SIL news

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Suncheon Bay, South Korea
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LETTER FROM

The President

This is the second time that I am writing a Letter from the President in my home office. A second wave of The COVID-19 pandemic is reaching many parts of the world, and requires that we keep physical distance from our colleagues. I would like to send greetings to all my colleagues who have suffered from the pandemic, either personally, among their colleagues, or in their families. I am aware of the difficulties under which many of you have to work now, often topped by caring for your family, relatives or friends. Stay healthy and optimistic!

During the last months, we have had several intense meetings and discussions about the perspective for our SIL society journal, *Inland Waters*. Have you seen the recent Table of Contents? Have you considered sending your most recent scientific manuscript to our journal? I understand that there is an enormous pressure, in particular on early-career scientists, to select the 'best' journal as an outlet for their scientific results. Unfortunately, *Inland Waters* is not among the journals that come first into the minds of limnologists when thinking about the most appropriate audience for their next submission. Why? Are we, SIL members and researchers, just the victims of international publishing policies, forced to select journals according to their impact factors? Personally, I think this is a too simple an answer. A scientific community such as SIL depends on the interest and engagement of its members, and on the attractiveness it can have for future members. There are a multitude of ways by which you can engage for SIL – as an elected member of the Executive Board, as a member of committees organizing congresses or selecting candidates for awards, or as an active communicator of SILnews and topics in social media. However, another expression of your bonding with SIL is the communication of scientific results in our society journal. It is not the journal name that makes a paper excellent but it is the opposite – excellent scientific results are excellent wherever they are published. Thus, do you have fresh results that soon shall be communicated via a new paper? Do you have an opinion on recent methodological developments or emerging hot topics in our science? Then, please consider *Inland Waters* as the potential outlet for these. The Editor-in-Chief of *Inland Waters*, David Hamilton, and his editorial board do their best to handle your submission fairly and as fast as possible.

A second major avenue along which scientific societies communicate their results is via international congresses. SIL has a long tradition of organising well-respected international meetings where researchers from many parts of the world have met, presented and discussed. Unfortunately, we had to cancel our regular congress in August 2020 because of the COVID-19 pandemic. We simply did not have enough time to re-organize the meeting in a completely virtual format, while observing the pandemic development in spring 2020. However, the Local Organisation Committee from South Korea has renewed its motivation and engagement to organize the SIL congress in Gwangju in August 2021. More information can be found on page 4. And the SIL congress in Berlin will follow one year later – we will celebrate 100 years of SIL!

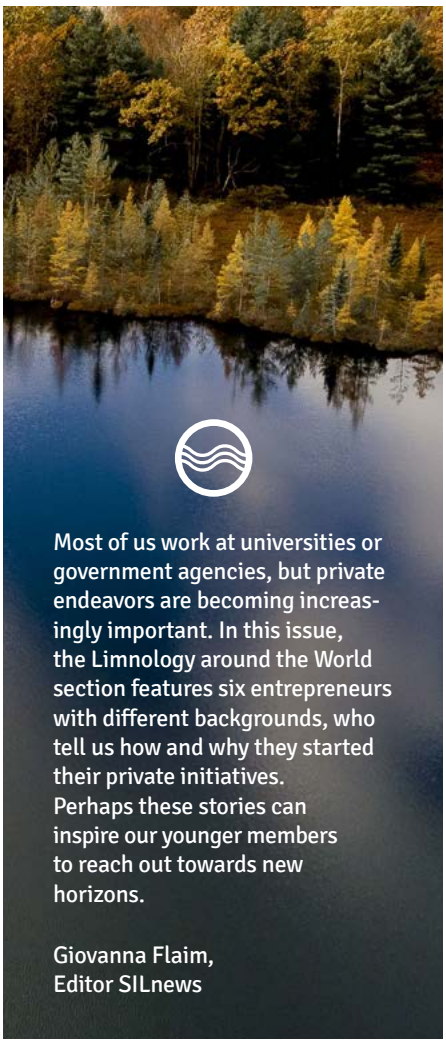
> "Do you have an opinion on recent methodological developments or emerging hot topics in our science? Then, please consider *Inland Waters* as the potential outlet for these."

Let me add another aspect of our society here that is related to history and tradition. Within the span of almost 100 years, the operation of a scientific society has changed massively. In the same way as typewritten manuscripts sent by mail have been replaced by online editorial managers allowing submitting the manuscripts virtually, the structures of a society and the necessary procedures to run society business have to be adapted to the new organizational environment. Just think about member databases, payment of fees, and society decision structures. SIL is in the process to modernize all these aspects. A big Thank You goes to Jack Jones, who, together with his group of volunteers, has performed a Governance Review of SIL. The recommendations on how to re-organize the society to meet the contemporary demands is currently under discussion in the SIL boards. We will inform you on the most important aspects and potential changes in the next SILnews in July 2021.

I hope you all had some relaxing holidays during the last weeks, and have fuelled your batteries for the New Year. I do not think the challenges will disappear without our engagement. Keep safe and healthy!

Thomas Mehner
SIL President

IN THIS ISSUE



Most of us work at universities or government agencies, but private endeavors are becoming increasingly important. In this issue, the Limnology around the World section features six entrepreneurs with different backgrounds, who tell us how and why they started their private initiatives. Perhaps these stories can inspire our younger members to reach out towards new horizons.

Giovanna Flaim,
Editor SILnews

INFORMATION ON THE

Upcoming SIL Congresses

The worldwide COVID-19 pandemic has made it necessary to postpone the 2020 SIL congress initially planned to be held in Gwangju, South Korea, in August 2020. We are happy that the local organizers from Korea are continuing their engagement and will organize the congress in Gwangju during 22-27 August 2021. Due to the uncertain pandemic situation, the congress will have a hybrid format – attendees from South Korea and hopefully from other Asian countries will attend in person, whereas other international colleagues can participate via virtual formats. The Local Organizing Committee from Korea is currently exploring the best ideas to create the new format, supported by the SIL Executive Committee. The already planned pre-congress series of free courses will be held on-line as-well. Volunteers are invited to contribute with ideas and experiences from other fully on-line and hybrid meetings – please contact business@limnology.org. Please mark the week in your calendar – it will become an exciting event!

In 2022, SIL will celebrate the centennial of its foundation in 1922, with a congress to be held in Berlin, Germany. The Local Organization Committee has already been formed and has started discussing the scientific aims, format and organizational details for this meeting. We are optimistic that the COVID-19 pandemic situation will allow more travel and in-person attendance in summer 2022. However, the SIL2022 congress will also have a substantial virtual component to ensure that all researchers dealing with water-related issues worldwide will get a chance to participate in the meeting. Hence, please start thinking about your attendance now – and send us suggestions about which activities and presentation formats would best suit you.

Korean Local Organizing Committee

Dear SIL Colleagues,

Greetings from Gwangju, South Korea.

After deep consideration of the current circumstances related to the COVID19 pandemic, SIL and the LOC concluded that the safety of our society is a non-negotiable priority.

SIL 2021 will be the first combined online & offline conference in the history of SIL. The hybrid SIL 2021 will be held on 22-27 August 2021. For those who wish to participate in and interact offline, the simultaneous offline congress will also be held in Gwangju, S. Korea.

The hybrid SIL 2021 - a rare experience to be able to take part in this historical stage as well as listen to world renowned SIL professionals, including the plenary lecturers and SIL awards winners, within your own comfortable time and place. All sessions including poster presentations will be available to click and view during the congress.

Knowing the limitations of an online meeting, we will still make every effort to render the offline SIL 2021 a place where you can meet SIL professionals and join lots of informative and satisfactory programs. The country is doing well controlling new infections and has secured anti-pandemic resources and policies. Our top priority is the safety of all participants, because your well-being guarantees and ensures the future of SIL.

Hence, the LOC is respectfully asking for your continued participation and involvement in SIL 2021 in this historical step we're taking. More detailed information and instructions will be announced as soon as possible on our website: http://sil2020.org

Thank you very much for your kind understanding and support of our decision. We are confident in your continued and keen interest in SIL 2021.

Regards,

Joo and Lee
LOC Co-Chairs of the SIL 2021

Gea-Jae Joo, Pusan National University, **gjjoo@pusan.ac.kr**
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COVID and Limnology

Challenges to documenting changes in aquatic systems due to altered human activities during the COVID-19 pandemic

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Many regions worldwide have been experiencing lockdowns due to the COVID-19 pandemic, reducing human activity (aka 'Great Pause' or 'Anthropause') and setting up a global experiment on altered human impacts on aquatic ecosystems. As a part of SIL's initiative to document these changes, we contacted limnologists worldwide in April 2020, asking if researchers were planning to collect samples from aquatic systems (e.g. water quality, foodweb structure, fisheries) during the crisis and their willingness to contribute to a systematic global-scale study. We received responses on 17 study systems (lakes, rivers, streams, wetlands), covering 10 countries across four continents. Recently, we followed up to see if respondents were able to conduct field work, any obstacles encountered and observed changes in human activity. Most were able to collect samples, but faced several challenges including limitations on field crew sizes, inability to recruit international graduate students, funding cuts and inaccessibility to some sites. Most researchers observed change in human activity in their respective studies, either reduction in transport or recreational use due to government restrictions, or increase in recreational use due to more leisure time. Most respondents have baseline-data from similar time periods (≥ five years), which will allow for quantitative comparison of anthropogenic effects before, during and after the pandemic, while controlling for natural variability. We hope to further expand our survey as pooling multiple datasets will allow a stronger comparison of limnological responses 1) across sites experiencing varying COVID-19-related human activity changes and 2) against human-inaccessible 'control sites'. This work may offer crucial mechanistic insights into recovery and resilience of aquatic ecosystems to human pressures.

