



SIL news

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1 OCTOBER 2017

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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 foreward

Let me at the outset wish all our newsletters readers, a very peaceful and prosperous 2017 that already began several weeks ago.

The year 2016 was a tumultuous one in many respects: our 33rd triennial SIL meeting was organised in July-August 2016 very successfully by our chief host Roberto Bertoni in Turin, Italy. The readers will also recall reading my Foreword to the previous issue of SIL newsletter for which I had requested Brian Moss, our former SIL Chairman, to write about his person and personal health (he was then suffering from cancer). He agreed to write and sent me an email letter with his bold, steadfast and unwavering views concerning life and death. I published it on the front page of the newsletter 68 (June 2016). Brian's unambiguous and frank views were greatly appreciated by many of our readers. Brian could not have made it to the Turin meeting in view of his grave illness. He said it plainly in his earlier mail to me that he was not too sure if he with his terminal health condition could travel to Turin. We learnt with great shock from his wife Joyce that Brian had passed away on 27 May 2016, i.e. few weeks before the meeting in Turin. His demise was announced at the Turin SIL meeting by our present Chairman Yves Prairie, followed by a minute's silence. Some other prominent limnologists also passed away in 2015-16 were also remembered. Obituaries of Brian's and some other senior colleagues are included in this issue of the newsletter.

Please excuse me for some unavoidable delay in the appearance of this winter 2016 issue of the newsletter. We hope things will get back to normal soon and there will be no further delays in the appearance of subsequent issues.

This issue contains several SIL announcements and reports from our readers. There is also a report on SIL Minutes by our Secretary Tamar Zohary. As already said, Roberto Bertoni reports on the Turin Meeting in greater detail.

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After the 33rd SIL Congress in Torino

Every reader of SIL News knows that we are an international non-profit organization dedicated to advancing limnology for the benefit of all. It is with this principle in mind that the congress co-chairs Cristiana Callieri, Luigi Naselli-Flores and I started organizing the 33rd SIL Congress with the clear goal to produce a scientifically relevant event, taking into account the interdisciplinary nature of limnology and promoting a large attendance of colleagues, in particular of young scientists, ensuring self-sufficiency of the congress. We kept the registration fees as low as possible, and we put a lot of effort in the preparation of the programme and in the conference logistics. We also tried to ensure proficient use of revenues from the subscriptions, reducing the unnecessary expenses and seeking additional funds, to offer participants extra benefits.

The congress statistics let us believe that we achieved our goal. This belief is supported by the 816 participants from 58 countries, coming to Torino, thanks to the appealing programme but also to the low registration fees, at least one-third lower than in previous congresses (450 regular and 550 € for members and non-SIL members, respectively). Thirty six % of those attending were students or early career colleagues, facilitated by the low registration fees (200 and 250 € for



The Opening Ceremony. From left to right: the Congress chair R. Bertoni, the SIL President Y. Prairie, the Congress co-chairs L. Naselli-Flores and C. Callieri.



33rd SIL Congress participants at the Opening Ceremony.

members and non-SIL members, respectively). The interest in limnology is confirmed by the participation of 58% of non-SIL members. Thus, it seems that there is room for the further growth and development of SIL.

The nature of plenary lectures and the speakers (see list below), certainly contributed to achieving the objectives:

1. Coaxing lakes to conduct experiments: palaeolimnology and the acid rain debate. Baldi Memorial Lecture, Rick Battarbee
2. Ecological isolation despite physical connectedness: evolution-dependent species richness in large and deep lakes. Kilham Memorial Lecture, Ole Seehausen.
3. Histories of cyanobacteria from a northern country: redefining limnological "nordicity". Frances R. Pick
4. Climate change and stoichiometric implications for zooplankton. Esteban Balseiro
5. Challenges and opportunities for research and management in Mediterranean-climate rivers. Núria Bonada
6. Limnology in the 21st century: incorporating data-intensive research, open science, and team science to address broad-scale problems. Kendra Spence Cheruvellil
7. Biodiversity and ecosystem functioning in miniature worlds. Thomas Bell
8. Climate change and multiple stressors in agricultural streams. Winner of SIL Students Competition, Jeremy J. Piggott

During the congress, as it is customary, the Naumann - Thienemann medals "De limnologia optime merito" medals were awarded to Ursula Gaedke, Michael L Pace and John R Jones.

A novelty of this conference was the kick-off plenary lecture, given by Professor Christian Greco, Director of the Egyptian Museum in Torino with the title: Water management in Theban archaeology. It was not on a limnological subject *sensu stricto*, but it aroused the interest because the lecture addressed the issue of traditional water use in ancient Egypt and the technical theme of the problems conserving Egyptians archaeological sites by the modern water use.

Another novelty of SIL 2016 was the plenary lecture given by the winner of SIL Students Competition, successfully just introduced by SIL to highlight the presence of young researchers in the Society. We were pleased to invite the winner, Jeremy Piggott from New Zealand, to present during the closing ceremony his view on SIL and the Congress.

Despite the difficult economic situation world-wide (only 4% of the total budget was borne by sponsors), we could obtain good support for students and some cash sponsorship were very welcomed by participants (e.g. free ice cream and beer). It was also possible to offer an Occitan music concert at the Congress Opening Ceremony which was well received by the participants.

We rented a comfortable conference venue (Lingotto Congress Center) and a good audiovisual management system. The ten parallel sessions during the 4-day conference have worked well, without any considerable loss of time due to technical problems. The SIL Congress was of a significant importance to the Italian news media. The three major national newspapers devoted space to the event and to published articles on topics related to ecology of inland waters. Even the radio channels and the national and regional TV channels interviewed the organizers and the participants. During the Congress there was a national round table which involved numerous water managing public bodies (see for summary at www.silitaly.it).

The 33rd SIL Congress was also rewarded with a very welcome surprise coming a few days after the Congress ended. This has bridged a little, at least emotionally, the gap in the absence of public funding. The President of the Italian Republic Sergio Mattarella offered a commemorative plaque in bronze in recognition of the international relevance of the 33rd SIL Congress.

Roberto Bertoni
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Memorial plaque offered to Roberto Bertoni, Chair of the Organizing Committee of the SIL 2016 Congress.
 (BY THE PRESIDENT OF THE ITALIAN REPUBLIC SERGIO MATTARELLA, TO XXXIII CONGRESS OF THE INTERNATIONAL SOCIETY OF LIMNOLOGY "SCIENCE FOR SUSTAINABLE FRESHWATER USE" TORINO, ITALY, JULY 31 – AUGUST 5, 2016)

Minutes of the 33rd SIL Congress, Torino, Italy, 2016

Meetings of the Executive Committee and National Representatives

I. Executive Committee (present and newly elected) – 31 July (Sunday), 14:00 – 15:15. Present: President, Yves Prairie; General Secretary-Treasurer, Tamar Zohary; Vice-Presidents, Vera Huszar, David Livingstone; Student/Early Career representative, Camilla Capelli. Editor-in-Chief (Inland Waters), Jack Jones, was present by invitation. Vice-President Sally McIntyre and Student/Early Career representative Iestyn Woolway attended the meeting through a Skype call.

Welcome and congratulations to the newly elected Student/Early Career representatives.

The President outlined the Agenda for the International Committee Meeting.

Points addressed were:

1. The financial statements (July 2013 – June 2016) were presented by Tamar Zohary. The net income during the triennial was USD 137,277. However, for technical reasons the triennial budget did not include several large expenses that would only show in the next financial year. This included the cost of *Inland Waters* for 2015-2016 (- USD 65,000) and fellowships (Wetzel, Tonolli) awarded to students (- USD 20,000). Furthermore, part of the income is in the form of interest to the SIL endowments, and is money that can be used only for the specific purpose of each endowment, not for SIL's running expenses. Hence the seemingly big net income is not really that big.
2. The new impact factor of *Inland Waters* was announced: 1.77. This is considered a big achievement for a new journal. Vera Huszar suggested displaying the impact factor on the SIL website homepage, and we agreed to do so.
3. The pending digitization of the *Verhandlungen* was announced. In due course this will allow SIL members to have free online access to this massive set of limnological publications that are currently practically unavailable.
4. Yves Prairie showed data indicating a long-term decline in SIL membership, amounting to a net loss of 4% per year, much of which is due to retiring scientists that cancel their membership and emeritus members that pass away. While the declining trend in the total number of members continued in 2015, the number of new members increased compared to 2014 and 2013. Furthermore, the number of student members has increased from < 1% in 2011 to 6% in 2016. Memberships from developing countries has also increased over the last triennium.
5. According to statistics from Roberto Bertoni, less than 50% of the congress participants were SIL members. One reason for this is that in many countries, the research institutes and universities do not cover society membership fees, but they do cover congress registration fees. Hence, many choose to have their institutions pay the higher registration fee of a non-member, rather than to pay the annual dues out of their own pocket. A suggestion was made that those who pay the higher non-member fee should automatically become SIL members, with the difference in price (usually ~100 Euro) going to SIL to cover their membership fee rather than going to the congress

organizing committee of the hosting country. This suggestion was later confirmed as a new SIL regulation.

6. Currently, SIL cannot consider reducing its annual membership dues, because the annual dues are SIL's main financial income. It was agreed to ask the National Representatives to invest more effort in collecting annual dues from members. It was also agreed that SIL should focus on recruiting Early Career members (who benefit from a 50% discount), who are more important to SIL in the long-term than Student members. The input of the Student/Early Career Representatives is essential in devising strategies for increasing the rate at which young members join SIL.
7. The Vice-President for Developing Countries, Vera Huszar, presented the achievements of the SIL course held at the Ecological Station of Seridó (Brazil) in 2014, which resulted in a paper published in *Frontiers in Microbiology*. Vera is now planning a course in Ethiopia in August 2017, which will host 21 students from Kenya, Ethiopia, and Uganda, and requested financial and other support from SIL. SIL's treasurer committed a sum of \$3000 to support this course, which may be increased if the financial situation of SIL will allow. Further financial support was requested from UNESCO's International Hydrological Programme and from The World Academy of Science (TWAS) for scientific meetings held in developing countries.

II. First meeting of the Executive Committee and National Representatives (International Committee) – 31 July (Sunday), 15:30 – 17:15

- The President greeted the National Representatives
- The President outlined the Agenda
- The General Secretary-Treasurer, Tamar Zohary, reviewed the minutes of the Budapest meeting in 2013.
- The General Secretary-Treasurer presented the proposed changes to the SIL statutes, all of which are changes that have already been implemented de-facto. The main changes affect membership categories and executive board composition:
 - §4, addition of the Early Career and Family categories of membership;
 - §8, 50% discount to dues for members from developing countries;
 - §11, addition of two Student/Early Career representatives to the Executive Board;
 - §17, the Congress will be held every two or three years;
 - §19 invited Congress keynote speakers are expected to submit their presentations as papers for publication in *Inland Waters*.
- The General Secretary – Treasurer reviewed the status and activities of SIL over the past triennium (2013-2016), including membership and finances. Particular attention was paid to Student Awards, Sponsorships, and Working Groups.
- The President presented motions from the Executive Committee.
 8. Membership trends: Membership continues to decrease, although from 2011 the percentage of student members has been increasing. This means that the recent initiatives to attract students are having an effect. Those initiatives included: annual dues for students of only \$5/year, student competition, Facebook and Twitter, and Tonolli and Wetzel awards. The main object is to recruit a young generation of SIL members.

