasurer.

According to the SIL traditions, the new officers will start their 3-year term right **after** the Congress in Nanjing (China) in August 2018. Since nearly all the SIL officers are changing simultaneously, our current President, Prof. Yves Prairie, has agreed to continue as President for one more year, while Dr. Thomas Mehner will act as President-elect. In August 2019 the change-over of Presidents will become actual.

In the meantime, I have the pleasure to call all the SIL members to congratulate our new SIL Officers and wish them success in their respective positions.

Looking forward to meeting you in Nanjing,
Luigi Naselli-Flores, luigi.naselli@unipa.it

(Chairman of the SIL Nominating Committee)

Thomas Mehner – President Elect

Tamar Zohary – Elected General Secretary/Treasurer

Inés O'Farrell –Vice-President Elect for Developing Countries

Jeremy Piggott – Vice-President Elect

Martin Kainz – Vice-President Elect

Welcome to SIL 2018 (Nanjing, China)

Figure 1. Zhonghua Hall, a multi-functional room at Nanjing International Expo Convention Center

The XXXIV SIL Congress (SIL 2018) will be held in Nanjing (Jiangsu Province, China) from 19th to 24th of August 2018. For updated information, please visit the website: www.sil2018.com

Among the many factors that determine the success of a congress, crucial are the plenary lectures. Eight exciting plenary lectures have been organized, including Baldi Lecture and Kilham Lecture:

1. Mixing Dynamics: From Hutchinson to the 21st Century (Baldi Lecture) (by Prof. Sally MacIntyre);
2. Limnology and the future of African inland waters (Kilham Lecture) (by Dr Richard Robarts);
3. Eco-evolutionary dynamics and the response of aquatic biota and ecosystems to global change: details that matter? (by Prof. Luc de Meester);
4. Rivers in crisis: What are the prospects for conservation of freshwater biodiversity in Anthropocene East Asia? (by Prof. David Dugeon);
5. Emerging perspectives on the role of benthic production and food web linkages in lakes (by Prof. Jake Vander Zanden);
6. Lacustrine deposit and past global change (PAGES) research in China (Prof. Ji Shen);
7. Anthropogenic lakes: Global environmental impacts of dams and reservoirs (by Prof. Philippe Van Cappellen);
8. Sequential impacts of climate warming on cold-water fish: From preferred habitat to behaviour and growth (by Dr Matthew Michael Guzzo).

There will be 15 regular sessions and 29 regular sessions, which cover both traditional topics of limnology and newly emerging issues in researches on inland waters. For detailed information, please visit http://www.sil2018.com/dct/page/70023.

For the convenience of participants, the registration of SIL 2018 will use a method of "one-pay-for-all" in which a participant will need to pay a registration fee and social dinner, lunch and excursion will be covered.

Organizing field excursions is one of the traditions of SIL Congress and this gives a great chance for participants to know more about the host country China. Five excursions will be organized for SIL 2018 and the places chosen are both of limnological, cultural and historical interests. For instance, an excursion will be organized to visit Lake Taihu, the most well-investigated lake in China, and a visit to the nearby city Wuxi which is well known, being one of the birthplaces of China's modern industry and commerce.

More information about the congress tours (field excursions) is available on the website http://www.sil2018.com/dct/page/70047.

We look forward to seeing you in China in August 2018.

Contact information:
Dr. Zhengwen Liu
Secretariat of SIL 2018
Nanjing Institute of Geography and Limnology,
Chinese Academy of Sciences, Nanjing, China

Tel: 0086-(0)25-86882103; 86882213
Fax: 0086-(0)25-57714759
Website: http://www.sil2018.com/
E-mail: sil2018@niglas.ac.cn or zliu@niglas.ac.cn

Figure 2. Places of limnological interests for field excursions during SIL 2018

Announcement: Wetzel Award Winners 2018 (SIL Congress, China)

Dear SIL members,

Here are the 2018 Wetzel Award winners.
These winners will be doing presentations
at the 2018 SIL Congress in China. Please
congratulate them at the congress and see their presentations.

Ger, Kemal	Brazil
Getachew, Melaku	Ethiopia
Grubisic, Maja	Germany
Karpowicz, Maciej	Poland
Nava, Veronica	Italy
Stewart, Simon Donald	New Zealand
Woolway, R. Iestyn	UK
Zvereva, Iuliia	Russia

Sally MacIntyre, SIL Awards Committee
Tamar Zohary, SIL General-Secretary-Treasurer

Winner of the 2nd SIL Student Competition

It is a great pleasure to announce the winners of the 2nd SIL Student Competition:

First Place: Matthew M. Guzzo, Canada.

For his article: Guzzo M, Blanchfield P, Rennie MD. 2017. Behavioural responses to annual temperature variation alter the dominant energy pathway, growth, and condition of a cold-water predator. Proceedings of the National Academy of Sciences (USA) 201702584.

Second Place: Ralf C.H. Aben, The Netherlands.

For his article: Aben RCH, Barros N, Van Donk E, Frenken T, Hilt S, Kazanjian G, Lamers LPM, Peeters ETHM, Roelofs JGM, Senerpont Domis de LN, Stephan S, Velthuis M, Van de Waal DB, Wik M, Thornton BF, Wilkinson J, DelSontro T, Kosten S. 2017. Cross continental increase in methane ebullition under climate change. Nature Communications 8(1): 1682.

Third place: **Clay Prater, Canada.**

For his article: Prater, C. Wagner ND, Frost PC. 2017. Interactive effects of genotype and food quality on consumer growth rate and elemental content. Ecology 98:1399-1408.

The winners will be awarded their certificates at the Congress in Nanjing this year and they will all be exempted from paying registration fee. The winner of the first place, Matthew Guzzo, will give a Plenary Talk.

We thank all those who contributed to the competition, including all the 40 applicants from 22 countries, mentors who wrote recommendation letters, SIL National Representatives who coordinated internal elections at the first stage of the competition, and national committee members who ranked the papers at the National Level competition.

We all owe great thanks to the nine volunteers who examined and ranked the 25 articles participating in the international stage of the competition. All of them are leading editors of limnological journals, thus experts in assessing the merits of scientific papers. Their identity will be revealed in Nanjing.

We take this opportunity to announce that the third SIL student competition will begin shortly after the Congress in Nanjing, where details of this competition will be provided. Its winners will present at the SIL Congress in South Korea in 2020.

Prof. Judit Padisák, Chair, Student Competition Committee

Dr Tamar Zohary, SIL General Secretary

Portrait of Matthew M. Guzzo

Matthew M. Guzzo on a field trip

Portrait of Ralf C.H. Aben

Ralf C.H. Aben on a field trip

Portrait of Clay Prater

Clay Prater on a field trip

International Symposium: Ecohydrology for the Circular Economy and Nature-Based Solutions Towards Mitigation/Adaptation to Climate Change, 26 – 28 September 2017, Lodz, Poland.