Inland Waters

DISCOUNT FOR OPEN ACCESS

The publisher of *Inland Waters* has created a 'SIL member code' that **SIL members** should use to be automatically entitled to member exemption from regular page charges for publishing in *Inland Waters*, as well as for being eligible for a 37.5% discount on Open Access (OA) fees. Starting January 2021 the charge for OA articles will be USD 3,300, but only USD 2,067 for SIL members.

The SIL member code can be accessed on the SIL website, Member Area page, that is reached after logging-in as a SIL member. This code should be used by authors when submitting their articles. The first author has to be a SIL member to be entitled to this discount. If you are not a SIL member, we invite you to become a member, this will immediately make it possible for you to access the code and make you eligible for the discount.

Note that publishing OA is optional, SIL members (first author) can publish free-of-charge without full open access. Their article will be free to download for all SIL members and all those belonging to institutions with subscription to *Inland Waters*. If the first author is not a SIL member, page charges of USD 75/page will apply. In that case we also encourage the first author to become a SIL member, this will immediately make him/her eligible to publishing with no page charges.

New Members!

This year, to attract new members as well as to encourage current SIL members to rejoin for 2021, we have launched a social media campaign that highlights all the benefits of being a SIL member!

Members of the International Society of Limnology have access to many benefits and opportunities, including:

- The chance to be part of the oldest international community on the study of inland waters, as well as access to network with its members from all around the world
- Access to our scientific journal, *Inland Waters*, and to publish there without page charges
- The chance to hear amazing lectures and meet international colleagues at our Congresses, such as at SIL2021 in Gwangju, South Korea
- Access to many grants and awards, including the Naumann-Thienemann Medal that recognizes excellence in limnology
- The chance to be part of a renewing society with a brand-new mission, focusing on advocacy and raising awareness on water-related global issues.

In addition, student members are eligible and encouraged to:

- Participate in our numerous volunteering opportunities such as Working Groups that focus on specific research topics
- Participate in the International SIL student competition for the best published paper, which is announced and presented at the upcoming SIL congress
- Apply for travel awards to cover part of their costs of participating in SIL congresses
- Submit a paper to *Inland Waters* with a fast track option that gives high handling priority to the editors to help you finish your PhD thesis
- Apply for research grants for students from developing countries, such as the Tonolli Award

Look at Mark Louie Lopez, a Tonolli Award recipient from 2015 that shared his thoughts on the award and why, in his opinion, students should join the Society.

Check out his video on our brand new YouTube channel: SIL International Society of Limnology.

SIL World Climate Statement

SIL's new mission includes "promoting excellence in studying and managing inland waters and addressing global issues through the fostering of interdisciplinary approaches and the transfer of knowledge".

As part of SIL's new mission, together with 110 other scientific societies representing about 80 000 researchers worldwide, SIL has recently signed the Statement of World Aquatic Scientific Societies on the Need to Take Urgent Action against Human-Caused Climate Change, Based on Scientific Evidence. This Statement provides evidence of what effects are currently happening and why world policymakers and all of humankind needs to act jointly and launch concerted actions now if they wish to mitigate these impacts.

We as a Society are proud of being part of this initiative led by the American Fisheries Society, and hope that you, as our members, are as well.

Let's continue our fight to save freshwaters together!

Thomas Mehner
SIL President

LIMNOLOGY AROUND THE WORLD: CANADA

Flett Research Ltd

Bob Flett
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I am Bob Flett, the owner and chief scientist of Flett Research Ltd., an ISO/IEC 17025 fully accredited lab situated in Winnipeg, Manitoba, Canada, specializing in low level mercury analyses (methyl and total Hg) and sediment core radio dating (Pb-210, Cs-137, Ra-226). Client samples come from lakes, rivers, peat bogs and ocean shelves spread around the world.

My undergraduate training was in microbial ecology at U. Manitoba. Graduate studies (1971-76) followed at the Freshwater Institute's Experimental Lakes Area (ELA), a remote collection of 58 pristine Canadian lakes in the boreal forest of Northwestern Ontario. The lakes were devoted to whole lake limnological studies, particularly eutrophication in those years. David Schindler was the chief scientist at ELA and he suggested that my thesis be devoted to measuring nitrogen fixation rates in lakes that were being artificially eutrophied with phosphorous. The lake nutrient budgets Dave had constructed allowed me to conclude that blue green algal nitrogen fixation was a significant source of fixed nitrogen in these phosphorous fertilized lakes. During the 5 years of study, both at ELA and my lab in the Freshwater Institute in Winnipeg, the scientific staff were generous with their knowledge and ensured that I received the best possible education as a limnologist.

A post doc followed at McGill University in the Limnology section of the Biology Dept. In summer, I oversaw the Lake Memphremagog Limnology Field Station and, over a period of 2+ years, learned how to core lake sediments and date them with Pb-210 and Cs-137. These were procedures I had briefly encountered at ELA and was excited to try myself. The department offered me a job at the end of my term in 1978, I thought it over, and reluctantly declined. McGill was great but I believe the idea of being part of a large teaching and research institution frightened me. Too much freedom had to be given up.

While returning to my home town of Winnipeg, I visited a scientist at the Ontario Dorset Limnology lab and unexpectedly received a contract to delve into acidification processes of boreal forest soil. This allowed me to eat, rent a low-income townhouse, get married to my girlfriend from McGill, and establish Flett Research Ltd (1979) in my townhouse basement. During the following 2 years I acquired nuclear spectroscopy equipment which allowed me to begin sediment core dating. In 1984 I was appointed an adjunct professor at U. Man. Microbiology and, over a 15-year period, was on 4 PhD committees and co-supervised one of these students. Concurrently, I was designing and building limnological equipment such as water samplers, sediment oxygen electrodes, and electronic water temperature meters for scientists at ELA. Environmental consulting for a number of heavy industries and Atomic Energy of Canada was also being done. In 1986 I moved into our present lab space, also into our own home, and became a father. In 1990, John Rudd, a mercury scientist at ELA/Freshwater Institute, asked me if I would be interested in setting up a clean lab to analyse mercury for his long-term whole lake/reservoir experiment at ELA. I said yes and spent the next 2 years establishing our lab for trace level methyl and total mercury analyses. Mercury analyses for the ELARP, FLUDEX, and METAALICUS projects at ELA kept us busy for nearly 10 years, with additional long-term Canadian government contracts for mercury analyses being acquired during this period and afterward. Sediment core dating work also steadily increased. In 2006 we were contracted by the Penobscot River Mercury Study in Maine, USA to do an intensive program of mercury analyses and sediment core dating that spanned 6 years. More recent work (2017 – 2020) includes the Muskrat Falls mercury study in Labrador and the Wabigoon River, Ontario mercury study, both in Canada. Core dating is also a component in both studies. The Muskrat Falls project in particular challenged us to lower our methyl Hg detection limit in fresh and sea water to the current level of 0.0035 ng/L. This is unusually low for a 30 ml sample.

We are a small lab, only 7 people, but we have accumulated here more than 100 person years in mercury analytical work and 65 person years in core dating experience with our present staff. We have never advertised but have relied upon word of mouth to generate clients from universities, governments and consulting companies large and small. We do gain some clients via our website but most are repeats or referrals. Avoiding advertising costs allows us to pay staff well enough to retain them. They continually gain experience and improve, have pride in their work, and build a good reputation for the lab. R&D is a welcome relief which fills in the occasional slow work periods.

For many years we have been an invited participant in CRM evaluations with IAEA, and since 2007 have been one of about 6 expert labs from around the world invited to regularly participate in the US Geological Service 'Mercury Deposition Network' proficiency program. Continued superior performance assures us that we are indeed in control analytically. This is important for all of us and permits the chief scientist to sleep peacefully at night.

For more information about our lab please click on our website **www.flettresearch.ca**. My email is **flett@flettresearch.ca**. It is always a pleasure to communicate with fellow limnologists, oceanographers and people in related fields.

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Boreal lakes Northern Saskatchewan, Canada
Photo by Anas Mohamed

LIMNOLOGY AROUND THE WORLD: FRANCE

Thirty years admiring beauty through a microscope

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Bi-Eau is a small firm, specialized in Phycology (www.bieau.fr). The founder, Maria Leitao, was a student of the famous French phycologist Pierre Bourrelly at the Muséum National d'Histoire Naturelle, Paris. She created Bi-Eau in 1988, when she moved to a small French town (Angers) where there was no micro-algological research. She started alone, but soon she was joined by young people, creating a small team of 3-4 persons.

Starting without any customers, Bi-Eau has progressively worked with many entities, from water companies, to state environmental agencies to universities. Aiming to keep abreast of the rapidly changing phycological taxonomy and knowledge, the team has participated through the years and all over the world in congresses, workshops and informal meetings, regarding taxonomy as well as ecology. This effort has allowed Bi-Eau to create a scientific network that provides a high level of expertise in algology, and acts as a scientific guarantee of its work (Fig 1). Through the years, Bi-Eau has also hosted many students from universities across Europe doing their thesis work regarding algae. Our studies mainly concern France and French territories, but sometimes we also work on other freshwaters (Belgium, England, Italy, Spain…). More than analysing samples, Bi-Eau also tries to offer additional considerations about the limnological situation of the studied site, therefore optimizing its analytical work with the added value of ecological interpretations.

In some particular cases, new situations or interesting phenomenon arise that warrant publishing the results (with customer agreement), and to share these experiences with other limnologists and readers of scientific journals such as *Hydrobiologia*, *Journal of Plankton Research*, *Freshwater Biology*, *Ecological Indicators*, *Phycological Studies*, *PloSone*… For example, Bi-Eau was the first to document the presence of the cyanobacterium *Cylindrospermopsis* in France. Thanks to this work, always done in collaboration

Fig. 1 Preparing a phytoplankton sample.

with international experts, the staff of Bi-Eau constantly improve their general knowledge (and make a lot of good friends!).