Further suggestions to increase membership were:

- a. Reduction of the annual dues for Regular Members, considering that society membership dues are not, or are no longer, supported by many research institutions. However, since the annual dues are the main financial income covering the publication of *Inland Waters*, it was agreed that the dues will be not reduced for the next 2 years (till the 2018 congress in China). At the same time, after many years in which the annual dues were increased by ~10%, each triennium, this time the annual dues will not be increased.
 - b. Introduce a discounted 2-yr Membership (e.g. Society of Canadian Limnologists).
 - c. The National Representatives were asked to monitor their own country members, as many members are in arrear with their dues.
9. Journal: The process of acquiring the copyright to the old issues of the *Verhandlungen*, and their digitization, is under way. The current contract with FBA as publisher of *Inland Waters* will end on 30 September 2016 and will not be renewed. The publication will be transferred to a commercial publisher, the identity of which will be revealed after a contract is signed. The main benefits of moving to a commercial publisher are: 1) lower expenses to SIL; 2) a better on-line system for handling manuscripts; 3) authors will not be charged page charges to publish. The recommendation from Budapest to convert *Inland Waters* to a completely open-access journal was rejected because of the prohibitively high costs involved.
10. Finances: SIL's financial statements (1 July 2013 – 30 June 2016) were circulated with the Agenda and a discussion took place.
- a. With SIL moving to another publisher, there will no longer be an annual cost of ~USD 60,000 for publishing the journal. Until now, publishing the journal has been the single major expense to SIL. Furthermore, SIL will collect royalties from the new publisher of about USD 15,000/year.
 - b. At the same time, there will be a loss of income to SIL from page charges of ~ USD 30,000/year. To reduce this loss, it was proposed to continue to page charges, but only from non-members. This would have the additional advantage of encouraging non-members to join SIL.
 - c. A second loss of income resulting from the move to a new publisher is the loss of membership dues from libraries ("Institutional members"), that currently make up ~ 30% of SIL's income from annual memberships, of ~USD 30,000 annually. This will occur because libraries will stop purchasing *Inland Waters* directly from SIL, instead purchasing it as part of a package of journals offered by the publisher.
 - d. The necessity for SIL to make a profit from its congresses was discussed. In many professional societies similar to SIL congresses provide a major income to the society. Common ways for the society to collect income from congresses are by means of a lump sum that is paid to the society by the organizers, or a sum per participant, or that the extra registration fee paid by non-members goes to the society (and at the same time grants society membership for a

year to the person paying). Hitherto, any net profit from a SIL congress has gone to the local host institute (which also took on the risk of shouldering any loss). This system will be changed, starting from the coming SIL congress in China in 2018.

- e. The Tonolli fund is invested and only the interest is used to finance awards.
- f. The SIL bank account in Switzerland was closed and the money transferred to a bank account in North Carolina, USA.
- g. A motion to accept the annual budget and triennial budget sheets was proposed and seconded, and passed without dissent.

11. Future Congresses: Bids for hosting the 35th SIL Congress in 2020 were made by Australia (Fran Sheldon), South Korea (Gea-Jae Joo), and Israel (Gideon Gal). The decision was to be taken at the second meeting of the International Committee.
12. The Ex. Committee/National Representative meeting was adjourned by President Yves Prairie to 17:15.

III. Presidential address and 1st General Assembly meeting. 1 August (Monday), 08:30-09:45

- Welcome: The audience was welcomed by Roberto Bertoni, Chair of the local organizing committee, and Yves Prairie, President of SIL.
- Necrology list: Yves Prairie read the necrology list, with extra words on Brian Moss, past president of SIL, who passed away in May 2016.
- Neumann-Thienemann medals: Yves Prairie awarded the Neumann-Thienemann medals to the recipients for 2016: Ursula Gaedke, John R. Jones, and Michael Pace.
- Baldi and Kilham Award lecturers: Yves Prairie announced the names of those invited to give plenary lectures at the 2018 Congress: the Baldi Lecture will be given by Sally MacIntyre and the Kilham Lecture by Richard Robarts.
- SIL Appreciation certificates: These were awarded to three persons who, over many years, have been performing voluntary services for SIL: Ramesh Gulati, the SILnews editor; Gordon Goldsborough (in his absence), SIL's webmaster; Ferdinand Schanz (in his absence) the auxiliary treasurer in charge of the SIL account in Switzerland; An additional certificate was awarded to Maciej Bartosiewicz (in his absence), who started and runs SIL's Facebook and Twitter pages.
- Presidential address: the president addressed the issue of why the membership of learned societies, including SIL, is declining (at an alarming rate of 4%/year for SIL) at a time when the discipline is growing.

IV. 2nd Meeting of the National Representatives – 3 August (Wednesday), 15:45-17:30

- Changes to Statutes: Concerning the paragraph on annual dues, with regard to the proposal of allowing a discount (50% of regular membership) for the second member of a family, it was proposed to change the term "family" to "partner". It was also suggested not to specify actual amounts when using the World Bank's Gross National Income per capita as a criterion for deciding which countries qualify as developing countries. These proposed changes were added to the Statutes.
- Gene Likens, past president of SIL and probably the most senior member of the society present at the congress, congratulated the current SIL board for making the correct decisions and leading SIL in the direction in which he would have wanted to see it go.

- Future Congresses: The proposals for hosting the 35th SIL Congress in 2020, Australia, South Korea and Israel, were summarized. All the three countries provided compelling presentations, and the countries' representatives replied convincingly to questions regarding the organization of the Congress. The National Representatives expressed continuing concern about the costs of Congresses. The representatives from Australia, South Korea and Israel then withdrew from the room. After a long discussion the proposals were put to the vote in two rounds of secret ballots. The first round involved all three countries, the second involved only the two countries that had obtained the highest number of votes in the first round. South Korea was eventually selected to host the 35th SIL Congress.
- Germany proposed hosting the 36th Congress in 2022, since 2022 will be the 100th anniversary of SIL, which held its first Congress in Germany in 1922. The presentation on behalf of Germany was made by Prof. Karl-O. Rothhaupt, who then withdrew. After a discussion about the possibility of introducing an open call for the 2022 Congress, the proposal of Germany to hold the 36th Congress in 2022 was accepted by a majority vote of the delegates present.
- A motion to confirm the mandate of the current members of the SIL Executive Committee, the President, Vice Presidents and General-Secretary-Treasurer, till the next Congress, was proposed by Luigi Naselli-Flores, the Chair of the SIL Nominating Committee. The motion was seconded and passed without dissent.

V. 2nd General Assembly – Wednesday 3 August 2016, 17:20 – 18:20

- Statutes – Proposed changes to the SIL Statutes were summarized. A motion to accept the revised Statutes was proposed and seconded, and passed without dissent. The amended statutes will be uploaded to the SIL website.
- Decisions regarding hosting countries for future congresses were announced: South Korea 2020; Germany 2022.
- Working groups – A report was presented on a meeting between members of the Executive Committee and chairpersons of SIL working groups. A need was expressed to find models for the integration of these working groups into the SIL Congress schedule. It was agreed that in future congresses (starting with China 2018) a time slot of 1 h will be allocated for meetings of the working groups. Additionally, the program should include in a 1-h plenary in which a representative from each WG will give a 5-10-min (depending on # of WGs presenting) summary of their activities since the previous congress. This would advertise and raise awareness to the SIL WGs and their activities.

- It is essential to diversify the sources of income to the society. From now on, a tightly linked relationship, financial and otherwise, between SIL and Congress organizers, will ensure that SIL receives income from its congresses. Details will be announced.
- *Inland Waters*. Negotiations of a contract with a new publisher for IW are at an advanced stage. An important consequence of the new contract is that the journal will provide SIL with a net financial gain rather than a net loss. IW increased in size from 180 pages in 2011 to > 550 pages in 2016, and its impact factor increased from 1.4 in 2011 to 1.77 in 2015. Among limnological journals, IW is now ranked 8th out of 20. These statistics represent a major achievement for a new journal.
- The Verhandlungen (Proceedings). At the moment, papers that were published in the old Verhandlungen are not searchable online, which nowadays means they are essentially unavailable. The Verhandlungen will be put online in a searchable form, and made freely available to all SIL members.
- Memorial lectures at the SIL Congress 2018: Baldi – Sally MacIntyre; Kilham – Richard Robarts.
- SIL 2018 in China – The 34th SIL Congress will be held from 19-24 August 2018 in Nanjing, China. A video on the Congress venue was presented by Liu Zhengwen.

VI. Closing Ceremony – Thursday 4 August 2016, 17:00 – 18:00 (Room 500)

- Yves Prairie opened the closing ceremony.
- Jeremy Piggott, the winner of the student competition, gave a 'closing remarks' speech as a representative of early career limnologists, in which he presented his view of the future of limnology.
- Roberto Bertoni thanked the many people who assisted in making the 33rd SIL Congress possible. He presented some interesting statistics from the Congress: e.g., 30% of the delegates were students or early career scientists, and more than 50% of those attending were not SIL members. Yves thanked the organizing committee, the presenters, participants and invited the audience to the 34th SIL meeting in China.
- Yves thanked the organizing committee, the presenters, participants and invited the audience to the 34th SIL meeting in China.

Minutes written by:

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Announcements



Announcement of 34th SIL Meeting: China, 2018

XXXIV SIL Congress will be held in Nanjing (Jiangsu province), China from 19th to 24th of August 2018. We are looking forward to seeing you in China in 2018. The website of the XXXIV SIL Congress will be available soon.

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Host City:

Nanjing, the capital of Jiangsu province, China.

Congress Venue:

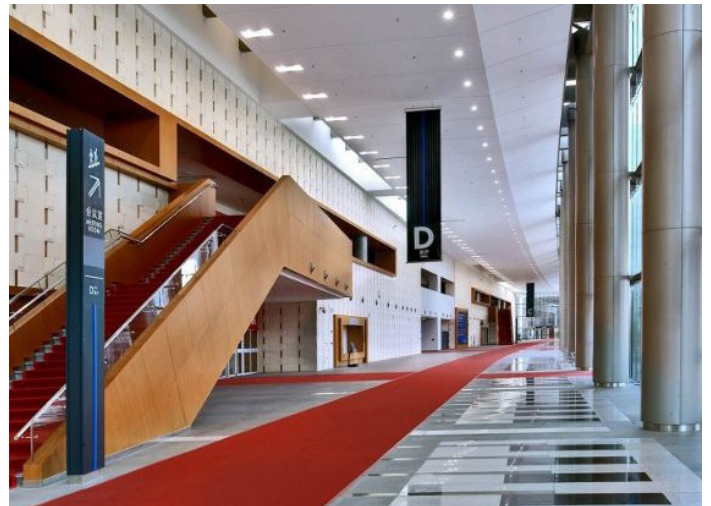
Nanjing International Expo Center (see photos above and below)
Jiangdong Zhong Lu 300
Jianye District, Nanjing, Jiangsu province, China



Photos: above, below;
Nanjing International Expo Center



Photo: Nanjing city



Working Group on Lake Restoration

The SIL working group on Lake Restoration was launched after the 33rd SIL Congress “Science for sustainable freshwater use” in Torino, Italy. All attendees at the special session on “Restoration of lakes and reservoirs through geo-engineering techniques: potentials and limitations” stressed the importance of launching a SIL working group to further facilitate co-operation, exchange of ideas and information, and to encourage an integrated approach to the science of lake restoration in a changing world.

