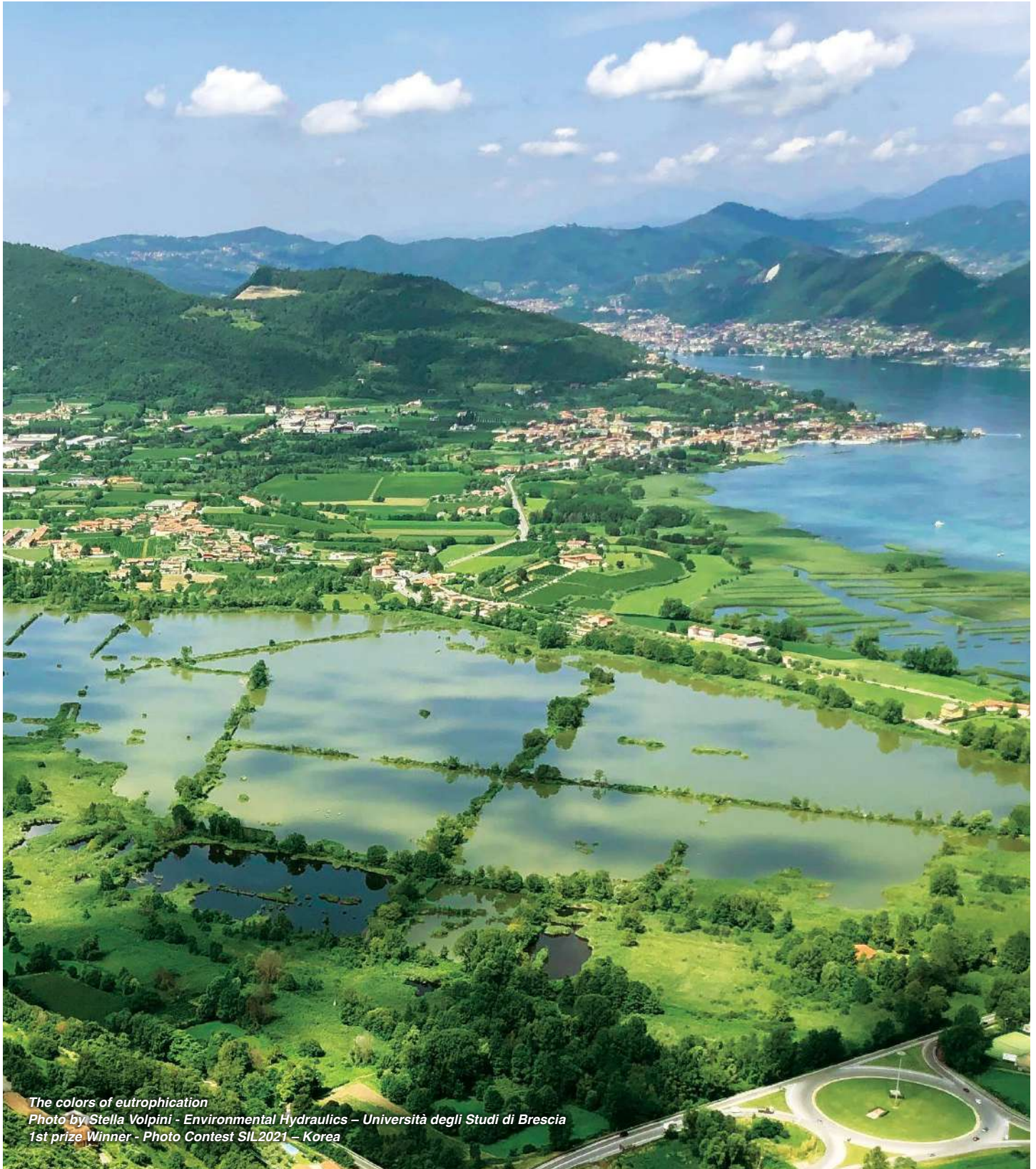


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*The colors of eutrophication*  
Photo by Stella Volpini - Environmental Hydraulics – Università degli Studi di Brescia  
1st prize Winner - Photo Contest SIL2021 – Korea





36<sup>th</sup> Congress of the  
International Society of Limnology  
7 – 10 August 2022 | [www.sil2022.org](http://www.sil2022.org)

We cordially invite you to

**BERLIN, GERMANY**

to attend the 36<sup>th</sup> Congress of the International Society of Limnology  
and celebrate the **100<sup>TH</sup> ANNIVERSARY**  
of its foundation.

SIL has led and nurtured the study of inland waters for a century, since limnologists **Einar Naumann in Sweden and August Thienemann in Germany founded the society in 1922**. This means that this year's conference will be SIL's Centennial! We thus return to Germany where the first conference took place and once again partner with Swedish limnologists. Our goal is to make this a splendid event that propels limnology into the future.

The Centennial will build on the rich history of limnology while focusing on current and future grand questions and challenges in inland water science, conservation, and restoration. This mission is reflected in the conference motto: **The next 100 years – Sensing and Safeguarding Inland Waters**. This motto encompasses the dual goals of increasing our understanding of aquatic ecosystems through measurements and theoretical advances, while also laying the foundations for inland water protection. A grand goal for the conference is to identify 100 limnological questions of fundamental importance to highlight priority areas of future research to advance both theoretical and practical knowledge.

The conference will promote limnological science and careers by facilitating a meeting in person. But there will also be an important virtual component to ensure that the large community of researchers and practitioners dedicated to water issues worldwide will be well represented. **The program will go beyond regular sessions at the venue, to include formats promoting exchange and interaction both on site and in virtual space**. This format is motivated by the need to reduce the environmental footprint of international conferences, particularly air travel, but also by the ongoing uncertainties associated with the COVID-19 pandemic.

SIL 100 is hosted by the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB), one of the largest and internationally leading research centers focusing on freshwater science. Here, aquatic scientists from around the world are engaged in ecohydrology, biogeochemistry, aquatic physics, ecology and evolution, microbiology, fish biology and fisheries as well as water management. **Berlin, apart from being Germany's capital, is foremost a city of science, education and culture**. Several major universities are located in the greater Berlin area, along with numerous institutes of the country's large research institutions such as the Leibniz Association, the Max-Planck Society, and the Helmholtz Association, as well as the Federal German Environment Agency. This makes Berlin an excellent setting to engage the international community of limnologists to reflect on, and present advances in, inland water science and stewardship.

Berlin is a blue – and green – city offering numerous surface waters and green spaces for recreation. It is also multicultural, providing opportunities for a wide range of cultural activities, sightseeing and museum visits, gastronomy, night life, and strolling and shopping in diverse neighborhoods. Berlin's famous Buddy Bear has become an unofficial ambassador of the city. More than 140 countries are represented in this project, promoting "tolerance, international understanding and the great concept of different nations and cultures living in peace."

We have chosen the **Seminaris Campus Hotel Berlin as the conference venue**. At a 5-minute walk from a Metro station which connects to the city center, the hotel and conference rooms are located on the campus of the Free



University of Berlin, where Albert Einstein, Lise Meitner, Otto Hahn and other heroes in science spent part of their careers. Other important criteria were the hotel's commitment to environmental sustainability and a format facilitating interaction among the conference participants. **There will be open space for jam sessions. So bring your instruments** to lift the coffee breaks and evenings to a delight and to a place of scientific and personal exchange where friendships develop. SIL president Thomas Mehner will join with his local Keller Blues Band where he plays the bass.

Reflecting the nationality of the SIL founders, the organizing committee formed as a mixed team of members affiliated with institutions in Germany or Sweden ([www.sil2022.org/committees](http://www.sil2022.org/committees)). We are supported by a Scientific Committee and a Planning Committee reflecting a broad mix of limnological expertise, career stage perspectives, and nationalities. Envisioning SIL 100 to become a conference of interaction, we encourage suggestions of ideas or contributions to be brought forward to the committee members.



As SIL is turning 100, we would like to launch the **100 Limnological Questions initiative**. Based on the insights emerging from the past 100 years of limnology, we aim to identify 100 key questions for limnology to address during the next 100 years. Get involved and turn in your question on the conference website ([www.SIL100.org](http://www.SIL100.org)) either now or when registering and submitting your abstract. The Scientific Committee will screen and sort all submitted questions and present a first synthesis of the collective effort during the conference.

After the scientific program we propose **joining an excursion**. Visit highlights of inland water landscapes as well as research and management projects in and around Berlin (one-day trips) and elsewhere in Germany and neighboring countries (multi-day trips). This includes well-known limnological research stations and sites, the LakeLab in Lake Stechlin and technical-scale experimental facilities of the Federal German Environment Agency, alpine and pre-alpine lakes and streams as well as restoration projects. One example is an ambitious multi-billion project in the Ruhr area, where the river network of an industrial area impacted by coal mining and heavy industry has recently been transformed to meet modern environmental standards. In addition, there will be options for canoe and boat trips on Lake Wannsee and the River Spree in Berlin. Those who have less time or simply would like to explore the city will also be offered visits to local restoration projects, guided walks on campus and downtown, and a tour to IGB on the shores of Lake Müggelsee.

We hope this short description gives you a flavor of what to expect at SIL 100 next August in Berlin. On behalf of the Planning and Scientific Committee, our sponsors and the entire community of limnologists in Germany and Sweden, we look forward to welcoming you there.