In a world that is progressively using more genetic tools and biochemical methods, Bi-Eau still believes that recognizing a whole organism or observing a natural population through a microscope, remains an ecological advantage and a personal privilege. Therefore, for more than 30 years, Bi-Eau has worked seriously, with passion, hoping that these small/micro observations, will lead to a better understanding of the world.

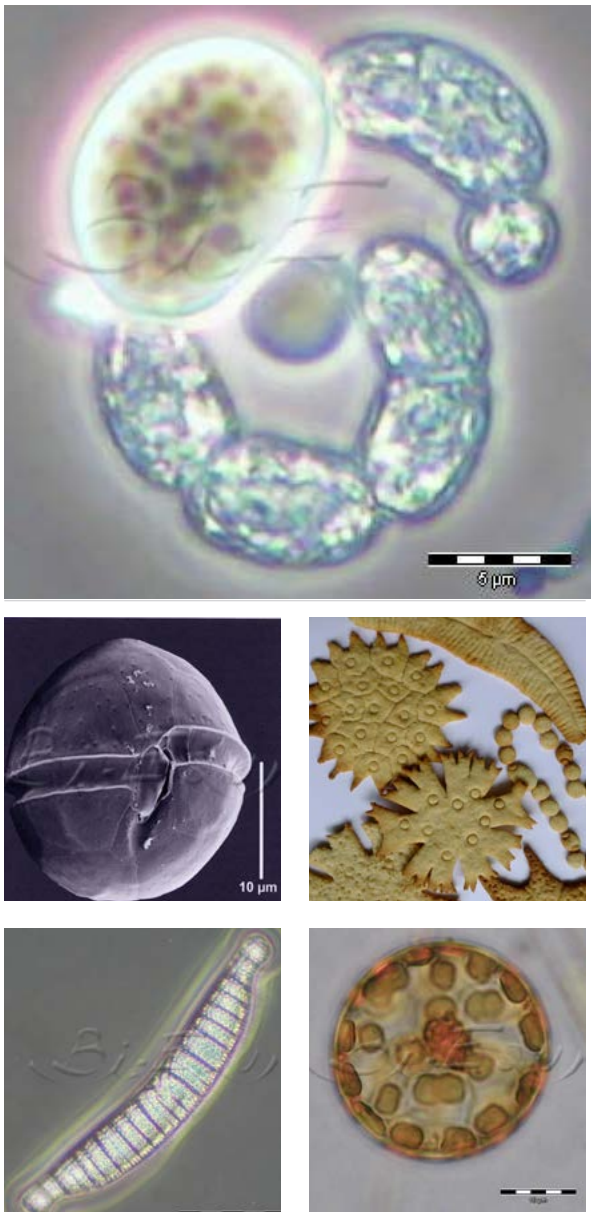

Fig. 2 Some photographs: a) *Anabaenopsis elenkenii;* clockwise *Durinskia balticum, Christmas cookies, Epithemia adnata, Stephanodiscus.*

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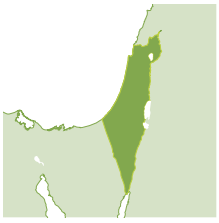

LIMNOLOGY AROUND THE WORLD: ISRAEL

The Israel National Culture Collection of Algae (INCCA) for biodiversity conservation

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The Israel National Culture Collection of Algae (INCCA) was founded with the mission to preserve Israeli microalgae biodiversity and to establish not only a live culture collection, but also a resource of algae-related knowledge (Kaplan-Levy *et al.* 2020). Our aim is to document, isolate and preserve the microalgae and cyanobacteria biodiversity of the country for future scientific, industrial and educational purposes.

INCCA was established at the Kinneret Limnological Laboratory (KLL), Israel Oceanographic & Limnological Research (IOLR), located at the Sapir site (Tabgha), on the northwest shores of Lake Kinneret (Sea of Galilee), Israel. The culture collection at KLL-IOLR was initiated in the 1970s to provide cultures of phytoplankton species from Lake Kinneret for experimental work. In 2007 the on-line phytoplankton catalogue of Lake Kinneret was created with photos and descriptions of Lake species. Since 2012 many species were added to the culture collection as part of a project to DNA-barcode Lake Kinneret phytoplankton (Kaplan-Levy *et al.* 2016).

At present the collection contains 103 strains, mainly from the Cyanobacteria (39%), Chlorophyta (39%) and Charophyta (16%) divisions (Fig. 1). Each isolated culture was first identified by microscopy and later analysed by DNA barcoding. The DNA barcoding is done using a two-*loci* system, based on the amplification and sequencing of the *rbcL* gene and the *rRNA SSU-ITS* region.

The unialgal (xenic) cultures are maintained on agar plates or liquid medium, at constant illumination and temperature (20°C or 25°C). Since most isolates originate from Lake Kinneret they are accompanied by environmental data derived from over 50 years of Lake Kinneret monitoring program, making INCCA unique among other culture collections. The advantage of such data is tremendous, since it enables linking environmental changes with the waxing and waning of microalgae species, as well as giving insights into allelopathic interactions. This knowledge on microalgae species can be tested in a lab and further exploited by industry.

The contribution of such a facility to a country is most significant, especially since the international supplementary agreement *"The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS)"* entered into force in October 2014, under the Convention on Biological Diversity (CBD). This agreement aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable way. However, it complicates the translocation of microorganisms between countries, emphasizing the need for an accredited culture collection of algae to preserve a country's biodiversity, especially for species at risk of extinction. We therefore aspire to join the World Federation of Culture Collections (WFCC), and improve our hardware facilities to enable cryopreservation, and the expansion of the collection from diverse habitats to include micro-algae and cyanobacteria from all over Israel. In parallel, we aim to continue recording DNA-barcodes of isolates, as well as microscopic imagery to be added to the on-line phytoplankton catalogue.

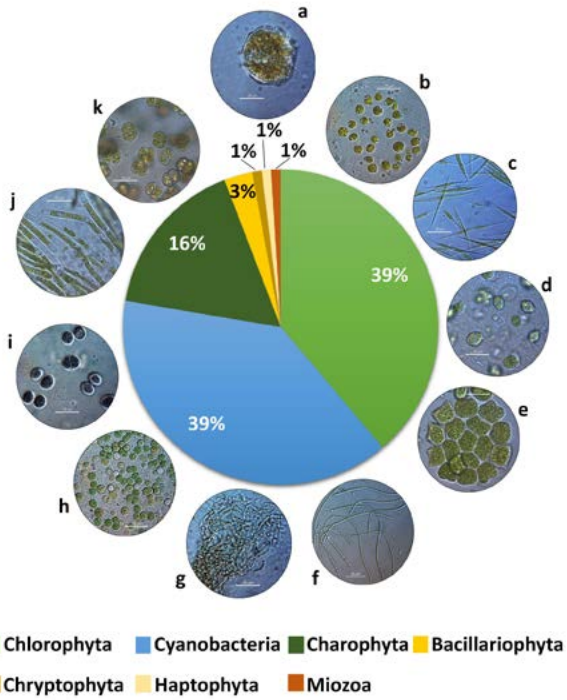

Fig. 1 Phylogenetic diversity of INCCA strains, March 2020, depicting the percentage of strains belonging to each phylum. Photographs of representatives from the Israel National Culture Collection are shown: Miozoa: **(a)** *Peridinium gatunense* INCCA-D1001. Chlorophyta: **(b)** *Mucidosphaerium pulchellum* INCCA- G1045; **(c)** *Ankyra* sp. INCCA-G1061; **(d)** *Lagerheimia citriformis* INCCA-G1047; **(e)** *Pediastrum duplex* INCCA- G1044. Cyanobacteria: **(f)** *Chrysosporum ovalisporum* INCCA-C3001; **(g)** *Pseudoanabaena* sp. INCCA-C2008; **(h)** *Limnococcus* sp. INCCA-1002; **(i)** *Chroococcus turgidus* INCCA- C1021. Charophyta: **(j)** *Mougeotia* sp. INCCA-Ch1006 **(k)** *Cosmarium* sp. INCCA-Ch1034.

By transforming INCCA into a formal internationally accredited collection that will expand to include species of microalgae from all types of habitats in Israel, we envision the first Middle-East facility for microalgal biodiversity preservation.

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LIMNOLOGY AROUND THE WORLD: ITALY

LimnoConsulting

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LimnoConsulting is a one-woman environmental research and consulting business founded in 2012. I am LimnoConsulting's founder and sole proprietor, and I hold a PhD from Kent State University (Ohio, USA).

LimnoConsulting's mission is to provide diagnostics and solutions in basic (research) and applied limnology (research and consulting), with a focus on environmentally friendly, science-based, "green" solutions to limnological and other environmental problems.

Fig. 1 Experimenting with macrophytes and snails.

Projects involve ad hoc collaborations with other researchers or consultants from all over Europe and beyond, thus allowing LimnoConsulting to participate in a wide specturm of projects, from small to large.

Given the poor attention to limnology in Italy, much of LimnoConsulting's recent projects have focused mainly on research. Research includes field and laboratory surveys and manipulative experiments. Basic ecological projects aim at providing knowledge that could be useful in solving real-life problems.

LimnoConsulting's and my core expertise is in benthic and shallow freshwater ecosystems, especially in macrophyte-based ecological communities and the application of their ecology to provide a solution to problems such as high-water turbidity or low biodiversity (e.g., due to eutrophication). Much of LimnoConsulting's research and consulting revolves around the concept of the "alternate stable states" theory for shallow lakes, according to which a healthy submerged vegetation community can at least mitigate the negative effects of eutrophication or siltation. To this end, a healthy macrophyte-dwelling invertebrate community is needed to attain or maintain the desirable clear-water stable state.

