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*Courtesy: Southern Brazil flood, Jeff Botega (2024)*

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## LETTER FROM

# the President

Dear SIL Members,

This is my first letter as President to you, the members of the International Society of Limnology. I view this letter as an important opportunity to establish good communication with you to discuss our achievements, needs and challenges. It is equally important to me to demonstrate transparency, encourage openness, and invite you to participate in our society in any way you can. While this approach may not be entirely new, I believe it is essential to clarify the foundation of the communication I wish to establish and the values that guide my actions.

Over the last six months, we have made good progress in various activities related to the organization, structure, and future plans of SIL. With regards to future plans, we are currently developing a strategic plan for SIL, identifying the outcomes we aim to achieve as a society in the short, medium, and long-term. This plan focuses foremost on strengthening our commitment to preserve healthier freshwater ecosystems. The outcomes will represent the changes we aspire to create, not only in the scientific community but also in society with its many stakeholders. By defining these outcomes, we can plan specific actions that will lead to positive changes for inland waters. We initiated this process before the SIL Congress in Brazil, and we will continue throughout the coming year. Our former manager, Geneviève Leclerc, has been crucial in this process and has offered to continue to support us as needed.

Regarding the organization, structure, and functioning of SIL, we have accomplished several activities and tasks. The board members and our new manager, Michelle Gross, have reviewed the statutes and proposed critical changes that were submitted to the SIL community for a vote, which received strong support. These changes include redefining member categories and membership fees based on national gross income per capita (GDP), establishing term limits for board members, adopting gender-neutral terminology, and defining the composition of the Global Outreach Network. We appreciate the insightful comments and suggestions made by the members, showing their engagement.

“We are currently developing a strategic plan for SIL, identifying the outcomes we aim to achieve as a society in the short, medium, and long-term. This plan focuses foremost on strengthening our commitment to preserve healthier freshwater ecosystems.”

Additionally, we recognized that early career researchers (ECRs) are the least represented group within SIL, while facing numerous challenges as they seek permanent and meaningful employment. To address these issues, we established an ECR committee, co-chaired by Kamil Hupalo (Poland) and Bruno Cremella (Uruguay), which includes all ECR representatives on the board as well as several volunteers. The role of the ECR committee is to provide resources for ECRs and to enhance their representation and voice within the society. I would like to express my gratitude to Bruno and Kamil for accepting this important task and for their ongoing commitment. Finally, the Vice President of Communication and Publication, Cécilia Barouillet, successfully organized a campaign to recruit volunteers for the different committees, significantly increasing our capacity to serve SIL members and developed several paths for increasing communication efficiency within the board.

We have adopted equity, diversity, and inclusion (EDI) principles in several actions, such as the allocation of Tonolli funds and decisions made by our committees. However, we firmly believe in the necessity of making these principles integral to all our actions and plans. For this reason, we have established an EDI task force, co-chaired by Belén Franco (Chile) and Anas Mohamed Usoof (Sri Lanka). Both individuals have extensive experience implementing EDI principles at other scientific societies that focus on the inclusion of underrepresented groups. This task force is developing EDI guidelines and best practices for SIL governance and activities, including awards, the mentorship program, and congress organization, among others. Anas, Belén, our EDI volunteers, and board members aim to implement these guidelines to encourage limnologists to engage with our society, achieving a global and diverse representation of the limnological community, fostering a culture of respect and inclusivity within SIL, and providing resources to bridge existing gaps.

This year, the Developing Economies Committee reviewed 17 eligible candidates for the Tonolli Fund, of which 10 were selected for funding. The Committee’s selection criteria focused on ensuring an equitable distribution of funds among different geographical areas, prioritizing the quality of research proposals, and maintaining a balance in gender representation. After many years of service as the Italian representative on the Tonolli evaluation committee, Professor Luigi Naselli-Flores has stepped down. We would like to express our gratitude to Professor Naselli-Flores for his contributions over the years and welcome the new Italian representative, Diego Copedi, as well as new members Csaba Vad and Linda May.

Additionally, I invite all members to explore the six new videos from Wetzel’s Limnology produced this year by the SIL Video Team and the Education Committee. This outstanding project, led by Warwick Vincent, offers amazing videos that summarize the main contents of individual chapters of the new edition of Wetzel’s Limnology. These resources, which we take great pride in, celebrate the rich diversity of lake and river ecosystems. The new videos cover topics related to salinity, light and color, fish and food webs, water as a substance, and shallow lakes and ponds. Enjoy and help promote them!

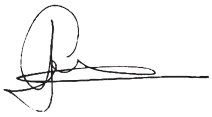
August Thienemann and Einar Naumann founded SIL 102 years ago to "embrace limnologists of all countries" and "bring limnologists together." The foundation of my presidency rests on two key pillars: You as SIL members and freshwater ecosystems. First, I aim to increase the global visibility of SIL among limnologists by facilitating knowledge transfer and promoting younger limnologists and networks. I believe in creating diverse and inclusive environments that offer equal opportunities for all. This may seem ambitious, but it is essential for our contribution to the field. Second, since inland waters are among the most threatened ecosystems and global water demand is constantly rising, we must focus our efforts on the preservation and sustainable management of freshwater ecosystems, aligning our actions with the United Nations Sustainable Development Goals.

Finally, even though I already expressed my gratitude in Brazil for the support I received to be the elected President, I want to do it once again. Thanks to the entire SIL community for entrusting me with this responsibility!

A new year is on the horizon, and on behalf of myself and the board members, I would like to wish all members the very best on their personal and professional projects.

Enjoy limnology, and let's work together for healthier ecosystems!

Best wishes,
Maria de los Ángeles González Sagrario



**María de los Ángeles González Sagrario**
SIL President

# Message from the Editor

This edition of SILNews opens with a thoughtful letter from our new president, Maria de los Ángeles, who outlines an inspiring vision for SIL's future directions. Building on this, highlights from the recent SIL-ASLO joint meeting showcase efforts to foster stronger global connections among limnologists, while the SIL Board introduced new initiatives poised to drive impactful change. The Book Review section offers a deep dive into *Lake Functioning: Internal Phosphorus Loading, Cyanobacteria, and Climate Change,* which is a valuable resource for addressing pressing challenges in aquatic system management. Shifting focus to current events, the Opinion piece examines the devastating 2024 floods in Southern Brazil, emphasizing the crucial role of wetlands in mitigating extreme climate impacts. Expanding on the theme of environmental challenges, the new *Limnology Around (a More Extreme) World* section explores how drying rivers in Spain are reshaping biodiversity and ecosystem functioning. It complements the findings from Spain and Brazil in *Limnology Around the World,* highlighting the central role of water-driven ecosystems and the urgent need to fill neotropical knowledge gaps. In this issue, we not only meet inspiring members from Chile, Canada/Sri Lanka, and Poland in the *FACES of the SIL section,* but also introduce a new feature spotlighting limnological societies worldwide. Finally, we pay tribute to two towering figures in limnology whose legacies continue to inspire.

Let this issue inspire action to address the pressing challenges in modern limnology.

Juan David González-Trujillo
Editor SILNews

## IN THIS ISSUE



*Bahia ondita, Guajira, Colombia. Photo by Dario Alarcon Naforo*

Contribution deadline for the July 2025 issue: **May, 2025**
Send to: SILnews editor at SILnews@limnology.org

*Morichal, Puerto Lçopez, Colombia. Photo by JD González-Trujillo*

SIL & ASLO JOINT MEETING:

# Connecting the Global Limnological Community

In February 2020, I met with Roxane Maranger, President of the Association for the Sciences of Limnology and Oceanography (ASLO) at that time, to discuss in more detail an idea that had us both fascinated for quite some time. We agreed that it would be timely to organize a freshwater science meeting jointly lead by ASLO and SIL. Both societies have their own long history and their own ways of organizing conferences, but we were convinced that there would be tremendous mutual benefit for members of both scientific societies, and even to non-member participants being, to discuss scientific results, to expand networks, and to meet friends, old and new. It took us some time and several meetings, supported by the boards of both societies, to finally fix a location and time for the first joint ASLO-SIL meeting: May 11 to 16, 2026, in Montreal (Quebec, Canada). We invite you to block this date already now in your calendar! We promise that both societies and joint society organizing committee of volunteers the conference (yet to be formed) will do their best to create an event that will have a long-lasting impact on the freshwater researcher community. Fairness, equitability and inclusivity will be among the fundamental principles for every activity during the conference. Both societies will have space and time for their society-related related events such as society business meetings and award ceremonies that were not able to be in the plenary due to time restrictions. However, most activities will be joint that make clear that fundamentally we all care for the same common goal: to generate a solid scientific understanding, and to ensure a sustainable use of the limited freshwater resources on earth. Please join us in this unique and exciting global celebration of freshwater science!