*Emma Kritzberg, Markus Weitere, Rita Adrian, Sami Domisch, Mark Gessner, Florian Leese, Ryan Sponseller, Lars Tranvik – The SIL 100 Organizing Committee*

## IMPORTANT DATES

### Late January 2022

Call for registration, abstracts and workshop proposals (see: <https://www.sil2022.org/>)

### 5 April 2022

Deadline for early bird registration, abstract and workshop submissions (see: <https://www.sil2022.org/>)

THE NEXT 100 YEARS:  
SENSING AND SAFEGUARDING INLAND WATERS

# The President



Lake of the Woods, MN, USA. Photo by Adam Heathcote

Dear SIL members,

The activities of our society remain intense and certainly visible to many of you. After the successful and primarily virtually held 35th SIL Congress in Korea, the preparation of the 36th Centennial SIL Congress in Berlin has moved forward into the next phase. Please save the dates 7th–10th August 2022 in your calendar. I invite you to participate in this conference, hopefully in person, but we will also provide a virtual component to facilitate a broad international audience and engagement.

While celebrating almost 100 years of our Society, our pending anniversary prompts consideration of the future of SIL. The future of traditional scientific societies will be different from what it used to be. We are now in an era of substantial and rapid changes of the entire scientific system. One of the central activities for scientific societies is promoting and communicating research results. Traditional avenues for research and science communication are scientific papers and (inter)national congresses. These activities are supported, if not led, by many traditional scientific societies. SIL publishes *Inland Waters*, the society journal that is the successor of the *Proceedings ("Verhandlungen")* of the International Society of Limnology. And SIL has already organized 35 congresses in its history – a remarkably consistent event that has always attracted a broad international audience. **Thus, why should we ponder about our future?**

There is a relatively simple, but far-reaching answer: activities of a society need man-power and financial resources. The vast majority of society work is done by volunteers – researchers of all career stages who are members of support decision bodies and strategic committees, society members who are part of editorial boards of journals or part of award committees, and members who engage in science communication and education, via social media or by direct teaching and instructing scientific content. I would like to express my deepest gratitude to all volunteers – whether working for SIL or other scientific societies. Inevitably, there are conflicts when time constraints require setting priorities, which are not always those required by the society. We, the members, should not complain about slow

progress and only punctual strategic development of our societies, but should understand that the shape of a society reflects the motivation and engagement of its members.

Many typical society activities have to be professionalized. Members and not-yet-members expect high-quality service from societies, whether this means updated and conveniently accessible member databases, an attractive society website, easy-to-find resources and continued traffic in social media to demonstrate the scientific mission and vision of societies. Members expect that the society journal publishes top-notch scientific papers, and that its congresses are hubs for scientific exchange and discussion, with the brightest peers of the discipline being present. Society members expect these services at low or no costs. Given that many technical installations and settings to run a society behind the scenes can no longer be executed by volunteers from scientific disciplines, there is an enormous need for sufficiently large financial budgets to cover just the running costs of the service for members.

Furthermore, societies are expected to support international networks, in particular with researchers from developing economies. SIL feels particularly responsible for these actions, and has created several programs and initiatives including reduced pricing for students and other members from low income countries, the mentorship program, and the Tonolli and Wetzel awards. It is further expected that scientific societies provide grants to facilitate participation of members to congresses. Even better if small research grants are available to support scientific work in countries with low financial power. And ultimately, shared scientific work among early career researchers, sources for online education and skill courses would be beneficial activities that attract in particular younger researchers to societies. SIL tries to address all these needs and wishes.

In contrast, most societies, SIL included, have only a limited portfolio of potential revenue sources. First of all, income is generated via membership fees. Continually adapting membership fees to increasing costs unfortunately causes some members to leave the society, perhaps to join other societies with similar sci-

entific context, but still lower fees (despite that these societies certainly suffer from the same financial dilemma). Another traditional source of income is a contract between society and scientific publishers, by which scientific content generated by the members is sold via subscription to members of the same or other societies, and some revenue of the publishers is shared with the societies. However, the publishing landscape has changed substantially during the last years, in particular by the strong move towards Open Access publications, such that revenue from publishing cannot be guaranteed, and its contribution to society

**“SIL has made progress during the last years to refresh its mission, to modernize activities and programs, to become younger and more service-oriented.”**

income will surely decline. The third activity, income generated by organizing congresses, is likewise exposed to substantial changes. Congresses of international importance and dimension can no longer be organized by a group of volunteers. To achieve a balanced budget for a congress covering all necessary services requires substantial participation fees, which may prevent numerous society members from participating. Obtaining a substantial net revenue for a society from a congress is almost impossible, while remaining inclusive/accessible to all of our members.

**If the challenges to run a scientific society are so high, the questions emerge: why are we trying to keep societies alive at all? Is a scientific society a dinosaur in a rapidly changing world?** I do not think so. Above all, members of scientific societies are scientists. The research we are doing is necessary to understand, explain and manage the world



under change. Scientific societies can still be the guardians of scientific quality and honest communication about research. Furthermore, international scientific societies have the power for capacity building in all parts of the world, because most of the problems we are facing are global. And societies can take the responsibility to contribute to educating the researchers and managers of tomorrow.

**Hence, what do we have to do to empower our society to address our mission and vision on the role of research and management in a changing world?** First of all, we have to understand that a long history is no guarantee of continued success. Societies, SIL included, have to change to remain key players in international research and science. SIL has made progress during the last years to refresh its mission, to modernize activities and programs, to become younger and more service-oriented. Many volunteers have helped in this process, and I would like to thank them again for their engagement. In the next steps, we have to establish strategic partnerships. First, with other scientific societies that face exactly the same problems as SIL. **We should learn to see each other as allies, not as competitors for members. How can we collaborate to achieve common goals? Which international initiatives will gain more attention if scientific societies together support them?** Second, we need to establish partnerships with international organizations beyond research and science, in particular in the fields of practical application of research results, management of and stewardship for natural resources,

and education. Finally, partnerships with industry can also become a mutual benefit for traditional scientific societies, not least with respect to financial support of new programs. It will be the major task of the SIL Executive Committee with all volunteer groups during the upcoming years to explore the potential dimension and practical implications of these partnerships.

**Is there anything that you, as an individual SIL member, can contribute directly?** Yes – we would welcome you as a volunteer for supporting the work of modernizing our society. There are numerous tasks in which you can become active – as a teacher, communicator, editor, or networker with international researchers. Further, for the reasons outlined above: pay your fees to SIL, in time and commensurate with the level of your professional career development. Act as an ambassador of SIL wherever you are, and help attract new members. Publish your research results in our society journal, *Inland Waters*. Participate in the SIL congresses, to make them scientifically attractive international events. And finally, send us your comments and suggestions how SIL can develop these partnerships described above. We will consider all suggestions and generate strategic initiatives to facilitate that SIL will remain an important and visible scientific society.



**Thomas Mehner**  
SIL President

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*Thank you forest, hello reservoir.*  
Photo by Masumi Stadler – Université du Québec à Montréal  
Runner-up SIL2021 Korea Photo Contest

In this issue we have an exciting preview of what SIL2022- Berlin will be like and SIL President T. Mehner has a thought provoking letter for members. Please meet our four newly elected SIL officers in the FACES of SIL section. This issue's Opinion article is about indigenous water rights and for Limnology Around the World we have a report back from the Dryland Limnology working group, Citizen Science monitoring and limnological research at IGB – host of our next congress. SIL's fruitful commitment to young limnologists can be seen in this issue's Tonolli Award report.

Hope you enjoy this issue of SILnews.

Giovanna Flaim,  
Editor SILnews

Contribution deadline for the July 2022 issue:  
**30 April, 2022**  
Send to: SILnews Editor, Giovanna Flaim, at  
SILnews@limnology.org



Mott Island, Isle Royale, Lake Superior, USA.  
Photo by Adam Heathcote

## Inland Waters:

Thanks to the hard work and dedication of Editor-in-Chief David Hamilton, together with the Associate Editors and reviewers, but most of all to contributing authors, the Impact Factor for SIL's society journal has increased substantially over the last year. The IF for *Inland Waters* is 2.299 for 2020, putting it in the Q2 category for both LIMNOLOGY and MARINE & FRESHWATER BIOLOGY journals (Journal Citation Reports™ 2020). Members' support of our Society's journal is crucial to its success!