Macrophyte-based research has involved close collaborations with The Norsk Institutt for Vannforskning (NIVA) and has mainly focused on field surveys (Mjelde *et al.* 2012). Recent investigations on benthic invertebrates have been carried out mostly in collaboration with researchers at the University of L'Aquila. Other projects deal with macrophyte–invertebrate interactions (Gross & Lombardo 2018) (Fig. 1), environmental indices (Miccoli *et al.* 2013; Lombardo & Mjelde 2014), catchment-scale surveys (Lombardo 2005). Current research projects (as yet unpublished) investigate the potential for

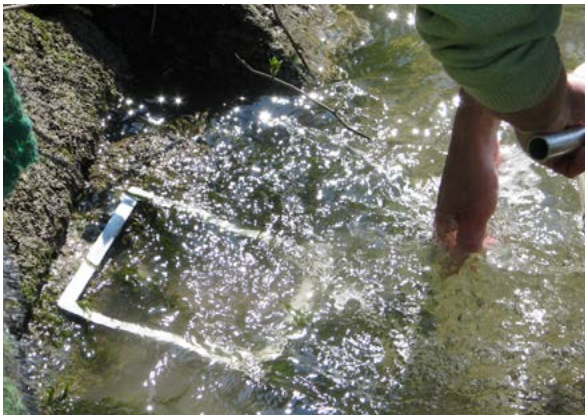

Fig. 2 Macroinvertebrate sampling on shoreline moss.

shoreline moss to increase local benthic biodiversity (Fig. 2), and the ability of aquatic gastropods (possibly keystone players in macrophyte-based ecological communities) to withstand short-term exposure to air. More information and my complete publication history are available at the LimnoConsulting website and my ResearchGate profile.

Experience as a consultant has come mainly from international projects, especially in the United States (aquatic vegetation assessments and diagnostic/feasibility studies) and in Norway; the latter including projects for the European Union (expert testimony within the context of the EU's Nitrates Directive). I have also taught environmental biology and limnology and I have served as an external advisor for two student Theses as an adjunct professor at the University of L'Aquila.

I have founded LimnoConsulting to have the freedom to pursue my own scientific and professional interests while cultivating my love of teaching. The one-person business has been a necessity to have a firm as much burocracy-free as possible, but my publication history is witness of my love for team playing. The main obstacle that I have encountered ever since coming back to my homeland of Italy is the paucity of consulting projects in my country, but I keep myself quite busy with limnological research and international projects. My professional experience has taught me to have a broad spectrum of expertise to diversify project participation, while keeping the focus on a relatively narrow ecological topic to be able to produce publication-level research and consultancy.

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LIMNOLOGY AROUND THE WORLD: JAPAN

Substantive editing in the land of the rising sun

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Thanks to the prevailing winds that carry moisture from the Sea of Japan and Pacific Ocean up over the mountains of Japan, this country receives abundant precipitation, which fills many rivers, lakes, and groundwater aquifers. These rich freshwater resources have nurtured lush ecosystems and facilitated development of Japan's culture and economy for thousands of years. On the other hand, intense precipitation events like typhoons harm Japanese people and society, and such events have been increasing in severity and intensity. For both the benefits and the harms, understanding the processes that control water resources has been well appreciated and Japan has a long tradition of hydrological studies; many important contributions here have been published.

Many SIL members are already familiar with Japanese hydrological sciences through cooperative research or participation in major international conferences in Japan (SIL in Kyoto in 1980, ASLO in Otsu in 2014, World Lake Conferences in Tsukuba in 1995 and 2018 and in Otsu in 1984 and 2001, among others). The International Lake Environment Committee Foundation, headquartered in Otsu, coordinates cooperation with many other international organizations and facilitates conferences, training and research. The Japanese government generously sponsors scholarships and fellowships to help foreigners study and conduct research in Japan.

In 1990, a few months after completing my first postdoc with Tom Berman at Kinneret Limnological Laboratory in Israel, I received one of these Japanese postdoctoral fellowships and moved to Japan to continue limnological research; in this postdoc with Takayoshi Kawai at the National Institute for Environmental Studies in Tsukuba, I used mass balances in mesocosms to study the ecology of Lake Kasumigaura. This postdoc was extended a few times until I landed a Foreign Professor position in biology at the University of Tsukuba, where I taught for 9 years. Along the way, my Japanese colleagues started asking me to polish up the language in their research manuscripts before submission to peer-reviewed journals. As the requests soon exceeded what I wanted to do myself, I made a side business and reached out on the internet to find skillful editors to farm the work out to. Little did I know that my little side business would steadily grow and I would quit my faculty position to run ELSS (my editing and translation company) full time and still be here doing it 30 years after I arrived in Japan!

Although my career objective was to be an aquatic ecology researcher, I have found other satisfying challenges and remain engaged in research through editing. In Japan and many other countries where English is not the native language, there is a great need for assistance to improve the clarity and cogency of the writing in research papers. The work is challenging and (usually) intellectually stimulating. The goal for each work request is to improve the writing such that the scientific story becomes easily understandable and convincing to readers. Good research writing goes beyond correct spelling and grammar; effective editors must wrap their minds around the story as a whole and find ways to smooth the reader's path to understanding. Although substantive editing is not peer review, good substantive editing overlaps with peer review and the best editors propose ideas that improve the science.

Although startup businesses are often risky, I reduced risk by operating ELSS in parallel with my academic career for about 10 years until incorporating. When the business started in the mid-90's, there were few companies in the market. As research has become more international, the language services marketplace has grown and become more competitive. My biggest challenge has been finding freelance editors who meet our high standards. A doctorate and research experience are useful, but not reliable indicators of the full package of substantive editing skills.

Good substantive editing requires proficiency in a wide range of skills. The results of editing are always best when the editor has deep knowledge of the research field of the paper being edited, which facilitates reading between the lines. Beyond intelligence and skillful writing, other important traits of editors are attention to detail, conscientiousness, and some perfectionism. Speed is not necessarily important for agencies or clients, but as pay is usually by the word, speed improves pay/time. Perhaps most important, effective editors are good at putting themselves in the shoes of the readers, who are the ultimate target of the paper. Although authors' or their institutions pay for the work, the ultimate client is the reader.

What kind of people are ELSS freelance editors? Some are retired academics who enjoy the cognitive challenges of substantive editing. Some are parents who appreciate flexibility in work schedules. Freelancing has advantages over more traditional work situations; freelancers can adjust the amount of work they accept and work from home (useful during a pandemic) or while traveling. Disadvantages usually include the lack of health and other social insurance. The flow of work is variable, but skillful editors usually can get as much work as they want and retain the right to refuse offered papers. As boss, I work hard, but every winter I look forward to sliding down that ample Japanese precipitation in some of Japan's many world class ski areas. Contact me if you'd like to tackle the challenges of substantive editing or skiing Japanese mountains.

ELSS, Inc. Mission Statement

ELSS, Inc. improves the quality and publication success of research writing and other technical communication through teaching, consulting, and provision of high-quality editing, dictation, and translation services. ELSS is a reliable, trustworthy, and responsive service provider and partner for its customers, and a pleasant, fair, and honest employer for its employees and subcontractors.

http://www.elss.co.jp

https://doi.org/10.5281/zenodo.4469342

A traditional Hobikisen fishing boat - Lake Kasumigaura, Japan. Photo by Rick Weisburd.

LIMNOLOGY AROUND THE WORLD: SPAIN

3edata

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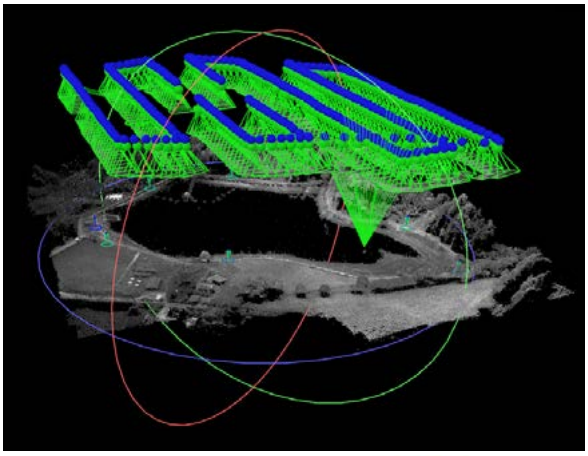
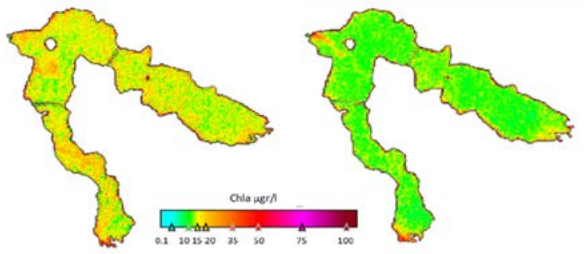
3edata is a Small and Medium Sized Enterprise (SME) founded in 2016, as a spin-off from the University of Santiago de Compostela (Spain). This corporate project was initiated by 3 researchers from the Campus Terra - USC, aiming to put their knowledge and experience, acquired within the University, at the service of the public and private sector; and to do it from a different and more focused and practical perspective.





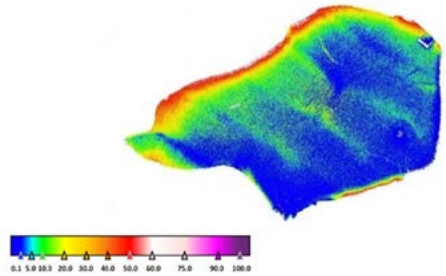


Fig. 1 Detail of UAV flight and image composition (upper left and right) and chl-a maps of two drinking water reservoirs obtained with different sensors: Sentinel 2 MSI (lower left) and a multispectral camera on board UAV (lower right).

The combination of expertise in data management, Remote Sensing (RS), GIS technologies, Forestry and Environmental Sciences (including Limnology) are the backbone of 3edata and the basis for our main job: the development of monitoring and assessment tools for the management of natural resources through the work of Data Analysts and Engineers.