Best, Thomas Mehner

SIL International Society of Limnology

NEW INITIATIVES

# From the SIL Board

Following a series of strategic planning meetings throughout 2023 and 2024, during the SIL2024 Congress the SIL Board developed an action plan, aligning future goals with current societal gaps and beyond. Among many projects that have already been implemented over recent years, two efforts in particular have been newly developed.

## Equity, Diversity, and Inclusion (EDI) Taskforce

SIL felt the need to review and standardize our practices with respect to EDI. As a starter, we convened a meeting during the SIL2024 congress to receive some informal feedback from members who were on site and integrate their perspectives with priorities already identified by the SIL Board over the last years. Co-chairs of a new taskforce were then appointed to lead an independent review of SIL's activities, identifying areas of priority and developing recommendations on integrating EDI practices throughout our society to make it a welcoming place within limnology.

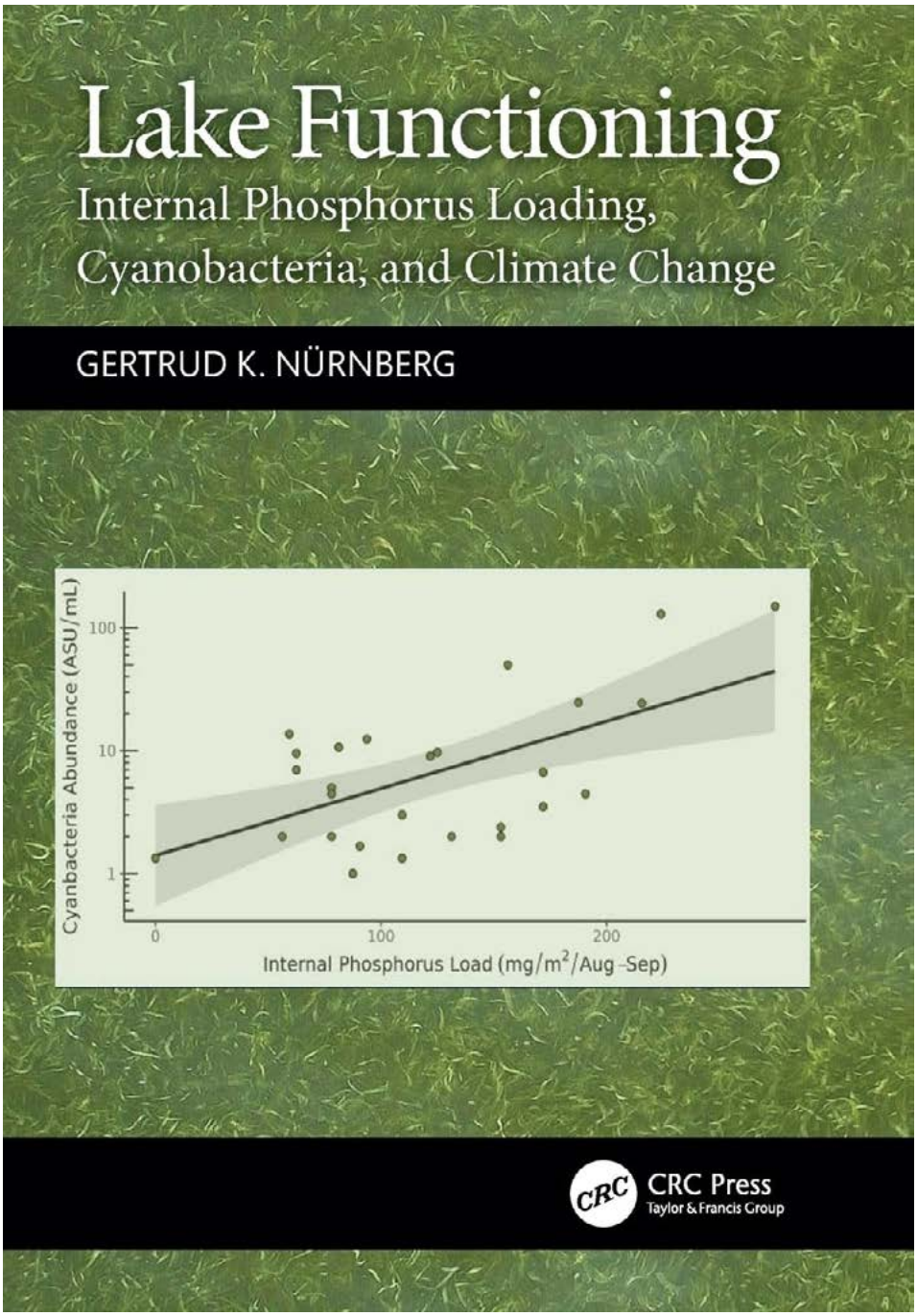
*Meet the co-chairs of the new EDI Taskforce:*
Belén Franco-Cisterna, postdoctoral researcher at the Netherlands Institute of Ecology, Netherlands
Anas Mohamed Usoof, Assistant Professor at the University of Winnipeg, Canada

## Early Career Researchers (ECR) Committee

Over recent years, the landscape of SIL membership has gradually shifted towards a dominance of student and early career members. As a first step to increase early career representation, specific ECR-oriented positions were added to the SIL Board. We have now established an ECR committee co-chaired by two ECRs to create a platform for early career members within SIL. The ECR Committee aims to consolidate and galvanise the early career researcher community. The Committee will also work towards providing tangible benefits to young SIL members by offering increased visibility and a series of ECR-oriented events including regular meetings, workshops and seminars.

*Meet the co-chairs of the new ECR Committee:*
Kamil Hupało, postdoctoral researcher at the University of Duisburg-Essen in Germany
Bruno Cremella, postdoctoral researcher at Laboratoire d'Oceanographie de Villefranche in France and the University of the Republic in Uruguay

# Book Review




**By Gertrud K. Nürnberg**

1st Edition, CRC Press (Taylor & Francis Group*)

**Paperback ISBN:** 978032294407

**eBook ISBN:** 978003301592

$97.5 or $50.5

* SIL members can get a discount code in the login area.

https://www.doi.org/10.5281/zenodo.14516886

Gertrud K. Nürnberg's Lake functioning is a bold and timely exploration of the challenges facing lake ecosystems in an era of compounding stressors. This book serves as both a synthesis of decades of empirical research and a practical guide for lake managers and restoration specialists to address the complexities of phosphorus-derived pollution, climate change, and harmful cyanobacterial blooms. In my view, this is a rare achievement: a text that bridges the gap between theoretical limnology and real-world applications, inviting readers to navigate these pressing environmental issues with both scientific rigor and practical insight.

The book is structured into six chapters, providing a comprehensive understanding of lake functioning in the context of internal phosphorus loading, cyanobacteria, and climate change. The introduction sets the stage by presenting the core hypothesis of the book: internal P loading has increasingly become a major driver of cynaobacterial growth, and climate change is integrating this effect. The next three chapters are tightly linked to help the reader build foundational understanding of the nutrient dynamics that underlie eutrophication, the complex and unique ecology of cyanobacteria, and the effects of climate change, connecting global drivers to local freshwater systems and highlighting how shifting climate patterns exacerbate existing nutrient and biological stresses.

In the fifth chapter, Nürnberg combines these elements and presents the intricate interplay between internal phosphorus loading, cyanobacterial proliferation, and climate change. This section serves as the analytical core of the book, weaving theoretical insights into real-world data to illuminate key mechanisms and tipping points. Finally, the sixth chapter offers a critical evaluation of treatment options, focusing on strategies to prevent and mitigate cyanobacterial blooms through targeted interventions. It offers not only conclusions and general recommendations, but also a framework for action-guidance that is both scientifically grounded and immediately applicable to lake restoration efforts.

