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Upcoming SIL 2020 Congress

SIL 2020: A YOUNGER AND GREENER MEETING!

The city of Gwangju (Republic of Korea) welcomes the opportunity to host the 35th Congress of the International Society of Limnology from August 23 to 28, 2020, devoted to the theme of **"Biodiversity and Ecosystem Functions: Healthy Rivers, Lakes, and Humans".**

One of the purposes of the SIL Congress is to promote **open discussions** on new scholarly findings and pioneering research in the field of limnology to **foster knowledge transfer to scientists and researchers worldwide.** It is important for SIL to host its Congress in **East Asia** to highlight and reflect on the scientific challenges for limnologists in the region. Accordingly, SIL facilitates developing a **stronger regional scientific network** to encourage **innovative scientific discussions on regional issues.** SIL2020 is the perfect opportunity for delegates to be a part of SIL's new mission that is concentrated on **promoting excellence in limnology** and solving global issues through the transfer of knowledge and the **fostering of a strong international community.**

SIL2020 will also be holding **short courses** to share the expertise of SIL scientists with society members, including students. Short courses will cover diverse topics from limnological studies. The full-day practical courses will represent a **unique opportunity to foster innovative ideas,** but also to **increase collaboration** among international limnologists. Indeed, these short courses not only provide technical knowledge, but will enable participants to **create networks** with great limnologists.

SIL2020.ORG

Material for the **July issue** should be sent to SILnews Editor, Giovanna Flaim, by 31 March 2020 at **flaim.giovanna@gmail.com**

LETTER FROM

the President

This is my first Letter since I have become SIL President in May 2019. These last months have been exciting because I have realized what it means to be the president of the oldest international limnological society. Essentially, I have to link the rich tradition of SIL with a vision on the role of SIL during the next decades. As President-elect, I have already been interacting with the SIL Executive Board since August 2018. I was impressed and glad to see that the former president, Yves Prairie and our SIL Managing Director Genevieve Leclerc had started several initiatives to modernize SIL conceptually and structurally. Furthermore, our General Secretary Tamar Zohary has supported these activities by her experience and opinion from the many years she has been serving SIL in a leading position. I would like to thank all of them for their initiative, and I would like to express my deep gratitude to the members of the SIL Executive Board and the numerous SIL volunteers in the committees for their hard work on the strategic development of SIL. As a result, SIL is currently undergoing major transformations into a society that is serving the values of its members (and potentially also of many not-yet members) better than previously.

One obvious result of the transformation is the new SIL membership database, which has been launched recently. I would like to ask all of you to update your profile and add the respective information on topical expertise. Future activities of SIL, for example a mentorship program and a member survey, will rely on the information in your profiles. A society as ours can be strong only if we know our members well – you can help us enormously here!

"Considering that our membership is truly international, SIL should be a strong ambassador and carry our mission and vision to all our member countries. We must find a way to better involve our members from all regions and broaden the dialogue on the role of limnological science on the global scale."

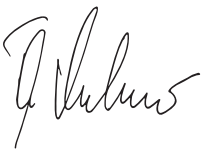
The transformation of SIL goes much further than the database launch. Despite being the oldest limnological society, SIL is still only poorly recognized as an actor and a voice in the international discussion around issues affecting our environment and sustainability goals. Considering that our membership is truly international, SIL should be a strong ambassador and carry our mission and vision to all our member countries. We must find a way to better involve our members from all regions and broaden the dialogue on the role of limnological science on the global scale. Although the number of early career researchers has increased recently, both as SIL members and as participants in SIL congresses, we still wish to see many more young limnologists engaged in our international networks.

The association model is under threat as the traditional role played by scientific societies has had to evolve in the age of the "Internet of things" and the multiplicity of voices on the international scene. There is no immediate remedy, and SIL is not alone, but shares the problem of declining membership with many other science societies. The transformation of the research environment into a global network, where people and information are often just a fingertip away, has been more rapid than the development of the traditional societies. As the President, I will take the lead to bring SIL forward along the way toward a modern scientific society, with a mission and strategy that match both the necessities of our members and the requirements and expectations of interested people in countries around the world. I am confident that our Executive Board will support the development by continuing the work in the strategic committees. We will keep you updated on the next steps.

You, our members, can help to facilitate the strategic development of SIL by actively engaging with us and helping us redefine what will be the scientific society of the future. Firstly, grab the opportunity to participate in the 35th SIL congress in Gwangju, Korea, in August 2020. There are several highlights planned during the congress, as outlined in more details in the newsletter. Participation will facilitate integration into scientific networks, in particular from South-East Asia. Secondly, if you have produced stunning scientific results, use our SIL journal *Inland Waters* as an appropriate outlet. And please use your networks in social media to discuss and highlight the values and benefits you gain from being a SIL member.

Lastly, a vast member consultation will be launched in the early months of 2020. We invite you to participate broadly and make your voice heard on how SIL can assist you and future researchers in the coming years, as our profession and the ecosystems we study are undergoing rapid transformation. The modernization of SIL will be successful only if our individual members share our motivation and engagement.

We wish you an exciting and enlightening New Year, and we look forward to hearing from you.



Thomas Mehner
SIL President

SIL 2020 Gwangju, Korea

35th Congress of the International Society of Limnology
August 23-28, 2020

Welcome to Gwangju! Republic of Korea

SIL2020.ORG

Photo credit: SIL Business Office

A younger and greener meeting!

The Local organizers will provide a comfortable forum for academic exchange, especially for **students and early career limnologists to broaden their academic perspectives.** Students and early careers will have many chances to meet limnologists who are looking for graduate students, post-docs and faculty members during the **career fair,** and will have the opportunity to become **Teaching Assistants** for special courses. In addition, **multiple awards** will be presented such as international and local traveling awards, and **many prizes** will be given to young limnologists. This is only a taste of what will truly be a student and early career focused congress!