In 2018 3edata was recognized by the Spanish Ministry of Science, Innovation and Universities as an "Innovative SME" due to our work in Research, Development and Innovation with competitive actions and projects in cooperation with Public Research Centers within the framework of Regional, National and European funding institutions.

MISSION AND VISION

Our aim is to promote the synoptic view that Earth Observation (EO) technologies can deliver into the hands of natural resources managers. These technologies and the downstream data they generate, when presented in an intuitive and comprehensive way, provide support to the decision-making process of our clients, both public and private. Our goal is to improve their capacity to optimize available resources while minimizing environmental costs and to contribute to the sustainability of our planet. To achieve this goal, we apply our knowledge to the development of new automatic tools for assessing, evaluating and monitoring natural resources using EO technologies (remote sensing and *in situ* data gathering) in the fields of forestry, agriculture, environment and water quality.

WHAT DO WE DO

In the field of water quality and management, our background comes not only from the EO domain, but also from Ecology and Limnological Sciences. Furthermore, we are members of European and global networks working with High Frequency Water Quality Data (HFWQD) and modelling, such as GLEON.

Since 2016 3edata is developing different multiplatform tools to monitor status and changes in forest stands, crop fields and waterbodies. We apply our expertise in Optical Remote Sensing, EO data processing, automatic classification, LiDAR, Unmanned Aerial Vehicles (UAV) technology and in situ sensors to provide innovative solutions for the spatially explicit retrieval and interpretation of environmental data for managers. 3edata is also involved in public procurement contracts for innovative technology and currently developing new solutions based on EO Technologies to cover the specific needs of the Public Administration in different sectors.

In the field of Limnology, 3edata is developing multiplatform monitoring tools for small to medium-sized water bodies especially focusing its efforts in addressing problems of high social impacts like eutrophication, Harmful Algal Blooms and turbidity in drinking water reservoirs. We use multispectral satellite imagery analysis, data intensive in situ monitoring technologies and UAV multispectral and hyperspectral data gathering to develop algorithms for the synoptic and spatially explicit quantification of chl-a and turbidity. The combination of observational platforms acquiring HFWQD both in time (profiling autonomous devices) and space (Autonomous Underwater Vehicles) with RS technologies, have been the focus of our latest 3edata research projects in collaboration with the EMALCSA Chair, the University of Santiago de Compostela and the University of A Coruña.

Research and development activities are a central part of 3edata's philosophy of constant improvement. An example of the activities carried out with this objective was the participation of our researchers in a project within the framework of the "Transnational Access 2019" call of the EU AQUACOSM Network. In the HiREMOT project, developed within the summer 2019 IGB-Lakelab CONNECT Project experiment, researchers from CSIRO Australia, the City University of New York and 3edata carried out research focused on high-resolution remote sensing of optical and temperature lake characteristics.

Recent Publications

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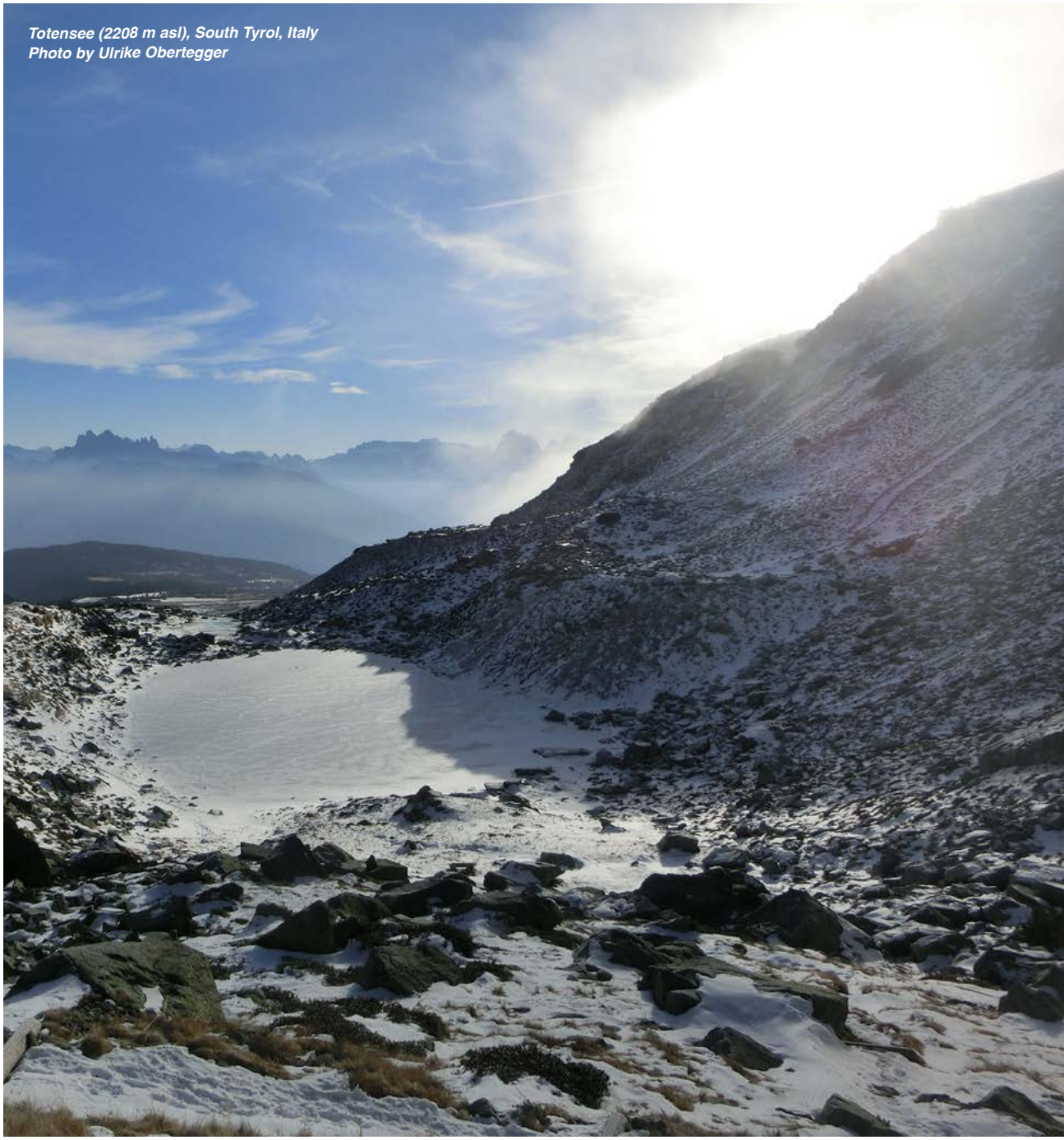

Totensee (2208 m asl), South Tyrol, Italy
Photo by Ulrike Obertegger

Opinion

Plastic Pollution:

A GLOBAL CHALLENGE THAT CAN BE SOLVED

Luca Marazzi
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What can we all do to limit plastic pollution? This question has been propelled to the forefront of public attention by an episode of Blue Planet II on the BBC. Perhaps even Sir David Attenborough did not expect the shocking images of seabirds badly injured or killed by plastic litter to impact so many viewers as much as they did. Environmental awareness increased vastly, however a recent study that directly tested the 'Blue Planet effect' suggests that people may have not changed their plastic-use behaviours much. The encouraging increase in awareness of the global plastic pollution plight has been years in the making, thanks to research and action by many scientists, volunteers, and NGOs. Such work has been giving some answers to the 'what can we do" question. In the past year, I worked as Research Manager for one of these committed NGOs, Earthwatch Europe. Here I will focus on macroplastics, i.e. plastics > 5mm long; these tend to be dominant in litter picks, with ten top10 items (Fig. 1: e.g. bags, bottles, and food wrappers) comprising 71% of the total number of litter items in eight studies in European aquatic ecosystems, mostly in the UK (Winton *et al.,* 2019).

As part of Earthwatch Europe's Plastic Rivers programme, my colleagues and I published a study on what consumers can do to reduce their plastic use. We explored the effectiveness of 27 plastic reduction actions to determine which ones may realistically have the most positive impact by reducing plastics in the environment. The results show that the most effective consumer-based actions are for people to switch to: wooden cutlery; reusable water bottles; plastic free cotton-buds; wooden stirrers; and to refill shampoo bottles. If everyone in the UK switched to reusable items, such as water bottles, we could reduce plastic pollution in our rivers and ocean by nearly 25,000 tonnes annually (Marazzi *et al.*, 2020). Through a parallel citizen science project we found that particularly bad habits are discarding empty food (e.g. wrappers) and drink containers (i.e. bottles) as well as cigarette butts and packaging in urban parks.

Though teenagers are often blamed for carelessly dropping their wrappers or bottles anywhere, but in the right bin (but see what movement two young sisters built!), we can all do better. Plastic can be reduced in our laboratories: plastic mono-use tips, culture flasks, pipettes, can often be readily substituted with glass. And the current, persistent COVID-19 pandemic, is causing plastic litter to increase because people drop, intentionally or not, disposable / single-use face masks and gloves in the streets. No littering is justifiable and, as responsible citizens, we are all called to 'go the extra-mile' by taking our litter home from parks, if bins are scarce and/or already full. But more structural solutions are needed. Groups of concerned residents and campaigning groups can (and do) contact local councils to urge them to (i) place more bins in key hotspots; (ii) place signs to urge people to avoid littering (iii) enforce fines on those who litter. Creative approaches such as ballot bins have shown promising results: smokers can discard cigarette butts whilst answering questions (e.g. "What is the best superpower: flying or invisibility?" or sports-related ones; Fig. 2).

Fig. 1 The most prevalent plastic items found by Winton *et al.* (2020).

Fig. 2 The customisable ashtrays ballot bins help reduce litter by 46%.