Figure 1. Welcome speech and rationale of symposium by Prof. Maciej Zalewski

Since water is a major driver of biogeochemical evolution, and hence of biodiversity and biological productivity, regulation of ecohydrological processes becomes the first and fundamental step towards achieving sustainability in the catchment, particularly in human-modified and degraded systems. Since its formulation under UNESCO's International Hydrological Programme, the WBSRC (Water, Biodiversity, Ecosystem Services for Society, Resilience to climatic changes and Cultural heritage) strategy aims to achieve synergies between nature-based solutions and the circular economy for a sustain development and to achieve increasing efficiency. Thus, SIL Working Group on Ecohydrology invited to Lodz top experts from scientific institutions and international organizations for discussion about the solutions for achieving the sustainability of aquatic ecosystems in adaptation to human manipulations and climate changes. The symposium was attended by 147 participants from 24 countries: there were 70 oral presentations and 25 posters dealing with interdisciplinary topics.

The Chairman of the Symposium Steering Committee was Prof. **Maciej Zalewski** (Director of the European Regional Centre for Ecohydrology of the Polish Academy of Sciences, Head of Department of Applied Ecology, Faculty of Biology and Environmental Protection, University of Łódź, Poland). The members of the Steering Committee were: **Giuseppe Arduino** (Chief of Eco-hydrology, Water Quality and Water Education Section, Division of Water Sciences, UNESCO International Hydrological Programme), **Johannes Cullmann** (Director of the Climate and Water Department, World Meteorological Organisation), **Giovanni Bidoglio** (Head of the Water Resources Unit, Institute for Environment and Sustainability, Joint Research Centre, European Commission), **Stefan Uhlenbrook** (Coordinator

Figure 2. Nature-Based Solutions for Water and Wastewater Management in a Circular Economy" plenary lecture by Prof. Stefan Uhlenbrook.

of United Nations World Water Assessment Programme, Director of Programme Office on Global Water Assessment UNESCO), **Carlos Garcia De Leaniz** (Chair in Aquatic Biosciences and Director of the Centre for Sustainable Aquatic Research at Swansea University, United Kingdom), **Zbigniew Kundzewicz** (Head of Laboratory of Climate and Water Resources, Institute for Agricultural and Forest Environment of the Polish Academy of Sciences, Member of the Intergovernmental Panel on Climate Change).

On the first and second day of the Symposium, prominent key-note speakers, gave talks on the various aspects of using the ecohydrological assumptions for sustainable management of environment combining the circular economy with nature-based solutions. The opening speeches, on the needs and perspectives of using ecohydrology for the protection of natural resources and their sustainable use, were given by Professors: Giuseppe Arduino, Giovanni Bidoglio, Stefan Uhlenbrook and Peter Bridgewater. The perspective of water resources management in the face of global threats was provided by Prof. Luis Chicharo (University of Algarve, Portugal). He pointed out that ecohydrology concept, proposed by the UNESCO-IHP, almost two decades ago sets the use of interrelationships between hydrological conditions and biota as a basis for improving the resilience and restoration of impacted ecosystems. Thus, ecohydrology is the Natural Based Solution that should be considered for the Circular Economy objectives of reducing and regenerating natural products and services, for aquatic ecosystems. Similar aspects were addressed by Prof. Patrick Meire (University of Antwerp), who discussed the importance of the integrated ecohydrologial approach for restoration of water ecosystems. He used Schelde estuary as an example. Whereas Prof. Edyta Kiedrzyńska (ERCE PAS) indicated the need to develop ecohydrological solutions for water quality improvement catchment areas of rivers to protect Baltic Sea resources. Interesting perspectives on developing ecohydrological approach in China were presented by Prof. Jun Xia (Wuhan University; Chinese Academy of Science).

We carried out the following sessions during the Symposium:

1. **Water and Environment as a Critical Components of Circular Economy.** Circular Economy is a rapidly developing strategy that promotes greater resource productivity and reduces waist production and emission of pollutants. This session was devoted to the integration of knowledge and frameworks of Circular Economy and ecohydrology.

On the third day of the symposium, the special panel session was organized together with the representatives of governmental and decision makers and with representatives from the industry and business sector. It provided an insight into the existing practice of translating knowledge into the wisdom of sustainable management of fresh water resources.

2. AMBER – the Role of Dams in River Ecosystems. The AMBER project (funded by the European Union's Horizon 2020 research and innovation programme) stands for Adaptive Management of Barriers in European Rivers. Discussion was focused mainly on the importance of dams and barriers in river systems.

3. Ecohydrology, Nature-Based Solutions and Circular Economy for the City of Future. The session was focused on integrated approach to the urban water cycle and natural capital management, which is necessary for the City of the Future, including cities in expansion or retrofitting (applying new solutions to improve existing infrastructure).

4. The special SIL session titled: **Limnology and Ecohydrology for Nature-Based Solutions.** The sessions aimed at integrating our limnological knowledge and ecohydrological models and principles, which provide scientific background for regulating the processes and interactions in order to enhance water resources, restoring and maintaining biodiversity, offering ecosystem services for societies and to build a resilience to climatic and anthropogenic impacts. We

Figure 3. Opening session of the symposium (from left: dr Giovanni Bidoglio, prof. Paweł Rowiński Vice-President of the Polish Academy of Sciences, Hanna Zdanowska, President of the City of Lodz, prof. Antoni Różalski, Rector of the University of Lodz)

Figure 4. Group photo of symposium participants

paid special attention to assess the environmental quality and role of its monitoring, as well as efficiency of ecohydrological solutions and ecosystem biotechnologies for solving the existing problems facing aquatic ecosystems.

The special event during Symposium was the "4th Symposium of Healthy Rivers and Sustainable Water Resource Management: Reservoir carbon cycling and GHG (greenhouse gases) fluxes: from the perspective of Ecohydrology for Mitigation and Adaptation to Climate Change". A Side Event was co-organized by Lodz Infrastructure Company and University of Lodz for the Blue-Green City of Future, during which participants of the symposium planted 15 trees as a mark of future cooperation for the development of blue-green network in the City of Lodz.

Concluding the Symposium, the sessions' chairmen found that ecohydrology revealed to us the new natural solutions and biotechnologies not only in the management and protection of environment but also in the enhancement of its sustainability potential expressed as WBRSC goals of sustainable management. The symposium deliberations show that we have started to manage water in a way that integrates water quality, quantity and biotic and abiotic processes, and that these holistic, global approaches are needed to develop further.