SIL is also dedicated to address **international sustainability concerns** in the organization of the event by recommending that participants follow a number of sustainable practices. Thus, SIL strongly encourages delegates to bring their own reusable items (e.g. tumblers and congress bags). By telling SIL that you will be bringing your own items, during the on-line, pre-registration process, **SIL will minimize unnecessary production of containers. SIL will donate the money saved to environmental NGOs to create a positive local impact** on the community. Also, SIL pledges to minimize use of plastic and paper during the congress to reduce the ecological impact of the event. But, those are only a couple of SIL's sustainable practices; we will keep our membership informed about other ways we can experience a greener Congress!

We are excited to see you in Gwangju!

COME SEE OUR INCREDIBLE

Plenary Speakers

Prof. Michele Buford

Dean of Research Infrastructure of Griffith University and Professor at the Australian Rivers Institute will be giving the ***Baldi Memorial Lecture****.*

This talk is entitled: Have we oversimplified the role of nutrients in promoting algal blooms? It will focus on research done by Prof Burford's group on nutrients and cyanobacterial blooms with a view to improving management and prediction.

Dr. Cayelan Carey

Associate Professor of Freshwater Ecosystem Ecology at the Department of Biological Sciences at Virginia Tech will be giving the ***Kilham Memorial Lecture****.*

The lecture will examine ecological forecasting as a framework for advancing freshwater biogeochemistry. Near-term iterative ecological forecasts, or predictions of future ecosystem conditions with fully-specified uncertainties, coupled to whole-ecosystem experiments hold great promise for improving our understanding of carbon and nutrient cycling in the face of increasingly variable environmental conditions.

10 reasons to attend SIL2020 in Gwangju, South Korea

There will be:

- 8 **world-class plenary talks**
- **Affordable** registration and accommodation
- About 40 **exhibition booths**
- Meetings with **eminent scholars and editorial board members**
- About 15 **free short courses** for young and early career limnologists (e.g. eDNA, ecological modeling, physical limnology, isotopes, etc.)
- Estimated 400 **oral presentations** and 300 **scientific posters**
- The possibility to participate in 10 SIL **working groups**
- Invitation to publish your SIL congress presentation in SIL's journal **Inland Waters**
- Numerous **side events** with free lunches (job fairs, auctions, interaction with limnologists from emerging countries, excursions to experience Korean culture and nature)
- **Student participation** as co-chairs of various sessions

Visit the website www.sil2020.org or the Twitter account @silgwangju2020 to know more!

Clay Prater (Canada), third-place winner of the second SIL student competition, at the podium, addressing the SIL2018 audience at the congress closing session. (Photo credit: SIL business office)

3rd SIL Student Competition

The third SIL student competition is on its way. The deadline for submitting applications to National Representatives (Stage 1) was 15 September 2019. We have at least 15 applicants from 9 countries (there could be more). By 15 December 2019, the National Representatives will have submitted to SIL all applications promoted to the international stage of the competition (Stage 2). By 15 April 2020 the winners (first 3 places) will be announced. In August 2020, the competition winners will be awarded at the SIL Congress in South Korea.

Why Join SIL - The International Society of Limnology?

- **SIL benefits your career**: It allows you to build your **own network** by interacting with different types of society members.
- **SIL benefits society**: SIL has mechanisms to **support researchers in developing countries** and enables them to share their knowledge.
- **SIL has tradition**: SIL is the **oldest** limnological society.
- **SIL is your primary lobbyist**: Having a strong society that represents your field of research is **one more strong voice** that emphasizes the importance of inland waters.
- **SIL has a biennial international Congress**: It gives you an opportunity to learn and network with international limnologists as well as **being a lecturer** yourself.
- **SIL has a scientific journal**: You can **publish and have access to articles** without fees in the Society's journal, *Inland Waters.*
- **SIL targets the needs of younger limnologists**: Students and early career members can apply for many **awards, grants and competitions**, and have other advantages that benefit their career such as **fast track publication** in *Inland Waters*.

Membership Category	Developed country fees	Developing country fees
Regular – 1 year membership	USD 93.60	USD 46.80
Student – 3-year membership	USD 30.00	USD 15.00
Early Career– 1 year membership	USD 46.80	USD 23.40
Emeritus Member A without journal subscription— For life	Free	Free
Emeritus Member B with journal subscription— 1 year membership	USD 46.80	USD 23.40
Family Member – 1 year membership	USD 46.80	USD 23.40

Visit our website limnology.org to know more!

Tonolli Memorial Award Recipients

Poza Azul in Coahuila, Mexico (Photo Credit: Robert Wallace)

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

The following students and young researchers are Tonolli Memorial Award recipients for 2019.

RECIPIENT	PROJECT
Sofía Baliña, PhD **Argentina,** *University of Buenos Aires*	Greenhouse gases dynamics in shallow lakes of the Pampean Plain with different alternative equilibria states
Daniela Cortes Guzman, PhD **Colombia,** *Universidad Nacional Autónoma de México*	Trophic dynamics of benthic macroinvertebrates in tropical streams of the Lacantun River sub-basin
Julie-An Gregorio. Msc **Philippines,** *Institute of Biology, National Science Complex, Univ. of the Philippines at Diliman*	Does the protection of terrestrial areas also guarantee the protection of our freshwater ecosystems? A look into diatom communities of selected terrestrial protected catchments of Southern Luzon Island, Philippines
Shea Kathleen Guinto, PhD **Philippines,** *University of Santo Tomas*	Genetic Diversity and Population Structure of Two Inland Water Copepods (Copepoda: Diaptomidae), *Arctodiaptomus dorsalis* (Marsh, 1907) and *Filipinodiaptomus insulanus* (Wright S., 1928) in the Philippines
Signe Marie Haakonsson Sorensen, PhD **Uruguay,** *Limnology Division, Faculty of Sciences at UdelaR*	Probabilistic prediction of cyanobacteria biovolume
Mara Sagua, PhD **Argentina,** *National Council of Scientific and Technical Research (CIT NOBA – CONICET)*	Biodiversity and ecology of microbial communities from shallow lakes located at the upper basin of the Salado River (Buenos Aires, Argentina)
Martin Saraceno, PhD **Argentina,** *Department of Ecology, Genetics and Evolution, University of Buenos Aires*	Urban conditioning factors of taxonomic and functional microbial diversity, and of the persistence of *Escherichia coli* in lotic environments: ecological impact assessment and implications for management and rehabilitation
Luca Schenone, PhD **Argentina,** *Instituto de Biodiversidad y Medioambiente (INIBIOMA, CONICET-UNComahue)*	The effect of glacier melting on freshwater planktonic food webs with focus on microbial loop

Figure 1 Collecting samples in Lake Mohicap and Lake Yambo

Moon Lake, Montello, Wisconsin, USA (Photo credit: Robert Wallace).