One of the book's greatest strengths is its visual clarity. Carefully selected tables, illustrations, and diagrams allow the reader to easily understand the complex relationship between foundational concepts from theory and the practical applications for management and restoration. In addition, the narrative unfolds through an impressive array of case studies, weaving together the author's extensive experience in lake management with insights from the international scientific community.

Understanding processes is at the forefront of this text: From the intricacies of phosphorus transfer and redox reactions in lake-bed sediments, to the cascading effects of climate-driven hydrodynamic shifts. Nürnberg's conversational tone and clear writing make this elaborate subject accessible, without diluting its scientific substance. As such, the book approach is deeply integrative, bringing together biogeochemical processes, ecological responses, and quantitative data from lakes worldwide to paint a detailed and urgent picture of risks.

What sets Lake Functioning apart is its ambition. No other book tackles the intersection of phosphorus cycling, climate change, and cyanobacterial blooms with depth or breadth. This is not merely an academic exercise, but a vital resource for those tasked with safeguarding aquatic ecosystems in the face of escalating threats. Recent events, from the staggering costs of cyanobacterial blooms to the looming specter of climate-induced tipping points, make this work an essential contribution to the field. By providing a blueprint for understanding and mitigating the forces driving eutrophication and cyanobacterial blooms, Lake Functioning offers hope and guidance in the face of daunting challenges.

**Prof. Juan David González-Trujillo**

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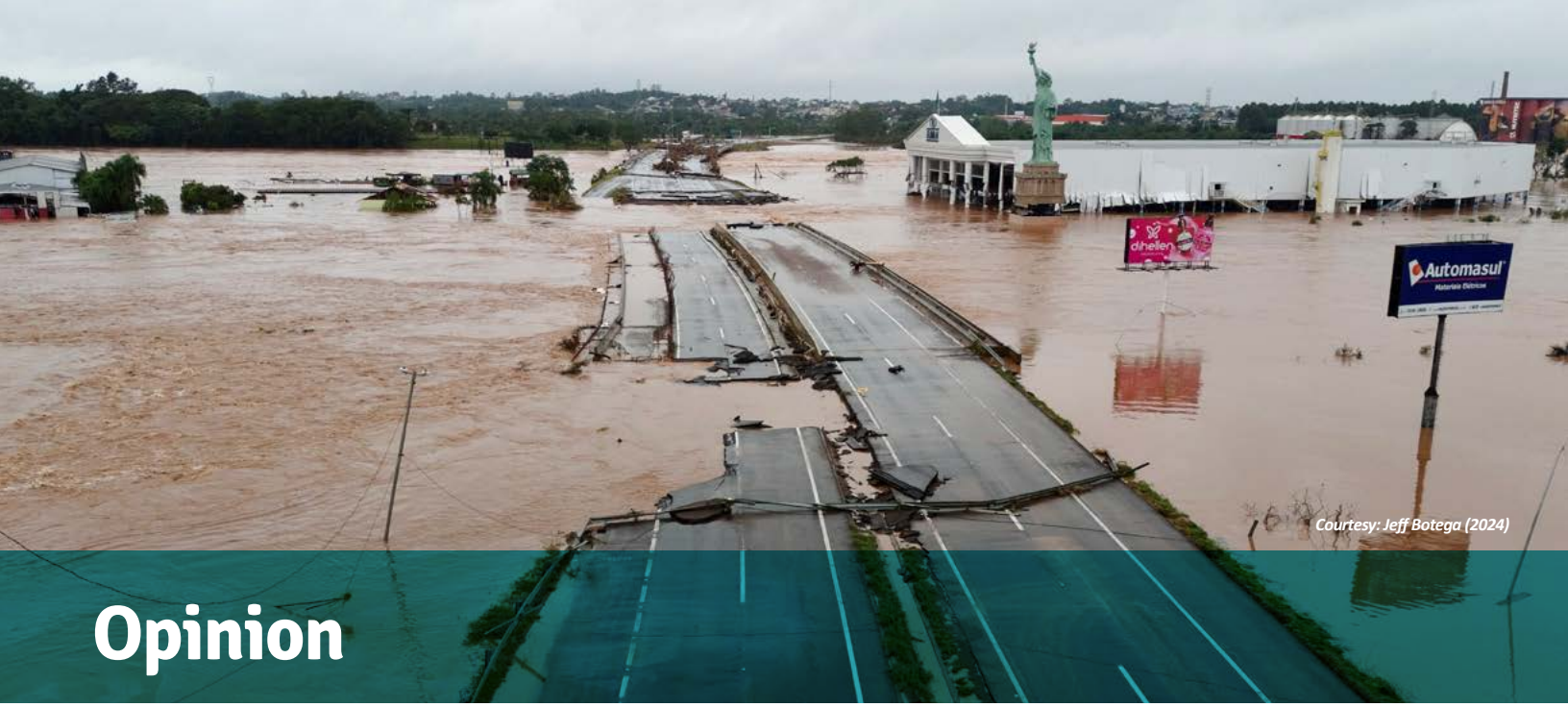

Courtesy: Jeff Botega (2024)

# Opinion

# Southern Brazil's 2024 Floods:

## CAUSES, IMPACTS, AND HOW WETLANDS CAN HELP MITIGATE EXTREME CLIMATE DISASTERS

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One of the most noticeable symptoms of global climate change is the increased frequency and intensity of extreme weather events (Lange *et al.* 2020, Wang *et al.* 2022). The progressive warming of the oceans and atmosphere, coupled with the resulting alterations in their circulation patterns, has intensified the magnitude of these natural events, leading to climatic events of unprecedented severity, such as recent droughts in the Amazon during 2023–2024 and devastating floods in southern Spain and Morocco's Sahara Desert in 2024. Among the most significant severe weather events in 2024 was the flooding that impacted Rio Grande do Sul, Brazil's southernmost state, which covers 281,707.151 km$^2$ (Instituto Brazileiro de Geografia e Estatística n.d.) and borders Argentina and Uruguay.

Although the tendency for increased rainfall in this region during austral autumn and spring is already well documented (Hasenack *et al.* 2023), a combination of unfavorable atmospheric conditions contributed to this extreme and catastrophic event: A prolonged heat wave induced high-pressure anomalies in the lower atmosphere over central–southeastern Brazil, intensifying the north-northwest winds of the low-level jet east of the Andes. This jet stream transported significant moisture into Rio Grande do Sul, where a low-pressure center had developed, facilitating deep convection and cloud formation. The situation worsened with the arrival of two cold fronts, the first on April 27$^{th}$ and the second on May 1$^{st}$. Their northward progression was obstructed by the high-pressure center in Tropical Brazilian Regions (Rocha *et al.* 2024). As a result, these fronts remained stationary over central and northern Rio Grande do Sul, generating intense rainfall in the Guaíba Lake basin, which is fed by five major rivers: Jacuí, Caí, Gravataí, Taquari, and Sinos. The headwater regions of the Taquari River were initially the most severely impacted; however, over time, the floodwaters converged toward Lake Guaíba, affecting the Metropolitan Region of Porto Alegre, the state capital. Between April 26$^{th}$ and May 5$^{th}$, total accumulated rainfall ranged from 650 to 800 mm at several locations, leading to the peak of flooding (Rocha *et al.* 2024).

Over 2.4 million people were affected by flooding in Rio Grande do Sul; more than 200 people died or went missing, and 600,000 were displaced (Pillar & Overbeck 2024). The infrastructure collapsed and left many without basic services, such as drinking water and electricity, as entire towns were submerged or isolated by the destruction of roads and bridges (Machado 2024, Martins-Filho *et al.* 2024, Pillar & Overbeck 2024, Rizzotto *et al.* 2024). Floods have also brought about a public health crisis, with possible long-lasting effects on the region's health infrastructure (Machado 2024, Martins-Filho *et al.* 2024, Rizzotto *et al.* 2024).