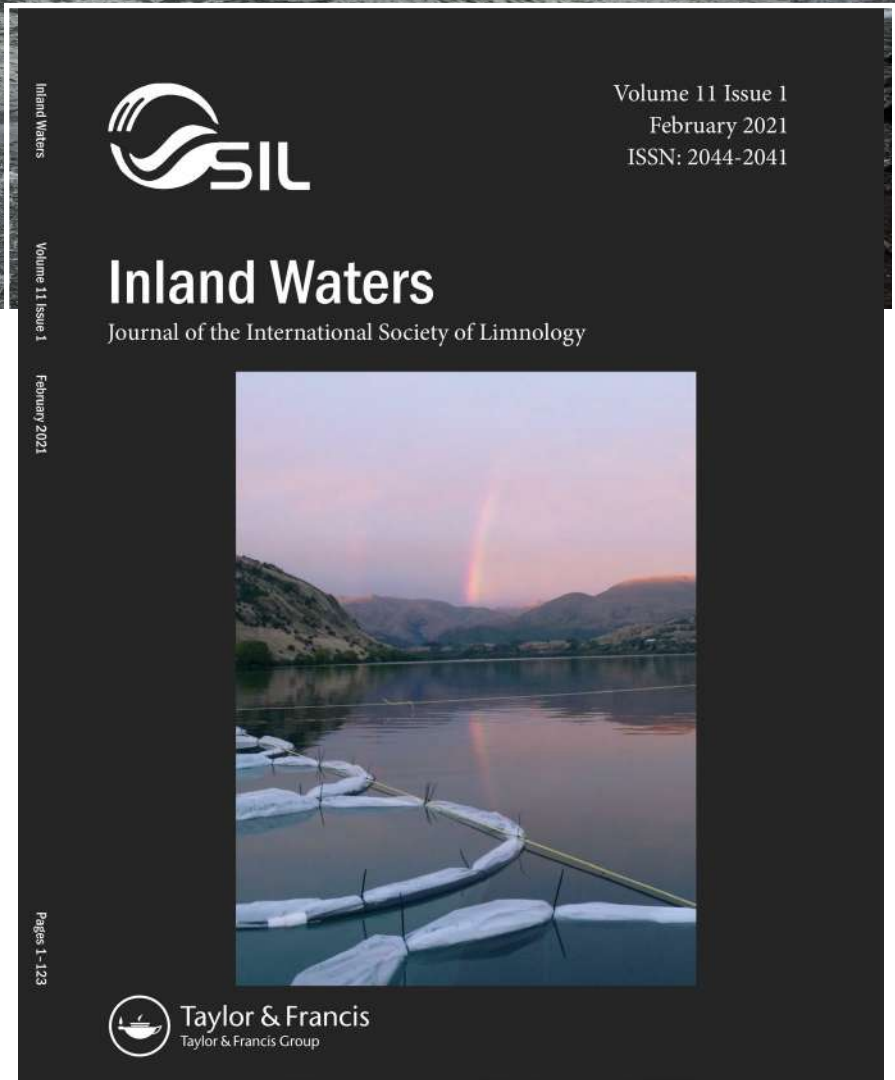
### SOME HIGHLIGHTS

#### Top downloaded Article in 2020:

Maberly SC *et al.* 2020. Nitrogen and phosphorus limitation and the management of small productive lakes. *Inland Waters* 10: 159-172

#### Top Altmetric Attention in 2020:

Moss B *et al.* 2011. Allied attack: climate change and eutrophication. *Inland Waters* 1: 101-105.



### TOP CITED ARTICLES IN 2020

- Wang FS *et al.* 2020. Effects of dams on riverine biogeochemical cycling and ecology. *Inland Waters* 8: 130-140.
- Gozlan RE *et al.* 2019. Status, trends, and future dynamics of freshwater ecosystems in Europe and Central Asia. *Inland Waters* 9: 78-94.
- Knoll LB. 2018. Browning-related oxygen depletion in an oligotrophic lake. *Inland Waters* 8: 255-263.
- Kosten S. *et al.* 2018. Extreme drought boosts CO<sub>2</sub> and CH<sub>4</sub> emissions from reservoir drawdown areas. *Inland Waters* 8:329-340.
- Bouffard D. *et al.* 2019. Under-ice convection dynamics in a boreal lake. *Inland Waters* 9:142-161.
- Naselli-Flores L. *et al.* 2019. Different invasibility of permanent and temporary waterbodies in a semiarid Mediterranean Island. *Inland Waters* 9: 411-421.
- Havens KE *et al.* 2018. Multiyear oscillations in depth affect water quality in Lake Apopka. *Inland Waters* 8: 1-9.
- Wu XL *et al.* 2018. Effects of cascade reservoir dams on the streamflow and sediment transport in the Wujiang River basin of the Yangtze River, China. *Inland Waters* 8: 216-228.
- Prentice MJ *et al.* 2018. Quantifying the role of organic phosphorus mineralisation on phytoplankton communities in a warm-monomictic lake. *Inland Waters* 9: 10-24.
- Soomets T *et al.* 2019. Spatial and temporal changes of primary production in a deep peri-alpine lake. *Inland Waters* 9: 49-60.



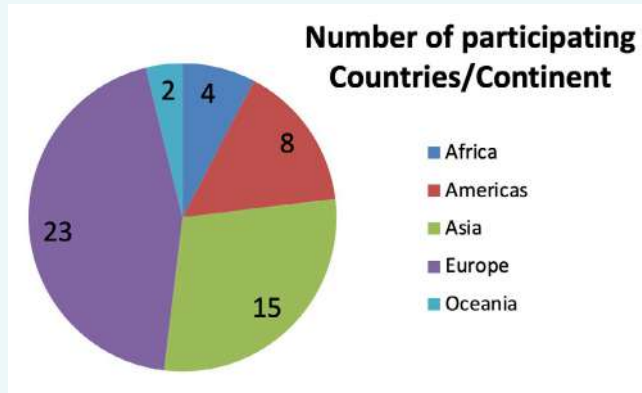
# 35th Congress of the International Society of Limnology

AUGUST 22-27, 2021 GWANGJU METROPOLITAN CITY, REPUBLIC OF KOREA

**Theme: Biodiversity and Ecosystem Services for Healthy Rivers, Lakes and Humans**

## SIL2021 Korea – Report Back

The 35th Congress of the International Society of Limnology AUGUST 22-27, 2021 held in Gwangju, Republic of Korea was a great success! Its theme *Biodiversity and Ecosystem Services for Healthy Rivers, Lakes and Humans* drew over 500 people from more than 50 countries. Over 100 students and early career researchers participated in on-line courses and over 50 students had inspiring brain dates with Eminent Scholars. On-line Working Group meetings also saw a healthy participation of members. Keeping with SIL's mission to encourage and train students and early career researchers, 32 students acted as co-chairs for the various sessions of the congress, giving them precious hands-on experience both in scientific discussion and the workings of a scientific meeting. For those interested, the minutes of the meeting can be found [here](#).



### The congress awarded several prizes:

#### The Best K-Water Oral presentations:

210277: *Effects of increased mean temperature and extreme heatwaves on plankton communities* by Thu Huong Huynh Ngoc, Zsofia Horvath, Peter Dobosy, Vivien Kardos, Karoly Palffy Beata Szabo, Csaba Vad (Hungary, Belgium)

210245: *Influence of sulfamethoxazole on the life table parameters of *Brachionus rotundiformis* under different *Chlorella sp.* densities* by Yutong Wang, Gaohua Ji, Mengyuan Li, Min Wen, Hongyan Xiao (China)

210173: *Effects of environmental stress on biomarker gene response in *Zacco platypus** by Won-seok Kim, Ji-Hoon Kim, Kiyun Park, Ihn-Sil Kwak (Korea)

#### The Best K-Water Poster presentations:

210166: *Comparison of zooplankton collecting methods (vertical vs. oblique towing) in reservoirs having different site characteristics* by Hye-Ji Oh, Yeon-Ji Chae, Doyeong Ku, Yerim Choi, Chang Woo Ji, Ihn-Sil Kwak, Yong-Jae Kim, Young-Seuk Park, Kwang-Hyeon Chang (Korea)

210275: *Relationship between forest development and water birds* by Mihyeon Kim, Sungwon Hong (Korea)

210162: *Diversity and community assemblage of aquatic insects in the tropical maar lakes of San Pablo City, Laguna, Philippines* by Sedney Serdeña Mendoza, Maria Claret Lauan Tsuchiya, Emmanuel Ryan Celzo de Chavez (Philippines)

Congratulations to these researchers and the winners of the popular photo and video contest!

### 4<sup>th</sup> SIL STUDENT COMPETITION

For the 4th SIL student competition, we have 41 applications from 20 countries: Argentina, Australia, Brazil, Burkina Faso, Czechia, Ethiopia, Germany, Hungary, Israel, Italy, Japan, Kenya, Mexico, New Zealand, Poland, South Korea, Spain, Sweden, Switzerland and The Netherlands. This is more participants than in the past competitions. The competition is for the best paper published based on MSc /PhD research findings, and has two stages: (1) National, in which each country votes for the best paper to represent it; (2) International, in which the best papers from all countries compete for the 1st, 2nd and 3rd places. Of the 41 applicants, 21 will participate in the second stage of the competition (one from each of the 20 countries, except Germany that is eligible to have 2 candidates participate in the second stage, so a total of 21). The judges at the international stage are a team of experienced editors of leading Limnological journals.

From past experience it is now evident that winners of this prestigious competition make a huge step forward in their scientific career. Encourage your students of Limnology to participate!





Fitzroy-River-Martowarra. Photo by Jones

# Opinion

## Indigenous Water Rights

### STAND WITH MARTUWARRA FITZROY RIVER FOR A FAIR GO!

**Dr Anne Poelina**

Chair - Martowarra Fitzroy River Council  
Australia  
Email: [anne@majala.com.au](mailto:anne@majala.com.au)

Forty-three thousand (43,000) people from across the planet stood in solidarity with the Martowarra Fitzroy River and signed petitions, many wrote submissions in response to the Western Australian (WA) government's, 'Discussion Paper' on water extraction from Martowarra, Fitzroy River. The Martowarra Fitzroy River Council worked closely with the WA Environmental Defenders Office and the Australian National University Water Justice Hub, eminent global scholars and practitioners, who spent considerable time, researching and comparing the two major submissions directed at water extraction within the Fitzroy River Catchment. The reports from these working groups were sent widely to diverse stakeholder groups, to share information, and draw attention to issues which require careful consideration. These submissions are not being made public and there are widespread concerns about the limitations of transparency and accountability to the greater public interests in this national and Aboriginal cultural heritage that is the Martowarra, Fitzroy River.