HERE IS A RECENT REPORT FROM A TONOLLI FUND RECIPIENT

Population Dynamics of (Cladocera and Copepoda: Calanoida) in Seven Crater Lakes of San Pablo, Laguna, Philippines

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Zooplankton are known to have different tolerance to environmental conditions. Fluctuations in zooplankton populations indicate habitat changes. My study aimed to: 1) determine the physico-chemical parameters that may affect the population dynamics of two zooplankton groups in the Order Cladocera and Class Copepoda: Order Calanoida, 2) to evaluate abundant zooplankton species and, 3) to assess current trophic status in response to zooplankton population and water quality in seven crater lakes of San Pablo, Laguna. Samples were collected from Lakes Calibato, Pandin, Yambo, Palakpakin, Bunot, Mojicap and Sampaloc which were considered 'Threatened Lakes of 2014' according to the Global Nature Fund. Extensive assessment on biodiversity, density, biomass, and physico-chemical parameters were conducted for six consecutive months on 2015. My study highlighted an updated record distribution of cladocerans in the lakes. For all seven lakes the population density of adult *Arctodiaptomus dorsalis* was inversely proportional to nauplii. Trends in the population of *A. dorsalis* nauplii were evident in October and December with 66% and 77% in abundance observed in Lake Bunot and Mojicap, respectively. *Moina micrura* has the highest amount of biomass values for all the lakes and was significant in yielding maximum energy gain per unit of handling time. The results of CCA analyses indicated that the density of zooplankton were affected by high levels of NO_3, PO_4, chlorophyll-a and temperature in each of the lakes. Based on these findings, Lake Pandin, previously oligotrophic, has now reached a mesotrophic status. Thus, more lake monitoring research efforts are recommended to design mitigation plans necessary to reduce eutrophication rates of the lakes.

As a young career researcher, the Tonolli Memorial Fund had provided the means to support and continue my research in lakes and zooplankton. The opportunity yielded findings that were significant to future monitoring studies that will be conducted in the lakes. I am thankful to the International Society of Limnology for the funding which helped me further improve my technical skills not only in fieldwork but also in conducting scientific studies in general.

LIMNOLOGY AROUND THE WORLD: INDONESIA

Floating cage aquaculture farms in Indonesian lakes and reservoirs

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After the global economic depression of the late 1990s, floating cage aquaculture farms contributed significantly to providing employment, and are now present in almost every lake and reservoir in Indonesia. Floating cage aquaculture not only supports many households across the country, but also boosts national inland water fishery production (mostly carp and Nile tilapia) to over 2.8 million tonnes per year in 2014, thus placing Indonesia as the 3rd biggest producer in the world (FAO 2016). This economic boom comes with a price. Water quality has deteriorated in most lakes and reservoirs because of over production in aquaculture and its corresponding nutrient waste (Henny & Nomosatryo 2016). In fact, massive die off of fish in the floating cages is now a frequent occurrence. For example, more than 5500 tonnes of fish were killed in Lake Maninjau (surface area of 99.5 km^2, maximum depth of 168 m), West Sumatra, causing estimated losses of US$ 8.7 million (Figure 1). Notwithstanding these setbacks, the industry generates much revenue that is very attractive for locals, as well as for investors, guaranteeing that floating cage aquaculture is undergoing a massive growth, often uncontrolled, and haunted by high costs.

Fig. 1 *Massive fish kills after a strong wind event. Local farmers dump dead fish along the lake shore (Photo credit: M. Badjoeri).*

Fish kills in aquaculture mostly occurred after strong wind events when anoxic bottom water upwells, reducing oxygen concentrations in the surface water. Upwelling may happen frequently in most tropical lakes and reservoirs as thermal stratification in these systems is weak. In eutrophic Lake Maninjau for instance, anoxic water can be observed at a depth as shallow as 8 m. Thus, with a constant wind speed of 25 km/h, anoxic bottom water is likely to mix with surface waters. The upwelled nutrient-rich bottom waters contribute to algal blooms (Figure 2). As eutrophication worsens in lakes and reservoirs, in large part due to increases of aquaculture farms, fish die offs are more frequent and spoil the magnificent natural scenery (Figure 3).

Fig. 2 *Thick cyanobacterial blooms occur more frequently (Photo credit: A. Dianto).*

Starting in 2009, the Ministry for the Environment has taken action to protect water quality by regulating nutrient loads, including the permissible number of aquaculture cages in lakes and reservoirs. However, as the regulation disregards physical and biogeochemical interactions in its design,

Fig. 3 *Dense floating cages cover most of the coast of Lake Maninjau, West Sumatra, interfering with its beautiful scenery (Photo credit: A. Dianto).*

impacts from aquaculture farms have not been reduced significantly. A comprehensive management strategy based on a better understanding of ecosystem processes is therefore required to restore Indonesian lakes and reservoirs. Integrated ecosystem modelling and the use of high frequency sensors (Santoso et al 2018) would be a good tool to better direct the management strategy and to attain the National target in lakes and reservoirs restoration.

References

FAO. 2016.The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all. Rome. 200 pp.