This disaster highlights the urgent need for improved disaster preparedness and climate mitigation efforts, particularly because underfunding in preventive measures has worsened the crisis in the region (Martins-Filho *et al.* 2024, Pillar & Overbeck 2024, Rizzotto *et al.* 2024). While much attention has been given to mitigation, adaptation, and recovery, the crucial role of natural areas, especially aquatic ecosystems, in regulating and reducing the impact of extreme events is often overlooked (Endter-Wada *et al.*, 2018; Ferreira *et al.*, 2023).

Continental aquatic ecosystems play an important and integrative role in the landscape by connecting processes between terrestrial and aquatic systems. Owing to their high vulnerability to global changes, they are frequently described as "sentinels" of anthropogenic impacts, signaling ecological shifts

Photo by Danilo Landa

across landscapes and watersheds (Adrian *et al.*, 2009, Williamson *et al.*, 2008, 2009, Zhang & Duan, 2021). Beyond acting as "whistleblowers" to climate change events, these ecosystems mitigate extreme events by recharging groundwater, reducing flood risks, and delaying droughts by storing and gradually releasing water (Endter-Wada *et al.* 2018; Ferreira *et al.* 2023). In coastal regions such as the long coastline of Rio Grande do Sul, wetlands also mitigate wave energy and reduce the impact of rising tides and storms (Endter-Wada *et al.*, 2018).

The state of Rio Grande do Sul is notable for its rich diversity of continental aquatic environments (Gonçalves *et al.*, 2024, Maltchik *et al.* 2024), ranging from tropical, subtropical, and temperate rivers to small streams, wetlands, marshes, and the extensive Patos-Mirim Lagoon system in the coastal landscape (Bastazini *et al.*, 2024; Gonçalves *et al.*, 2024; Maltchik *et al.*, 2024). The rich diversity of aquatic ecosystems supports high levels of biodiversity (Gonçalves *et al.*, 2024, Bastazini *et al.*, 2024, and references therein), which are becoming increasingly threatened by human activities (Gonçalves *et al.*, 2024, Maltchik *et al.*, 2024).

This rich diversity of aquatic ecosystems may play a significant role in mitigating the impact of extreme climate events by regulating water flow, reducing flood risks, and storing water during droughts. For instance, the Patos-Mirim Lagoon system and extensive wetlands serve as natural buffers against the rising frequency of floods and other climate-related disasters. Yet, to date, empirical evidence regarding the contribution of aquatic ecosystems to climate change mitigation in the Rio Grande do Sul region remains limited.

Insights from analogous contexts suggest that enhancing the conservation and integration of aquatic ecosystems into land-use planning strategies could strengthen the resilience of local ecosystems to climatic extremes, safeguard human populations, and protect livelihoods. However, in recent years, successive regional governments have weakened environmental legislation meant to protect native habitats, leaving aquatic ecosystems increasingly vulnerable to degradation and extirpation (Pillar & Overbeck 2024, Rizzotto *et al.* 2024, Silva 2024, Soler & Dias 2024). Thus, to fully understand the potential of these aquatic ecosystems for climate mitigation, it is crucial to conduct further research and quantify their impacts on the attenuation of extreme events. Meanwhile, policymakers must recognize the protective potential of continental aquatic ecosystems, incorporate them into climate policies, and establish mechanisms to minimize their degradation and destruction, ensuring their long-term persistence and contribution to climate mitigation efforts.

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## LIMNOLOGY AROUND (A MORE EXTREME) WORLD: SPAIN

# Biodiversity and ecosystem functioning when rivers run dry

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Rivers and streams in arid or semi-arid regions often experience periodic low flows or complete drying lasting from a few days to long hydrological periods. These river systems, known as intermittent or temporary, play vital roles in their landscapes by connecting aquatic and terrestrial ecosystems and supporting a unique biodiversity. The biota of these systems is adapted to fluctuating water availability and enduring conditions, ranging from episodic flash floods to stagnant or dry phases. Because these hydrological oscillations are largely predictable, organisms have evolved diverse strategies to adapt, such as migration, refugia seeking, synchronizing reproductive cycles, or employing specific morphological or physiological mechanisms to cope with wet-dry conditions. Consequently, a wide array of specialized organisms, including microbes, invertebrates, fish, and mammals, exhibit unique developmental patterns and survival strategies in these systems.

Temporary streams and rivers display characteristic patterns of local (alpha) and spatial or temporal (beta) biodiversity, which are closely linked to their hydrological phases. These phases transition from flowing to contracting and drying, often in rapid succession, and later to recovery phases when favorable conditions return. Although many studies have focused on biological diversity during wet phases, the overall biodiversity present throughout all hydrological phases remains underestimated. Typically, alpha diversity declines during the drying phase, yet specialist taxa capable of forming dispersal or dormant stages (e.g., seeds, eggs, or cysts) sustain richness. During flowing periods, alpha and beta diversities in temporary systems are comparable to those in permanent systems. Conversely, during the recovery phase, beta diversity may either increase through recolonization by various species or decrease through the re-establishment of common species. Because these systems dry and recover at different times and to varying degrees, their beta diversity often exceeds that of permanent systems, which tend to be more stable and homogeneous.

Temporary streams and rivers perform essential ecosystem functions, their relative importance changing across hydrological phases. Alternating wet and dry phases create pulses of materials and energy that differ from those in permanent systems. During dry phases, organic materials such as leaves and branches accumulate, break down, and mobilize upon rewetting to fuel microbial and detritivore activity. Primary productivity during flow periods is similar to that in permanent rivers, although it intensifies during low flow and ceases during desiccation because of algal die-off. The desiccation phase reduces gross primary production (GPP) and increases $CO_2$ emissions (Sepp *et al.*, 2024). And then, the rewetting of dry sediments can release pulses of $CO_2$ and $CH_4$ emissions, with the intensity depending on the availability of organic matter. These findings highlight the role of temporary streams in greenhouse gas production, which should not be underestimated.

These features establish temporary rivers and streams as hotspots of biodiversity and ecological functions and play critical roles in the resilience of arid and semi-arid landscapes. Although some patterns are well understood, many ecological and evolutionary aspects remain unknown. Significant research efforts, such as Dryver, StreamCLIMES, and AIMS, aim to unravel their biodiversity values and functions. Other initiatives (e.g., https://valuing-nature.net/TemporaryRiverNC) emphasize the biodiversity value of these ecosystems in temperate areas, where intermittent systems are becoming more frequent.

Although these systems have enormous ecological and evolutionary value, they can also offer insights into the impacts of human-driven alterations on water flow. Human intervention in the hydrological cycle is increasing, significantly affecting global watercourses (Messager *et al.*, 2021). Climate change, water abstraction, and regulation, which affect both surface and groundwater, have caused many formerly permanent river systems to experience altered flow dynamics or even complete flow cessation in certain areas or during specific periods. Natural temporary rivers exhibit high resilience to predictable water flow interruptions; however, the rise in unpredictable conditions in once-permanent watercourses can severely compromise their ecological integrity. Hydrological alterations due to extractive water use are often accompanied by additional impacts, such as water pollution and invasive species, which are exacerbated by habitat homogenization and nearby human activities. These cumulative pressures threaten the biodiversity, ecological

*River Siurana, NE Spain, during spring*

*River Algars (NE Spain) during the contracting phase (late spring)*

functions, and critical services provided by these systems, such as clean drinking water and flood regulation. Evaluating the responses of altered permanent rivers in comparison with natural temporary systems could offer valuable perspectives for sustainable management.

River conservation should prioritize temporary watercourses, as they may serve as "living laboratories" to study ecological and evolutionary processes shaped by wet-dry cycles. In certain regions such as the tropics and Antarctica, the isolated nature of temporary streams and rivers can drive genetic differentiation and speciation. Ecological traits, such as rapid growth, high fecundity, and desiccation-resistant life stages, are likely underexplored and may yet be discovered. Our understanding of these systems remains incomplete, particularly regarding the structure of their trophic webs, which are shaped by strong links between the aquatic and terrestrial states. Numerous unanswered questions highlight the need for dedicated research and underscore the importance of raising the awareness of these ecosystems. Fully incorporating them into conservation and management plans is essential to preserve their ecological and evolutionary significance.