Of particular concern is the lack of climate science, more importantly, how climate change is real and is now impacting the health and wellbeing of our Aboriginal people living in remote areas in the Country. Food insecurity and water

scarcity are real and many of the living water systems are being impacted and drying up. The seasonal calendars Aboriginal people rely on, are all out of balance. Aboriginal people are worried, and we hear the words of senior Elders now past, 'you came, you stole the land, you made us slaves, now you are back for the water, what is going to be left for blackfellas'.

As Chair of the Council I have often stated that 'if we want to prevent ecocide and genocide it is time to redefine the dream of Northern Development, the dream must take notice of what the elders are saying'. Senior Walmajarri Elder, Joe Brown, asks the hard questions, 'how come government think they own the water, they never been born alongside the river...if they drain the water out, that will kill the culture'. Many believe without specific legislation for climate science, governance, and adaptive management of the Martowarra, all they can see is foreseeable harm.

The Martowarra Fitzroy River Council strongly believes that now is the moment in history to prevent a disaster. We need a statutory framework, with serious investment to bring everyone to the table to co-design any 'water plans' for this system. Hopefully, limnologists and

other water scientists and managers will unite with us to create a truly equitable water plan. Martowarra Fitzroy River Council elders and their young leaders as guardians of the Martowarra from the beginning of time, are clear, they support economic development and prosperity but it can't be business as usual 'after 150 years of invasive colonial development, it's time for justice and equity now, it is no longer about a water interest, it is about a water right. Importantly, our law of obligation is to protect Martowarra now, for all generations to come'.

Rivers are the lifeblood of all Nations, and rivers must be valued and respected, beyond seeing them as a 'resource' for the benefit of a few. Traditional Owners believe these cultural and environmental assets and capital are the catalyst to new and forever economies, published in the Martowarra Fitzroy River Catchment Estate Conservation and Management Plan. We must all stand together globally, with our rivers to ensure our rivers have the right to life, to live and flow. Stand with with Martowarra and stay connected with this sacred River, ancestral serpent being, see [www.martowarrafitzroyriver.org](http://www.martowarrafitzroyriver.org).



19th June 2021 River Country Photo by Lachie Carracher





Rosie and Grace Mulligan

Dr Anne Poelina is a Nyikina Warrwa Traditional Owner (Australia), Chair Martuwarra Fitzroy River Council, Adjunct Professor Senior Research Fellow with Notre Dame University and a Research Fellow with Northern Australia Institute (Charles Darwin University). She is also a Visiting Fellow at the Australian National University and a Member of the Water Justice Hub.

#### Some Publications

RiverOfLife M, Taylor KS, Poelina A. 2021. Living Waters, Law First: Nyikina and Mangala water governance in the Kimberley, Western Australia, Australasian Journal of Water Resources, DOI: 10.1080/13241583.2021.1880538

RiverOfLife M, Poelina A, Bagnall D, Li M. 2020. Recognizing the Mardoowarra's First Law Right to Life as a Living Ancestral Being. Special Edition: Indigenous Water Rights in Comparative Law, University of Canterbury School of Law, Christchurch (New Zealand).

O'Donnell E, Poelina A, Pelizzon A, Clark C. 2020. Stop burying the lede: the essential role of Indigenous law(s) in creating rights for nature. Special Edition: Indigenous Water Rights in Comparative Law, University of Canterbury School of Law, Christchurch (New Zealand).

RiverOfLife M, Poelina A, Alexandra J, Samnakay N. 2020. A Conservation and Management Plan for the National Heritage Listed Fitzroy River Catchment Estate (No.1). Fitzroy Crossing, Western Australia: Martuwarra Council. <https://doi.org/10.5281/zenodo.3870606>

Poelina A, Taylor KS, Perdrisat I. 2019. Martuwarra Fitzroy River Council: An Indigenous cultural approach to collaborative water governance. Australasian Journal of Environmental Management 26: 236-254.

Lim M, Poelina A, Bagnall D. 2017. Can the Fitzroy River Declaration ensure the realisation of the First Laws of the River and secure sustainable and equitable futures for the West Kimberley? Australian Environment Review 32: 18-24.

<https://doi.org/10.5281/zenodo.5730003>



19th June 2021 River Country. Photo by Lachie Carracher



# Some suggested readings for those interested in water rights

Other information on books on water-related topics can be found at:

[www.water-alternatives.org](http://www.water-alternatives.org)

Beasley, R. 2021. *Dead in the water. A very angry book about our greatest environmental catastrophe. the death of the Murray-Darling Basin.* Allen & Unwin. ISBN 9781760878450, 296 pp. AUD \$29.99.

Doorn N. 2019. *Water ethics: An introduction.* Rowman & Littlefield Publishers. ISBN 978-1-78660-951-9 (Paperback), 314 pp. \$39.95.

La Jeunesse I, Larrue C. (Eds). 2019. *Facing hydrometeorological extreme events: A governance issue.* Wiley. ISBN: 978-1-119-38355-0, 536 pp. €11 1.99.

Langford M, Russell AFS. (Eds). 2017. *The human right to water. Theory, practice and prospects.* Cambridge: Cambridge University Press. ISBN 9781108722315, paperback 2019, 713 pp. £ 32.99.

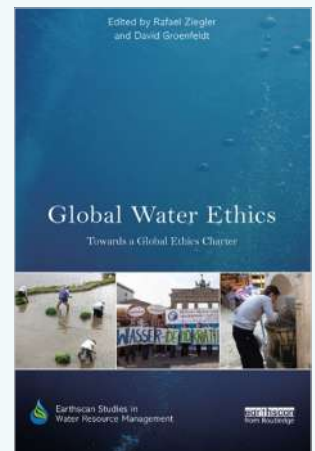
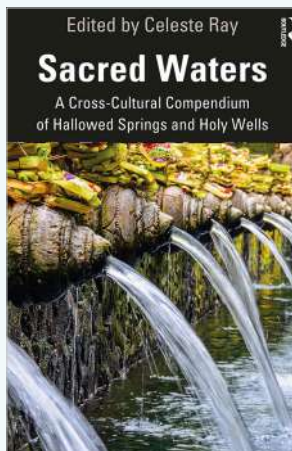
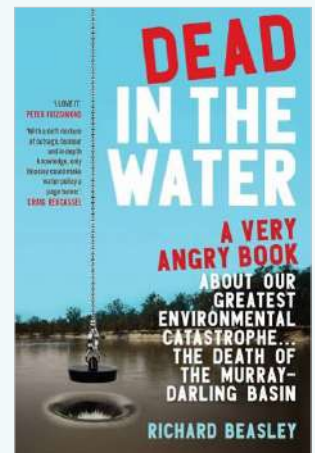
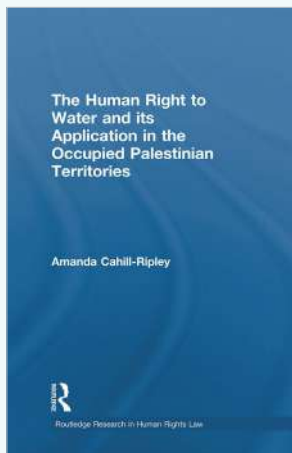
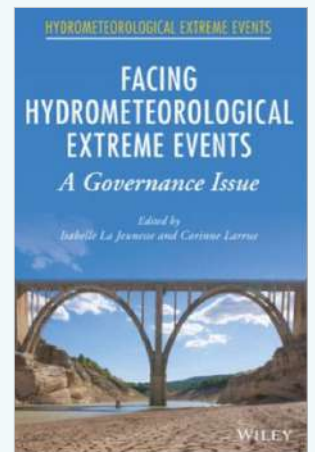
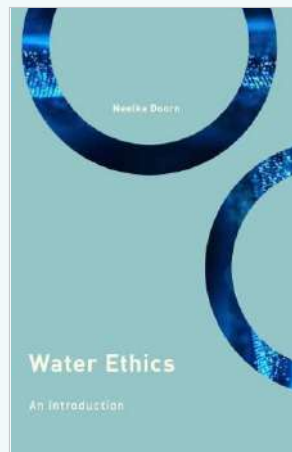
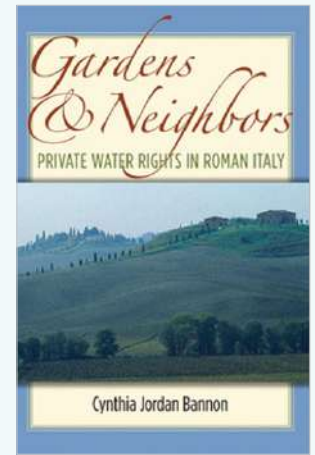
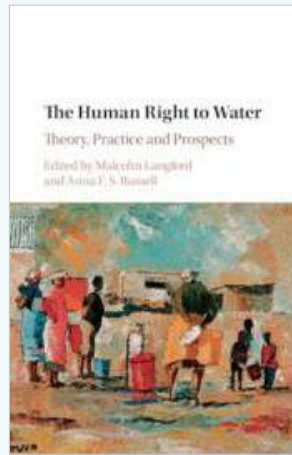
Ripley AC, 2011. *The Human Right to Water and its Application in the Occupied Palestinian Territories.* Routledge, UK. ISBN 9780415859813; 240 pp. £38.99.