Henny C, Nomosatryo S. 2016. Changes in water quality and trophic status associated with cage aquaculture in Lake Maninjau, Indonesia. IOP Conference Series: Earth Environmental Science 31: 012027

Santoso AB,Triwisesa E, Fakhrudin M, Harsono E, Rustini HA. 2018. What do we know about Indonesian tropical lakes? Insights from high frequency measurements. IOP Conference Series: Earth and Environmental Science 118: 012024

LIMNOLOGY AROUND THE WORLD: REPUBLIC OF KOREA

Limnology of Korea

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The following summary on Limnology in Korea comes as a preview to the pending 35th SIL Congress, to be held in Gwangju, South Korea, 23-29 August 2020

There are few natural lakes in Korea. Geological formation of the Korean Peninsula is mostly old granite that is much older than the usual life time of natural lakes. Located between 34N and 43N parallels, there was no glacial activity which created many natural lakes in northern regions. The most remarkable geomorphological feature is that 70% of the Korean Peninsula is mountainous. Therefore, rivers are short and have steep slopes compared with rivers in large, flat continents.

The summer monsoon is the major controlling factor of lake and river hydrology (Lee et al 2014). While the annual precipitation is close to the world average, actual climatic conditions of Korea are almost semiarid, because half of the annual precipitation occurs in summer with little rainfall in other seasons. Among the countries in the East Asian summer monsoon area, Korea shows the most extreme concentration of annual rainfall in a few episodic heavy rain events that often exceeds 100 mm day^{-1}.

Hydrology is governed by high slopes of stream beds, heavy rains in summer and drought in winter, all of which impose harsh stress to the adaptive evolution of freshwater animals (Fig 1). Animals must find shelters from drying and freezing streams in winter, and active longitudinal migration is a common behavior. In summer, animals must endure torrential currents and high turbidity. Stream beds are extremely disturbed during storms and most benthic animals are washed downstream, a phenomenon considered as a "reset of the ecosystem".

Fig. 1 *Lake Soyang - showing barren lakeshore due to large water level fluctuations.*

Fig. 2 *An impoundment (Sangju Dam) built by the Four River Restoration Project in the Nakdong River.*

Anthropogenic impacts are also serious. The high population density in South Korea (ca. 507/km^2) is 15 times higher than in the U.S.A. and it is concentrated in the plains. Due to the adverse rainfall distribution and high water demand, 17,500 reservoirs have been built to secure water supply in South Korea (Fig 2). The density of reservoirs is so high that most of middle and downstream reaches of rivers have been changed from lotic habitats into a series of reservoirs or highly regulated channels. In addition more than 34,000 weirs were built for agricultural water intake, which hinder animal migrations. And most rivers are confined by river banks, which resulted in channelization of streams. Hydrologic and morphologic modifications have resulted in the loss of diversity of streambed microhabitats and physical disturbances might be the major controlling factor of stream ecosystem health.

Eutrophication imposes additional stress to both lotic and lentic habitats. Phosphorus is the primary limiting nutrient for algal growth in Korea, the effect of nitrogen is limited because of high natural background concentration of this element. Major sources of phosphorus are sewage, compost, and fertilizer. Eutrophication of upstream reaches is caused by sewage that is untreated or partially treated without phosphorus removal, causing an excessive growth of periphyton. In rural areas suspended sediment and bed load are additional threatening factors for stream ecosystems, which is prominent during storm events (Fig 3). Periphyton biomass builds up during low flow seasons and is washed off in stormy seasons. Excessive periphyton biomass in eutrophic streams causes large diel fluctuation of dissolved oxygen, choking benthic animals at night. In urban streams the first flush effect of rainfall is manifested as the peak of turbidity and oxygen depletion that most sensitive fish cannot tolerate.

Fig. 3 *Turbid storm runoff in the Soyang River (2006)*

A unique limnological feature of East Asian countries subject to summer monsoons are very dynamic flow rates and nutrient loadings far from a steady state (Kim et al 2019). Because most lakes are artificial, large water level fluctuations, short hydraulic residence time and the effect of summer monsoon are the major forcing factors of Korean lakes. Summer monsoon exerts different effects on large dams and small reservoirs. In large dams turbid storm runoffs in summer bring in most of annual phosphorus loading, causing 'monsoon blooms' of phytoplankton after the summer monsoon season (Fig 4). In small reservoirs with shorter residence time, plankton communities are flushed during storm events, so phytoplankton blooms occur only in periods of drought.

Fig. 4 *Typical cyanobacterial bloom in a eutrophic reservoir (Lake Kihung) caused by sewage.*

Eutrophication is the major threat to ecosystem health in reservoirs. About one half of Korean reservoirs are eutrophic, and cyanobacterial blooms are common. Hypoxia in the hypolimnion and toxic cyanobacterial blooms are major factors that determine the survival of sensitive animals and the biological diversity in reservoir ecosystems. Eutrophication impairs the value of water resources and becomes a main environmental issue in water resource management, because all rivers are important sources of water supply. In large dams located in the middle reaches of river systems, agricultural runoff is the main cause of eutrophication (Reza et al 2016), comparable to the effects of municipal sewage in impoundments in the lower reaches of river systems.

Ecosystem health in streams are regularly assessed at 1,300 sites by the nation-wide survey of water quality, periphyton, benthos, and fish. The number of monitoring sites in reservoirs are smaller than in streams. The ecosystem health assessment program in reservoirs is expected to be enhanced in the near future.

References

Kim D, Kim Y, Kim B. 2019. Simulation of eutrophication in a reservoir by CE-QUAL-W2 for the evaluation of the importance of point sources and summer monsoon. Lake and Reservoir Management 35:64-76.

Lee Y, Kim JK, Jung S, Eum J, Kim C, Kim B. 2014. Development of a water quality index model for lakes and reservoirs. Paddy and Water Environment 12: S19-S28.

Reza A, Eum J, Jung S, Choi Y, Owen JS, Kim B. 2016. Export of non-point source suspended sediment, nitrogen, and phosphorus from sloping highland agricultural fields in the East Asian monsoon region. Environmental Monitoring and Assessment 188: 692.