Concluding the SIL session, the chair Prof. P. Meire said that we had a very interesting presentations. Despite that the presentations concerned various problems, the anthropogenic disturbances in the dynamics of water ecosystems were crucial. In order to counteract this, a comprehensive approach based on the assumptions of ecohydrology is necessary as proper risk assessment requires integrative analysis of the structure and dynamics of hydrological and biogeochemical processes at a catchment scale. This allows identifying of the regulatory feedbacks between hydrology and biota for potential application of ecohydrological nature-based solutions and ecosystem biotechnologies.

The papers resulting from the symposium will be published in *Ecohydrology & Hydrobiology* journal (http://www.elsevier.com/journals/ecohydrology-hydrobiology). This special Issue of the journal will also include a paper on the conclusion and synthesis, which will focus on the emerging areas of collaboration between research, policy and practice, key challenges and the predicted problem-solving approaches.

The symposium was organized by the European Regional Centre for Ecohydrology of the Polish Academy of Sciences in cooperation with: University of Lodz (Poland), UNESCO International Hydrological Programme, Ecohydrology Programme (France), World Meteorological Organization (Switzerland), UNESCO World Water Assessment Programme (Italy), International Centre for Water Resources and Global Change u/a UNESCO (Germany), Chongqing Institute of Green and Intelligent Technology Chinese Academy of Sciences, Key

Figure 5. Key note lectures and Chairmen of the sessions at IS EHCNC 2017 after the successful action of trees planting. From left: prof. Stefan Uhlenbrook, prof. Pawel Rowiński, dr Giovanni Bidoglio, prof. Peter Bridgewater, prof. Charles Vorosmarty, Yohannes Zerihun Negussie, Radosław Łuczak (President of the Lodz Infrastructure Company), dr Giuseppe Arduino, prof. Luis Chicharo, prof. Wolfgang Junk, prof. Maciej Zalewski, prof. Jun Xia. Each tree is supplemented with a plaque with names of the prominent scientists who participated in the symposium.

Laboratory of Reservoir Environment Chinese Academy of Sciences, UNESCO Chair on Ecohydrology: Water for Ecosystems and Societies, University of Algarve, Faro (Portugal), International Center for Integrated Water Resources Management (USA), AMBER – Adaptative Management of Barriers in European Rivers (HORIZON 2020), International Society of Limnology (SIL), Joint Research Centre, European Commission and Lodz Infrastructure Company (Poland).

More information could be found at http://isehcnc.com

Authors: **Adrianna Wojtal-Frankiewicz** (University of Lodz, Poland; vice-chair of SIL Working Group on Ecohydrology; adrianna.wojtal@biol.uni.lodz.pl), **Maciej Zalewski** (ERCE PAS; chair of SIL Working Group on Ecohydrology).

World Lake Conference to be held in Japan: An Announcement

The World Lake Conference is globally recognized as a place for multi-sectoral participants to exchange their views and experiences on the sustainable management of lakes and their basins. The next conference will be held in Ibaraki Prefecture, Japan with the theme of "Harmonious Coexistence of Humans and Lakes-Toward Sustainable Ecosystem Services" in October 2018. It is our honor to invite you all to participate in the conference and share the latest issues related to the lakes in the world.

1 Host Organizations

- Ibaraki Prefectural Government
- The International Lake Environment Committee Foundation (ILEC)

2 Dates

- October 15-19, 2018

3 Venue

- Tsukuba International Congress Center （Tsukuba City, Ibaraki Prefecture, Japan）

Special sessions will be also organized to supplement the regular programme of SIL 2018, and are intended to provide a sample of the state-of-the-art in a field of special interest to inland waters.

4 Main program

- A Keynote Speech
- B Policy Forum

Domestic and overseas policy managers will discuss the future conservation of the lake environment.

- C Lakes Session

Citizens, administrators, researchers, etc. of lake basins in Japan and other countries will discuss the theme of 'Harmonious Coexistence of Human and Lakes“

- D Lake Kasumigaura Session

Stakeholders in the Kasumigaura region will discuss the future vision on Lake Kasumigaura.

- Technical Sessions
- Technical Session 1: Biodiversity and Biological Resources
- Technical Session 2: Sustainable Use of Freshwater Resources
- Technical Session 3: Water Quality and Ecosystem Functions of Lake Environment
- Technical Session 4: Lakeside History and Culture
- Technical Session 5: Regional Activities and Culture
- Technical Session 6: Monitoring Based on Scientific Knowledge
- Technical Session7: Countermeasures and Technologies for Sustainable Use of Ecosystem Services
- Technical Session 8: Citizens' Activities and Environmental Education
- Technical Session 9: Integrated Lake Basin Management(ILBM)
- E Exhibition

5 Registration

- Online registration is available.
- Details: http://www.wlc17ibaraki.jp/en

On the salmonids presence in Chilean inland waters

Figure 1. Salmonid at Serrano river (51°S Chile).

The salmonids are widely distributed geographically in inland waters (Wetzlar, 1979; Iriarte et al., 2005). They, include both brown trout (*Salmo trutta*) and raibow trout (*Oncorrhynchus mykiss*) that are widespread among practically all Chilean continental territory (Wetzlar, 1979; De los Ríos-Escalante & Mardones, 2013, Fig. 1), including coho salmon (*O. kisutch*), chum salmon (*O. keta*), red salmon (*O. nerka*),

Figure 2. Brown trout captured in Tierra del Fuego (53°S Chile).

chinook salmon (*O. tchawytscha*), and Atlantic salmon (*S. salar*). They all are all widespread in Chilean Patagonian (39-53°S) rivers and lakes (Iriarte et al., 2005; Encina et al., 2017). Both brook trout (*Salvelinus fontinalis* and lake trout (*S. namaycush*) are restricted to high mountain and southern Patagonian (53-56° S) inland waters (Iriarte et al., 2005). Salmonids species were introduced in Chilean inland waters for sport fishing or aquaculture or for both purposes (Fig. 2; Iriarte et al., 2005).

The salmonids presence in Chilean inland waters lead to strong ecological effects in native fauna such as fishes and invertebrates, because salmonids are active predators, that can reduce the abundance of native fishes and invertebrate animals (Soto et al., 2007). In this scenario, some benthic endangered invertebrate species such as crustaceans would be more vulnerable due active salmonids predation on them, as has been observed in northern (De los Ríos-Escalante & Mardones, 2013) and Patagonian inland waters (Encina et al., 2017). In Chile, salmonids have no natural predators, otherwise perhaps the sport fishing would be a good option to manage fishes stocks so as to ensure sustainability of the salmonids as well as protection of native fauna.

The salmonids presence has been reported also for Peruvian (Hurlbert et al., 1984) and for Argentinean Patagonian (Reissig et al., 2006) inland waters, the literature reports that young salmonids would be active zooplankton predators in lakes (Hurlbert et al., 1984; Reissig et al., 2006) and Argentinean Patagonian rivers (Pascual & Ciancio, 2007). Nevertheless, the ecological effects of salmonids on pelagial and benthic food webs need more ecological studies, and also it is needed to do more interdisciplinary studies considering the social and economic effects due sport fishing activities.