Ray C. (Ed). 2020. *Sacred waters: A cross-cultural compendium of hallowed springs and holy wells:* Routledge. ISBN 9780367445133, 416 pp. £36.99.

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## LIMNOLOGY AROUND THE WORLD: BRAZIL

# Limnology of Drylands – SIL Working Group Report

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Currently, the elucidation of the consequences of climate change and human impacts on drylands is a priority, considering the vulnerability of these zones. Accordingly in 2016, we created the International Network on Limnology of Drylands (INLD - [www.inld.pro.br](http://www.inld.pro.br)) in Areia (Paraíba, Brazil), aiming to expand our knowledge on aquatic ecosystems in dryland zones by focusing on biodiversity, climate change effects, and local multiple stressors. A few months after its foundation, the INLD was formalized through the creation of the International Society of Limnology (SIL) Working Group “Limnology of Drylands”. Since its creation, INLD has been established in regions such as Europe, Africa, Asia, Oceania, South and North America. The projects and actions developed in these regions are based on the space-for-time approach, gathering information about multiple stressors in



**Fig. 1** Congress of the Network of Environmental Studies of Portuguese Speaking Countries (Angola, Africa)

aquatic ecosystems (e.g., eutrophication, salinization, climate change) from local and global perspectives.

Regarding the activities performed around the world, in 2019 some actions were carried out in Brazil, Africa, and Australia. Firstly, INLD was present at the Congress of the Network of Environmental Studies of Portuguese Speaking Countries, held in Angola (Africa), which allowed the consolidation of relevant partnerships between Portugal, Cape Verde, and Brazil (Fig. 1). In the same year, fieldwork was performed across the dryland zones of Australia, by Professors Brian Timms and Luciana Barbosa, aiming to assess the biodiversity distribution in Australian rockpools (gnammas) (Fig. 2). Also, in 2019 INLD held a workshop entitled *Knowledge gaps and analysis tools in temporary ecosystems* at the “XVII Brazilian Congress of Limnology and the 2nd Ibero-American Congress of Limnology”. Among the main outcomes of this workshop, we highlight the creation of the INLD subproject “Scientometric and meta-analysis studies in global dryland freshwater ecosystems”, currently being developed.

In 2020, a special issue of *Inland Waters* (<https://www.tandfonline.com/toc/tinw20/10/4?nav=tocList>), dedicated to “Limnology of Drylands”, was edited by Guest Editor Prof. Luciana Barbosa (INLD President and Chairperson) and supported by Editor-in-Chief Dr David Hamilton. This issue included 9 articles about the biodiversity of aquatic environments from different continents (Barbosa *et al.*, 2020a; Carvalho *et al.* 2020; de Farias *et al.* 2020; Hulot *et al.*, 2020; Ilhéu *et al.*, 2020; Lanfranco *et al.*, 2020; Morant *et al.*, 2020; Silva *et al.*, 2020; Zadereev *et al.*, 2020) and an editorial paper (Barbosa *et al.*, 2020b) that presented INLD, its objectives, mission, as well as a theoretical vision of dryland zones worldwide. Emphasis was given to the updated INLD objectives: i) to assess the current state of biological diversity in dryland aquatic ecosystems; ii) to evaluate the multiple environmental stressors acting in drylands; iii) to develop predictive models to estimate the effects of global changes on drylands.

The emergence of the COVID pandemic in 2020, promoted changes in the international scenario, imposing new meeting formats to continue ongoing activities. Thus, the Working Group Meetings were held online, enabling a much wider participation of members and colleagues from different countries. Among the special sessions in 2021, the first one was held in the 10th International Shallow Lakes Conference under the title “Ecology and energy flow in tropical temporary ecosystems”. This meeting was coordinated by INLD and the Ecology Laboratory from the Federal University of Rio



**Fig. 2** Professors Brian Timms and Luciana Barbosa in Australian gnammas

de Janeiro, Brazil, with presentations emphasising aquatic community ecology, as well as, energy and matter flow, which expanded the understanding of the functioning of temporary ecosystems across drylands regions.

In the 35th Congress of the International Society of Limnology (SIL2021), INLD held a special session called “Ecology, management and conservation of temporary water bodies”, coordinated by INLD, the International Society for Salt Lakes Research - ISSLR, and the Ecology Laboratory from the Federal University of Rio de Janeiro. This session featured presentations from Brazil, South Korea, China, and Spain. Additionally, the official Working Group Meeting had a special focus on the actions developed between 2019 and 2020, as well as a proposal for planning future actions, including the establishment of common field and laboratory protocols to be implemented by members in all countries. Common protocols



**Fig. 3** Official Meeting of Working Group “Limnology of Drylands” in the 35th Congress of the International Society of Limnology (SIL2021).

will greatly facilitate data sharing and analyses. Colleagues from Brazil, Spain, Portugal, Mexico, Egypt, Ecuador, Greece, Hungary, India, among others, were present (Fig. 3). Recently, INLD participated in the Global Lake Ecological Observatory Network meeting (GLEON), discussing the relevance of international cooperation in climate change scenarios to mitigate environmental problems in lakes worldwide.

Nowadays, the main projects being developed by INLD are: i) “Scientometric and meta-analysis studies in global dryland freshwater ecosystems” aiming to understand and fill research gaps in dryland areas around the world; ii) “Rockpools (and temporary ecosystems) in world drylands: trophic interactions and the relationship between diversity and ecosystem stability”; iii) “Galapagos program: Iconic Galapagos aquatic ecosystems as a climate change hot-spot?”.

The future challenges for INLD will include understanding the synergistic effects of climate change and local human impacts on aquatic ecosystems. Accordingly, current alterations in the water balance in dryland zones are promoting increases of extreme droughts on broad scales, reducing hydroperiods and impacting water quality in zones with great scarcity of this important resource. Thus, more research is needed in dryland zones, especially in underrepresented countries, which might significantly contribute to the understanding of global impacts on dryland aquatic biodiversity.

**Acknowledgements:** We thank Dr David Hamilton, Editor-in-chief of *Inland Waters* and SIL Executive Committee for all support, and Dr Brian Timms for his important contribution to the development of limnology in dry zones.

In memoriam of Dr. Brij Gopal  
Member of INLD Executive Committee

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## LIMNOLOGY AROUND THE WORLD: CANADA/US

# Many hands on deck: Working with communities to monitor lake water quality

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As the global profile of citizen and community science continues to rise, so do opportunities available to limnologists and lake management professionals. For instance, in the United States alone, the National Water Quality Monitoring Council estimated in 2014 that there were 1,720 volunteer monitoring groups active across the country, collecting water quality data on a wide range of parameters including phosphorus, nitrogen, dissolved oxygen, pH, temperature, and conductivity (NWQMC; Albus *et al.*, 2019). While many target rivers and streams, a significant number of citizen science groups are engaged in sampling lakes.

The potential benefits that such groups can provide to limnology and lake management are well-known: they are capable of gathering information at spatial and temporal scales that would otherwise be difficult or costly to collect; the regularity of their efforts is crucial to obtaining essential baseline data; and they provide eyes on the ground to flag areas that are potentially in need of further study or management action. Nevertheless, many scientists and environmental managers still express concerns about data quality, and there is evidence to suggest that attitudes towards the presumed accuracy and reliability of volunteer-generated data act as a barrier to the use of these valuable datasets, even when programs have extensive mechanisms for volunteer training, protocols for quality assurance, and oversight by professionals (Albus *et al.*, 2019). In response to these concerns, a growing number of comparative studies have demonstrated that volunteers can produce scientifically-credible data on par with professionals, at least for many common indicators (Hoyer & Canfield, 2021).

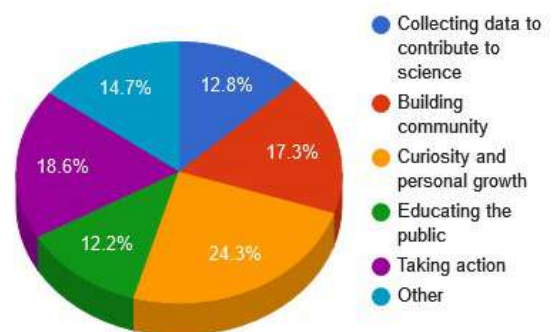
Scientists tend to be most interested in citizen science as a way to increase the scale of data collection, but there are a host of other beneficial outcomes for environmental management, including improved community-based management, inter-organization communication, stakeholder literacy, attitude changes, empowerment, engagement, and improved social capital for participants (Stepenuck & Genskow, 2018). Turrini *et al.* (2018) identify a "threefold potential" of environmental citizen science, where projects can simultaneously advance objectives related to knowledge generation (creating new "opportunities to generate knowledge and insights which are new and relevant for science, society, or administration and management, especially with respect to nature conservation"); learning (improving environmental literacy and promoting increased public understanding of science); and civic participation (empowering citizens to become in-

involved in policy debates and decision-making processes). Other typologies of goals and outcomes of citizen science have made similar distinctions, differentiating between action-, conservation-, investigation-, and education- oriented programs (Wiggins & Crowston, 2011), or between project outcomes focused on increasing the volume of data, improving scientific and environmental literacy, building community leadership, fostering equitable collaborations between scientists and laypeople, producing locally-relevant environmental data that may be missing or inadequate, driving policy changes, or assisting with the enforcement of environmental laws and regulations (Kimura & Kinchy, 2016).