LIMNOLOGY AROUND THE WORLD: RUSSIAN FEDERATION

How to save the Aral Sea

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The Aral Sea is an endorheic lake, lying amidst the vast deserts of Central Asia and was once the world's fourth largest lake according to its surface (371,000 km^2 in 1960), draining an area of about 1.8 million km^2. The water level and salinity of the Aral Sea are closely dependent on its hydrology, which is strongly influenced not only by climate change, but also by water abstraction for irrigation from the inflowing rivers Syr Darya and Amu Darya. From the 1600s to the 1960s, the hydrology of the Aral Sea followed a natural regime. After 1961, there was a rapid drop in water level and an increase in salinity (Fig. 1) accompanied by the disappearance, and in some cases the extinction, of most invertebrate and fish species.

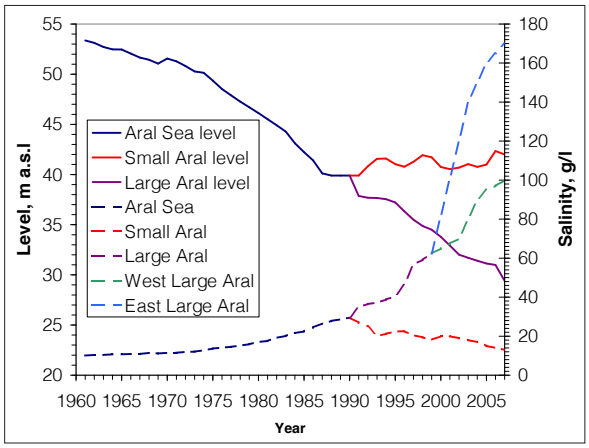

Fig. 1 *Water level and salinity changes in the Aral Sea.*

By the end of 1980s, water level had decreased by about 13 m, reaching about +40 m a.s.l. and salinity had increased from 10 g/l in 1960 up to 30 g/l. Surface area and volume were reduced to 60% and 33% of 1960 values, respectively. The Aral Sea was now divided into two residual water bodies – a northern Small Aral and southern Large Aral, with different hydrological regimes (Micklin et al., 2014). Changes in the hydrological and hydrochemical regimes of these two lakes occurred independently (Fig. 1).

The Small Aral has a positive water balance, its level has stabilized and its water has begun to feed the Large Aral through the Berg Strait. In 1992 the first dam in the strait was built and now been replaced by the new Kokaral Dam completed in 2005 (Fig. 2). Following construction of this dam the Small Aral has seen an increase in water level and a gradual decrease in its salinity (Fig. 1) (Aladin, 2014), making restoration efforts possible. Restoration of its former biodiversity is underway, and the decrease in salinity has fostered the reappearance of many invertebrate species. Commercial freshwater fish species have also returned to the Small Aral from the Syr Darya and lakes in its lower reaches and their populations are stable. Fisheries are recovering and catches are growing (Micklin et al., 2014; Aladin et al., 2012; Ermakhanov et al., 2012; Plotnikov et al., 2016).

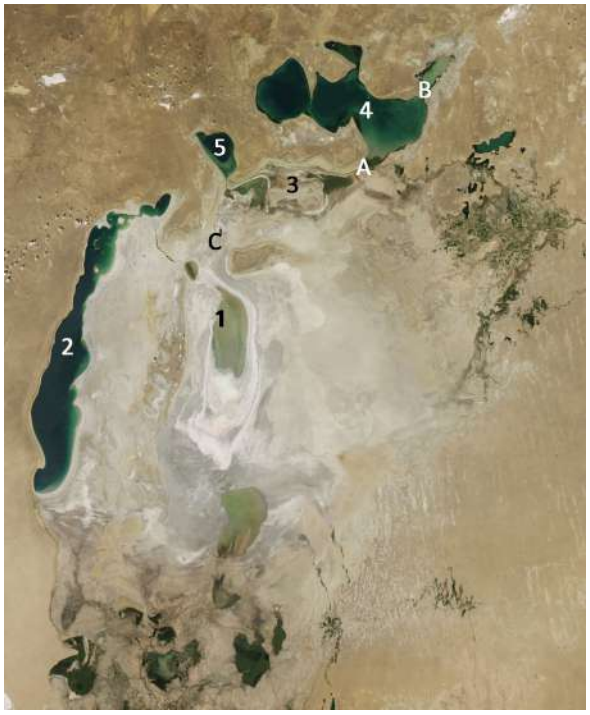

Fig. 2 *The Aral Sea today:*
1 - Dried Eastern Large Aral;
2 - Western Large Aral;
3 - Central Aral;
4 - Small Aral;
5 - Tsche-Bas Bay;
A - Kokaral dam;
B – proposed Northern dam;
C – proposed Southern dam.

Unfortunately, the water balance of the Large Aral remains negative, and is the most ecologically devastated part of the lake. Drying and salinity are continuously increasing (Fig. 1) and since the late 1990s it has become so hypersaline that brine shrimp (Artemia *parthenogenetica*) have naturally colonized the Large Aral. The eggs of this crustacean have become a valuable biological resource and are harvested. Water level decline has divided the Large Aral into three parts (Fig. 2): Western Large Aral, Eastern Large Aral and Tsche-Bas Bay (Micklin et al., 2014). Over the last decade, a fourth basin has also appeared – the Central Aral (Fig. 2), created by the overflow from the Kokaral dam. Its area varies greatly depending on the season of year. When the Central Aral is largest, it connects through a narrow channel with Tsche-Bas Bay and supplies it with some water. This new water body is shallow and, therefore, loses a great deal of water via evaporation and evapo-transpiration from the extensive reeds that grow in it.

Some actions have been taken to save the Aral Sea. Restoration of the Kamyshlybash and Akshatau lake systems in the lower reaches of the Syr Darya has created over 40 thousand hectares of water and wetland systems. This is improving the socio-economic and health conditions of the population.