Acknowledgements

Projects MECESUP UCT 0804, Tides Foundation (Grant TRF13-03011), and M.I. for her valuable comments and suggestions to improve the present manuscript.

References

De los Ríos-Escalante P, A. Mardones, 2013. Ecology of the malacostracans of northern Chilean inland waters. Crustaceana 86 :1511-1519

Encina F, Vega R, Lara G, P De los Ríos-Escalante, 2017. Ecological role of benthic crustaceans in Chilean North Patagonian lakes and rivers (Araucania region, 39° S). Crustaceana 90: 437-447.

Hurlbert SH, W Loayza, T. Moreno. 1986. Fish-flamingo-plankton interactions in the Peruvian Andes. Limnolology & Oceanography, 31: 457-468.

Iriarte A., Lobos GA, FM Jaksic, 2005. Invasive vertebrate species in Chile and their control and monitoring by governmental agencies. Revista Chilena de Historia. Natural, 78: 143-151.

Pascual MA, JE Ciancio, 2007. Introduced anadromous salmonids in Patagonia: risk, uses and a conservation paradox. In: Bert., T.M. (Ed). Ecological and Genetic Implications of Aquaculture Activities, 333-353 p. Springer.

Reissig M, C Trochine, C Queimaliños, E Balseiro, B. Modenutti, 2006. Impacts of fish introduction on planktonic food webs in lakes of the Patagonian Plateau. Biological Conservation, 132: 437-447.

Soto, D, I Arismendi, C Prinzio, F Jara. 2007. Establishment of Chinook salmon (Oncorhynchus tshawytscha) in Pacific basins of southern South America and its potential ecosystem implications. Revista Chilena de Historia Natural, 80: 81–98.

Wetzlar H 1979. Beiträge zur biologie und Bewirtschaftung von Forellen (Salmo gairdneri und S. trutta) in Chile, Freiburg, 1979. PhD Thesis Dissertation-Albert Ludwigs Universitat, Germany.264 p.

Patricio De los Ríos. Departamento de Ciencias Biológicas y Químicas, Facultad de Recursos Naturales, Universidad Católica de Temuco, Casilla 15-D, Temuco, Chile; and Nucleo de Estudios Ambientales UCTemuco. Email: prios@uct.cl

The Oldest Lake on the Planet (Lake Baikal) Experiences Rapid Ecological Changes in the Coastal Zone

Considering its giant water masses, some limnologists believed, that Lake Baikal was resilient to eutrophication because its vast volume of water would dilute nutrients considerably (Grachev, 2002; Kozhova and Izmest'ev a, 1998). A similar opinion existed among marine scientists during the first half of the 20th century about the vulnerability of the oceans to eutrophication and other forms of pollution. Now, however, coastal eutrophication and the resultant dead zones in the ocean are well recognized globally (Diaz and Rosenberg, 2008; Rabalais et al., 2002), and oceanographers working offshore beyond the continental shelf acknowledge that no place is immune to the effects of human-derived nutrients (Karl and Tien, 1997; Van Dover et al., 1992). The same is true for Lake Baikal. Results of our investigations show a permanently progressing "ecocrisis" in the shallows of Lake Baikal and provide the arguments how the coastal zones of large aquatic ecosystems are 'first responders' to the most concentrated land-derived sources of contamination (Schneider et al., 2014), and it is here that

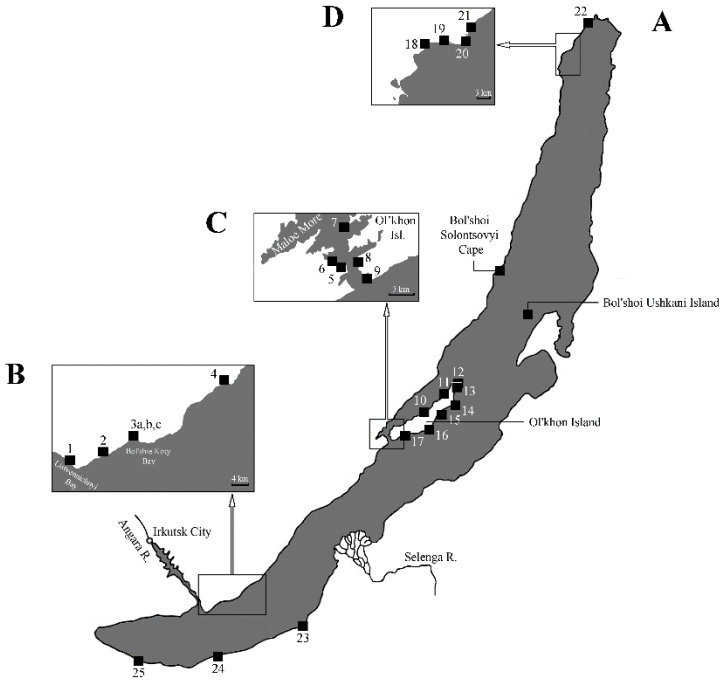


Figure 1. Map of Lake Baikal with sampling localities: 1 — Listvyanka Settlement, 2 — Emelyanikha Bay, 3 — Bol'shie Koty Settlement and Bay (a, Chyornaya Stream; b, Zhilishche Stream; c, Bol'shaya Kotinka Rivulet), 4 — Bol'shoe Goloustnoe Settlement, 5 — Tutaiski Bay, 6 — Sakhyurte Settlement, 7 — Kharin-Irgi Cape, 8 — Perevoznaya Bay, 9 — Ushun Bay, 10 — Khuzhir Settlement and Shamanka Bay, 11 — Zantyk Cape, 12 — Khoboi Cape, 13 — Shunte Levyi Cape, 14 — Izhimei Cape, 15 — Khara-Khushun Cape, 16 — Ukhan Cape, 17 — Khalzyn Cape, 18 — Senogda Bay, 19 — Zarechnoe Settlement, 20 — Tyya River mouth, 21 — Severobaikal'sk City, 22 — Nizhneangarsk City, 23 — Babushkin City, 24 — Tankhoi Settlement, 25 — Baikal'sk City (courtesy of Dr. A. Shirokaya).

eutrophication problems are most acute (Timoshkin et al., 2016; 2018). For many decades Lake Baikal has been considered as one of the most pristine and untouched freshwater ecosystems in the world. This is, however, not the case according to the results of our current research.