Overall, people may find it hard to choose how to cut down on single-use plastics because they receive conflicting information on alternative products or appropriate choices. Science is so important because clear and accurate information is needed on the feasibility of different actions to reduce plastic pollution. Every person, business, authority and organisation have a role to play to reduce plastic use, incorrect disposal and thus pollution. Ultimately, environmentally sustainable actions need to become new norms and widely accepted habits, which means people have to stop denying their responsibility or the effects of their actions on wildlife in rivers, lakes, and the ocean.

So let's start with measuring how much and which plastics we use. You can complete this on-the-go plastic use survey and share it widely (>1,300

Fig. 3 Earthwatch Europe's plastic footprint calculator gathers key data on people's plastic use and actions to reduce it.

responses so far: Fig. 3); it also asks you to share what you are doing to reduce your plastic use and/or what obstacles you face in doing that.

Although, for plastic pollution and other phenomena, it is much better to 'close the tap' than 'mop the floor', some organisations are reclaiming plastics from the ocean to produce new plastic items. (e.g. The Ocean Cleanup and Plastic Bank). Plastics are useful and not always bad for the environment; think about how much lighter airplanes and cars are today than some decades ago and how paper bags are heavier so that their transportation emits more greenhouse gases. But too much plastics is bad, especially when not strictly necessary (in the UK, the average person uses 150 plastic bottles when carrying one's own reusable bottle costs way less!). The Refill campaign made so many new water points available, so far saving 100 million bottles from ever being used. The global plastic pollution challenge can indeed be solved, with creativity and commitment by citizens, businesses, NGOs, and governments. As virgin plastics is produced from fossil fuels, a more sober plastic use and alternative options will reduce greenhouse gas emissions, thus supporting climate change mitigation. Less single-use plastics around will ultimately help humans as well as freshwater fish, sea turtles, and marine mammals and birds.

Acknowledegments

Many thanks to Steven Loiselle, Debbie Winton and all the other Earthwatch Europe's collaborators working on the Plastic Rivers programme.

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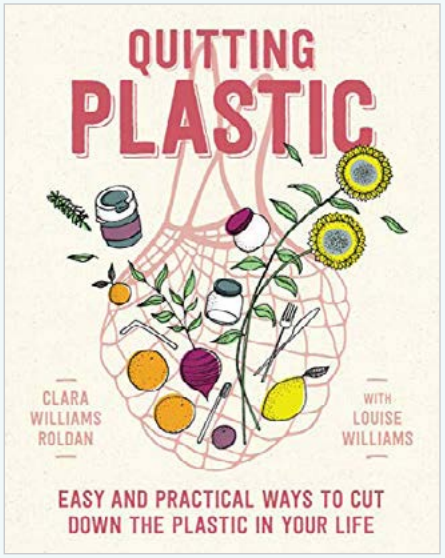
Winton DJ, Anderson LG, Rocliffe S, Loiselle S. 2019. Macroplastic pollution in freshwater environments: focusing public and policy action. Science of The Total Environment 704: 135242.

https://doi.org/10.5281/zenodo.4469359

Other useful readings and websites

The fight against plastic pollution is rapidly becoming a grassroots movement as seen from the number of recent popular science books on this subject. Here are a few examples:



McCallum, Will. 2018. **How to Give Up Plastic: A Guide to Changing the World, One Plastic Bottle at a Time.** Penguin Life. ISBN 9780241363218. €14.20

Harris, Sandra Ann. 2020. **Say Goodbye to Plastic: A Survival Guide for Plastic-free Living.** Hatherleigh Press, U.S. 192 pp. ISBN 9781578268603. $15.00

Dorey, Martin 2018. **No. More. Plastic: What You Can Do to Make a Difference** – the #2minutesolution. Random House, New York. 160 pp. ISBN n 9781473561649 /€9.00

Williams, Loiuse & Williams Roldan, Clare. 2019. **Quitting Plastic: Easy and practical ways to cut down the plastic in your life.** Allen & Unwin Publishers 224 pp. ISBN:9781760528713 PB. AUD $19.99

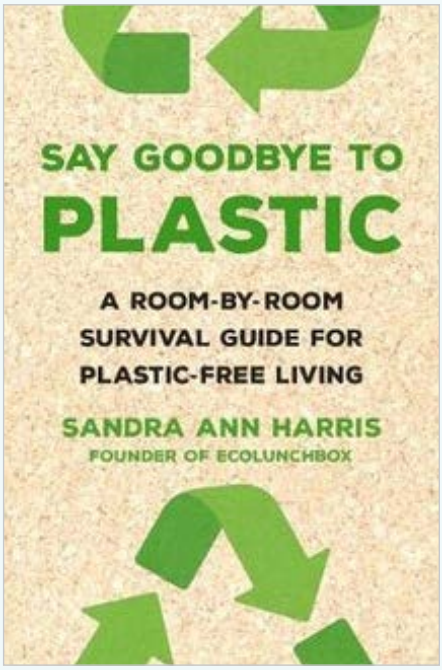
Siegle, Lucy. 2018. **Turning the Tide on Plastic: How Humanity (And You) Can Make Our Globe Clean Again.** Hachette UK. 272 pp. ISBN 9781409183006

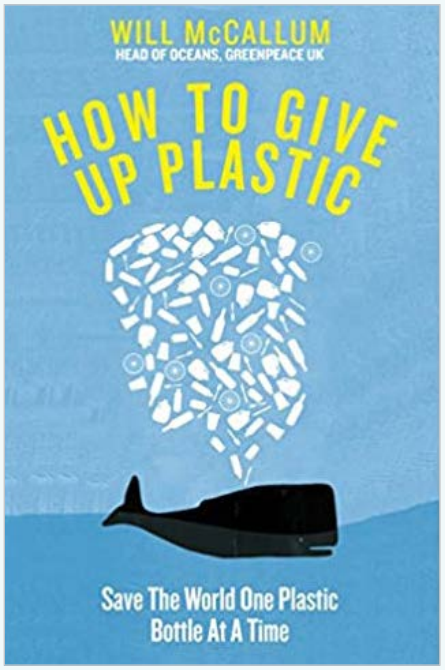
https://www.keepbritaintidy.org/

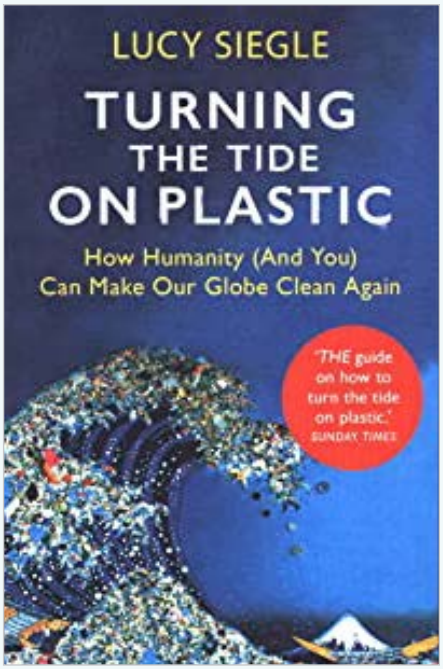
https://www.sas.org.uk/our-work/plastic-pollution/

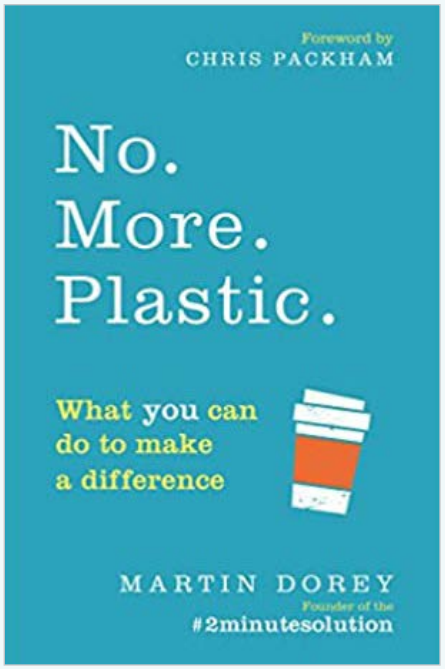
https://plastic-pollution.org/

https://www.nationalgeographic.com/environment/habitats/plastic-pollution/









Tonolli Memorial Award

The Tonolli Fund of SIL was created in 1985 through a bequest from Vittorio and Livia Tonolli, well known limnologists at the Istituto Italiano di Idrobiologia in Pallanza, Italy. The purpose of the fund is to provide assistance to young limnologists in developing countries and encourage them to join SIL. Information about the fund can be found at **LIMNOLOGY.ORG/tonolli-memorial-award.** Below are two reports from recent Tonolli Fund recipients.

Carmela Vicera (Philippines)

Chitinoclastic *Aeromonas* sp. from planktonic copepods in Lake Taal, Philippines

Carmela Vannette B. Vicera[1] and Mary Ann G. Santos[2,3]
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Approximately 10^{11} metric tons of chitin are produced annually, and biodegradation of this insoluble polymer is important in the nutrient cycling in lakes. In freshwater ecosystems much of the chitin is derived from crustaceans (Cauchie, 2002; Köllner *et al.*, 2012), and one of the best initiators of its biodegradation are bacteria. These chitinoclastic microorganisms are thought to be responsible for the mineralization of approximately 93% of the chitin in freshwater environments and have been estimated to represent circa 1% of all prokaryotes in aquatic environments (Beier *et al.*, 2011). They can be found in sediments, in the water column, and even as bacterial communities associated with plants and animals. We wanted to investigate other niches where we can possibly isolate these microorganisms, and this led us to delve deeper into the freshwater copepods in Lake Taal, Philippines.