There is also a project for the further reconstruction of the Small Aral. It involves the creation of a 50 m dam at the entrance to the Bolshoy Sarycheganak Bay (Fig. 2) and the laying of a channel from the Syr Darya to supply part of its flow to this bay. Another dam could be built at the southern end of the Central Aral Sea (Fig. 2). This dam will retain water that is now lost via the spillway of the Kokaral dam rather than allowing it to flow southward into the Eastern Basin of the Large Aral. However, this proposal needs detailed ecologic, engineering, and economic analysis.

Together with water from the Small Sea, a large number of valuable commercial fish (Fig. 3) are transported through the Kokaral Dam to the Central Aral (Fig. 4). The Executive Directorate of IFAS in Kazakhstan signed a contract to implement a large investment project "Preserving the fish of the Northern Aral". The aim of the project is designing a hydro-acoustic fish protection device on the Kokaral dam to prevent the loss of fish during water discharge downstream from the Northern Aral.

Fig. 3 *Fish transported and killed through the Kokaral Dam.*

Fig. 4 *The Kokaral Dam feeding the Central Aral.*

Some suggestions for the conservation of biodiversity and biological resources of the Aral Sea **include the following: (1)** as soon as possible raise the dam in Berg Strait by 2-3 m in the next few years; **(2)** build a dam in the throat of Sarycheganak Bay; **(3)** build a simple dam to the south of the Kulandy peninsula; **(4)** do not maintain the shallow reservoirs existing in the Amu Darya delta; **(5)** redirect the rest of the Amu Darya flow to the Western Large Aral.

In order to reduce the direct impact of salt-dust dispersion from dried sediments, and thereby protect people, settlements, agricultural lands, flora and fauna of the region, we suggest creating a multi-tiered "Green Belt", about 70 km long and 200-1000 meters wide. The belt will serve as a kind of "ecological screen" area where plants could be irrigated by the collector-drainage waters and surplus water of the Aksai and Kuan Darya lakes systems, and by potential discharges from the Syr Darya. This "Green Belt" could be a phyto-remediation effort planted with drought- and salt-tolerant desert trees or shrubs such as black saxaul (*Haloxylon aphyllum*) that grows on different types of soil, has moderate fodder value and is widely used to create protecting sand-holding strips. Kochia (*Kochia prostrata*) is also a drought-resistant and salt-tolerant shrub that grows in saline and sandy steppes and deserts and is a good fodder plant. Other possible plants include the pamirian winterfat (*Kraschenninnikovia ceratoides*), a xerophilous shrub and a good pasture and haymaking plant and amaranth (*Amaranthus* spp.), another forage crop that surpasses traditional crops in terms of yield, drought tolerance, quantity and quality of protein.

Additional water will be sent to the Large Aral Sea to create wetlands and to water the tree plantations of the "Green Belt". A system of polders is being created along the collector, which will contribute to the improvement of water quality. The biodiversity of the region is increasing and conditions are being created for the return of native species of wild ungulates and deltaic vegetation. This 'Green Belt' will act as a special "ecological screen" to protect populated areas, irrigated massifs and pastures from dust and salt removal, and the rate of desertification of the region is decreasing.

However, international intellectual solidarity with the Aral Sea is needed. Only joint efforts of the intellectuals all over the world can stop the Aral Sea catastrophe (Aladin, 2018; Rzymski & Klimaszyk, 2019; UN News, 2018).

References

Aladin N. 2014. The dam of life or dam lifelong. The Aral Sea and the construction of the dam in Berg Strait. Part one (1988-1992). El Alfoli Boletin 15: 1-3.

Aladin N. 2018. What the future of the Aral Sea can be like. El Alfoli Boletin 23: 3-13.

Aladin N., Plotnikov I., Micklin P. 2012. 20 years anniversary (1992-2012) of the contraction of the first earthen dike in Berg's strait of the Aral Sea (Kazakhstan). SILnews 61: 5-7.

Ermakhanov Z. K., Plotnikov I. S., Aladin N. V., Micklin P. 2012. Changes in the Aral Sea ichthyofauna and fishery during the period of ecological crisis. Lakes & Reservoirs: Research and Management 17: 3-9.

Micklin P., Aladin N., Plotnikov I. (Eds.) 2014. The Aral Sea: The Devastation and Partial Rehabilitation of a Great lake. 454 p.

Plotnikov I.S., Ermakhanov Z.K., Aladin N.V., Micklin P. 2016. Modern state of the Small (Northern) Aral Sea fauna. Lakes & Reservoirs: Research and Management 21: 315-328.

Rzymski P., Klimaszyk P. 2019. Solidarność dla Jeziora Aralskiego. Jakie są skutki największej katastrofy ekologicznej ubiegłego wieku? POLYTIKA, 10 marca 2019. https://www.polityka.pl/tygodnikpolityka/nauka/1784310,1,solidarnosc-dla-jeziora-aralskiego-jakie-sa-skutki-najwiekszej-katastrofy-ekologicznej-ubieglego-wieku.read

UN News. 2018. UN launches new fund to advance sustainable development in Aral Sea region. https://news.un.org/en/story/2018/11/1026701

FACES of SIL

With this issue we will be featuring FACES of SIL. SIL is truly an international organization and this section will emphasize the diverse SIL community with short stories about SIL members. If you want tell your story, send a short text (maximum 250 words and a photo) to the editor at flaim.giovanna@gmail.com.

SHIRA NINIO | ISRAEL

I am a senior scientist at the Kinneret Limnological Laboratory, Israel Oceanographic and Limnological Research institute. My work focuses on aquatic microbes - how they react to change, and what governs their interaction with other organisms in their ecosystem. Using molecular approaches, my lab aims to uncover the composition and function of bacterial populations, and pinpoint underlying forces which influence and shape these populations. We are currently working on a project dedicated to defining the microbiome of Lake Kinneret at different seasons and within distinct regions of the lake. Lake Kinneret is a warm monomictic freshwater lake in Israel which provides an excellent location for this type of study, as it is a complex ecosystem comprised of a collection of extremely divergent yet interconnected habitats. Another project in my lab aims to uncover the evolutionary forces which act upon bacterial pathogens from the genus *Legionella* that naturally occur in freshwater habitats as parasites of protozoa. Our results may shed light on the kind of genetic adaptations required in order to transition between a pathogen and a symbiotic bacterium. Finally, we are looking at microbes which are carried by atmospheric aerosols, in aim of determining the potential of these organisms to establish themselves in new aquatic environments given anticipated future changes in climate and water management. I believe one of the most pertinent issues in our field is the need to understand and to help disseminate the important role biodiversity plays in maintaining stable freshwater ecosystems.