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## LIMNOLOGY AROUND THE WORLD: SPAIN

# Water-driven transitional ecosystems: the crucial role of water availability shaping biodiversity and ecosystem functioning

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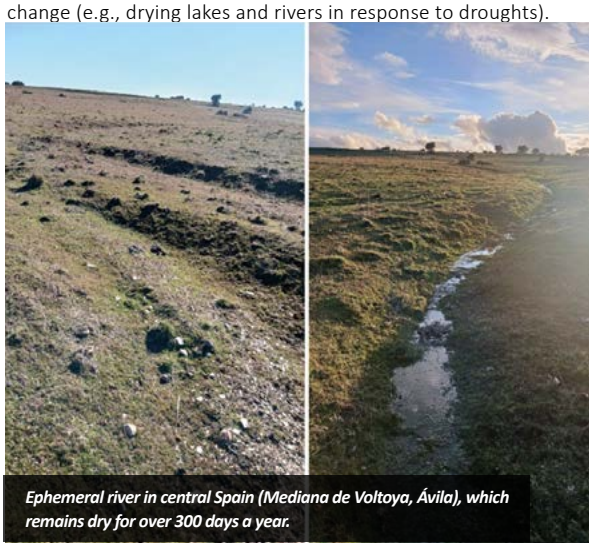
Most ecosystems on Earth are either consistently covered by water, such as oceans and permanent rivers, or are predominantly dry, such as forests and deserts. However, many ecosystems undergo natural and periodic shifts between wet and dry phases (e.g., intermittent rivers and ephemeral streams, palustrine wetlands, coastal shores, and freeze-thaw lakes). In these water-driven transitional ecosystems, both phases are interconnected components of a single, highly dynamic meta-ecosystem, where biodiversity and ecosystem functionality are shaped by the duration, frequency, and intensity of wet-dry cycles. Despite this inherently coupled dynamic, water-driven transitional ecosystems have historically been studied from a biased perspective, predominantly focusing on their aquatic phase, which currently limits our comprehensive understanding of these unique ecosystems. Addressing this knowledge gap is more important than ever because the number of ecosystems facing wet-dry or dry-wet transitions is increasing globally in response to climate change (e.g., drying lakes and rivers in response to droughts).



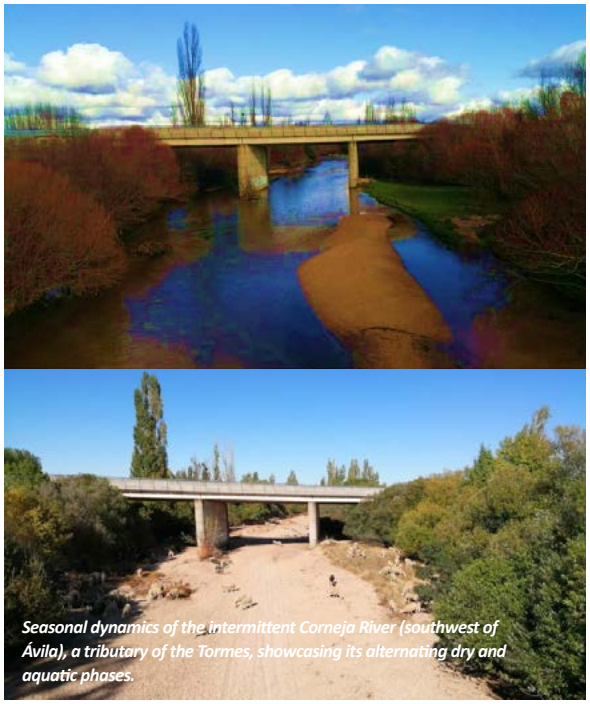
*Ephemeral river in central Spain (Mediana de Voltoya, Ávila), which remains dry for over 300 days a year.*

Biological covers – complex assemblies of organisms such as algae, fungi, bacteria, cyanobacteria, bryophytes, lichens, and protozoa – provide a unique opportunity to assess the response of biodiversity to periodic shifts between wet and dry phases. In fact, biological covers are adapted to wet-dry cycles, developing three-dimensional structures that reflect the interplay between water availability and ecological succession. These communities are globally distributed and encompass a wide range of forms, from aquatic biofilms found in environments with high water availability, to biocrusts typically associated with environments experiencing water scarcity. Despite their shared organisms, biofilms and biocrusts have often been studied as separate entities, limiting our understanding of how they respond to hydrological change. Recognizing them as part of a continuum underscores their shared eco-evolutionary capacity to adapt to cycles of hydration and desiccation, highlighting their role as a unique component of biodiversity that is essential for advancing our understanding of highly dynamic transitional ecosystems.

*Rebeca and Pilar sampling Biological covers.*

In water-driven transitional ecosystems, the temporal availability of water is a core driver of biodiversity and ecosystem functioning. Thus, the duration, frequency, and rate of change of wet-dry cycles shape three distinct scenarios that drive the succession and functional contribution of communities with the eco-evolutionary capacity to thrive under fluctuating water availability (i.e., biological covers). Overall, the following scenarios illustrate the interplay of biological cover with wet-dry dynamics, emphasizing how hydrological fluctuations influence biodiversity across biomes from daily to annual cycles:

1. Long and sustained wet transitional phase followed by a short dry phase: This is common in non-perennial marshes and floodplains and may favor water-adapted organisms such as cyanobacteria, protozoa, algae, and bacteria during wet phases. Dry phases allow drying-tolerant lichens and bryophytes to colonize.
2. Repeated alternating cycles of wet and dry phases. This is common in shorelines, which have the potential to host a wide range of biological covers. The maintenance of a certain level of humidity during dry phases supports species such as lichens and bryophytes, whereas wet phases rapidly reactivate cyanobacteria, fungi, and other microorganisms.
3. Short wet transitional phase followed by a prolonged dry phase. This is commonly found in ephemeral streams and may favor the prevalence of biological covers dominated by drying-tolerant lichens and bryophytes, whereas aquatic species rely on their desiccation-resistant traits to survive.



*Seasonal dynamics of the intermittent Corneja River (southwest of Ávila), a tributary of the Tormes, showcasing its alternating dry and aquatic phases.*

Global change disrupts wet-dry cycles, altering the composition, structure, and function of biological cover. These impacts, especially considering the risk of becoming a stable dry ecosystem, pose threats to the contribution of water-driven transitional ecosystems to global biogeochemical cycles, climatic stability, and human welfare, necessitating a more intense investigation of these ecosystems. In addition, extreme wet events (such as floods) can reshape these ecosystems entirely, creating opportunities for new colonization but also challenging ecosystem stability. Understanding water-driven transitional ecosystems as interconnected entities opens up new possibilities for research. We hope that embracing wet-dry-driven transitions will foster a new field of novel interdisciplinary research beyond the current consideration of alternating transitional states as independent and disconnected entities. By embracing these dynamics, we can develop strategies for the conservation and management of these fascinating ecosystems.

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## LIMNOLOGY AROUND THE WORLD: BRAZIL

# Global bias in stream ecology highlights neotropical knowledge gaps

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Neotropical streams are fascinating ecosystems that have been captivating naturalists for centuries. Their abundance is remarkable, filling the largest hydrographic basin (the Amazon basin) and floodplain in the world (the Pantanal wetland). Although dense rainforest streams may be the first image that comes to mind for Neotropical streams, these ecosystems are highly diverse, ranging from sandy, low-flowing 'igarapés' in the heart of the Amazon, open-canopy streams in the Pampa biomes built on boulders and rapids, to snowy water in the Central Andes (Fig. 1). Despite their limited spatial extent, Neotropical streams are among the most biodiverse aquatic environments in the world, supporting rich and abundant vertebrate, invertebrate, and microbial communities (Meyer *et al.* 2007). Neotropical streams and their biodiversity support different ecosystem services for human society, including material, non-material, and regulating ones (Ferreira *et al.* 2023; Encalada *et al.* 2013).