Baikal coastal zone ("BCZ") was investigated for about ten years during 2007–2017 (Fig. 1). Several negative ecological phenomena have been detected in the benthos of "BCZ" within last 5–7 years: (1) mass development of *Spirogyra* spp. ("SBL") near settlements throughout the lake (Fig. 2); (2) patchy autumn replacement of native filamentous *Ulothrix zonata* by *Stygeoclonium tenue* in shore-line macrophyte communities around entire "BCZ"; (3) mass development of Baikalian benthonic blue-greens belonging to *Tolypothrix, Schizothrix*, *Phormidium* genera (potentially capable to produce toxins, Belykh et al., 2016) in near shore communities around the coastal settlements; (4) huge amounts (up to 100 kg/m2 wet weight) of algal wash-ups annually detected in 4–5 coastal areas (Fig. 3); (5) mass disease/death of the main filtrators – endemic Lubomirskiidae sponges accompanied by abundant development of saprophytic, toxin-producing Oscillatoriales and other benthonic cyanoprocaryotes at the scale of entire Lake.

In this short report we are able to concentrate exclusively on the mass *Spirogyra* proliferation and its reasoning. Significant changes in macrophyte composition, development and stratification were recently described (Kravtsova et al., 2011; 2014; Timoshkin et al., 2014–2018). Abundant proliferation of non-typical for Baikal *Spirogyra* spp. was first detected in the upper macrophyte zones, locally, in Listvennichnyi and Bolshye Koty bays (South Baikal), in 2010–2011 (ob. cit.). No earlier monitoring data existed due to financial reasons. Regular June and September round-Baikalian surveys, started in 2013–2017, indicated, that "SBL" were mostly detected in August–October (average wet biomass 120–200 g/m2; 40–60% of the projection area; up to 500 g/m2 and 100% of the projection area in the most polluted areas) in "BCZ" throughout much of the lake (Fig. 1). This abundance of "SBL" is compatible with the maximum wet biomass values of native macrophytes recorded formerly (Izhboldina, 1990: 0.5 kg/m−2). Also in 2014–2017, the "SBL" was noted on Ol'khon Island at two localities (i.e., the ferry harbor in Perevoznaya Bay and Shamanka Bay opposite the town of Khuzhir on Ol'khon Island). By 2015, "SBL" were reported at several new localities along the west coast of South Baikal (Emelyanikha, Sennaya Bays and a coast opposite Polovinnyi Cape) as well as Maloe More Strait. From 2016 its mass proliferation was detected in Aya Bay (one year after the new hotel, ca. 300 m away of the shore line, was opened), and in majority of the north-western shallows from Senogda Bay to Elokhin Cape. In summary, *Spirogyra* spp. became massively developed and even dominated the benthic macroalgal communities along much of the eastern coast, and in many areas along the western coast of Baikal (Fig. 2).

Listvennichnyi Bay in South basin and Tyya–Senogda coast in North basin investigated to date were characterized by year-round "SBL", which invariably included other non-typical filamentous macro-algae (mainly *Oedogonium* spp., etc.) and blue-greens (see above). In May–June 2016, "SBL" have also been detected in the littoral opposite of Baikalsk City (at least, at 3–7 m depths – evidently, one more, the third all-the-year round vegetation area of *Spirogyra* spp.), and several wooden harbors. In autumn the alga already dominated on shallower areas (till 0.5 m). To conclude, *Spirogyra* distribution area is gradually increasing both horizontally and vertically. In some investigated areas of stony littoral it became abundant up to 24–30 m depth.

Figure 2. Typical example of the mass *Spirogyra* "morphotype 1" bloom around the coastal settlements, 100% of projective area. November 10, 2012, Bolshye Koty Bay, depth 1.5 m.

Figure 3. Typical view of the giant algal wash-ups and gastropod "cemeteries", annually detected in Senogda Bay (North Basin). September 23, 2017.

Causal Factors

Several hypotheses were applied to explain the "SBL": global warming, water level fluctuations, decrease of the grazing pressure, increase of methane concentration in water due to the gas hydrate destruction and anthropogenic eutrophication.

To clarify the reasons, we analyzed the conditions in 2013–2017: "SBL" spatial-temporal distribution along the west coast of the Lake; spatial distribution around islands in Lake Baikal; inter-annual dynamics of the quantitative characteristics at west coast of South Baikal. In parallel, the ground, lake, tributary water hydrochemistry and element composition were studied, as well as the distribution and abundance of faecal indicating microorganisms (as the waste tracers). We finally tried to correlate these data with above mentioned potential drivers: global warming, water level fluctuations, etc. (Timoshkin et al., 2018).

Only one of ca. 12 *Spirogyra* morphotypes, found in the Lake and its tributaries, dominated the macrophytobenthos of these areas of "BCZ" within 2011–2017 (so-called *Spirogyra* "morphotype 1" (for description and Figs, see Timoshkin et al., 2018). Potentially, due to specific reproduction pattern (microscopic free-floating zygospores and filament fragments), *spirogyra* is able to colonize all "BCZ". Nonetheless, its distribution is patchy, the blooms are mostly concentrated opposite of the settlements and recreation centers, in late summer–autumn. Bol'shoy Ushkaniy Island, eastern coast of Ol'khon Island and some areas of the north-western coast remain free of Spirogyra till 2017. Hydrochemical and elemental analysis of the ground waters (lyzimeter samples), splash zone interstitial waters, some tributaries near "SBL" show significant nutrient concentrations (sewage contamination), which causes the benthic algal outbreaks. High concentration of faecal matter indicating bacteria in the interstitial water samples (Enterococci: 3,000–12,000 CFU 100 mL−1), and even in lyzimeter ground water samples (E. coli and Enterococci: 1580 and 2140 CFU 100 mL−1, respectively) taken opposite the private houses, at 3.5–4 m depth within the soil, supports this conclusion. Even more, the lyzimeter samples were enriched with Na, Cl, S (typical of groundwater polluted by fecal wastes). Important biogeochemical data were obtained by Kulikova et al. (2017). They performed ICP–MS analysis of three common Baikalian macroalgae: Ulothrix zonata, Draparnaldioides baicalensis, Tetraspora cylindrica var. bullosa and *Spirogyra* spp. The authors observed, that the spyrogyra from Baikal accumulates about 200–20–80 times more sodium and 8–2–40 times more chlorine (which could enter ground waters from urine only) than three mentioned Baikalian macroalgae respectively.

Conclusions. No correlation between patchy spatial-temporal *Spirogyra* "morphotype 1" distribution in Baikal and the 1940–2017 surface water temperature dynamics, water level fluctuation or other factors was found. Surprisingly, the trend for surface water temperature in the south basin near "SBL" was negative at all three meteorological stations, along the west coast from 2000–2016 (i.e., −0.2 to −0.3 °C per 10 years) (Shimaraev M.N., pers. comm.).

Results of our multidisciplinary investigations indicate that the anthropogenic contamination of "BCZ" through the wastes is the primary and most important factor of "SBL" appearance in Baikal. The minor, but permanently entering nutrients in the coastal zone, as well as Na and Cl from the non-purified sewages provide possibility to colonize the rocky bottom at about 20 m depths the lake in its northern part or even 30 m in its southern part (South Baikal – I.V. Khanaev, pers. comm.). *Spirogyra* "morphotype 1" should be considered as perfect indicator of the non-purified domestic sewage contamination.