Recognizing that each water body has unique features requires a specific suite of water quality management measures to ensure effective management. Mitigation measures should then start with a comprehensive ecosystem scale diagnosis - a system analysis - to determine the water- and nutrient balance of the waterbody, the drivers of movement of nutrients, and the biological make-up of the system and its function(s) and thus is an imperative prerequisite to the selection of the most appropriate measure(s). Consequently, activities of the working group will not be limited to in-lake measures, and include catchment management as well.

We encourage all those who would like to contribute or to be updated about the working group activities to send an email to the co-chairs Miquel Lurling (miquel.lurling@wur.nl) and Bryan Spears (spear@ceh.ac.uk).

For more lake restoration information, please visit the facebook site at <https://www.facebook.com/LakeRestoration/>

The IX International Shallow Lakes Conference, Merida (Mexico)

The IX International Shallow Lakes Conference, Merida (Mexico), under the auspices of SIL, will be held during February 19-24, 2017 at Merida City in Yucatan State, Mexico. The venue for this conference is the hotel Hyatt Regency Merida (Ave. Colon esq Calle 60, a 100 metros del Paseo Montejo, Merida, Mexico, 97000. Tel: +52 999 942 1234).

The entire conference will be dedicated to the memory of the late Prof. Brian Moss. More than 80 Abstracts have been so far received for the conference. Erik Jeppesen from Denmark will deliver a special talk on the contributions of Brian Moss to the development of Shallow Lakes Research. The other invited speakers include Henri J Dumont (Belgium), Ramesh D. Gulati (The Netherlands), Karl Havens (US), Terry W Snell (US) and Eduardo Vicente (Spain). They will talk on diverse topics related to the theme of the conference.

As in previous conferences, the present meeting will have both oral talks and poster presentations. Proposals from some participants for workshops on selected themes of Shallow Lakes Research are being finalized.

The proceedings of the conference will be published in a standard indexed journal, the details of which will be announced during the meeting.

The Mid-Conference excursions include options to visit:

- 1). Mayan pyramids of Chichén-Itzá or
- 2). The Celestún Biosphere Reserve (a shallow coastal lagoon, rich in birdlife) (about 110 km from the conference site). Accompanying persons will have the possibility to visit the karstic sinkholes (cenotes) close to Merida City.

The Conference hotel is offering a special package for the participants. The interested participants may book rooms in the hotel Hyatt Regency Merida using the following promotion code:

<https://aws.passkey.com/go/unam>

There are also other suggested hotels nearer to the Conference site. These are indicated in the website of the Shallow Lakes Conference.

Additional information is available from the website: <http://www.iztacala.unam.mx/shallowlakes2017/>

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Jean-Jacques & Berthe Symoens Prize for Tropical Limnology

In 1992 the Belgian Royal Academy for Overseas Sciences set up a fund for a three-year Prize of 2,500 EUR, named ‘Jean-Jacques & Berthe Symoens Prize for Tropical Limnology’, which is intended to reward the author of a memoir of great scientific value on a subject related to tropical limnology.

The Prize was awarded for the seventh time in 2014 to Mr Abebe Beyene HAILU (Department of Environmental Health Science and Technology, Jimma University, Ethiopia & Department of Biology, Vrije Universiteit Brussels, Belgium) for his dissertation “Development and Validation of Ecological Water Quality Monitoring Tools for Ethiopian Rivers”. Next awarding ceremony will take place in 2017. Information about this Prize may be obtained at: Royal Academy for Overseas Sciences, avenue Louise 231, B-1050 Brussels, Belgium. Tel. 32-2-538 02 11. E-mail: kaowarsom@skynet.be. Website: www.kaowarsom.be

Reports



Predictive Limnology Workshop, (August 5-8, 2016, Corconio, Orta, Italy), A Report

During the 33rd SIL Congress held in Torino, Italy (July 31 – August 5, 2016), the daylong Session 37 entitled Predictive Limnology Revisited: Rob Peters' legacy after 20 years was a great success with a large number of congress participants attending presentations of scientists from 7 different countries. This session was organized by Antonella Cattaneo, John Downing, and Yves Prairie to re-examine Rob Peters' scientific contributions in view of the increasingly pressing questions posed by the global water and environmental crises. Rob Peters and his mentor Frank Rigler had proposed predictive limnology as an approach focusing on the development of interconnected empirical constructs and regularities about relevant lake processes and organisms. The session examined the actual state of this approach, its achievements, its shortcomings, and the way ahead.

This discussion on the relevance and the future of predictive limnology was continued after the Torino Congress by a group of friends of Rob and former students, and associates in an informal workshop held August 5-8th 2016 on Corconio (Lago d'Orta). Rob Peters cherished this place where he spent many holidays and his sabbatical years enjoying the peace and the beauty of Lago d'Orta and Monte Rosa and profiting from the proximity to the Institute for Ecosystem studies at Pallanza, nearby.

The group comprised 18 scientists from Canada (Antonella Cattaneo and Bernadette Pinel-Alloul - UdeM; David Bird, Dolors Planas, and Yves Prairie – UQAM; David Currie and Frances Pick – U. Ottawa; Gertrud Numberg – Freshwater Research; Jérôme Marty – DFO; Chantal Vis - Parks Canada), the U.S. (John Downing – U. Minnesota; Jack Jones – U. Missouri; Mike Pace – U. Virginia; Rob Striegl – USGS), Italy (Angela Boggero and Rosario Mosello – ISE-CNR), Brazil (Alessandra Giani – UFMG), and Germany (Marc Gessner – IGB).

In an easy-going, convivial atmosphere sustained by the excellent food and wines from Piedmont, the participants considered several points: i) what did we learn from Predictive Limnology since 1996? ii) how predictive models have been successful in the management of lakes and rivers? and iii) what should be the future research development to fulfill the needs of managers and public for preserving the quality of water resources and ecosystems? The emphasis was on the future challenges rather than the past successes.

The productive atmosphere of the meeting led to several propositions to support global predictive limnology among scientists, managers, and the public. The first proposed output would be for Wikipedia entry on Predictive Limnology, which would include the philosophical and historical aspects of this approach and the main applications to environmental issues in freshwater management (eutrophication, algal blooms, acidification, fisheries, biodiversity, invasive species, and contaminants). This contribution aimed mainly for the general public, should be followed by a more academic perspective paper on Predictive Limnology highlighting past contributions but especially considering the development of new models to address the mounting challenges posed by climate change, floods, droughts, cyanobacteria blooms, and water contamination.

This meeting was a wonderful opportunity to be still close to the legacy and spirit of Rob Peters, who was a great source of inspiration and strength to his students and colleagues who are now left in charge to advancing his dream of a relevant Limnology.

Antonina Cattaneo, Université de Montréal
Bernadette Pinel-Alloul, Université de Montréal
Yves Prairie, Université du Québec à Montréal, all from Canada
And John Downing, University of Minnesota, USA

Establishment of different riparian plant communities from the same soil seed bank

(A summary of Ph.D. thesis, awarded by the University of Groningen, The Netherlands to G.N.J. ter Heerdt on 19 February 2016)

Introduction

The cover of riparian plant communities such as reed beds, helophyte stands and mudflats with annuals and biennials, decreased strongly (Verhoeven, 2014). European legislation, notably the *Water Framework Directive and Natura 2000*, demand that the EU member states restore and maintain riparian plant communities. In the Netherlands, waterboards started the restoration of riparian communities stretched across 4000-8000 km, involving use of methods such as water-level management and drawdowns, the construction of gently sloping banks, (re)creation of floodplain flats, and removal of the vegetation and topsoil. However, riparian communities often did not establish as expected (Lamers et al., 2014). Therefore, we need to optimize restoration measures, especially by right drawdown period and designing of gently sloped banks. This knowledge is also required to anticipate climate change by adapted water-level management.

There are indications that presence and composition of riparian plant communities is affected by changes in weather conditions, resulting in strong differences in moisture and temperature conditions in the soil (Van der Valk and Welling 1988; Weiher and Keddy, 1995; Baskin and Baskin, 2001). Therefore, for this study, I simulated the formation of riparian plant species under different moisture and temperature conditions. The case study was the drawdown in the Oostvaardersplassen, where various riparian communities had formed under different weather conditions (Ter Heerdt and Drost, 1994). The study results were used to determine the effect of drawdown date on the probability that various riparian communities will establish under present climate and after climate change.

Potential for the development of riparian communities from the seed bank after a drawdown

I attempted to simulate which communities could establish after a drawdown, based on the composition of the soil seed bank in the Oostvaardersplassen and the estimated plant size at the end of the growing season (ter Heerdt and Drost, 1994). To determine the soil seed bank accurately, an improved method was used (ter Heerdt et al., 1996; 1999). The most abundant species in the soil seed bank of the lake were *Typha latifolia*, *Senecio congestus*, *Chenopodium rubrum*, and *Rumex maritimus*, *Phragmites australis* being rare.

Two vegetation zones, were simulated to form.. One zone was dominated by *Typha latifolia*, with *Senecio congestus* as codominant, the other by the former species alone. Percentage coverage is assumed to be 100% in both the zones. The observations, however, revealed that four zones established instead, with three different communities. One zone was dominated by *Typha latifolia*, a second one by *Senecio congestus*, a third was also dominated by *Senecio congestus*, and the fourth one by *Chenopodium rubrum* and *Rumex maritimus*. In the last three zones, total cover was much <100%, because not all seeds had germinated, seedlings died, or that the plant growth was not as large as expected.

Each community established under different weather conditions. The *Typha latifolia*-dominated community established during a very wet period, when mean evaporation and precipitation were in balanced and the intervals between rainy periods were 2-3 days. The community dominated by *Chenopodium rubrum* and *Rumex maritimus* established during a very dry period, when the mean evaporation surplus was 1.70 mm/day and when the interval between rainy periods was up to two weeks. *Senecio congestus* became dominant in wet conditions following a very dry period. Together with the low %cover, this implies that differential emergence, survival and growth of the species under different moisture conditions could be causal for the development of different communities.

The effect of moisture, temperature and soil type on seedling emergence and mortality of riparian plant species

Seedling emergence was tested in Petri dishes and 12-liter mesocosms in climate chambers. The first experiment revealed that *Typha latifolia* seedlings emerged after preferred warm conditions, *Senecio congestus* cooler conditions, and the other species showed an equivocal responses. A second experiment showed that seedling emergence and mortality of *Typha latifolia*, *Senecio congestus*, *Chenopodium rubrum*, *Rumex maritimus* and *Phragmites australis* differed under differing moisture and temperature conditions. Under very wet and cold or wet and cool conditions, *Senecio congestus* performed the best (Fig. 1). Under very dry & hot conditions *Typha latifolia* emergence was low because most seedlings died (Fig. 1). *Chenopodium rubrum*, on the other hand, emerged better than all other species under very dry & hot conditions, with seedling mortality. Some species showed an optimum under wet and cool conditions, others under dry and warm conditions (Fig. 1). Fewer seedlings emerged and survived from sandy soil than from clayey soil, especially if conditions were very dry.