Neotropical streams face numerous threats linked to human activity. The Neotropical region contains many megacities that continue to expand over natural ecosystems, where streams are often channelized and flow underground beneath roads. The economies of many Neotropical countries rely heavily on commodities, and the high demand for these resources is the primary driver of habitat loss and species extinction. For example, projected deforestation in the Brazilian Cerrado suggests that agricultural expansion and limited protection of natural ecosystems could lead to a loss of 31–34% of the remaining natural vegetation by 2050 (Strassburg *et al.*, 2017). In addition to habitat loss, land-use changes have other negative consequences for stream biodiversity and functioning, such as hydrogeomorphological alteration, nutrient loading, and toxic chemical pollution. As they are usually associated with land-use changes, species invasion and climate change are also important drivers of biodiversity loss and changes in Neotropical streams.


**Fig. 1** Neotropical streams: A) a dense Atlantic rainforest stream, B) an open-canopy stream in the Brazilian Cerrado, C) a degraded stream resulting from forest-to-pasture land use conversion in southeast Brazil, D) a Brazilian urban stream, E) an intermittent stream in the Brazilian Caatinga, and F) a mountain stream in the Central Andes.

While this information is familiar to most limnologists, we always ask ourselves how much the ecology of Neotropical streams is understudied compared to other regions. In a recently published paper Valente-Neto et al. (2024), we reviewed and synthesized three complementary ecological perspectives and the main threats to Neotropical streams, and compared the bibliometric data for each perspective between Neotropical streams and streams in other regions of the world (Valente-Neto *et al.* 2024). These three ecological perspectives cover important drivers of community structure and diversity maintenance. The "horizontal perspective" examines processes affecting communities of guilds at the same trophic level, particularly focusing on resource competition within groups. The "vertical perspective" addresses processes that organize multitrophic communities, including roles and patterns associated with predation, omnivory, biomass turnover, and food web stability. Finally, the "regional perspective" explores patterns arising from spatial and temporal variations across multiple gradients and the processes shaping metacommunity organization.

The results of our bibliometric analysis confirmed the existence of a disparity in the number of studies conducted in the Neotropical region compared to other regions across the three perspectives assessed. Some findings are especially notable, such as the low proportion of Neotropical studies, comprising only 2-4% of the total stream ecology studies around the globe. Annual growth rates (a geometric progression ratio) for each perspective in Neotropical streams consistently lagged behind those in other regions. The horizontal perspective was particularly understudied, with only 22 studies (compared with 927 studies in other regions). Temporal patterns further underscore that this perspective has received little attention from researchers in the Neotropics over the years. For example, the annual growth rates for the horizontal perspective was 0 in the Neotropical region and 5.1 in other regions.

Reviewing and synthesizing current knowledge from each perspective enabled us to identify several research gaps and suggest directions for future studies. From a horizontal perspective, few studies have rigorously examined how stabilizing (niche differences) and equalizing (fitness equalization) mechanisms drive coexistence in Neotropical streams, especially among invertebrates. Approaches such as the unification of field observations, experimental manipulations, and stable isotope analysis can help overcome the challenges inherent in horizontal perspective studies. From a vertical perspective, multitrophic diversity has mostly been studied through the lens of pairwise predator-prey relationships and omnivory, and more recently, including ecosystem functions and energy flux calculations. Predator-prey interactions are influential in structuring multitrophic diversity, yet whether top-down control is a primary driver in Neotropical stream communities remains an open question. While omnivory is generally more prevalent in Neotropical than Temperate stream communities (González-Bergonzoni *et al.*, 2012), further investigation is needed to understand how this high omnivory affects vertical community organization and the relative contribution of ecological processes. Future studies addressing the vertical perspective should enhance the food-web analysis of Neotropical stream communities by incorporating diet analysis, feeding trials, and stable isotope techniques to clarify how multitrophic diversity is structured in these ecosystems.

From a regional perspective, most studies rely on snapshot surveys to investigate how environmental selection, dispersal, and ecological drift shape Neotropical stream communities. However, temporal dynamics can alter the influence of these processes on community variation, especially in intermittent streams where flow conditions fluctuate over time. Despite its importance, the effects of temporal variation on Neotropical intermittent stream communities remain poorly understood. To gain a comprehensive understanding of the processes structuring stream communities, Neotropical ecologists should prioritize surveys that include temporal datasets from both perennial and intermittent streams. The diverse topography of the Neotropical region, including the Andes Mountains, offers an opportunity to study how altitude and climate warming influence stream biodiversity. Although human impacts are the most frequently studied topic in Neotropical streams, significant knowledge gaps remain. Most research has focused on land use changes, primarily agriculture and urbanization, and few studies have assessed the effects of invasive species and climate warming on stream communities. Few studies have investigated the combined effects of multiple and interactive human impacts on biodiversity. Experimental approaches, such as artificial streams, can provide valuable insights into how multiple human impacts affect Neotropical stream biodiversity.

We hope that our review and synthesis will stimulate new research in the Neotropical streams that fill the identified research gaps. This is essential for the sustainability of the Neotropics, considering the growing human pressure jeopardizing their high biodiversity and multiple ecosystem services spanning from them.

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# Limnological societies around the world


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The sedimentary ancient DNA (sedaDNA) approach allows us to track past changes in terrestrial and aquatic biodiversity by analysing DNA archived in the sediments. Samples can be lake sediments, marine sediments, and permafrost, and can range from surface sediments to samples up to 2 million years old (current record). The sedaDNA approach allows the study of taxa which are difficult to study or identify using traditional palaeolimnological proxies, such as soft-bodied organisms. Since the first studies in the 2000s, sedaDNA analyses have brought about a revolution in researching palaeo environments, with new ecological insights into specific taxa or whole ecosystem responses to drivers of change.

The sedaDNA approach poses a few challenges, some methodological challenges, and some related to genetic and ecological knowledge gaps. Therefore, in 2021, researchers put their heads together to create an international collaborative network, the "sedaDNA scientific society". This society was launched and coordinated by Eric Capo until September 2024, and is now coordinated by Maïlys Picard.

The sedaDNA society aims to transmit information about current sedaDNA research, increase collaboration between research groups, and promote best practices. The sedaDNA society is unique as its organising board is solely composed of early career scientists, supported by an advisory board composed of established professors and scientists from around the world.

## ACTIVITIES OF THE SOCIETY

### Providing access to information

The primary aim of the Society is to provide readily available information about sedaDNA research. As such, the Society's newsletters share recent publications and advances in the field, and the organising board is in charge of regularly updating a literature survey that lists all publications of sedaDNA work as an Excel file and on Google Scholar.

### Promoting best practices

Several initiatives by the Society's members have resulted in reviews or books to promote best practices (see our outcomes webpage). A book of best practices and the most up-to-date methodology dedicated to lake sedaDNA was published at the end of 2023 as part of the 'Tracking environmental change using lake sediment series. A chapter about lake sedaDNA was also published in the Encyclopedia of Quaternary Sciences 3rd Edition, and review papers about sedimentary DNA applied to microbes, fish, aquatic macrophytes, and bioinformatics applied to palaeo environments also promote best practices.

### Improving collaboration

Members of the sedaDNA society organised the sedaDNA meeting every two years, and the first mini-symposium was organised in 2021 in Uppsala (Sweden), followed by a bigger meeting in Potsdam (Germany) in 2023, and the next one will be held in June 2025 in Tromsø (Norway). The sedaDNA society is also actively collaborating with other societies, such as the SPAAM (Standards, Precautions, and Advances in Ancient Metagenomics) community, and is present at various congresses revolving around water or sediment sciences.

### Improving access in developing countries

Although this society is intended to be inclusive, certain geographic regions are poorly represented, including South America and Africa. Members of the Society created the "African sedaDNA working group" in 2021 to facilitate accessibility of sedaDNA research for African researchers. While the African sedaDNA working group is no longer active, the working group's activity in its first year allowed us to (1) identify the gaps and challenges faced by African researchers to apply the sedaDNA approach and (2) initiate new research projects led by African groups. The African sedaDNA working group members are now part of the sedaDNA society.

## INTERESTED TO JOIN?

The Society is currently composed of 460 members. Registration for membership is for free and will always be, as well as access, to all our tools and services. Members do not need to be experts in sedaDNA to be part of the Society; any researcher, following our code of conduct, is warmly welcome.