The governmental schemes of the ecological monitoring of the deep large lakes are often not effective due to "superconcentration" of the efforts exclusively on the pelagic zone. In order to detect, understand and describe the anthropogenic changes of the ecosystems at the full scale we have to include the monitoring of the "most sensitive" coastal zone (the splash and near-shore zones including). Benthonic communities deserve special attention. As distinct of planktonic communities, the precise investigations and monitoring of benthos is almost "extinct direction" in limnological surveys of many countries.

Special thanks to the LIN SD RAS staff, members of federal project No. 0345–2016–0009 "Large-scale changes in ecology and biodiversity of coastal zone communities of Lake Baikal…", supported the present studies.

References

(for full list of cited References, see Timoshkin et al., 2016; 2018)

Kozhova, O.M., Izmest'eva, L.R., 1998. Lake Baikal: Evolution and Biodiversity. Backhuys, Leiden.

Kravtsova, L.S., Izhboldina, L.A., Khanaev, I.V., et al., 2014. Nearshore benthic blooms of filamentous green algae in Lake Baikal. J. Great Lakes Res. 40, 441–448.

Kulikova, N.N., Chebykin, E.P., Volkova, et al., 2017. Determination of the element composition of benthic macro-algae for the indication of water quality of the shallow zone of the Listvennichnyi Bay (South Baikal) // International Scientific-Research Journal, No 12 (66), part 2, 166–176.

Timoshkin O.A. (Ed.). 2001–2011. Index of Animal Species Inhabiting Lake Baikal and Its Catchment Area. In 2 Volumes and 4 books. Nauka Publ., Novosibirsk, Vol. 1, book 1 (2001): 832 p.; Vol. 1, book 2 (2004): 833–1679 p.; Vol. 2, book 1 (2009): 980 p.; Vol. 2, book 2 (2010–2011): 981–1668 p.

Timoshkin, O.A., Samsonov, D.P., Yamamuro et al., 2016. Rapid ecological change in the coastal zone of Lake Baikal (East Siberia): is the site of the world's greatest freshwater biodiversity in danger? J. Great Lakes Res., 42, 487–497.

Timoshkin, O.A., Moore, M.V., Kulikova, et al., 2018. Groundwater contamination by sewage causes benthic algal outbreaks in the littoral zone of Lake Baikal (East Siberia) // J. Great Lakes Res., 44, 230–244.

Timoshkin Oleg A.

Limnological Institute SD RAS, Ulan-Batorskaya, 3, 664 033, Irkutsk, Russia

e-mail: tim@lin.irk.ru

Status of Inland Waters of Asian Tropics

It will be after about half a century that SIL will hold this year its Congress in Asia for only the second time (since 1980 Congress in Japan) and for the first time in China. On this occasion, I take the opportunity to make a few observations on the status of our science in Asia and the contribution of SIL in the region. Limnological studies in Asia date back to the beginning of the 20th century when Annandale surveyed extensively all kinds of inland water bodies from Dead Sea in Israel to Lake Biwa in Japan. The German Limnological Sunda Expedition (1928-29) by Prof. Thienemann, the co-founder of SIL, laid the foundations of tropical limnology. Limnological studies in Asia have been discussed at several international conferences organised in the region under the aegis of SIL and other organisations such as the International Lake Environment Committee (ILEC) (Dudgeon and Lam 1994, Schiemer and Borland 1996). However, our understanding of Asian inland waters remains fragmentary and inadequate for their scientific management and conservation. More significant is the fact that most of the significant limnological studies are those emanating from projects led by European and North American researchers with overseas funds. These researches benefit most the overseas partners whereas the host institution or country gains little because neither these efforts are sustained nor is capacity built at local level adequate (see also Crisman and Steever 1996). Among the Asian countries only China has invested considerably as well as actively promoted aquatic science research.

Figure 1. View from the Opening Session on APN-funded Workshop on Capacity Building in Wetlands Biodiversity and Ecosystem Services at the Central Inland Fisheries Research Institute, Kolkata (19 February 2015). Dr Lew Young, Sr Regional Adviser, Asia-Oceania, Ramsar Convention, also addressed the participants

Thus, with the objective to enhance the understanding of inland aquatic ecosystems in the Asian region through interaction among researchers, exchange of knowledge, and capacity building for research on all aspects as well as their management and conservation, SIL had constituted a Working Group on Asian Tropical Inland Waters, with the undersigned as the chairman, at the 32nd Congress held in Budapest (August 2013). SIL had also agreed to endorse and sponsor a series of Short-Term Training Courses (1-2 weeks) on various topics, to be organised by the Working Group. The Working Group intended to organise collaborative research and management projects, training workshops, conferences and seminars, and a variety of publications focusing on the region. The Working Group is currently hosted in India by the Centre for Inland Waters in South Asia and its activities are coordinated by a Committee comprising of members from Sri Lanka, Nepal, Oman, Malaysia, Pakistan, Thailand, Philippines and Indonesia, besides India. The SIL General Secretary-Treasurer, Prof. Tamar Zohary (Israel) and SIL News editor, Dr Ramesh Gulati (the Netherlands) represent SIL on the Committee. The Working Group maintains a voluntary database of researchers and individuals on the Centre's website: www.aquaticecosystems.org

During the past five years, the WG members have organised, through their national or regional associations, many activities which have brought together the researchers not only from their respective countries but also from some other countries.

In India, two major areas of interest have been the biodiversity and ecosystem services of both the wetlands and rivers. The Centre for Inland Waters in South Asia (CIWSA), in collaboration with the National Institute of Ecology and the WWF-India conducted studies on Ecosystem Services and their economic valuation in some stretches of rivers Shivna (Tributary of Godavari) and River Ken (tributary of Yamuna). Also, the ecosystem services of River Ganga were discussed at a two-day workshop funded by the National Mission on Clean Ganga, and attended by researchers from all relevant disciplines, government officials as well as

Figure 2. Field work on Kolsi beel, during the APN-funded Workshop in Kolkata

representatives of World Bank and CSIRO (Australia) among others.

The CIWSA collaborated with scientists in India and Nepal, under a one year programme of capacity building funded by APN-GCR (Japan) to organise three one-week training courses on rapid assessment of wetland biodiversity and ecosystem services, in Kathmandu (Nepal), and Kolkata and Guwahati (India). The Centre has also actively promoted wetland conservation in the State of Chhattisgarh by conducting surveys, field studies and organising workshops. Factsheets on four important wetlands/wetland complexes and brief status reports have been published in association with the State Planning Commission. All relevant publications and reports are available on the Centre's website www.aquaticecosystems.org

The Centre also collaborates with WWF-India in helping researchers and managers of several states (Arunachal Pradesh, Assam, Karnataka, Telangana, Punjab, Rajasthan and Uttar Pradesh) on issues of wetland studies and management.