Not all seeds germinated during the first month, but remained viable in the soil. When the seed samples from the previous experiment were kept wet and warm, a second cohort of seedlings appeared. After very wet and cold or wet and cool conditions, emergence of *Typha latifolia* was highest and of *Chenopodium rubrum* lowest. After dry and warm or very dry and hot conditions, hardly any seedlings of *Typha latifolia*, *Senecio congestus* and *Rumex maritimus* emerged, but *Chenopodium rubrum* emerged in high numbers. From sandy soils a larger proportion of the remaining seeds emerged than from clay soils.

The effect of moisture conditions and soil type on growth and competition of riparian plant species

The effect of various moisture conditions on growth and competition was tested in 290-liter mesocosms in greenhouses. The yield of the different species in monoculture depended largely on moisture conditions, and this effect differed strongly among species (Fig.2). After very wet conditions yield of *Typha latifolia* was the highest, but that of *Chenopodium rubrum* the lowest, while the other species yielded in-between. After dry or very dry conditions, yield of *Chenopodium rubrum* was highest but those of *Senecio congestus* and *Rumex maritimus* lowest (Fig. 2). Species were also grown pairwise together to test the effect of competition. In mixed cultures, the larger species in monoculture, grew even larger and suppressed the smaller ones (Fig. 2). Therefore, as moisture conditions determined the plant size, they also determined the outcome of competition.

The effect of drawdown date on the probability that various riparian communities will establish under current and future climate scenarios

Water managers often adapt their water-level management to enlarge the probability that their target plant community will establish (Abrahams, 2008; Walck et al., 2011). Based on the results of the previous experiments, I defined a series of community assembly rules that determine the establishment of riparian communities under various moisture and temperature conditions. The probability that a range of moisture and temperature conditions would occur for each drawdown date was determined from current Royal Dutch Institute of Meteorology (KNMI)-data and the KNMI W⁺ climate-change time-series (Franken

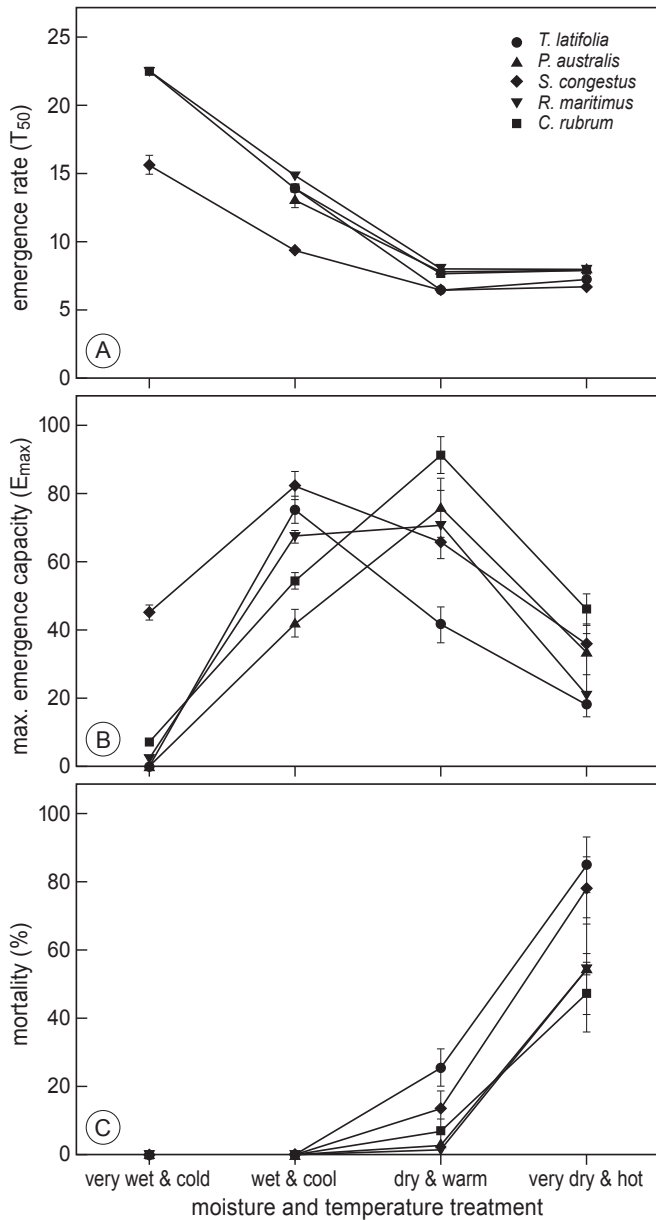


Figure 1: Effect of moisture and temperature treatment on A: emergence rate (T_{50}), B: maximum emergence capacity (E_{max}), C: percentage mortality. Comparison between *Typha latifolia*, *Phragmites australis*, *Chenopodium rubrum*, *Rumex maritimus* and *Senecio congestus* on clay. Marks indicate means, error bars indicate \pm S.E. of the mean ($n = 6$).

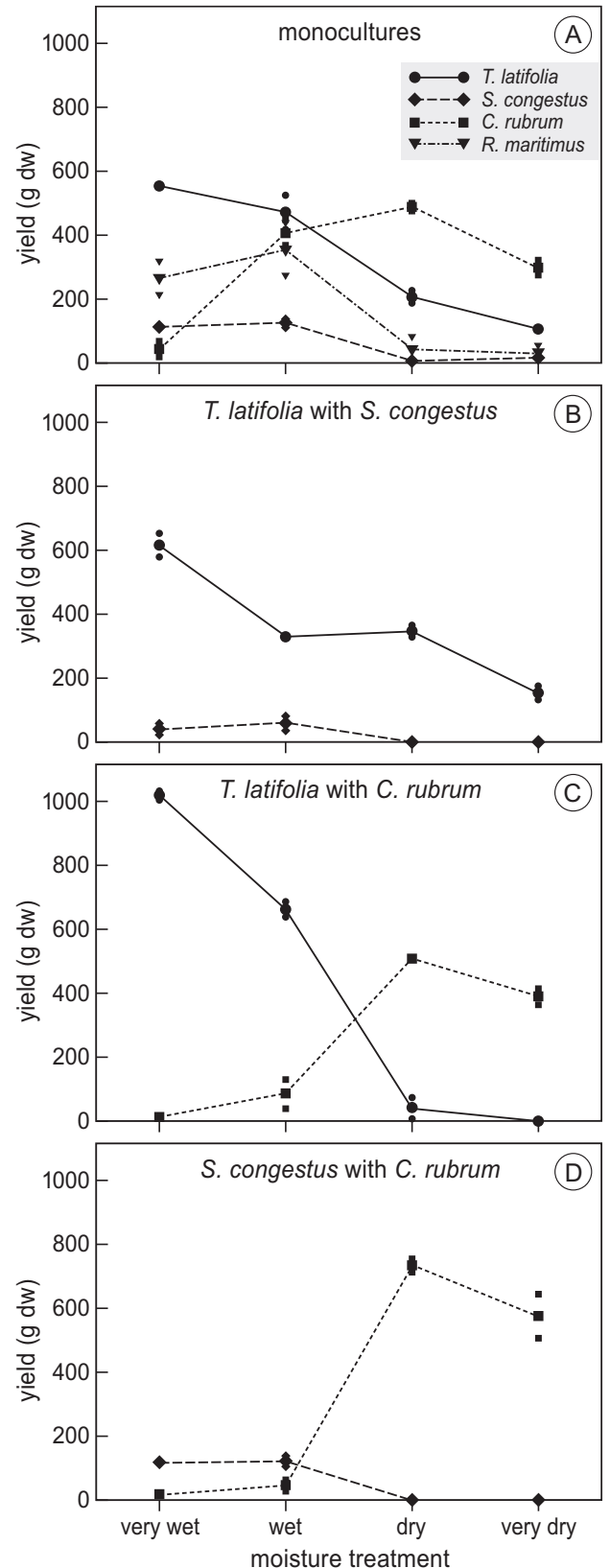


Figure 2: Yield (mean gram dry weight per mesocosm) of species growing in monoculture (A) and mixed cultures (B, C, D) under four moisture treatments. Comparison between *Typha latifolia*, *Chenopodium rubrum*, *Rumex maritimus* and *Senecio congestus* growing on Oostvaardersplassen clay. Small marks indicate the yield of the each individual replicate, the line indicates the mean of each pair.

et al., 2013). Simulations showed that, under the current climate, the probability that a *Typha latifolia* dominated community will establish is more or less equal after a drawdown starting between March and July (Fig. 3). However, the probability that a *Chenopodium rubrum* dominated community will establish is highest after a drawdown in March and but it decreases during later months. On the other hand, communities with *Phragmites australis*, *Senecio congestus* and *Rumex maritimus* will establish more likely during a late drawdown (Fig. 3). After climate change, when summers become drier, the risk will increase that the soil remains bare after a summer drawdown (Fig. 3). The probability that a *Typha latifolia* dominated community will establish after a drawdown between March and July becomes smaller. The establishment of communities dominated by *Chenopodium rubrum* and by *Phragmites australis*, *Senecio congestus* and *Rumex maritimus* becomes more likely (Fig. 3).

I advise the waterboards in the Netherlands, a well-controlled water-level management, lowering the water level slowly from March to August, with flooded conditions during winter. The alternation of dry and wet periods during these drawdowns will result in the establishment of a variety of riparian communities, dominated by emergents or annual/biannual mudflat pioneers. To promote helophyte communities, waterboards should decelerate the drawdown, especially during dry periods, or keep water level high until June and then lower the water level slowly. A semi-natural water-level management, starting in March and allowing the water level to drop naturally until the lowest permissible level is reached in April or May, is less suitable for species that prefer wet conditions.