# FACES of SIL

**Belén Franco-Cisterna**

Netherlands Institute of Ecology

## BELÉN FRANCO-CISTERNA | CHILE

Hello! I am Belén, an aquatic scientist from Chile working as a postdoc at the Netherlands Institute of Ecology (NIOO-KNAW). My research focuses on carbon cycling in marine and freshwater ecosystems and the roles of phytoplankton and zooplankton in carbon sequestration. I have conducted experimental and observational studies in the South Pacific, the Arctic Ocean, and temperate lakes in the United Kingdom.

Besides doing my research, I also enjoy participating in outreach activities. Recently, I collaborated on the art and science projects of the Gender & Science group of the Iberian Association of Limnology (AIL). Through these projects (art exhibition for adults and storybook for children), we raise awareness of how problems associated with climate change and freshwater ecosystems differentially affect women in many parts of the world.

In SIL, as the co-chair of the equity, diversity, and inclusion (EDI) task force, I aim to work for a society where everybody feels respected and heard; particularly, where people from underrepresented groups and non-privileged origins are supported and valued. I hope I will contribute to SIL with my personal experience as a female scientist from Latin America and the knowledge gained as a member of the EDI committees of AIL and NIOO-KNAW.

I look forward to meeting you, learning from you, and participating meaningfully in SIL.

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**Anas Mohamed Usoof**

University of Winnipeg

## ANAS MOHAMED USOOF | CANADA

My research interests connect aquatic ecology and quantitative ecology, with an emphasis on the impacts of environmental perturbations on freshwater organisms and ecosystem processes. This includes understanding and predicting the cumulative effects of human pressures on aquatic ecosystems, developing and using ecological indicators, and assessing spatial priorities for the management and conservation of freshwater. My research spans various scales, from local to continental, and covers diverse organisms from microbes to fish, to inform sustainable freshwater management and conservation strategies.

I completed my PhD in Aquatic Ecology in 2019 and have an MSc in Biology from the University of Regina. I also hold an MSc in Biostatistics and a BSc in Aquaculture and Fisheries in Sri Lanka. My career includes working as a biologist for Fisheries and Oceans Canada and Environment and Climate Change Canada, as well as postdoctoral research at the University of Toronto and University of Alberta. I will soon join the University of Winnipeg as an Assistant Professor, where I look forward to furthering my research and teaching in quantitative (aquatic) ecology.

As a co-chair of SIL's newly formed EDI task force, my focus is on advancing equity, diversity, and inclusion within the limnological community. With a commitment shaped by my diverse background and professional experiences, I aim to foster a more inclusive society by enhancing representation, mentorship, and outreach and advocating for best practices in governance and accessibility.

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# FACES of SIL

**Kamil Hupalo**

University of Duisburg-Essen, Germany

## KAMIL HUPALO | POLAND

I am currently a postdoctoral researcher at the University of Duisburg-Essen, Germany. Having background in molecular phylogeography, my research interests revolve around studying freshwater biodiversity and ecology using a variety of DNA-based methods including DNA barcoding and (e)DNA metabarcoding.

In my current research project, I plan to investigate the potential applicability of environmental DNA (eDNA) metabarcoding for the holistic assessment of the fish parasite community. Recent literature reviews have shown that eDNA is useful for the detection of single parasite species. However, there is no consensus on the optimal sampling conditions (i.e., filter pore size and water volume) for detecting certain parasite groups. Therefore, I plan to evaluate the optimal sampling conditions for detecting certain fish parasite groups using water, sediment, and tissue samples. Subsequently, I am involved in several collaborative projects that revolve around evolutionary history, integrative taxonomy, and eco-evolutionary adaptation. In these research projects, I have studied freshwater amphipods as eco-evolutionary model organisms.

As a co-chair of the Early Career Researcher Committee, my work in SIL focuses on consolidating and galvanizing the ECR community within our society and beyond through joint activities, workshops, and meetings oriented towards young freshwater researchers. I am a strong believer in international collaborations, and my goal is to bring early career researchers from across the world together to form lasting collaborations.

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# Obituaries

**Maciej Gliwicz**

**1939-2024**

## Life history

Maciej Gliwicz was born in Warsaw, in 1939, where he lived and worked until his death in June 2024. He began his academic education in 1956 at the Faculty of Shipbuilding at Gdańsk University of Technology. One year later, he interrupted these studies to start another at the Faculty of Biology and Earth Sciences at the University of Warsaw (UW). After graduating in 1962 with the defence of his master's thesis on the zooplankton of Tatra lakes, he began his PhD studies in the Department of Hydrobiology of the UW. He was awarded a doctorate in 1969 (after defending a thesis "Food size selection and seasonal succession of filter feeding zooplankton in a eutrophic lake" later published in *EKOLOGIA POLSKA* (Ser. A 17:663-707), and became a professor of natural sciences in 1991.

Professor Maciej Gliwicz was a professional and committed academic teacher. He perceived the education of students as a kind of mission, treated students seriously and with respect, at the same time set high expectations for them, and was always perfectly prepared for his classes. His inspiring lectures and field courses always attracted numerous attendants. From the mid-1980s to 2009, he headed the Department of Hydrobiology at the UW. Thanks to him, the department has become an internationally renowned institution, well known in the global community of aquatic ecologists.

## Scientific interests

His impressive scientific output remains in the field of ecology, particularly in the behavioral and evolutionary ecology of aquatic organisms and the ecology of pelagic communities. His interests include predator-prey relationships and trophic cascades in aquatic communities: predatory fish-planktivorous fish-zooplankton-phytoplankton. In addition to basic research, he was an expert in biomanipulation methods, including those based on the use of predatory fish and semiochemical compounds such as kairomones, to control the biomass of planktivores and, as a result of cascading trophic effects, reduce the biomass of algae by planktonic herbivores.

His favorite research grounds were the Masurian Lakeland and the Tatra Mountains in Poland, although he also carried out research in tropical, saline, man-made lakes and rivers during his numerous internships abroad. He also worked in the laboratory, often using original research methods and apparatus of his own design. He planned and organized many research projects in the laboratory and in silico, with extraordinary drive and infectious enthusiasm.

His output of over 200 publications cited over 10 000 times, has placed him at the forefront of contemporary ecologists and limnologists. On three occasions (including 2024), he was ranked among the top 2% of the world's most influential scholars in terms of the total output across all scientific disciplines (Scopus ranking).

## Major contributions/discoveries

During his academic life, he collaborated with many scientists all over the world and at an institutional level, mostly with the Max Planck Institute of Limnology in Plön. His interests in the field of ecology, particularly behavioral and evolutionary ecology and population and community ecology, focused mainly on predator-prey and herbivore-plant relationships and trophic cascades in aquatic communities. He also dealt with the mechanisms of prey selection by predators and prey defence against predation involving changes in morphology, life history, and behavior.

He described (*NATURE 343(6259), 638-640*) the relationship between the body size of filter feeders and the threshold of food level at which the population growth rate is zero. This discovery sheds new light on the mechanisms of ecological competition and offers a mechanistic explanation for Brooks and Dodson's (1965) *size-efficiency model*, a cornerstone of zooplankton ecology. He was the first to describe the interference of filamentous cyanobacteria with food acquisition (filtration) processes in large-bodied cladocerans. He showed that this phenomenon, along with selective fish pressure, can reshape the species composition of zooplankton communities in eutrophic lakes (*ARCHIV FÜR HYDROBIOLOGIE 88(2), 155-187*).

He discovered - and described for the first time (*ECOLOGY 67(4), 883-897*) - the "moon trap" phenomenon, which explains periodic collapses of zooplankton populations in a large African lake. This involves disruption of the typical cycle of diurnal light changes that initiate diurnal vertical migration of plankton. At the time of the full moon, the period of darkness between sunset and the moon's appearance is followed by a period when the amount of light reaching the surface waters is sufficient for fish to detect cladocerans, whose populations are then decimated.