Success factors for citizen science-based water quality monitoring programs must take into account the attributes of volunteers (knowledge, experience, and awareness; socio-economic background; motivations), the attributes of institutions (support structures, organizational cultures), as well as the interactions between them (San Llorente Capdevila *et al.*, 2020). In 2015, the European Citizen Science Association published their "Ten Principles of Citizen Science" (ECSA, 2015) to codify best practices and guiding principles which can inform the successful development and management of volunteer-based programs and help to strike a balance between the scientific and social values of citizen science practice.

The authors are involved with three successful lake monitoring programs which are focused on obtaining high quality data, but which also have reported outcomes related to transformational volunteer experiences and citizen empowerment (Fig. 1). In Ontario, Canada, the Lake Partner Program (LPP) facilitates a network of around 600 independent volunteers who record Secchi disc depth and water temperature readings and collect water samples for laboratory analysis of phosphorus and calcium concentrations (Fig. 2). Established in 1996, the program is a partnership between the Federation of Ontario Cottagers' Associations and the Ministry of the Environment, Conservation, and Parks (MECP). In Connecticut, USA, volunteers in the Citizen-led Environmental Observatory (CLEO) record Secchi disc depth and other visual observations and collect water samples for nutrient and cyanobacterial toxin analysis (Fig. 3). Established in 2006, the project is a partnership between Friends of the Lake (Lillinonah) and Fairfield University. In New Hampshire, the state sponsored Volunteer Lake Assessment Program (VLAP) was launched in 1985 to establish a citizen-based lake sampling program to assist NHDES in evaluating lake water quality throughout the state, and to empower citizens with information about the health of the state's lakes and ponds. Local lake associations have partnered with NH Department of Environmental Services (DES) to enable this effort. One of the partners, the Lake Sunapee Protective Association (LSPA), runs a designated DES-satellite laboratory for the VLAP program, training, educating, and processing samples for 25 lakes and ponds in Central West New Hampshire.

### "What do you value most about citizen science?"



**Fig. 1** Themes discussed by LPP volunteers when asked what they value about participating in citizen science. Each pie slice shows the percentage of all comments that relate to each theme



**Fig. 2** FOCA Director Terry Rees sampling for the LPP. See <https://foca.on.ca/lake-partner-program-overview/> for more information about the LPP.



**Fig. 3** CLEO volunteer records data during the annual training program. See <https://tinyurl.com/CLEOLillionah> for more information about CLEO.

Even in programs that are focused explicitly on obtaining useful baseline data, we have seen volunteers report outcomes related to empowerment, community engagement, and transformational learning (Fig. 1). Volunteers use the baseline data to inform conservation efforts on local lakes, for instance by educating their neighbors about the importance of ongoing water quality monitoring, initiating community-run invasive species monitoring programs, or creating lake by-laws related to natural shorelines, mandatory septic inspections, or phosphate use. As one LPP volunteer expressed, “You can go armed with the information and if it’s backed up by an organization like the Lake Partner Program, I think you’re that much more credible. So, in that sense it is empowering. You’ve got the weight of this expertise behind any argument.” CLEO volunteers have expressed that they talk more with their neighbors after participating in the program, and that taking on this work gives them a sense of pride in the organization. Some have reported that having the data gives them a seat at the table with the state management agency, which they have used to argue for revised permits on the wastewater treatment plant. The experience has also contributed to some transformational life outcomes. One participant who started volunteering as a teen now works for a limnology consulting firm; another changed her major to environmental biology as a result of learning more about water quality issues as a volunteer.

Some distinguish between research-oriented citizen science and empowerment or justice-oriented community science (Cooper *et al.*, 2021). Yet regardless of the explicit goals of any given citizen science program, we have observed that education and empowerment outcomes can be present in citizen science programs that are focused primarily on obtaining good data. Thus, it is useful, practical, and important to carefully consider the sociological dimensions of the experience of volunteers in all types of citizen science. Doing so can make for better citizens and better science.

**Acknowledgements:** We thank all the volunteers who have inspired this work and the Global Lake Ecological Observatory Network (GLEON) community science working group for thoughtful discussions on citizen science in limnology. This work was partially funded by the College of Arts and Sciences Biology Department and the Fredrickson Family Innovation Lab at Fairfield University and the Geoffrey F. Bruce Fellowship in Canadian Freshwater Policy at Ryerson University.

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## LIMNOLOGY AROUND THE WORLD: GERMANY

# Research for the future of our freshwaters

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Whether as a resource, recreational space or biodiversity hotspot: inland waters are the focus of research conducted at the Leibniz Institute of Freshwater Ecology and Inland Fisheries, or IGB for short. Intact waters are indispensable for human well-being and the conservation of a fascinating fauna and flora. However, rivers, lakes, floodplains and wetlands are among the habitats most affected by human activity – with massive negative impacts on their biodiversity. Climate and landscape changes are further increasing the pressure on inland waters. Counteracting this requires a sustainable approach to manage freshwater resources and ecosystems. Cooperation between different disciplines, involving user groups and affected stakeholders, is essential for this. This is what IGB stands for. As Germany's largest and one of the leading international research centres for freshwaters, scientists from all over the world study the structures and processes in rivers, lakes and wetlands as well as their populations, communities and ecosystems. While this basic research is certainly well known to limnologists worldwide, IGB also conducts applied research. A few examples of recent projects are elucidated here.

### Spatio-temporal dynamics of water-based recreational activities

The AQUATAG project, for example, is investigating when and where inland waters are used particularly intensively for recreational activities, and how this recreational use could be better managed. After all, recreational use and the quality of water bodies influence each other. For example, each type of use has its own demands on the quality of a lake or a river, such as natural environment, infrastructure, accessibility and visitor density. The project team follows the key assumption that quality of use and ecological quality can be addressed via the common interface "ecological and social carrying capacity". The mandatory basis for this is the systematic, temporally and spatially differentiated recording of the various uses and effects. To this end, researchers are bringing together novel research approaches and data sources at different spatial and temporal levels. For example, they combine data from GIS-analysis, surveys, field studies and social media by evaluating geo-referenced data from Twitter and fitness trackers, and compare it with user information from various sports and leisure associations. As the project exemplifies, the relatively young research branch of recreation ecology holds ample potential for research into aquatic systems, e.g. for species monitoring or for work on ecosystem status and, as here, human impacts and well-being.

Find out more: <https://www.igb-berlin.de/en/projekt/aquatag>

### Services to human society provided by ecosystems of rivers and their floodplains

Recreation, flood retention and carbon sequestration are just some examples of the diverse ecosystem services that freshwaters provide to society. A cooling effect during heat waves, purification and provisioning of water resources, habitat diversity and fishery yields could also be mentioned here.

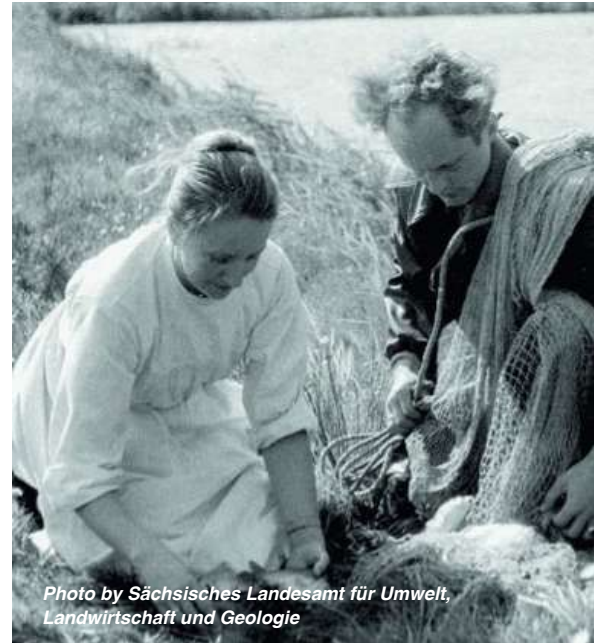


Photo by Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie

Employees of the predecessor institution IfB during field work in 1955. The origins of IGB can be traced even further back to 1893, when hydrobiologist Johannes Frenzel founded the Biological and Fishery Experimental Station at Müggelsee – one of the first research facilities in this field.

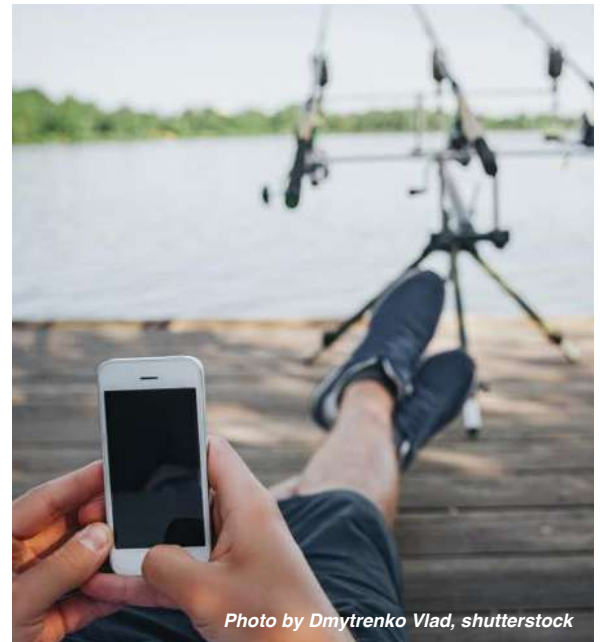


Photo by Dmytrenko Vlad, shutterstock

Today, enormous quantities of photos, videos and texts of all kinds are posted on the internet. More and more people use fitness trackers and post their data online, while spending their leisure time at inland waters. For a few years, scientists have been taking advantage of big data on the internet.