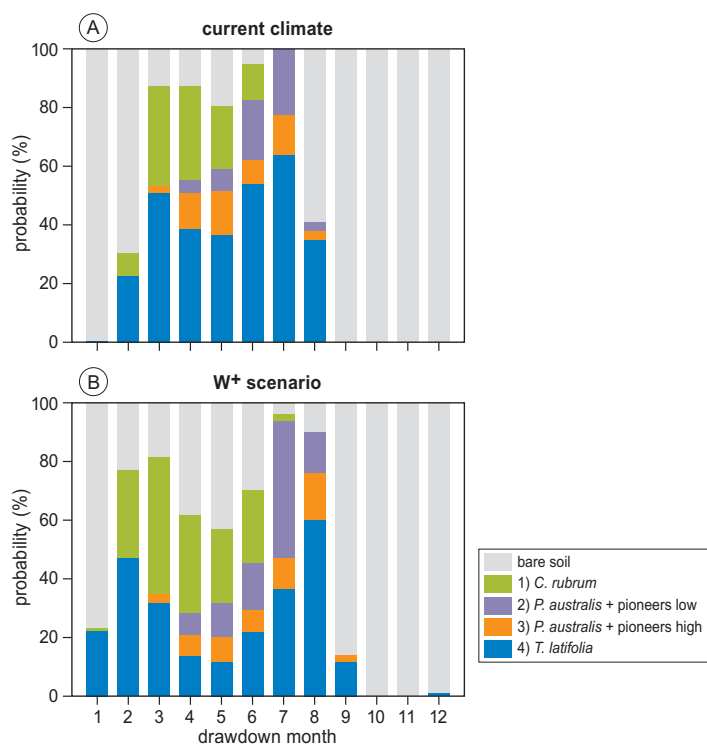


Figure 3: Probability that various riparian communities will establish 3.5 months after drawdown in the current climate (A) and under the climate change W^+ scenario (B). Numbers indicate communities: 1) *Chenopodium rubrum*-dominated, 2) *Phragmites australis* with mudflat pioneers, no *Typha latifolia* and a low cover, 3) *Phragmites australis* with mudflat pioneers, *Typha latifolia* and a high cover and 4) dominated by *Typha latifolia*.

When climate warming proceeds, natural drawdowns between April and July might become unsuitable for establishing moisture dependent communities as this period generally will be too dry for most riparian species. To keep the soil wet, waterboards then might let in water to delay and reduce the drawdown rate. Moreover, waterboards could lower the water level artificially during wet periods in early spring or late summer.

As sand dries out fast, riparian plants may not develop well and the bank will be vulnerable to erosion. Therefore, gently sloped banks with sandy soils with a layer of clay are recommended, as is common practice to protect the shoreline against erosion when building a dike or embankment. Design of gently sloped banks should allow inundation during winter and drawdown during summer.

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Waterfall Project (south-east Brazil): The Union of Sport, Science and Society

This project aims to address the current status of the land-water-atmosphere compartments in the Paraíba do Sul, a 1137 km long river in the Southeast region of Brazil (Fig. 1). This river system supplies water to about 14 million people in >180 municipalities in one of the highly populated regions in Brazil (20-50 inhabitants. km⁻², Ibge 2010). About forty six per cent of the domestic sewage generated in this area is untreated (Agevap 2011) and loaded directly to the river, exerting a large influence on river water quality and its biodiversity. Untreated domestic sewage accounts for about 90% of the pollutant load to the Paraíba do Sul River. Reservoirs along the river have experienced drastic eutrophication in recent decades due to this load, leading to frequent and intense cyanobacterial blooms (Branco et al. 2002; Rangel et al. 2012; Pacheco et al. 2015) and large macrophyte banks (Facioli and Moreira 2013).

In this unique project, carried out between 12th July and 13th September of 2015, the professional athlete, Pedro Olive, supported by an environmental science team (Fig. 2) from six Brazilian research and education institutes, traveled 1137 km along the Paraíba do Sul River, i.e, from the headwaters to the ocean, on board of a Karma Unlimited Jackson kayak.

The project had great visibility and impact on the local society promoting science, environmental education and sport. The expedition included strategic stops in major cities to promote educational and informative activities on topics related to water resources. These forums were a great opportunity for the project members to share knowledge and experiences acquired by paddling the waterway, and foster the connection of the local population to the river environment. Communities living near the river were invited to share their knowledge and perceptions about the environment and the importance of the river as water resource and ecosystem with the scientists and athletes. They were motivated to think about how their activities affect the river and communities downstream. People were encouraged to share information,

by drawing maps and telling their points of view, on major issues related to the river environment, as part of their communities. Concomitantly, kayak teaching activities were offered to kids to learn the basic skills and encourage a healthy lifestyle through sports.

For scientific activities of the expedition, the kayak was transformed into a sampling platform (Fig. 3), for the athletes to collect samples every 5 km for analysis of biological and physic-chemical characteristics of the water. A multiparameter sonde (model YSI 6600, Yellow Springs, OH, USA) was attached to the kayak to measure temperature, conductivity, pH, dissolved oxygen and turbidity every five minutes. In addition, a weather balloon attached to the kayak collected atmospheric temperature and humidity data in a vertical profile using sensors (Maxim, iButtons, San Jose, CA, USA) tied to the balloon's rope (sensors every 2 meters up to 10 meters). Twenty iButtons sensors were installed along the riverbank prior to the beginning of the expedition to investigate spatial and temporal variation of temperature and humidity. During the 63 days of expedition, the team collected 438 samples, two each from 219 sampling points. In total, there were 393,881 records of temperature and humidity with the sensors installed along the riverbank and weather balloon's rope.

Now the whole team is working to the data are now being processed and will be published.. The preliminary analyses show the influence of the city economic profile on water's biogeochemical parameters. This observation mirrors the cities with high population density, and poorer economic condition that lead to further degradation and erosion of the riverbanks. The Funil reservoir, located in the lower river reaches, and considered the more degraded reservoir of the Paraíba do Sul River, plays a buffering role on retaining the excess nutrient load from upper river, leading to better downstream water quality, which will, ultimately, feed the city of Rio de Janeiro. Associated with the retention of nutrient by Funil reservoir, the best preservation of the riverbanks in the downstream reach is an important factor preventing erosion, sediment transport and, thus, contributing to a better quality of the river ecosystem. The Waterfall Project is preparing textbooks and teaching manuals, from the acquired

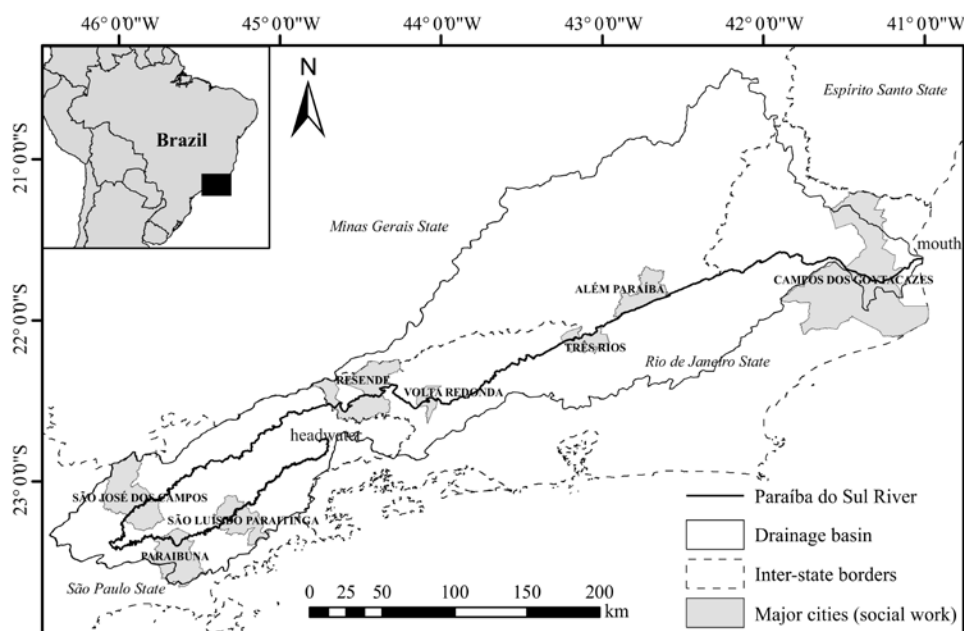


Figure 1: Map showing the Paraíba do Sul River. The professional athlete traveled the 1137 km of the main river, from the headwater to the ocean, on board of a kayak. Water samples were collected every 5 km for analysis of biological and physic-chemical characteristics of water. The gray polygons are major cities where social work were made with local people.

knowledge on the development and implementation of the project, including information on land cover, water quality, influences of the river on the local microclimate, and societal perception of the neighborhood environment. These documents will contribute as guides for teachers of the primary and secondary schools (for students in the 5–19 year age group), providing up-dated information on the current situation and on the problems existing in their watershed. In this project, the sport (extreme kayaking) worked as an efficient and interesting tool to unite science and society.

In addition to being an extremely effective communication strategy on propagating scientific knowledge to the society, the data generated by the project will feed the scientific peer-reviewed literature, bringing in an integrative manner, the impact and risks that the tropical ecosystem freshwater environment are facing.

A second expedition of the Waterfall Project is planned to be conducted in the Iguaçu River in the Southern Brazil in October and November 2017.

Spreading a good practice

We sought reaching a large number of people through presentations and interviews with local communities showing local problems and good practices that can minimize the impact of Man's activities. The presence of the professional athletes at social activities was extremely important to engage people in the project objectives and environmental cause. During the expedition, people from many places followed the kayaks and the project team. Many of them had already seen Pedro Oliva on TV dropping giant waterfalls worldwide and they were happy to see a celebrity working for an environmental cause in their region. Also, the project had the partnership of spontaneous media, radio, and newspapers, which leveraged the propagation of the project information and ideas.

Involvement of Research and Education Institutes

The Project was conducted under the supervision of scientists from six Brazilian research and education institutes: Malafaia, M. from INPE; Anderson, L.; Anderson, L., Andrade, M., Iwama, A., Marchezini, V., Rundorff, C.; Trajber, R. from National Center for Monitoring and Early Warning of Natural Disasters (CEMADEN); Reis, A., Sales, M. from UNIFEI; Correia, G., Domingos, P. from UERJ; Medeiros, L. from São Paulo State University (UNESP) and the authors.

The project had the financial support of research institutes and universities (listed above), São Paulo Research Foundation (FAPESP, project number 2014/06556-3) and eight private companies, including Clean Environment Brazil, GEOKLOCK Environmental Consultancy and Engineering, etc.

This text is a short (amended) version of the article “Waterfall Project: Sport, Science and Society Coming Together”. For more information about the project, see Pacheco et al. 2016.

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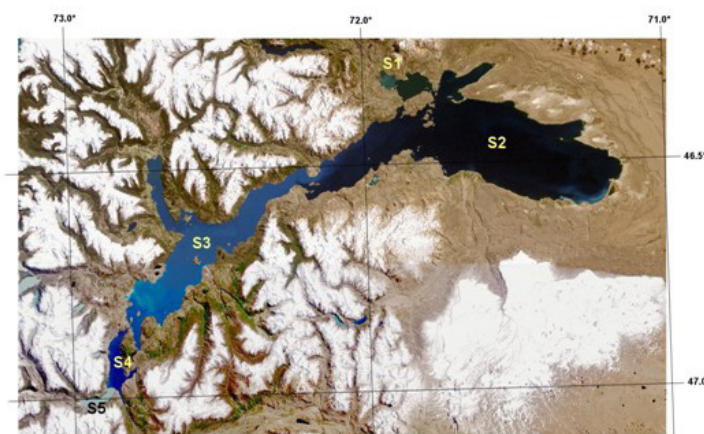
Figure 2: Participants of the project. Photo: Allan Yu Iwama.