Copepods are small multicellular crustaceans that can be found within the water column and on sediments in both marine and freshwater habitats. They can support distinct bacterial communities and thus they play an important role in the overall microbial diversity and functions of distinct microhabitats (Tang *et al.*, 2010). Commonly, the bacteria in copepods are found attached to egg sacs, and their oral and anal region where presumably the release of nutrients is high. In lakes, several studies on calanoid and cyclopoid copepods have revealed that both these groups harbor distinct bacterial communities. To have a glimpse of the microbiology of copepods in a tropical lake, we endeavored to isolate and identify the cultivable chitinolytic bacteria associated with copepods in Lake Taal (Fig. 1 and 2).

Fig. 1 Open water sampling site in Lake Taal, Philippines.

Copepods are the most abundant zooplankton in Lake Taal, making up 64% and 84% of the zooplankton abundance and the total biomass, respectively, over different seasons (Papa *et al.*, 2011).When these copepods die or molt, their exoskeletons tend to accumulate in the lake therefore the ability of chitinoclastic bacteria to hydrolyze this chitinous exoskeleton is vital to lake-wide carbon cycling. In fact, the degraded exoskeletons release dissolved organic nutrients in the surrounding water that are made available for other organisms. This shows the importance of chitin degrading bacteria in the initiation of carbon cycling in the aquatic ecosystem.

Six individuals each of the cyclopoid (*Mesocyclops ogunnus* (Onabamiro, 1957) and calanoid (*Arctodiaptomus dorsalis* (Marsh, 1907) were sampled. Extreme variability in the heterotrophic bacterial load was seen for each individual copepod species, where bacterial counts ranging from ~$1x10^3$ – $1x10^5$ were recorded. From the 12 copepod individuals, a total of 81 bacteria were isolated: 44 from calanoids and 37 from cyclopoids. Colloidal chitin plate agar assay showed that 9 out of 81 isolates demonstrated chitinoclastic activity, six of which were isolated from the cyclopoids and three from calanoids. Using 16s rRNA gene sequencing analysis, these bacteria were identified as *Aeromonas* sp. *Aeromonas hydrophyla, A. caviae, A. ichthiosmia, A. jandei* were recovered from cyclopoids, while *A. veronii and A. fluvials* were from calanoids. Interestingly, *A. dhakensis* was found on both copepods.

Aeromonas is a very good producer of the enzyme chitinase (Hiraga *et al.*, 2014). In environments where some bacteria are not able to survive, this versatile genus can easily adapt and produce metabolic enzymes for survival.

We further investigated the ability of this bacterial group to degrade chitin when environmental

Fig. 2 Fish cages near sampling site in Lake Taal.

conditions are altered. We found that isolates from both copepods favor an alkaline pH, temperatures ranging from 28-35°C, a low salinity concentration of 0.85%, and peptone as nitrogen source. These results reveals that *Aeromonas* are capable of degrading chitin using both organic and inorganic carbon source and in a wide range of pH and temperature, suggesting that the different species of this group of bacteria easily adapt to the environmental changes in the lake, allowing them to produce chitin-degrading enzymes even under unfavorable conditions.

This study was able to show the presence of chitinoclastic *Aeromonas* on copepods present in Lake Taal. Although we have not fully identified the bacterial community for each copepod species, we believe that this study can influence other researchers to further explore the bacterial community of copepod species in Philippine lakes. To our knowledge this microbiological study is the first to be done for copepods in Lake Taal, and this would not have been possible without the aid of the Tonolli Memorial Fund.

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Michael Figueroa (Mexico)

Effect of zooplankton, macrophytes and piscivorous fish in the control of *Microcystis* spp. (cyanobacteria): mesocosm experiments

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Cyanobacterial blooms are one of the main problems in urban water bodies, especially when these are refilled using partially treated wastewater as is the case for several ponds, lakes and canals in Mexico City (Figueroa-Sánchez *et al.*, 2014; 2020). These blooms affect the water quality, aquatic biota and the people who use these sites for recreation. This is the case in the rowing and canoeing canal "Virgilio Uribe" (RCC) an artificial, eutrophic water body (Gayosso-Morales *et al.* 2018) affected by *Microcystis* blooms throughout the year. The canal provides refuge to migratory or partially migratory birds such pelicans, storks and coots. The canal also has a small colony of the endemic but highly endangered Axolotl (*Ambystoma mexicanum*), and the native acocil crayfish.

Fig. 1 Mesocosm set up in the RCC and the first author at the study site.

Research on biomanipulation in tropical and subtropical systems is relatively new. For the RCC, we hypothesized that the abundance of the cladoceran *Simocephalus*, a crustacean species capable of surviving on *Microcystis* (Nandini and Rao, 1998) will increase in the absence of the omnivorous fish *Goodea atripinnis* (Goodeidae), while the presence of the macrophyte *Typha latifolia* will provide shelter to the cladoceran against fish predation and promote the decrease of nutrients, resulting in a decrease in cyanobacteria. On the other hand, the abundance of *Simocephalus* would increase in the presence of the piscivorous fish *Petenia splendida* due to its predation on *Goodea atripinnis*.

To test this, we isolated *Simocephalus cf mixtus* from a canal in Lake Xochimilco and cultured them in 30L containers in aerated tap water and a mixture of the green algae *Chlorella vulgaris* and *Scenedesmus acutus* for more than a year before experimentation.

Typha latifolia was available in the RCC. Juvenile stage macrophytes (1.5 m) extracted from the root were washed and used. Subsequently, the plants were placed in 20 L containers with RCC water previously filtered through a 90 µm mesh size. All the above was carried out 48 h before setting up the experiment. *Goodea atripinnis* (1.5 ± 0.05 cm total length) were captured from the RCC using homemade traps made with PET (1 L) nasa-type bottles. The fish were kept in a 20 L tank containing unfiltered water from the RCC. The fish were fed *S. cf mixtus* every 2 days prior to experimentation. *Petenia splendida* (14±1cm), a piscivorous fish were acquired from Acuapets aquaculture fish farm in the State of Tabasco and transferred to Mexico City.

For both experiments sixteen cylindrical aluminum frames covered with transparent polyethylene to form closed containers (45 cm diameter, 60cm length and 80L capacity) were employed (Figure 1). Each was filled with 70 L of previously filtered (mesh size 200 and 90 µm) water from the site. Mixed population of *S. cf mixtus* (5 ind./ L) was added to the mesocosms from a previously established laboratory culture. A bunch of *T. latifolia* (600 g) was added to the treatments (T). We also introduced three individuals of *G. atripinnis* (2 cm) previously captured from the site. In treatments with the piscivorous fish, one *P. splendida* (Ps) (14±1cm) per container was introduced. Four replicates per treatment were set up. The mesocosms were placed inside the canal, firmly tied so as to avoid tilting from wind or wave action. Observations and sampling were carried out for 16 days.

Zooplankton species were quantified; cladocerans were counted and subsequently returned to each treatment while rotifers and copepods were filtered using a mesh of 50 µm and fixed in 4% formalin for later analysis. *Microcystis* spp. were quantified as individuals or colonies per ml. For both sets of experiments, chlorophyll (Figure 2), largely contributed by *Microcystis* sp. declined with the presence of *Simocephalus* and *Typha*. The presence of fish, omnivores or piscivores, resulted in a decline in the cladoceran density and thereby an increase

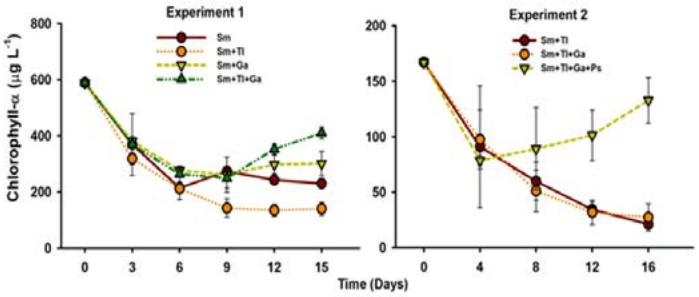

Fig. 2. Chlorophyll a concentration of experiment 1 and 2 in the different treatments with *Simocephalus* cf *mixtus* (Sm), *Typha latifolia* (Tl), *Goodea atripinnis* (Ga) and *Petenia splendida* (Ps) during the established period.

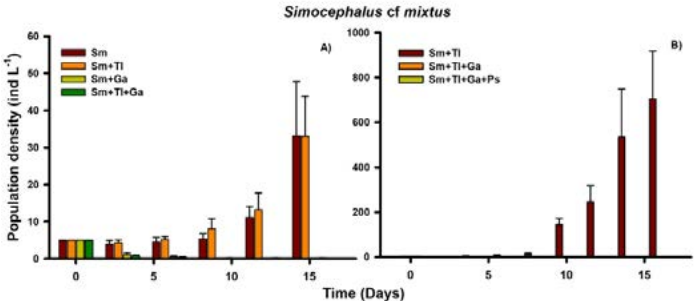

Fig. 3. Population density of *Simocephalus* cf *mixtus* in the different treatments with *Simocephalus* cf *mixtus* (Sm), *Typha latifolia* (Tl), *Goodea atripinnis* (Ga) and *Petenia splendida* (Ps) during the established experimentation period in 2018 (A) and 2019 (B).

in the density of the cyanobacteria was observed (Figure 3).

Our study showed that mesocosms with cladocerans alone or with the macrophytes had a lower growth of cyanobacteria than did those that had piscivorous and/or planktivorous fish. The presence of *Simocephalus cf mixtus* resulted in a 60 to 80% decrease in chlorophyll a. *Simocephalus*, in this study, was adversely affected by fish, and our tests show that introducing piscivorous fish alone may not suffice to the control planktivorous fish in tropical systems; physical removal of fish, in addition to nutrient input controls, may be necessary to increase cladoceran density and reduce phytoplankton. Further studies are necessary to test the combined effect of piscivorous fish and macrophyte cover on the control of cyanobacteria.