What all these ecosystem services have in common is that they can only be guaranteed in the long term if rivers and lakes are in good ecological status. But maintaining and restoring surface waters and floodplains is often a complex and expensive undertaking. Sometimes it is even uncertain which measures are worthwhile, because restoration goals also depend to some extent on the different views of stakeholders. Together with partners from water management authorities, scientists at IGB have therefore developed an assessment approach based on the concept of ecosystem services that enables them to show and quantify the various benefits of rivers and floodplains to various parts of society. The River

Ecosystem Service Index (RESI) developed at IGB facilitates the identification of optimised management scenarios that support most sustainable management goals and uses. Integration of such analyses into planning procedures may help practitioners to identify and defuse potential conflicts of use at an early stage. To this end, RESI has already been applied to an 80-km section of the Danube River, where it facilitated the reconciliation of flood retention and nature conservation goals in regional planning.

Find out more:

<https://www.igb-berlin.de/en/project/resi>

<https://www.igb-berlin.de/en/project/ides>

### **Species protection through environmentally friendly lighting**

A relatively new but rapidly increasing stressor for aquatic ecosystems and their biotic communities is excessive artificial light at night. IGB has pioneered the young research field of light pollution, bringing together different scientific disciplines and citizen scientists. As a result of this engagement, there is now a deeper understanding of why light is one reason for the decline in insect numbers worldwide, and how artificial light affects the hormonal balance and natural behaviour of fish and other vertebrates. But solutions are also being developed: In the current AuBe project, IGB researchers are developing insect-friendly street lighting designs together with partners from the lighting technology sector. These are intended to counteract the progressive loss of insect biomass and the rapidly increasing illumination of night landscapes and habitats.

Find out more:

<https://www.igb-berlin.de/en/projekt/species-protection-through-environmental-friendly-lighting-aube>

### **Waters and fisheries sciences since the 19th century**

Research at IGB not only pursues promising new approaches, it also reaches far back into history: Research on fish biology was conducted at one of its precursor institutions as early as the late 19th century: the Biological and Fishery Experimental Station at Lake Müggelsee. A few years later, this station became the "Royal Institute for Inland Fisheries" and, after World War II in 1951, the "Institute for Fisheries". In 1992, this institute and two other predecessor research institutions were merged to create IGB. At that time, IGB employed 103 scientists; it now employs a total of about 250 people, including around 150 scientists. A nationally and internationally acknowledged aquatic research institute soon developed, combining expertise from hydrology, biogeochemistry, physics, microbiology, ecology, evolutionary ecology, fish ecology and fisheries biology under one roof. Disciplinary research is bundled in five research departments. In addition, programme areas address issues of high social and scientific relevance, such as global change, aquatic biodiversity and sustainable use and management of freshwaters. The numerous research activities involve societal stakeholders and are carried out in close cooperation with universities and research institutions, both locally and worldwide. The institute is still located on the shores of Berlin's Lake Müggelsee, with an additional location at Lake Stechlin, Brandenburg's most famous clear-water lake.

Would you like to learn more about IGB? The bimonthly FRESHWATERS NEWS keeps you up to date with the latest research findings of the institute and its cooperation partners > [www.igb-berlin.de/en/newsletter](http://www.igb-berlin.de/en/newsletter)

<https://www.igb-berlin.de/en>

<https://twitter.com/LeibnizIGB>



*Photo by Joachim Pressl on Unsplash*

Inland waters are particularly affected by light pollution as the shores of rivers and lakes are often densely built up and brightly lit at night. After all, many flying insects are drawn to light sources, where they perish, leading to a decline in their natural habitat. New research results at IGB show that this effect is also applicable under water. Researchers say that current researchers, current strategies for reducing the impact of light pollution do not go far enough in protecting aquatic insect species effectively.



*Photo by Fatseyeva, Shutterstock*

Using the example of the multi-state Danube River, IGB researchers assessed different ecosystem services for the current status quo of the river and its floodplains as well as for two different planning states.

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# Tonolli Memorial Awards

Siecha Lakes Colombia. Photo by Carlos Rivera

## Colombia

### Benthic macroinvertebrate food webs are mainly sustained by autotrophic resources in tropical first-order forest streams

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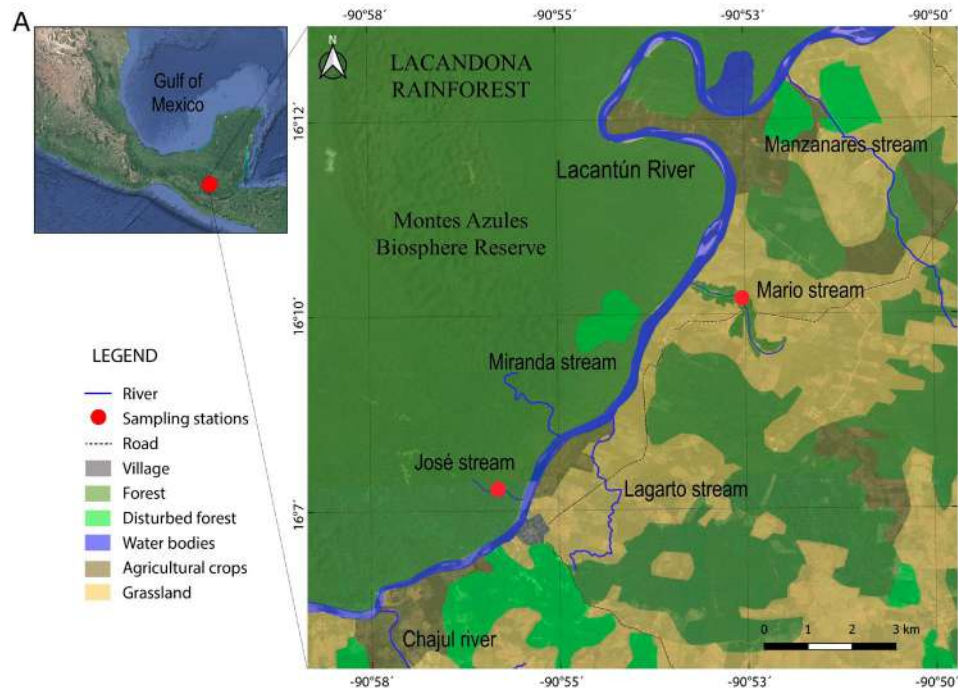
Email: [dacortesgu@unal.edu.co](mailto:dacortesgu@unal.edu.co)

Food webs that are based on detritus are usually shorter, less size-structured, and with a lower degree of omnivory than food webs based on autotrophic resources (Potapov *et al.*, 2019). In tropical first-order streams, the availability of basal resources changes with seasonality and its effect on the hydrology of streams. We aimed to establish whether the benthic macroinvertebrate food web in two tropical first-order forest streams relies on autotrophic or detrital food resources on a seasonal basis (rainy and dry seasons).

We evaluated the assimilation of autotrophic (benthic algae) and detrital (leaf litter) food resources through carbon and nitrogen stable isotope analysis ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) in two tropical first-order forest streams, José and Mario, in the Lacandona rainforest, in Chiapas, Mexico (Fig. 1). We included the biomass of macroinvertebrates sustained by each trophic pathway and the food web structure, i.e., trophic position, size structure, and degree of omnivory.

The largest available biomass of food resources (99%) in both streams and seasons was detritus, which increased in the dry season compared to the rainy season. Detrital biomass likely increased in the dry season due to a leaf drop peak associated with water stress of the riparian trees and low flow in the channel that increased litter retention (Tonin *et al.*, 2017). Detritus showed high C:N values (18.6–30.8) and depleted  $\delta^{13}\text{C}$  values (Fig. 2).

Autotrophic food resources represented 1% of the biomass of potential food resources. Their biomass was higher in the dry season than in the rainy season. In tropical streams, the biomass of benthic primary producers increases in the dry season when water discharge and turbidity



**Fig. 1:** A. Location of the study streams. B. José stream (left) and Mario stream (right). Modified from Cortés-Guzmán *et al.* 2022b.

decrease (Branco *et al.*, 2017). Autotrophic food resources showed low C:N values (2.8–11.5) and enriched  $\delta^{13}\text{C}$  values (Fig. 2).

The contribution of the autotrophic pathway (67%) to the macroinvertebrate biomass was higher than the detrital pathway (33%) in the José stream, particularly in the dry season. In contrast, the contribution of the detrital pathway did not differ between seasons. The contributions of the autotrophic (53%) and detrital (47%) pathways did not differ in the Mario stream. Even when their availability is limited, high selectivity for algae is probably associated with algae's higher

nutritional value compared to the recalcitrant components of leaf litter (Schmidt *et al.*, 2017).