Limnology and remote sensing and its applications in Chilean lakes

The use of remote sensing techniques in limnology was developed many years ago. Remote sensing can be utilized for studying lakes that are otherwise inaccessible because they are mainly situated in mountain zones and other difficult terrains. (Kondratyev & Filatov, 1999). In Chile, there are many such lakes with accessibility problems, e.g. in Atacama Desert that has 52 lagoons associated with saline deposits; there are many mountain lakes all over the country, especially in zones with native forests where they are accessible via the long and curvy mountain paths. Patagonian plains are in extreme southern Chile that is a distant zone with climatic problems, especially due to strong winds (De los Ríos-Escalante, 2010). Also, the Easter island crater lakes are exceptional with respect to accessibility, namely, in the region of Rano Kau volcano (Cañellas-Bolta et al., 2012; De los Ríos-Escalante & Ibáñez, 2015).

The remote sensing applications in limnology are based on integration of environmental data such as temperature, conductivity, chlorophyll, plankton or other similar parameters, that are contrasted with quantitative optical properties (Kondratyev & Filatov, 1999). Reports of use of remote sensing techniques in Chilean lakes are scarce and are mainly from the Patagonia region (41-55° S). An example is General Carrera lake (46° S), a lake that Chile shares with Argentina where it is called Buenos Aires lake. The lake has glacial sediments in its western basins, with a greenish coloration in some bays, or a blue coloration in other zones. These variations in optical properties are related to the zooplankton composition: greenish coloration generally indicates areas where species composition is markedly low (De los Ríos-Escalante et al., 2013; De los Ríos-Escalante & Acevedo, 2016b). Other option would be mountain lakes such as Puelo lake and river basin, such as Tagua Tagua lake (41° S) that receives glacial inputs from upper Puelo river and its lake effluents (Lara et al., 2008). We found a relationship between the zooplankton composition and optical properties (De los Ríos Escalante & Acevedo, 2016a,b). Other potential application of remote sensing are from Ana lagoon in Pali Aike National Park (53° S; Dominguez et al., 2004), a saline lagoon located in extreme southern Chile that would have strong surface variations in water chemistry and other parameters due to rains but also to dry seasons.

On the Easter Island, there are two permanent crater lakes (Rano Kau and Rano Raraku) and ephemeral lagoons in the plains (Rano Aroi).



Satellite image of General Carrera lake, Chile.



Figure 3: The professional kayak (Karma Unlimited Jackson Kayak) was adapted to be a data-sampling platform. Water quality probes, weather balloon, weather station, GPS and cameras collected data from the water, atmosphere and riverbanks. Photos by F. S. Pacheco and Pedro Oliva.

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This territory is very far from the continent and not quite accessible for systematic studies (Cañellas-Bolta et al., 2012; De los Ríos-Escalante & Ibáñez, 2015). In these inland water systems, the most difficult to access is Rano Kau crater volcano. The bottom of the crater has very steep slopes that cause additional difficulties of accessing the area (Cañellas-Bolta et al., 2012). Thus, the use of remote sensing techniques would be important tool as first approach for collecting limnological data.

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Aerial view of Tagua Tagua lake

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Ana lake in Pali Aike National Park.

Pioneering Symposium on Philippine Freshwater Biodiversity and Lake Taal's first Biomuseum

(Another version of this article has been published in the University of Santo Tomas (UST), Manila, Philippines, website <http://www.ust.edu.ph/news/ust-hosts-pioneering-symposium-on-philippine-freshwater-biodiversity-and-lake-taals-first-biomuseum/>)



From June 7 to 10, 2016, the University of Santo Tomas (UST) in Manila, Philippines, hosted the *1st Philippine Symposium on Freshwater Biodiversity and Ecosystems (PSFBE)*. The four-day event, chaired by S.I.L. member and former recipient of Tonolli Award Dr. Rey Donne S. Papa, gathered international and national experts from limnology and freshwater biodiversity. There were 143 participants and 20 invited speakers from the Philippines and neighbouring countries, including Hong Kong, Japan, Taiwan, Thailand and Singapore. The pioneering symposium was held in cooperation with the California Academy of Science, Pusod, Inc., the Institute of Biology – University of the Philippines (Diliman campus), Ateneo de Manila University, Bureau of Fisheries and Aquatic Resources – National Fisheries Research and Development Institute, the Association of Systematic Biologists of the Philippines with support and endorsement from the International Society of Limnology. The event was mainly funded by the U.S. National Academy of Science & USAID PEER Project of Dr. Papa with additional support from the UST College of Science and the Research Center for the Natural and Applied Sciences.

Awards were conferred on the first day to 7 pioneer scientists of Philippine freshwater research. They have all greatly contributed to the development of freshwater biology research and education in Philippines in the past 3 decades. This ceremony was followed by the Keynote Scientific Lecture entitled “*Apocalypse in Anthropocene Asia: Can we conserve freshwater biodiversity in this rapidly changing world?*” by Prof. Dr. David Dudgeon of the University of Hong Kong (current editor-in-chief of the ISI journal *Freshwater Biology*).

On the first day, an exhibit featuring Lake Taal was opened. This lake is one of the most interesting lake ecosystems of the Philippines in view of its geological origins, and biodiversity as well as being the location of the lowest (altitude) active volcano in the world. The exhibit, entitled “Taalaman: The Lake’s first Biomuseum” was the culminating project of

the Biodiversity and Conservation Biology class of the UST Graduate School. Twenty one students set up the two-part exhibit in the lobby of the Main Building as well as the Exhibition Gallery of the UST Museum, helped by the exhibit curators – Richard Thomas Pavia and Prof. Mary Ann Bulanadi. The exhibits showcased the rich biodiversity of Lake Taal as well the many threats this lake is currently facing from intensive aquaculture and deteriorating water quality due to excessive nutrient inputs

from the watershed. Among the highlights was the live exhibit, which showcased for the first time in Philippines different animals collected from Lake Taal and maintained in several aquaria. The exhibits included endemic, native and introduced species in the lake. The exhibits are aimed to provide an alternative means of educating the public about freshwater biodiversity and conservation.

On days 2 and 3, invited plenary lectures were held in parallel sessions, including a poster session. On day 3, winners for the best poster and best graduate student oral presentations were awarded. To ensure the sustainability and the continued growth of freshwater biology in the country, a group of local scientists met during the second day of the symposium to establish the Philippine Society of Freshwater Sciences (PSFS), which is proposed to organize the new Society meetings. The establishment of the society was announced at the closing ceremony and the meeting was wound up with an announcement that the University of the Philippines (Diliman campus) will be the venue for the meeting in 2018.

On the last day of the symposium, a trip was organised to the Taal Lake Conservation Centre by Pusod Inc. – a NGO which promotes the conservation of Lake Taal and its environs. The participants had an opportunity to get, first-hand, information on Lake Taal and its surrounding landscapes and see how conservation efforts are being conducted by Pusod Inc. with its partner communities and academic institutions. A 40-minute boat ride to the volcano island near the centre of the lake was the main highlight of this trip. Afterwards, the participants trekked for an hour to the viewing deck of the crater lake in the middle of the island, the site of numerous past-volcanic eruptions, as well as Vulcan Point – a small island located inside the crater lake.

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Obituary

The whole is more than the sum of the parts: a tribute to Brian Moss

Brian Moss, a pioneer in the ecological restoration of lakes worldwide, sadly died on the 27th May 2016. Examining the scientific contributions of Brian Moss reveals a long, fruitful and distinguished career. Initially focusing on detailed algal studies and the functioning of shallow lakes, he later generalized and explored the relationships between aquatic systems and society. This later work did not just consider ecosystem functioning as the sum of bottom-up or top-down processes, but taught us to consider broad lessons from cultural studies, especially the arts. His view of freshwaters was certainly more than the sum of the parts.

Brian's first paper written during his Ph.D. at The University of Bristol, studying the algae of a small pond, described an innovative method for quantifying the abundance and pigment content of algae on submerged sediments. Following his Ph.D., he developed his career on tropical limnology, holding a research post at Lake Chilwa in Malawi for a year. Due to an exceptional drought in 1968, however, the lake dried up and his work there ended after only 1 year. Nevertheless, this was the start of Brian's long-lasting passion for African limnology with hippos and floodplains featuring strongly. He followed his time in Africa with post-doctoral work at Michigan State University, USA, where he worked on a large-scale experimental lake system, investigating the impacts of nutrients on algae. This work delivered a seminal series of papers on the influence of environmental factors on the distribution of algae (Moss, 1972; 1973a; 1973b, 1973c). Importantly, it was here that he was first stimulated by colleagues at Michigan to think more broadly about the functioning of lake ecosystems. He moved to The University of East Anglia to a department where this broader environmental science vision was encouraged. Brian and the many students and post-docs in his lab, alongside long-term collaborators in the Netherlands & Denmark, began to analyse key aspects of the structure and functioning of shallow lakes, highlighting the crucial role of submerged vegetation as a refuge for zooplankton against fish predation (Timms & Moss 1984); the direct and indirect trophic interactions in the classical food web and the consequences on phytoplankton consumption (Moss, 1990); the existence of alternative ecosystem configurations or regimes in a wide range of nutrient concentrations (Scheffer et al. 1993); the multiple feedback mechanisms associated with eutrophication and oligotrophication processes (Moss, 1990) and the role of salinity in shallow brackish lakes (Moss, 1994). Brian was instrumental in many of these new frontiers in shallow lake ecology and continued this work following his move in 1989 to become Professor at the University of Liverpool. At Liverpool, he demonstrated the importance of nitrogen limitation in shallow lakes (Moss et al., 1994) and the role of nitrogen in the loss of submerged plants (James et al., 2005), and established a large lake mesocosm facility to examine the effects of climate on the ecology of shallow lakes (Moss et al. 2003). More recently, Brian wrote about the interactions between science and politics (Moss 2008) and profound reflections on the links between man and nature, and the main current challenges of human societies (Moss 2010).

The scientific contributions of Brian promoted a systemic holistic approach in Limnology (dominated sometimes by fragmented and reductionist perspectives) and an interdisciplinary exchange with other disciplinary domains. The challenges of the restoration of eutrophic ecosystems decisively defined the main features of his scientific career.



However, his education, political and ethical opinions, are also key factors for understanding the main interests of Brian and his legacy.

The study of shallow lakes required collaborations with experts from other disciplines. As a part of such collaborations, Brian conducted multiple consultations, delivered postgraduate courses, supervised many overseas postgraduate students, and conducted joint research projects with scientists from all over the world. An interesting example was a series of interactions he had with scientists in Uruguay, initiated by a postgraduate course he gave there in 1998. The course "Ecology and restoration of shallow lakes" was given only once, but it attracted a large number of advanced students and senior researchers from many South American countries. Interestingly, Southern hemisphere scientific cooperation was rare in those days, but many strong scientific and personal ties among the course participants were initiated then. These contacts continue today and have actually strengthened with time. Brian's contribution was not only to encourage cooperation but also to change the philosophy and approach of limnological research. The scientific exchange between Uruguayan, Argentinean and Brazilian researchers promoted a systemic perspective in several limnological groups, a rare feature in the context of Latin America's research two decades ago.