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HERMAN VAN DAM | THE NETHERLANDS

I am an aquatic ecologist with a broad experience in water and nature and was working for 20 years as a scientist (phytobenthos, monitoring in freshwater ecosystems) in a government institute. From 1994 to 2006 I worked as a senior-ecologist in an engineering company. Since then I work as an independent researcher and senior-consultant (water quality, landscape ecology) in a large network of researchers, consultants and institutes. I have written over 400 professional papers and technical reports.

I was educated as a botanist at the University of Amsterdam. There I started my research on the use of diatoms as indicators for water quality, which I am still continuing. My checklist of diatoms with ecological indicator values (1994) is still used intensively world-wide.

Another field of special interest is long-term ecological monitoring. I started the monitoring of diatoms and chemistry in a network of shallow poorly buffered lakes in The Netherlands in order to document the changes by reducing acid atmospheric deposition. The reduction of sulphur emissions has reduced acidification of the lakes considerably since 1978, but further improvement is hampered by excessive deposition of nitrogen compounds.

I have been a SIL-member since 1973 and I founded my international network by attending SIL-congresses. Moreover, the field excursions during these congresses contributed a lot to my insights in structure of and processes in aquatic ecosystems. I hope that SIL will have these functions for young limnologists in future.

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FACES of SIL

SHEA GIUNTO | THE PHILIPPINES

I am Shea Kathleen P. Guinto, M.Sc., a copepod taxonomist from the University of Santo Tomas, Manila, Philippines, and currently pursuing my doctorate on the population genetics of Filipinodiaptomus insulanus (Wright S., 1928) and Arctodiaptomus dorsalis (Marsh, 1907). My advisers are Prof. Rey Donne S. Papa (University of Santo Tomas, Philippines) and Prof. Ryuji Machida (Academia Sinica, Taiwan).

I believe the most pressing issue facing my country is the unsustainable use of natural resources, especially lakes, resulting to biodiversity loss, land-grabbing, and even the killing of those sworn to protect the environment. For a country that depends heavily on aquaculture to provide food security and employment to many Filipinos, lakes have been continuously used and abused for many years with overstocking and excessive use of commercial fish feeds. This has led to a drastic decrease in water quality, eutrophication, and the introduction of invasive species leading to the loss of biodiversity at an alarming rate. Currently, the government is focusing on short-term solutions for problems that need to utilize scientific know-how and not merely business plans.

I believe that organizations such as SIL can be a powerful force in information dissemination not just for the scientific community but for all of society. Besides my career goals to join academia, I consider it my social responsibility as a biologist to increase awareness and appreciation for scientific research and the utilization of data produced by scientific research for policy-making and the conservation of valuable natural resources. I look forward to meeting you at the next SIL meeting in Korea!

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ROBERT WALLACE | UNITED STATES

I have three professional passions: teaching, rotifers, and inland waters, especially bogs, ponds, and small lakes. While retired from teaching, I am still 'Dr. Bob' to students and alumni and occasionally I am called upon to lecture, instruct a laboratory, give a seminar, or counsel a student. Indeed, it is hard for me to stay away from teaching. These passions, as well as my general interest in science, can be traced to when I was 10 and acquired my first microscope. During that summer my friends and I would frequent local ponds looking for globs of algae to examine. It was then that I saw my first rotifer, no doubt a bdelloid. But after that wonderous time, rotifers slipped to the back of my mind, until my invertebrate zoology professor at university suggested I study them. Luckily, I ended up in the laboratory of one of the foremost experts in the field, John J. Gilbert. At that point my interests in these animals was reawakened and has continued ever since. Thus, in retirement I continue my research on rotifers with several colleagues. Yet as a limnologist I accept that studying water is a calling that comes with responsibility. Accordingly, I volunteer my free time with two local organizations. One is lake association which promotes conservation of Green Lake (Wisconsin) by focusing on projects that enhance water quality. The other is the Wisconsin Water Action Volunteers; we monitor streams conditions for the Wisconsin Department of Natural Resources.

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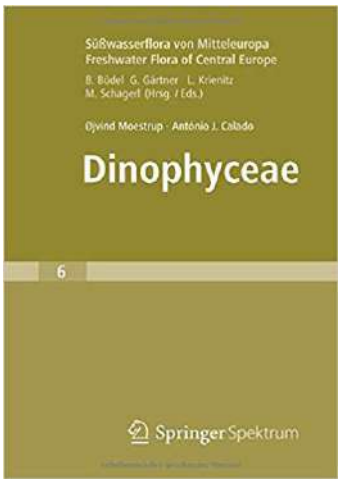

Øjvind Moestrup and António J. Calado Süßwasserflora von Mitteleuropa, Bd. 6 Freshwater Flora of Central Europe, Vol. 6: DINOPHYCEAE. Springer.

Hardcover: ISBN 978-3-662-56268-0, €126,35;
eBook :ISBN 978-3-662-56269-7, €99,99.

Truly this is a *magnus opus*. While technically part of the Freshwater Flora of Central Europe, Dinophyceae is international in scope, took 14 years to complete, has 560 pages, and will probably never be repeated. The amount of work necessary to compile data on most freshwater dinoflagellates species in the world is hard to grasp. Kudos to the authors and contributors.

The previous version of the information, Dinophyceae (Dinoflagellida) by Popovský and Pfiester (1990) had 169 species in 30 genera, this volume has 350 species in 65 genera. The Popovský and Pfiester book consolidated many species (lumped), most have been recognized in the current text as species. Major splitting has occurred in this book as species are moved into different genera. Users of guides to species should always cite the text they are using so later readers can reconstruct the current name. All taxa names are, after all, hypotheses, to be modified as new information is gained.