The trophic structure was characterized by a higher maximum trophic position in the dry season in both streams. Isotopic enrichment in the dry season could be related to an increase in light penetration (Lau *et al.*, 2009). In both streams and seasons, between 52 and 79% of taxa were classified as omnivorous, while between 21 and 48% of taxa occurred at discrete trophic positions. Omnivory is widespread in tropical streams, likely as an adaptive response to the temporal variability of food resources

relative to the life span of the organisms (Digel *et al.*, 2011). We did not find a correlation between the macroinvertebrate trophic position and body mass (body mass [Ln (mg C) + 1] = 0.918 + 0.3 \* trophic position,  $r^2 = 0.01$ ,  $p = 0.098$ ). Some taxa, such as crustaceans or gastropods, had large body mass but occupied an intermediate trophic position, which resulted in a poorly developed food web size structure.

We concluded that the autotrophic pathway played an important role in the macroinvertebrate food web in tropical streams, even when their availability was limited. Its relative importance varied with seasonality (Cortés Guzmán *et al.* 2022a;b).

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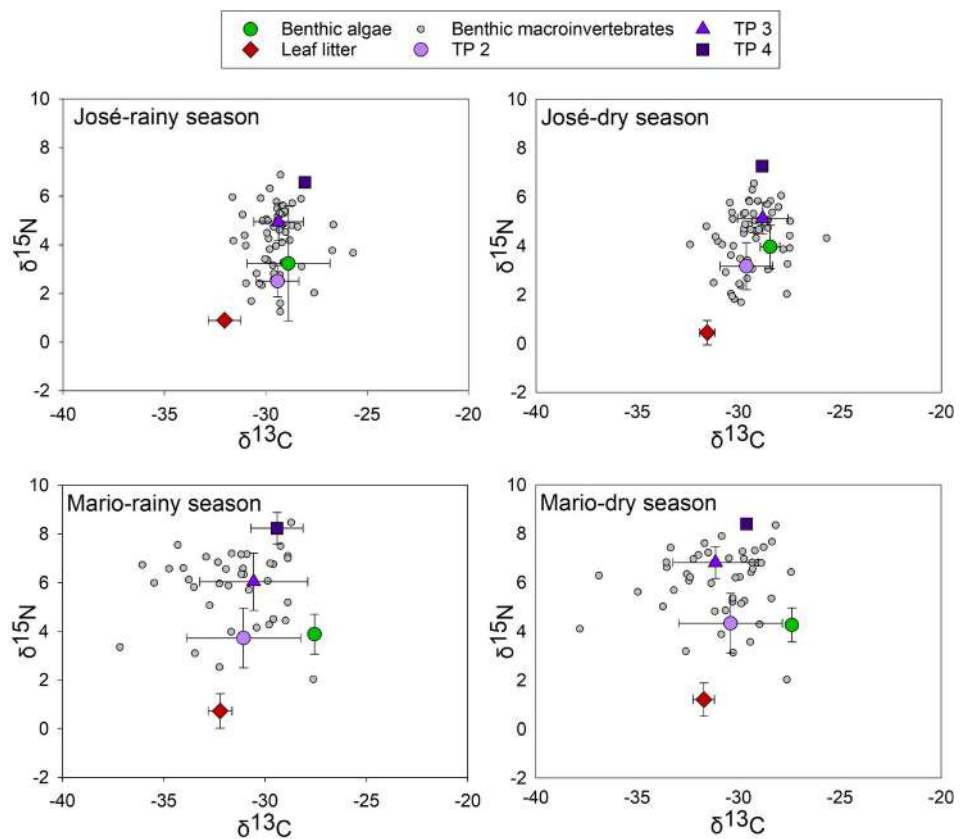
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**Fig. 2.** Distribution of the isotopic signature of the macroinvertebrates and basal resources in the José and Mario streams, México in the rainy and dry seasons. (TP: average values of trophic positions 2, 3, and 4).

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## NEWS FROM MEMBERS

### Brazilian SIL member Hugo Sarmento shares the following news:

We had a big fire on the shores of the Broa reservoir, a lake we have been following long-term, and we intensified our sampling efforts to study the effects of forest fires on this aquatic ecosystem. More info at: <https://fb.watch/8y-jFr4r17/>

The Tara schooner is in Brazil, part of the AtlantECO project (H2020). Although this project is mainly about marine science, we did some sampling in the Amazon River and the Amazon plume. Check out this video: <https://youtu.be/byORIMjFcaw>



# FACES of SIL



## María de los Ángeles González SAGRARIO

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## MARÍA DE LOS ÁNGELES GONZÁLEZ SAGRARIO | ARGENTINA

I am a limnologist and a researcher at CONICET (National Council of Scientific and Technological Research of Argentina) at the IIMyC. I focus my research on the ecology of shallow lakes, especially on lake dynamics and functioning. I am interested in regime shifts in lakes, the effect of nutrient imbalances in primary producers, food web dynamics, and interactions between the littoral and pelagic habitats of lakes.

Our planet is facing an environmental crisis that we, humans, provoked. As limnologists, we have a responsibility and should be committed to preserving and restoring the water quality of inland waters. Many of these freshwater ecosystems are crucial to mitigating climate warming. However, there is a global imbalance in the protection, regulation, and management of inland waters and the development of limnology in developed and emerging countries. This imbalance also translates into disparities for students and early career limnologists between developed and low-income countries that is necessary to reduce.

As the SIL Vice President for Education, I am committed to the international promotion of limnology and empowering the researchers of tomorrow. For that, it is crucial to foster and facilitate knowledge transfer through specific actions. I plan to work with the Education Committee to i) provide educational material for students and educators, ii) organize an inspiring seminar series and online courses and workshops, and iii) support an international scientific network. I am fully committed to these goals, and I will work hard towards their achievement. I appreciate the support that the SIL community gave to me.

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## Juan David González-Trujillo

## JUAN DAVID GONZÁLEZ-TRUJILLO | COLOMBIA

I am an ecologist currently working as a postdoctoral researcher at the Museo Nacional de Ciencias Naturales in Spain. My research interests are in the intersection between community ecology and historical biogeography. I am particularly interested in understanding how historical events have shaped current biodiversity patterns and how they can forecast future changes.

The favorite stage of my Ph.D. was the fieldwork, for I met different people who are extraordinarily committed to nature conservation. I was so amazed – and inspired – to find that they had a unique classification system of rivers and biodiversity. Some were empiric naturalists; they knew where to find every fish species, its feeding behavior, preferred microhabitat, and even the mating period. Sadly, some of them are not with us anymore. The avarice for natural and mineral resources is threatening environmental leaders in Colombia. With their loss, cultural and historical legacies are also at risk.

My interests also go beyond the academy. I am part of a group (@QuienCiencia on Twitter) that is creating awareness on the importance of communicating scientific results in different languages. A working plan which closely aligns with the renovated face and goals of SIL, and will help secure SIL's international leadership on freshwater topics.

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## CÉCILIA BAROUILLET | FRANCE

I became interested in limnology during my Bachelor's and Master's degrees in Environmental Sciences. I studied different intriguing subjects and it was challenging to decide where to focus but I soon discovered that in limnology it is possible to integrate so many aspects that you never get bored!

I am currently a third-year PhD student at the University of Milano-Bicocca (Italy). I am studying how different anthropogenic stressors affect freshwater ecosystems. In particular, my research focuses on microplastics, tiny plastic particles that are receiving increasing attention. Studies about these contaminants in freshwater systems are still limited, thus my research focuses on understanding their occurrence and distribution in lakes and rivers with different anthropogenic impacts. Besides this, I am also investigating how microplastics interact with freshwater organisms and in particular with microalgae, as fundamental components at the base of aquatic food webs.

SIL had a special role in the trajectory of my career in limnology. The conference in Nanjing was my first scientific conference. There, I had the chance to meet amazing scientists, and I found a society made of people helpful and inclusive. Besides, many opportunities arise from this conference for me. I am extremely happy to help SIL also with the management of their website, and it is amazing to see the passion and the commitment of the people involved in SIL for pressing environmental issues that are affecting freshwater ecosystems.

I am looking forward to attending the next SIL meeting and benefiting from all the opportunities that will come from this amazing society!

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## BARBARA BARTA | HUNGARY

I am a first-year PhD student at CER and Eötvös Loránd University in Hungary. My studies focus on small water-bodies such as temporary and urban ponds and water-filled tree holes. I'm interested in their metacommunity structure and how various anthropogenic activities (forest management practices, urbanisation, fragmentation etc.) affect them. Previously, I obtained my BSc from the University of St Andrews, Scotland and my MSc from the University of Copenhagen, Denmark. For my master's thesis I had the amazing opportunity to travel to Ecuador and sample high altitude, páramo lakes and glacial lakes in the Andes. This experience and working with local researchers made me realise the importance of forming such international collaborations. Most of the environmental issues we are facing today are global in nature, especially when considering freshwaters that often form interconnected networks that go beyond national borders. Therefore, we need to find global solutions for these challenges. I believe that SIL can play a crucial role in this quest by bringing researchers together from all over the world and fostering international and global collaborative projects focusing on the most pressing issues affecting our freshwaters. As the recently elected ECR representative for Education, I will work to get the most out of this potential, specifically focusing on providing students and ECRs with tools and opportunities to get involved. I feel honoured to represent young researchers within SIL and I'm always open to suggestions and feedback, so do not hesitate to get in touch!

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