In Sri Lanka, Prof. Ivan Silva has actively promoted aquatic sciences through the Sri Lanka Association for Fisheries and Aquatic Resources (SLAFAR) which organises, beside their annual scientific meetings, lectures and training workshops. Of special interest was a Workshop on "Stream Ecology and Environmental Flow" (9-10, March 2016) at Kotmale International Training Institute (KITI), sponsored by Asia Pacific Network for Climate Change Research (APN), Japan. The periodic Newsletter, Water Lanka, and details of SLAFAR activities are available at their website: www.slafar.lk

Only recently, a symposium on Freshwater Biodiversity and Ecosystems was organised in the Philippines during June 2016 (see SIL News 69:16). In Oman, Prof Reginald Victor, who leads the limnological investigations, has recently undertaken the first ever survey of macrophytes of 26 freshwater habitats of northern Oman. Indonesian researchers organised the ILEC's 16th World Lake Conference in Bali during November 2016. The Conference with the theme "Lake Ecosystem Health and Its Resilience" brought together researchers from 35 countries and had a special session devoted to tropical limnology.

The WG is considering a proposal to start regular short- and long term training courses on contemporary and practical subjects such as wetlands management, Environmental Flow Assessments, Ecosystem Services Assessment and Valution; Water Quality Monitoring, etc.

We seek active participation and collaboration from members within the region as well all those elsewhere working on tropical Asian freshwaters. It is necessary to raise funds for various activities and therefore suggestions for possible sources shall be greatly appreciated. Finally, researchers from the region are also invited to communicate with the undersigned if they are willing to share the responsibility of moving the Working Group's mission ahead. We wish to name a new chairperson for the SIL WG, and individuals willing to take up the responsibility may offer themselves.

Crisman, T.L. and Streever. W.J. 1996. The legacy and future of tropical limnology. pp. 27-42, ln: F. Schiemer and K.T. Boland (eds.) Perspectives in Tropical Limnology. SPB Academic Publishing, Amsterdam, The Netherlands.

Dudgeon, D. and Lam, P.K.S. (1994). Inland Waters of Tropical Asia and Australia: Conservation and Management. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart (Mitteilungen Internationale Vereiningung für Limnologie no. 24)

Schiemer, F. and Boland, K.T. (Eds) 1996. Perspectives in Tropical Limnology. SPB Academic Publishing, Amsterdam.

Brij Gopal

Chairman, SIL Working Group on Inland Waters of Tropical Asia; & Coordinator, Centre for Inland Waters in South Asia
brij.ciwsa@gmail.com; ciwsa.nie@gmail.com

Figure 3. View of River Ken (a tributary of R. Yamuna) at Gehrighat (near Panna in Madhya Pradesh). Here the river forms a deep gorge where the cliffs are the main habitat of endangered long-billed vultures (*Gyps indicus*) and will be submerged under the reservoir formed for the planned Ken-Betwa River Link project.

Science, Policy and Law of Wetland Conservation in India

Figure 1. Is it a wetland? No, unless notified by the State Wetland Authority under Indian Law

Wetlands are known to harbour high biodiversity and provide numerous ecosystem services. Wetlands are the only ecosystems for whose conservation an international convention – the Ramsar Convention- had been adopted as early as 1971. Until now, 169 countries have joined the Convention as contracting parties, committing themselves to conservation of all wetlands within their territories by considering them in their national land-use planning, and designating one or more wetlands as 'internationally important'. India is a Contracting Party since 1982 and has designated until now 26 wetlands on the Ramsar List. Despite several wetland-related programmes and activities at the Central and State level, there has been, however, increasingly greater concern about the degradation and loss of wetlands in different parts of the country.

India has no wetland-specific policy or law. The ecosystem services of wetlands are recognised in India's National Environment Policy, 2006 which also mentions the need for maintaining their ecological character. The Government adopted in 2010 the Wetland (Conservation and Management) Rules under the Environment Protection Act, 1986, to regulate various activities affecting the wetlands adversely. These Rules were replaced recently by the Wetland (Conservation and Management) Rules 2017 (http://www.moef.nic.in/content/gsr-1203e-wetlands-conservation-and-management-rules-2017?theme=moef_high), which together with some judgements of the National Green Tribunal in cases involving wetlands have cast a deep shadow over the future of wetlands in India. These recent developments highlight the inefficacy of the policies and inherent weakness of laws both of which are not driven by science.

The Wetland Rules, which refer to the ecosystem services of wetlands and the value of conservation, do not prohibit or restrict hydrological alteration in spite of identifying it among various threats to the wetlands. Most of the provisions in the Rules do not support in any manner wetland conservation. The scope of the Rules is itself restricted to only a few wetlands in the country. The Rules define wetlands to reiterate the Ramsar's definition, but clearly exclude "river channels, paddy fields, human-made water bodies/tanks specifically constructed for drinking water purposes and structures specifically constructed for aquaculture, salt production, recreation and irrigation purposes". Effectively, it means that all human-made wetlands are accorded no legal protection. All small, medium or large reservoirs are indeed constructed for irrigation or drinking water supplies. The recent National Wetlands Inventory and Assessment (https://vedas.sac.gov.in/vedas/downloads/atlas/Wetlands/NWIA_National_atlas.pdf) has identified 122,370 tanks and 14,894 reservoirs among the 145,641 man-made wetlands (both inland and coastal). The Rules may be interpreted to exclude all of them from the purview of regulations. Notwithstanding the designation of the Wular lake (the River Jhelum flowing through it) and Upper Ganga River (stretch from Brij Ghat to Narora), the Government does not consider rivers to be wetlands. The fact that the Bhoj wetland - a Ramsar site - was created centuries ago specifically for drinking water and irrigation, may bring its status also to dispute.

In view of the Indian Constitution listing land and water to be the State subjects, the 2017 Rules provide for conservation and management of wetlands identified and notified by the Wetland Authorities of respective States. The notification will be based upon the preparation of a 'Brief Document' for each wetland providing its boundaries, describing its ecological character and listing pre-existing rights and privileges as well as the activities to be permitted and regulated. In most of the States, State Wetland Authorities have not yet been constituted (though they were required also under the 2010 Rules) and those constituted have not started functioning. Preparation of the 'brief documents' remains uncertain because of the large number of wetlands and the amount of data to be collected, lack of expertise and capacity in the States. The fact that wetlands are tricky habitats – "now you see them, now you don't" because they appear and disappear within a year or between years, makes it difficult to demarcate them and decide about the fate of the land they occupy. Indian researchers have not yet developed indicators for any of the three criteria used in the United States for delineation.