Acknowledgements

Receiving support from SIL for the realization of this project has stimulated the curiosity of one us (MAFS) to apply the biomanipulation tools in tropical systems. MAFS thanks the PhD programme (CBS) of the Universidad Autónoma MetropolitanaMexico, we thank the Administration of Rowing and Canoeing Canal Virgilio Uribe during 2017-2019 and the International Society of Limnology for the Tonolli Award 2017.

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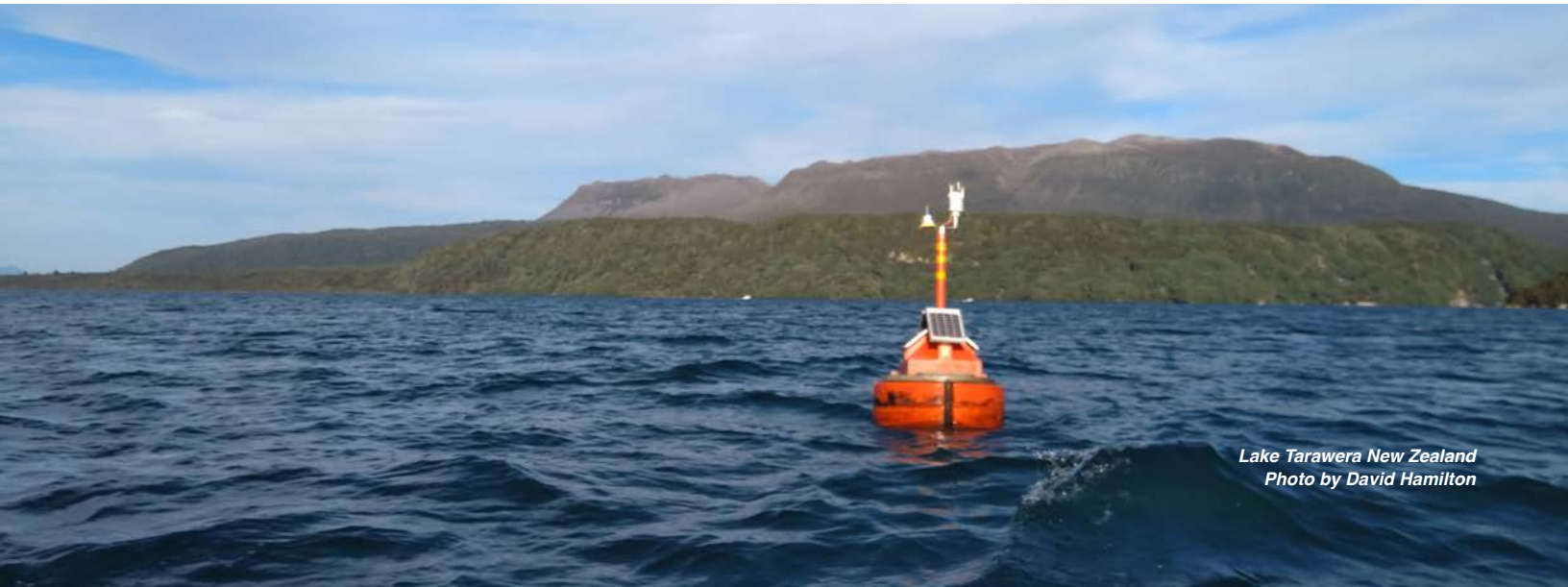
This year (2020) the Tonolli Committee has awarded Maite Colina (Uraguay) USD 1500 for her project to run a microcosm experiment exploring CO_2 uptake and carbon sedimentation in eutrophic warm conditions.



Lake Tarawera New Zealand
Photo by David Hamilton

FACES of SIL

SIL is truly an international organization and FACES of SIL wants to emphasize our diverse community with short stories about SIL members. If you want to tell your story, send a short text (~ 250 words and a photo) to the editor at SILnews@limnology.org

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JACOB ITEBA | KENYA

I am an aquatic scientist, working as a Fisheries expert at the County Government of Busia, Kenya. My main interest is on the biodiversity status of tropical freshwater bodies in the midst of multiple anthropogenic stressors. My MSc. Research (University of Natural Resources and Life Sciences, Vienna) focused on the influence of large mammalian herbivores (cattle and hippos) on the water quality, nutrient dynamics and algal development in the Savannah River Ecosystem (Mara River), which is central to the livelihoods of the resident pastoral community (Maasai) and the diverse wildlife community depending on the Mara River system which is also my favorite. Currently, I have turned my attention to how the changing climate and river habitat modification is affecting the food and feeding pattern of different fish species in the Lake Victoria Basin (LVB). In the LVB, deterioration of the aquatic environment as a result of anthropogenic influences has led to the disappearance of endemic species. Environmental and ecological changes in the LVB are mainly caused by human population growth and urbanization, growth of agriculture and agro-industrial activities, water pollution, introduction of exotic species and overfishing. Climate change enhanced by the destruction of vegetation in the LVB is a threat affecting this ecosystem that cannot be ignored. Therefore, being a new SIL member and with the diverse research expertise that the platform provides, I believe I will be able to disseminate informed decisions concerning appropriate management strategies of biodiversity in the LVB, which is being impacted by multiple anthropogenic multi-stressors.

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JI YOON KIM | KOREA

I am a wetland plant ecologist and currently working at the Center for Climate Change Adaptation- NIES. My recent study focuses on the spatio-temporal prediction of wetland plant communities under climate change and land-use modification scenarios. I am trying to identify vulnerable or resilient functional traits against different environmental factors structuring the community composition of wetland plants. I am also interested in social conservation studies to support wetland conservation programs by understanding public interest or their behavior patterns using big data.

I enjoy seeing floodplain wetlands in Asian countries. Especially, Upo Wetlands is one of my favorite sites in South Korea. Aquatic plants living in this wetland ecosystem are attractive as they adapted to the dynamic state of hydrological conditions and prolonged floods during the monsoon season. However, even with recent conservation efforts, continued expansion of anthropogenic development near river or wetland environments is still resulting in massive degradation of wetland habitats in South Korea and other Asian countries. Through global collaboration with SIL experts, I hope we could share more scientific findings to highlight the ecological value of wetland ecosystems to increase adaptation capacity of our society under the changing environment.

Lastly, I look forward to seeing all of you at the next SIL meeting in South Korea! Even with difficult global conditions, SIL members are preparing to facilitate knowledge exchange over physical boundaries and strengthen the adaptability of the SIL community. Hope this event will be an active place to test a new shape of the SIL congress!

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FACES of SIL

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ANDRAS ABONYI | HUNGARY (AND AUSTRIA)

I got infected with limnology during my MSc (2009, University of Pannonia, Hungary) after realising the importance of the mixing regime in the life of lakes. I studied the diversity and distribution of phytoplankton in man-made oxbows at the beautiful River Tisza Valley and was impressed by the high diversity of shapes and functions found.

My PhD (2015) focused on how functional units* in phytoplankton reflected on natural versus human-induced alterations in the environment along the River Loire (France). During a short Postdoc at WasserCluster Lunz, Austria (2016), I learnt that phytoplankton diversity was not only a response to the environment but it also affected the functioning of communities. We showed that functional diversity (what species can do) predicted ecosystem functioning on top of taxonomic richness (how many taxa are there). This view helped me understand the functional response of the Danube River phytoplankton to extending periods of low flow, warming and oligotrophication and how it may affect functioning. Currently, I am working to quantify the functional importance of chytrid algal parasites at the phytoplankton-zooplankton interface as a Postdoctoral Associate at WasserCluster Lunz.

I always worked on diversity in space and time. I believe that the diversity-functioning relationship also applies to human communities, from labs to institutes, and from regions to global. Therefore, human communities perform better under high diversity of - among others - scientific knowledge, experience and culture. I support this view representing SIL and the European Federation for Freshwater Sciences (EFFS) at the country level in Hungary.

*known as the phytoplankton functional group concept *sensu* Colin S. Reynolds

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PROFESSOR MERYEM BEKLIOĞLU | TURKEY

I am an aquatic ecologist at Middle East Technical University, Turkey where I head the Limnology Laboratory and Ecosystem Research and Implementation Centre (EKOSAM). I earned my PhD in the ecology of shallow lakes at Liverpool University, the UK, under the supervision of our beloved deceased Brian Moss studying my favourite organisms, the zooplankton, along with other trophic levels using mesocosms experiments and monitoring. Now, I am working on ecological structure and functioning of shallow lakes and ponds in semi-arid and Mediterranean climatic regions through multiple approaches using long-term monitoring, space-time substitutes, paleoecology, mesocosm experiments and modelling. We study major pressures that affect lakes: eutrophication, climate change, DOC pulses, microplastics and lately salinization. Land affected by drought will double in this century, freshwater lakes and ponds are becoming saline in Turkey, thus our priority is to enhance our understanding on how the structure, function and ecosystem services are changing. Over the years I benefited from generous EU research funding through several projects in FP7 and H2020 including Refresh, Mars, Aquacosm, Aquacosm-Plus, Ponderful. In addition, I am an associate editor of Limnology & Oceanography Letters & Turkish Journal of Zoology.

I am also currently co-chair of the international scientific committee of SIL2020, S. Korea Congress.

My wish for SIL - to be a medium for stimulating scientific collaboration outside of our comfort-zone, we all need to reach out little bit more to ensure equality for the underprivileged, all genders, all races. As we care more for others, our community will care more for global ecological problems.

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Kassiansee (2475 m asl) South Tyrol, Italy
Photo by Ulrike Obertegger

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1-5 MARCH, 2021 (VIRTUAL MEETING)
Find out more about the event

1st Scientific Conference in Memory of Prof. Vladimir I. Shadin
19-23 APRIL 2021, ST. PETERSBURG, RUSSIA
Find out more about the event

4th International Conference: Integrative Sciences and Sustainable Development of Rivers
21-25 JUNE 2021, LYON, FRANCE
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