Brian further facilitated and promoted the interactions between research groups of South America with European groups led by other renowned researchers, such as Erik Jeppesen or Marten Scheffer, with whom research ties continue today. The following anecdote illustrates his strong sense of networking. When the research team in Uruguay started to analyze the main differences in the fish communities between temperate and (sub)tropical systems, he instructed: "sampling techniques of fish communities are a very complicated business, it is essential to start working with Erik Jeppesen". The scientific cooperation that emerged led to several research programmes and activities aimed at understanding: the role of crucial ecosystem components such as large free floating plants in shallow lakes of (sub)tropical climates (e.g. Meerhoff et al. 2003); structural and functional differences of shallow systems associated with latitudinal gradients (e.g. Kosten et al. 2012); interactions between eutrophication and climate change (e.g. Moss et al. 2011).

Another example is from Turkey. Brian was a strong supporter of Turkish scientists working on the ecology and functioning of shallow lakes, rallying against managers and people who held deep-seated perspectives that macrophytes needed to be removed from shallow lakes. To



Brian teaching students on a boat. Photo credit: Mike O'Connor

change such misconceptions, Brian delivered three elegantly laid out, influential talks together with his dearest and long lasting colleague and friend Erik Jeppesen. These talks convinced the 200 or so people in the audience attending the symposium and later became part of a symposium book that was translated into Turkish which truly established the scientific understanding of shallow lakes in Turkey.

Brian was a gifted speaker, a unique story teller who knew how to mix art, poetry and science in a splendid cocktail. One of his last conference talks was the Shallow Lakes Conference held in Turkey in 2014. Here he delivered the last plenary of the conference, elegantly reviewing the state of the science and encouraging the audience to be more holistic in their approach. He returned to the example of an un-engineered African floodplain ecosystem in Tanzania, where he had recently spent 2 months studying the shallow lake ecosystems and the fauna that depended on them. It highlights his interest in international limnology that he started and finished his scientific career thinking about African freshwaters and using them to show that European waters lack the important large herbivores and predators in the catchment to really be considered undisturbed. Long after being retired he was still able to shake the audience with his novel ideas and because of high demand, the talk is available to view on YouTube (<https://www.youtube.com/watch?v=MM7l8uH9PzI>).

Brian had a long research connection with the Netherlands ; he was a member of the scientific committee at the Limnological Institute, Nieuwersluis, since the mid-1990s, now called the Netherlands Institute of Ecology (NIOO) and located at Wageningen. He started visiting the Netherlands in the late 1980s and early 1990s in connection with the initiation of studies on lake biomanipulation at RIZA (Institute for Inland Water Management and Waste Water Treatment at Lelystad). His lecture at the First Biomanipulation Conference, held in Amsterdam in 1989, on engineering approaches to lake restoration from eutrophication has now become a well cited paper (Moss 1990). Later, such studies facilitated, under Brian's supervision, the start of European Union Studies on comparing the effects of climate change in lakes of varying latitude. These included lakes in Scandinavia in the North to Dutch and Belgian lakes in Central Europe and lakes in Spain in the South. At one of Brian's last visits to the Netherlands; he was invited as an honorary guest to attend

the retirement and farewell Symposium in December 2011 of the famous Dutch limnologist, Dr. Harry Hoser. Harry had worked for many years at RIZA on biomanipulation of dozens of Dutch shallow lakes (see SILnews letter 59). Brian was a member of the editorial board of Aquatic Ecology from 1996-2011 and continued this honorary work until his passing away last year. He hardly declined reviewing a MS sent to him for review and he often helped young student authors with their scientific writing, in addition to the scientific content.

The personal characteristics of Brian Moss and his interest in learning about different cultures and regions of the world, were promoted through his prominent role in the SIL. Brian first joined SIL in 1969 and was a member continuously for 47 years. He received the prestigious Naumann-Thienemann Medal Award in 2007 in Montreal, Canada, “for creating, through his research and scientific leadership, a fundamentally new understanding of shallow-lake ecosystems”. In 2007 he was also elected President of SIL, and served two terms of 3 years each, up until the 2013 SIL Congress in Budapest, Hungary. For much of these two terms he also acted as General Secretary-Treasurer for the society. His presidency was during a period of major change in the Society. At many previous Congresses the national representatives had discussed how SIL's publications, the former Proceedings, could be transformed to be more “citable” publications with a rigorous review system. Brian became the leading force in the transformation of the Proceedings to SIL's current peer-reviewed journal *Inland Waters*. Although others participated with energy in the process, Brian made it happen, with the first issue of *Inland Waters* appearing in January 2011. Thus, he made SIL take an important step into the 21st century. Choosing a name for the new journal was an issue that couldn't be resolved within the SIL executive committee due to differences of opinion, so Brian involved the entire SIL membership to vote for a suitable name, and *Inland Waters* was eventually chosen.

In addition to being an outstanding scientist, Brian was always a supportive person and inspiring leader. He was always helpful, generous, willing and wise about dealing with people. All his years of joint work and scientific interactions, allowed many of us to get to know a person deeply committed to his work, with a spartan austerity, generosity in sharing knowledge and experience, and a great promoter and coordinator of research networks and collaborative research.

In the last few months of his life he was simply remarkable. He faced the prospect of his nearing death with no fear, and shared his experiences with those close to him. He was remarkable in the way he was open, direct and courageous about his liver cancer, saying that as an ecologist he knows that he should die and leave room for the younger generation. A few weeks before his death he wrote a personal letter to SIL members that opened the June 2016 issue of SILNews. This letter reflected his courageous personality. Unexpectedly his death on the 27th May 2016 preceded the circulation of this Newsletter, so that his letter could be read only in retrospect.

He deserved every bit of the incredible respect that he received from the the limnological community. Undoubtedly, he represented one of the founders of the community of scientists associated with the study of shallow lakes. Through his public lectures, widely read textbook (Moss, 2010), and wide travels he became more than that, he was an ambassador for freshwater science and ecology at large and its importance to society across the globe.

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Romuald Z. Klekowski (1924-2015): An outstanding scientist and a charismatic mentor

Romuald Z. Klekowski passed away May 5, 2015 at age 91. He was born in Pinsk in the northeastern part of former Poland, now in Belarus. During the Second World War he was an anti-nazi partisan in the Armia Krajowa (the Home Army). In 1944, this anti-nazi group was incorporated into the Soviet Red Army. In 1947 he was awarded the Medal of Victory and Freedom 1945.



Romuald Klekowski on one of the expeditions to Spitsbergen.

Romek, as his friends knew him, took his M.Sc. from the Lodz University in 1950. He received his Ph.D. (1960) and habilitation (= D.Sc, 1968), both from the Nencki Institute of Experimental Biology, Polish Academy of Sciences. He became Extraordinary Professor in 1970 and a full Professor in 1978. Romek was a member of the Societas Internationalis Limnologiae (SIL) from 1956. He participated in several SIL Congresses and co-organized the 16th SIL Congress in Warsaw.

Romek's legacy to science includes hundreds of publications covering a broad range of research topics: from polar ecosystems to tropical water bodies; from laboratory scale experimental basins, to temporary freshwater pools and oceans. Nevertheless, the primary object of his studies was fresh-waters. He excelled in studies of a range of poikilotherms from protozoa through nematode, crustacea, insects, mollusks, fishes and amphibians. He practiced faunistics, animal ecology and physiology, developed new methodologies and typologies. In late 1960s and early 1970s a contribution to a new discipline – ecological bioenergetics – stemmed from discussions with A. Duncan, J. Phillipson, F. Schiemer, and G.G. Winberg's former students (E.A. Shushkina, M.B. Ivanova, L.M. Sushcheniya and G. A. Galkovskaya). The landmark book based on these joint studies was the IBP Handbook No 24



Prof. Klekowski with a trophy fish on board the Kurchatov

(Grodziński, Klekowski and Duncan [Eds] 1975). The discipline reached full development just 10-20 years later; Romek has since this time remained an international authority on the subject. Further advancements in ecological bioenergetics were summarized in Klekowski and Fischer [Eds] (1993). More recently, his scientific activity has expanded towards mathematical modeling, which resulted in a book *Mathematical Modelling of Ecological Processes* by Klekowski and Menshutkin (1996). One particular attribute to his activities was an integration of the Polish science with those of the West and East even during the years when such ideas had little general support.

At an early age of 26 Romek, then M. Sc., was asked to build a new department, the Department of Experimental Hydrobiology at the Nencki Institute of Experimental Biology. At that time the three remaining departments of the Nencki Institute were headed up by respectable Polish professors. Later (in 1970-1973), Romek was a deputy Director of the Nencki Institute, and then the Director of the Institute of Ecology, Polish Academy of Sciences (1973-1982). He occupied high positions in the Central Office of the Polish Academy of Sciences: the deputy secretary of the Biological Division (1970-1973), and the secretary of this Division in the years 1984-1995. He was the Editor-in-Chief of the journal, *Polish Archives of Hydrobiology* (1965-1998).

His explorative character took him to sea research. He actively participated in the Polish polar research and in the foundation of the Polish Antarctic Station H. Arctowski (1977). He was a member of six scientific cruises (1974, 1978, 1982, 1985, 1989 and 1993) on the Soviet Union ships. Altogether, he spent about 20 months on ship board, doing research on all oceans, including Antarctic Ocean. His contribution to research in polar ecosystems has been recognized in the naming of a peak Turnia Klekowskiego (Klekowski's Peak) on the Antarctic King George Island in South Shetlands and a new species of fossil penguin *Palaeudyptes klekowskii* Myrcha et Tatur 1990. In addition, he spent four summers on Spitsbergen, studying the tundra biome. During his absences, his wife, Krystyna, was left at home with their two children, Michał (born 1961) and Marta (born 1968). Once Krystyna had told me: "I thought I married a scientist, not a traveler". But she understood his passion for scientific research and supported him, which can be seen from a book, she co-authored with Romek and Volodia Menshutkin (2012), who was

Romek's regular travel companion and his co-author of many scientific publications.

The importance of Romek's achievements was manifested by election to the Polish Academy of Sciences (a Corresponding Member in 1979, and a Regular Member in 1994), and to the Belarusian Academy of Sciences (1995). The President of the Polish Republic awarded Professor Klekowski the *Polonia Restituta* Knight Cross (1971), the *Polonia Restituta* Commander Cross (1977) and the *Polonia Restituta* Commander Cross with Star (1986). He also received from the Sea Fisheries Institute a Professor Kazimierz Demel Medal in 1995. In 1997 he was awarded the Prime Minister of Poland Prize for Outstanding Scientific Achievements.

Notable was his exceptional gift for instilling his pupils and friends with an enthusiasm for science. He supervised 25 students to their Ph.D. - a high number considering that he was a non-university professor! Several habilitated doctors and four full professors emerged from the Klekowski's School. His partisan past was reflected by spicy sayings in Polish or Russian. Most of them were short and to the point, but none of them can be printed.

Romek was an outstanding scientist, an inspiring mentor and a fine colleague. We all will remember him for his generousities and dispositions.