This brings in the law and its judicial interpretation in Indian courts. Water bodies are treated differently at different times under different laws. In several cases, the Indian Supreme Court had decided against encroachments and other interferences in or along the water bodies. As early as 1996, the Indian Supreme Court applied the public trust doctrine to the protection of a river against interference with its natural flow in the case M.C. Mehta v Kamal Nath and others. In another significant judgement in January 2011, the Supreme Court treated tanks and ponds as village 'commons' (common property resources) and ordered removal of all kinds of illegal encroachments into them throughout the country. More recently, the Supreme Court in its order of 8 February 2017 directed the Government to notify under the provisions of Wetland Rules 2010, all the 201,503 wetlands identified and mapped in the National Wetland Atlas (NWIA 2011). Since the new Wetland Rules 2017 were notified in the meantime, the matter is still before the Supreme Court.

All environmental cases are now decided by the National Green Tribunal against whose judgements an appeal can be heard by the Supreme Court. Several wetland-related cases have been discussed in the NGT during the past few years. Hearing the matter in one of the cases, the NGT had also issued directions in 2016 (before the Supreme Court Order of February 2017) to all the States to identify and notify at least a few important wetlands in their respective territories, whereas the NGT has in general passed orders in favour

of the environment and asked for its restoration, there are instances where the cause of wetlands was lost simply because the water bodies in question, despite having wetland features and avian biodiversity, were not notified as wetlands under the Wetland Rules 2010. These include the case of wetlands at Samdhiyala Bandhara (Bhavnagar, Gujarat), Bil Akbarpur (Dadri, U.P.) and Basai (Gurgaon, Haryana).

Thus, the future of wetlands in India appears to be very bleak because they cannot claim any protection unless notified after due process by the State Wetland Authorities under the Wetland Rules 2017. This threat goes a step beyond this because the Wetland Rules 2017 do not take cognizance of more than half a million wetlands smaller than 2.25 ha recognised in the National Wetland Inventory. It is readily forgotten that these small wetlands provide far more important and valuable ecosystem services for the overall well-being of the people living around them in rural areas and these wetlands are more crucial to the water, food and livelihood security of the people and in meeting the challenge of climate change.

Brij Gopal
Coordinator, Centre for Inland Waters in South Asia
brij.ciwsa@gmail.com; ciwsa.nie@gmail.com

Attention: Manufacturers of Limnological Equipment and Publishers

SILnews accepts advertisements for equipment and publications that will be of interest to SIL members.

SILnews is distributed twice a year to more than 3,000 SIL members and libraries world-wide. If your company is interested in acquiring advertising space in SILnews, please contact Ramesh D. Gulati or Ms. Denise Johnson at the Editorial Office for rates, or use the mailing address indicated on the front page.

A complimentary copy of SILnews, in which your advertisement appears, will be sent to you once it has been published. SILnews is posted on the SIL web-site at http://www.limnology.org after it has been published.

Limnology Jobs and Studentship Notices

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

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

Submissions should include:

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

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

Submissions for the SIL web site should be sent by e-mail to webmaster@limnology.org or by fax to the attention of Gordon Goldsborough at: +1 (204) 474-7618.

Are you moving?

Please send your change of address to:
Ms. Denise Johnson
SIL Business Services Coordinator 5020 Swepsonville-Saxapahaw Road
Graham, NC 27253 USA
E-mail: siloffice1922@gmail.com

The International Society of Limnology (formerly International Association of Theoretical and Applied Limnology; Societas Internationalis Limnologiae, SIL) works worldwide to understand lakes, rivers, and wetlands and to use knowledge gained from research to manage and protect these diverse, inland aquatic ecosystems.

For Your Information

SILnews is now on the SIL and Taylor and Francis websites in PDF format. To open, use Adobe Acrobat Reader.

SIL Officers 2016-2018

PRESIDENT
Yves Prairie (prairie.yves@uqam.ca)
Université du Québec à Montréal
Departement des Sciences Biologiques
C.P. 8888 Succ.
A Montréal, QC H3C 3P8
CANADA

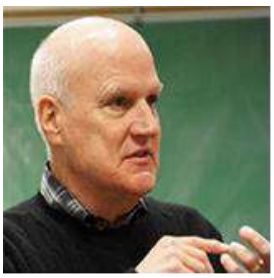
GENERAL SECRETARY-TREASURER
Tamar Zohary (tamarz@ocean.org.il)
Y. Allon Kinneret Limnological Laboratory
Israel Oceanographic & Limnological Research Ltd.
P.O. Box 447
Migdal 14950
ISRAEL

EXECUTIVE VICE PRESIDENT
David Livingstone (living@eawag.ch)
Eawag
Ueberlandstrasse 133
CH 8600 Düebendorf
SWITZERLAND

EXECUTIVE VICE PRESIDENT
Sally MacIntyre (sally@eri.ucsb.edu)
The University of California
Department of Ecology, Evolution, & Marine Biology
Santa Barbara, CA 93106-6150
U.S.A.

EXECUTIVE VICE PRESIDENT
DEVELOPING COUNTRIES
Vera Huszar
(vera.huszar@pq.cnpq.br)
Phycology Laboratory
National Museum
Federal University of Rio de Janeiro
Quinta da Boa Vista s/n, 20940-040
Rio de Janeiro
BRAZIL

EDITOR-IN-CHIEF, *INLAND WATERS*
John R. Jones (jonesj@missouri.edu)
University of Missouri-Columbia
SNR, Fisheries and Wildlife Sciences
302 Anheuser-Busch Nat. Res. Bldg.
Columbia, MO 65211-7240
U.S.A.



STUDENT/EARLY CAREER REPRESENTATIVE
Camilla Capelli
(cc.camilla.capelli@gmail.com)
San Marco Veterinary Laboratory
Molecular Biology and Genetics
via Sorio 114c
35141 Padova
ITALY

STUDENT/EARLY CAREER REPRESENTATIVE
Richard Iestyn Woolway
(riwoolway@gmail.com)
University of Reading
Department of Meteorology
Harry Pitt Building, 3 Earley Gate
Whiteknights, Reading
UNITED KINGDOM

EDITOR, *SILNEWS*
Ramesh Gulati
(gulatird@gmail.com)
De Rijklaan 19, 1217RD
Hilversum
THE NETHERLANDS

WEBMASTER
Veronica Nava
(webmaster@limnology.org)
SIL Webmaster
University of Milano-Bicocca
Department of Earth and Environmental Sciences
Piazza della Scienza 1, 20126
Milano
ITALY

FACEBOOK MANAGER
Maciej Bartosiewicz
(maciej.bartosiewicz@unibas.ch)
Department for Environmental Science, Basel University
Bernoullistrasse 30
4056 Basel
SWITZERLAND

BUSINESS MANAGER
Denise Johnson
(siloffice1922@gmail.com)
5020 Swepsonville-Saxapahaw Road
Graham, NC 27253
U.S.A.