Prof. Maciej Gliwicz, together with several other limnologists from the *Plankton Ecology Group*, developed a model of the seasonal succession of lake plankton that has been adopted since the mid-1980s as a universal standard for describing the dynamics of phyto- and zooplankton populations in temperate zone lakes (the PEG model). This study (*ARCHIV FÜR HYDROBIOLOGIE, 106(4), 433-471*) has received more than 2,500 citations. Another ground-breaking study on the extent of migratory behavior of planktonic animals in Tatra lakes (*NATURE, 320(6064), 746-748*), provided one of the first pieces of evidence that the evolutionary cause of the diel vertical migrations of aquatic organisms is the pressure of predators.

## Awards

Among many other awards, Maciej Gliwicz was the recipient of the Polish Prime Minister's Award for Outstanding Scientific Achievement (2010) and (2001) Foundation for Polish Science's award, the "Polish Nobel Prize," in the field of natural and medical sciences.

He was also the recipient of several very prestigious international awards: Smithsonian Institution Award for Academic Achievement (1970), Einar Nauman and August Thienemann Medal *"De limnologia optime merito"* given by the International Association of Theoretical and Applied Limnology SIL (1998), Ecology Institute Prize in Limnetic Ecology awarded by the International Ecology Institute (ECI) in 1997. The latter award comes an invitation to write a book in the Excellence in Ecology series. In 2003, Prof. Maciej Gliwicz published his opus magnum "Between hazards of starvation and risk of predation: the ecology of offshore animals," an invaluable compendium of knowledge on freshwater plankton. He also received in 2012, together with Winfried Lampert, co-author of many of his publications and, privately, a friend, the Alfred C. Redfield Award from the Association for the Sciences of Limnology and Oceanography (ASLO). A special honor for his contribution to plankton science is the name of the newly described genus of diatom *Gliwichia*.

## Personality

Prof. Maciej Gliwicz staged his research and teaching projects with a great panache and hype. In the role of project director, he flourished, spreading coworkers and students with enthusiasm and passion. He set the bar high, made enormous demands, and did not tolerate ignorance, omissions, and sloppiness. However, he demanded the same from himself, and there was no doubt that we were given to interact with a great personality in science and academia, an authority, and a master. We, Maciej's disciples, and later coworkers, were privileged to interact with an unquestionably great person and researcher, an authority and a master.

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# Obituaries

**Brij Gopal**

**1944-2021**

## A Lifetime of Knowledge, Passed to Future Hands: The Legacy of Professor Brij Gopal

The global limnological community lost one of its most distinguished members with the passing of Professor Brij Gopal in January 2021. Born in 1944 at Muzaffarnagar (India), he shows an extraordinary passion for academia, completed his High School at the age of 12 years, and received his PhD at 24 years of age, under Prof. RD Mishra, who is considered the father of Indian Ecology. After one year at Agra College and his marriage in 1971, he moved to Jaipur and served as Assistant Professor at Rajasthan University of Jaipur until 1985. In 1986 joined the School of Environmental Sciences (SES) at Jawaharlal Nehru University (JNU), New Delhi, where he taught until retirement in 2009 as Professor and supervised 17 PhD and 12 MPhil students. Between 2008-2011, he set up the Center for Inland Waters in South Asia (CIWSA) in Peera Village, near Khajuraho, in the State of Madhya Pradesh, India.

His love for research and science was acknowledged when he became the first recipient of the Science Academy Medal for Young Scientists from the Indian National Science Academy, New Delhi, in 1974. However, this prize does not come alone. This was followed by a remarkable number of prizes, such as the Alexander von Humboldt Fellowship for conducting post-doctoral work in Germany at the Max Planck Institute of Limnology, PLÖN (1982-83); the International Fellow Award of the Society for Wetland Scientists, and the Naumann-Thienemann Medal of the International Association of Limnology (SIL), which was given for the first time to someone outside Europe and North America. In 2007, he was one of the lead authors in the Ecosystems chapter for the Nobel Prize-winning IPCC's Fourth Assessment Report and RBS Earth Hero Award (2018).

As a renowned ecologist and staunch advocate of India's rivers and wetlands, Professor Gopal's life is marked by his profound commitment to understanding and conserving aquatic ecosystems. His influence on the field is perhaps best embodied in his extraordinary personal library, a collection of over 6,000 volumes, including books, journals, and manuscripts, meticulously curated over the lifetime of scientific rigor and curiosity. He began this collection when he was a student. He used his food allowance money to subscribe to and purchase books. Consequently, his library grew over time. From one corner of the house to the full room, his library expanded to over 10 thousand books. Eventually, he shifted his important collection to Peera Village, where he was working to develop the Center for Inland Waters of South Asia.

After Prof. Gopal passed, it took his family over two months to prepare a catalogue for donation purposes. Carefully selected, signed, and catalogued, these volumes now grace the shelves of Nalanda University's School of Ecology and Environment Sciences, forming one of the most comprehensive private collections on limnology worldwide. Spanning decades of scholarship, with rare works dating back to 1955, this library stands as a testament to Professor Gopal's dedication to advancing ecological science and his passion for fostering knowledge.

Professor Gopal's library is more than a reflection of his academic achievements; it embodies his belief that scientific knowledge must serve society and uphold ethical practices. Each book represents not only a resource but also a fragment of his life's story, his quest to find solutions to the environmental challenges facing rivers, lakes,

and wetlands. His steadfast dedication to preserving India's aquatic ecosystems often put him at odds with government authorities, as seen in his opposition to the Ken-Betwa River Linking Project. His advocacy underscores the need for conservation strategies rooted in the unique characteristics of local ecosystems and policies that honor these distinctions. His writings consistently promoted a balanced approach to resource use and conservation, offering timeless lessons for policymakers and researchers.

The selection of Nalanda University as the home for Professor Gopal's collection carries profound symbolism. Once an ancient center of learning, Nalanda housed the world's largest and most revered library, attracting scholars from across the globe. Its modern revival renders it a fitting custodian for this collection (see https://nalandauniv.edu.in/about-nalanda/history-and-revival/).

Nalanda University's School of Ecology and Environment Sciences plans to digitize and catalogue the collection, ensuring accessibility to students, researchers, and conservationists worldwide. In doing so, the library will not only preserve Professor Gopal's legacy but will also continue his work by supporting future endeavors in freshwater ecology and environmental stewardship.

While most of Professor Gopal's library has been donated to Nalanda, some volumes have been set aside for a noble cause. His family saves a portion of the collection and plans to sell it to fund scholarships for promising young scientists in ecology. This initiative aims to cultivate new voices in conservation science, echoing Professor Gopal's enduring belief in empowering the next generation.

Through his unparalleled contributions to aquatic ecology and enduring gifts to Nalanda, Professor Brij Gopal finds a new purpose. His library stands as both a scholarly resource and powerful legacy, inspiring curiosity, critical thought, and profound commitment to protecting our planet's fragile ecosystems. By ensuring the continued use of his knowledge, Professor Gopal's legacy will guide future generations of limnologists, researchers, and conservationists, enriching the field in which he devoted his life.

### Tributes to Professor written by students and colleagues

https://nieindia.org/Journal/index.php/ijees/article/download/2467/656

https://www.downtoearth.org.in/water/brij-gopal-a-tireless-advocate-for-india-s-rivers-74974

https://link.springer.com/article/10.1007/s10750-024-05498-2

https://south-asia.wetlands.org/news/wetlands-international-south-asia-condoles-the-sad-demise-of-prof-brij-gopal/

### Professor Brij Gopal master classes

Inaugural 'Prof. Brij Gopal Memorial River Lecture' | World Water Day | India Rivers Forum

Demystifying Aviralta & the e-flow Challenge- Prof. Brij Gopal | IRW 2018

Pollution Sources, Mitigation Strategies & State's Response- Prof Brij Gopal | IRW2018

Yamuna: By Brij Gopal and Manoj Misra at Living rivers, dying rivers series-Part II

# 20th World Lake Conference

**WLC20 is a global conference that gathers scientists, policymakers, NGOs, and youth to collaborate and exchange ideas on environmental challenges and sustainable solutions for the world's lake basins. The event will take place in Brisbane, Australia, from July 21 to 25, 2025.**

20th World Lake Conference | Brisbane 2025

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