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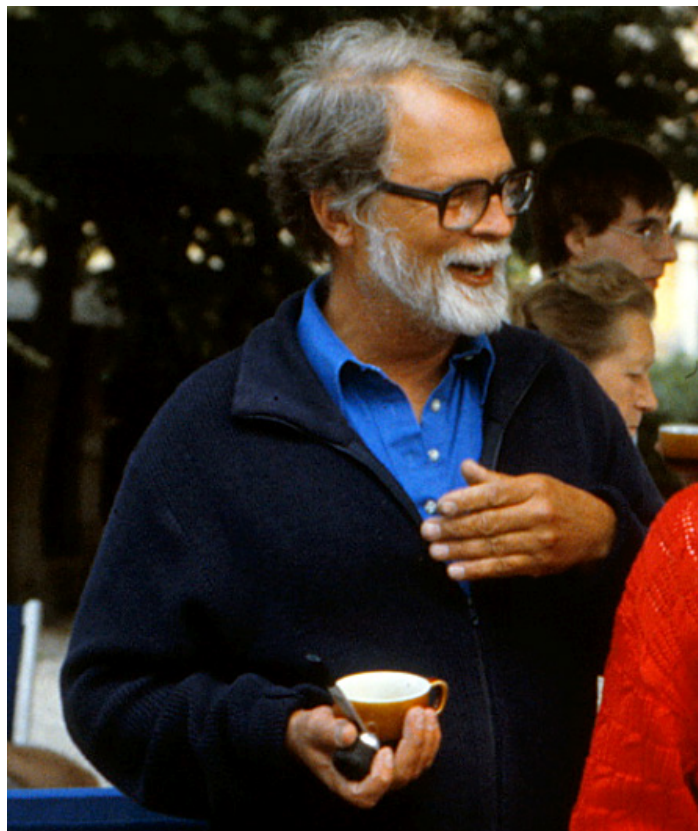
In memoriam — Charles King

Charles E. King, Professor Emeritus at Oregon State University, died September 5th in Alaska at age 82. Charles grew up in Florida, but traveled to Atlanta where he received his bachelor's degree in biology at Emory University in 1958. After a MS degree from Florida State University, he made his way to the University of Washington where he earned a PhD in 1965 under the supervision of Alan Kohn and Tommy Edmondson. It was here that he became enamored with rotifers and spent the remainder of his career working on these intriguing animals. Charles served the majority of his academic career at Oregon State University after brief stints as an assistant/associate professor at the University of Illinois, Yale, and the University of South Florida. During his 26 years at Oregon State, he played a major role in developing the Department of Zoology into a highly regarded program, especially during his years as chairman from 1977–1986.

Before his retirement in 2003, Charles built an international reputation as a geneticist and population biologist working on experimental and theoretical aspects of life history evolution. Charles was especially fascinated with the interaction between ecology and population genetics of cyclical parthenogens like rotifers and cladocerans. His work emphasized how cyclically parthenogenetic life cycles impact the interplay between natural selection and genetic drift and determine evolutionary trajectories. Charles was keenly interested in adaptation to seasonal environmental variation and how cyclical parthenogens coped with these challenges. His first big splash scientifically was his 1967 Ecology paper on food and age on the population dynamics of lab populations of *Euchlanis dilatata*. This led to multiple subsequent papers on aging using rotifers as experimental models. Charles also maintained an interest in theory and the use of mathematical modeling to explore general hypotheses about evolutionary dynamics. His 1970–1971 papers with Wyatt Anderson on age-specific selection are good examples of this line of investigation. Charles was a strong advocate of rotifers as a model organism to investigate general problems in evolutionary biology. His 1972 paper on adaptation to seasonal variation by *Euchlanis dilatata* clones was highly regarded and was followed with an equally impressive 1977 paper describing similar adaptation by *Asplanchna girodi*. Charles summarized these experimental results in 1980 with conceptual models of the genetic structure of rotifer populations, models that would considerably influence the direction of future research. One of his most cited papers was on the tradeoff between survival and fecundity (1977), figures from which appeared in multiple textbooks. More recently, Charles published with co-authors Manuel Serra and Terry Snell, an important contribution to understanding the optimization of the timing of sex in cyclically parthenogenetic life cycles (2004).

Charles was a tireless advocate for the world community of rotifer scientists. At the very first International Rotifer Symposium in Austria in 1976, he volunteered and then edited the entire proceedings volume. The high standards that he set remain a tradition today as these triennial meetings have continued uninterrupted for more than 30 years, influencing another generation of rotifer biologists. The intellectual leadership provided by Charles with his probing questions and good-natured repartee is the stuff of legend and a constant feature of meetings — something appreciated by all who have ever attended a rotifer symposium.

Because of his lively intellect and rigorously critical thinking, Charles was a widely sought after visitor. He had visiting scientist appointments at the University of Milan with Claudia Ricci and the University of



Charles King: geneticist and rotifer biologist, at the 5th International Rotifer Symposium (September, 1988). Photo courtesy of C. Ricci

Valencia with Maria Rosa Miracle and Manuel Serra. Charles and his wife Davi were fond of hosting visitors in their beloved Corvallis and many enjoyed their kind hospitality over the years. Charles enjoyed cooking for his guests at his home at Soap Creek. He had a special section of his library close to the kitchen, where cooking books were stored. Manuel Serra remembers eating Charles' exceptional Thai curry, and an excellent Italian pasta, undoubtedly influenced by Claudia Ricci, also a frequent visitor to Soap Creek.

Charles loved boating, first sailing in the Gulf of Mexico out of Tampa and later fishing in the Pacific off the coast of Oregon. His preference was for fishing and boating in remote areas, where he enjoyed the challenges of a rugged environment with little external help. Eventually Charles made a few forays to Alaska and was soon hooked by its natural beauty and sense of adventure. After several summer visits to South Alaska for camping on isolated islands, he and Davi decided to buy a small house in Tenakee Springs, a tiny town on the Alaska seashore. Spending summertime in Tenakee convinced Davi and Charles that the town — small but lively and with an exciting cultural life — was a perfect fit for the lifestyle that they sought in retirement. Soon thereafter they bought a larger house — a real one, Davi said — and became fully active and year-round members of the Tenakee community. In this way Charles enjoyed the last part of his life, beside his beloved Davi, hosting family and friends in a place that he loved.

Charles' colleagues have shared some reflections of his impact on their careers. Terry Snell (Georgia Tech) said, "Charles was a strong mentor who taught me the standard of critical thinking required to be successful in science. Much of my success today I attribute to the rigor that he required in experimental design, analysis, and in drawing



A more recent photograph in retirement. Photo courtesy of D. Richards.

conclusions.” Claudia Ricci (University of Milan) remembers how her visits to Corvallis, and his subsequent return visits to Milan, stimulated their scientific interests and re-enforced a strong friendship that extended to their spouses. Bob Wallace (Ripon College) recalled Charles’ counsel before he embarked on writing his first review paper on sessile rotifers: he told him “to not just review the facts, but to take a wider view — to synthesize the discipline.” Manuel Serra (University of Valencia) said “Charles showed me how important mapping genotypes into phenotypes and into environments is, how to integrate field, lab and modeling, and how friendship fuels scientific interaction.” John Gilbert (Dartmouth College) said that he enjoyed Charles very much and admired his work. “His study on the seasonal changes of clones with different temperature optima for reproduction was one of the first indications of seasonal clonal selection in natural rotifer populations.”

It is clear that Charles made important contributions to rotifer biology and was much admired by his colleagues. He will be greatly missed.

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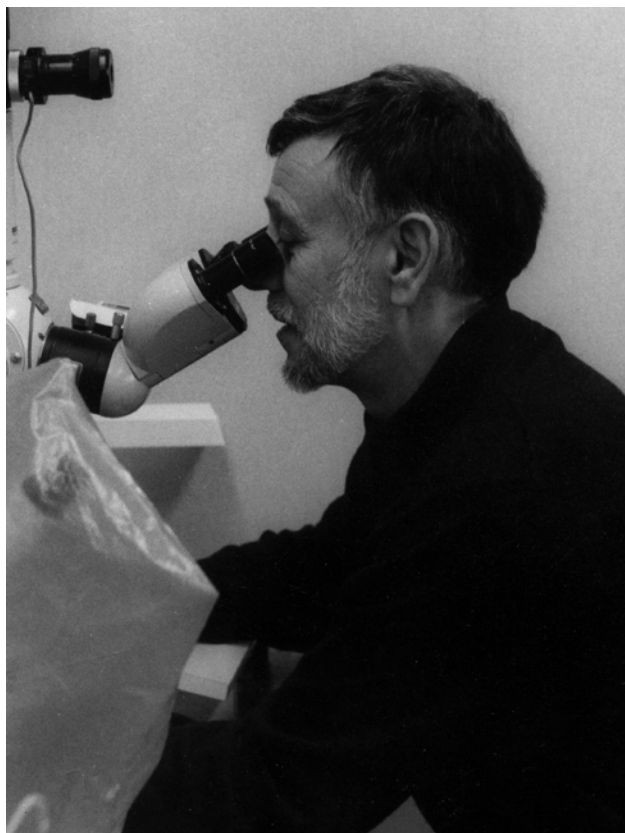
Obituary: Pierre Compère (1934-2016)

Pierre Compère left us on April 29, 2016 in Brussels (Belgium). Pierre was a distinguished phycologist at the National Botanic Garden of Belgium, and was for many years Secretary of the Committee for Algae at the International Association for Plant Taxonomy and Editor of the *Belgian Journal of Botany*.

Born in 1934 in Aywaille (Wallonia, Belgium), he got a degree in Botanical Sciences at the University of Liège. As a young botanist he had the opportunity to work in Congo in 1959, in the Institut National pour l’Étude Agronomique du Congo (INEAC) where he made a cartography of the vegetation of the Bas-Congo region. He collected more than 3000 herbarium specimens, preserved in the collection of the National Botanic Garden of Belgium.

Back from Africa to Belgium because of the political events that led to the independence of Congo in July 1960, he started a long and successful career in phycology with a major contribution to systematics and ecology of freshwater algae and cyanobacteria. Actually, he developed a phycology section at the National Botanical Garden of Belgium, in Brussels.

Pierre Compère became a world reference in freshwater algae. He gave several major contributions to the knowledge of algae from the African continent, such as his 7 volumes of the algae from Lake Chad region (*Algues du Sahara et de la Région du lac Tchad*) published between 1974 and 1977, which are still a masterpiece and a useful reference for algologists interested in the African and tropical microflora. He visited Brazil in 1998 and contributed to the knowledge of the Brazilian flora, and also published a practical flora of Belgian freshwater algae in 4 volumes from 1987 to 1992, among many other notable contributions, already highlighted in a number of tributes published by prominent colleagues (Ector and Hoffmann 2000, Fabri et al. 2000,



Golubic and Wilmotte 2014), compiling a complete list of publications (Van de Vijver 2014) and taxa described by Pierre (Bogaerts et al. 2014).

More particularly, we would like to emphasize what we will remember human qualities the most about Pierre. When someone would knock on his door with some samples - no matter if they were taken from a trivial private pond or from the greatest of the African lakes, brought by a young student or a senior researcher - not only would he open his lab, but also would spend hours next to him/her on the microscope, always humble and enthusiastic. We will never forget the after-lunch walks in the National Botanical Garden of Belgium (his office) where we talked about science, botany and life... Pierre always impressed us all for his remarkable competence, simplicity and kindness. That is how he will be remembered by so many friends throughout the world. He will stay in our memory forever.

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