The introductory material is well written, quite readable and interesting with some humorous notations. History of dinoflagellate studies is reviewed, emphasizing Europeans working in Europe and elsewhere in the world, but all major non-European researchers are mentioned. The biology of the cell discusses the anatomy of the cell, important since dinoflagellates have some distinctive features. There are sections on the ecology of freshwater dinoflagellates, their life cycles and what is known about toxic freshwater species (estuarine and marine dinoflagellates cause red tides and can be exceedingly toxic). A section on culturing the algae includes recipes for media.

Part II of the book is the taxonomic treatment, giving details of the 12 Orders, 25 Families, 65 Genera, and 350 species reviewed in the book. The Orders are listed with comments. There are keys to families within each order, genera within families, and species within genera. Each species has the authority, year published, page reference and in most cases the original line drawings. Lists of synonyms follow, then species descriptions including the cell and cyst if known. Additional information from SEM, TEM, and molecular studies is referenced. If the ecology of the species is known, it is included. Geographical information ranges from the single reported occurrence to consolidated lists (by continent) for the widely reported species.

The taxonomic section ends with a review of the genus *Glenodinium*, an old, but poorly described genus that was thecate but without a plate tabulation pattern. Species assigned to that genus have been removed to other genera as plate patterns were discerned, leaving a few species with descriptions but still no known plate pattern. Including those species acknowledges the work of earlier researchers without discarding the genus as unknowable. Following the *Glenodinium* section are taxonomic housekeeping sections, lists of species with insufficient descriptions and a list of new taxa originating in this volume. Literature cited is 48 pages. The index is a listing of taxa; interestingly all specific epithets are included as well as genera, families and orders. Most often the same species under two different genera is a synonym (you can tell by the page number), but sometimes the same specific epithet is used by two unrelated genera.

Dinoflagellates are a fascinating group of protists, they have a suite of characters that make them distinctive, but within the group there is tremendous variability in external anatomy, internal anatomy, nutrition, and ecology. Previous works, relying on light microscopy, grouped like with like. This book follows a more phylogenetic approach, using molecular analyses, details of internal organelles based on transmission electron microscopy (TEM), and life cycle details. Fewer-plated thecate genera end up in the Gonyaulacales, Peridiniales, and Thoracosphaeralaes. Multi-, thin plated thecate genera end up in Suessiales and Tovelliales. Most naked, motile genera in Gymnodiniales, most non-motile genera in Phytodiniales. If you have identified a dinoflagellate to species using an older source, this is the book to check for the current taxonomy. If you are looking at a cell you know is a thecate dinoflagellate you will have to work through several keys to determine the identification.

There are many issues the authors had to tackle in assembling this compendium. Reports of phytoplankton from freshwater, while sometimes including the authority for the taxon, often do not include the source used for identification. Names of dinoflagellates are included but there is no way to confirm what was seen. There are a few genera that accumulated many species before the type species was closely defined. *Peridinium, Peridiniopsis,* and *Gymnodinium* are three such. Species have been extracted from *Peridinium* and *Peridiniopsis* and placed into new genera, and that process will continue. The authors discuss the variety of species in *Gymnodinium,* commenting on the need for work to resolve placement of the species, then divide the 92 species into four groups based on presence/absence of an eyespot and plastids. *Gymnodinium fuscum*, the type species has an apical groove which is difficult to see in the light microscope and rarely (never?) illustrated in older species descriptions. The fate of such species may be the way *Glenodinium* species are treated. Determination to organize taxa based on phylogenetic analyses sometimes forces difficult couplets in the keys to families, genera and species. Families Borghiellaceae and Suessiaceae are separated by type of eyespot. A note informs the reader that genera *Borghiella* and *Biecheleria* require cyst morphology and eyespot to distinguish. Most keys have only single characters in a couplet, rather than including secondary characteristics. The book format, in keeping with 23 other volumes of the series, and the previous version, limits what can be included. With the huge increase in taxa included, there is no room for modern renditions of the line drawings, micrographs, or color images.

This book joins the 18 others on algal identification and importantly replaces the older version that prompted incorrect names for many species due to consolidation of species names. Its international scope highlights work across the planet, both as a reference and as an impetus to new work. Dinoflagellates are an amazing group and the struggle to understand the evolution and relationships within the group is clear throughout the book. Again, kudos to the authors and contributors.

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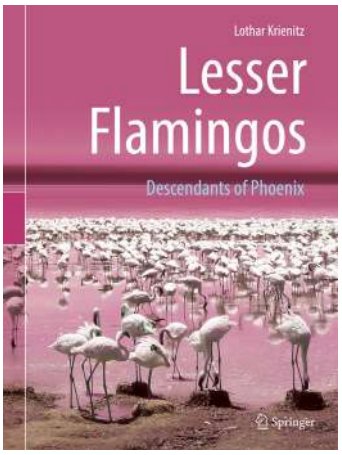

Lothar Krienitz
LESSER FLAMINGOS: DESCENDANTS OF PHOENIX.
Springer Nature, 2018.

Hardcover: 28.5 x 21.5 cm, 244 pages, 99 figures mostly in colour, 8 tables, ISBN 978-3-662-58162-9. € 40,65;
eBook: ISBN 978-3-662-58163-6. € 32,12.

The well-illustrated book Lesser Flamingos - Descendants of Phoenix describes in many ways the habitats of the Lesser Flamingo and other animals, mostly birds in tropical soda lakes. The focus in East Africa is on Kenya (e.g. lakes Bogoria, Nakuru, Oloidien), followed by Uganda, Tanzania (Lake Natron), Ethiopia, and the wetlands in southern Africa (Botswana, Namibia and South Africa), but also in India.

The author Lothar Krienitz describes the breathtaking beauty of the natural spectacle of the mass occurrence of the Lesser Flamingo (Phoeniconaias minor), the so-called Pink Diamonds: "Approaching a soda lake in the East African Rift Valley, all of our senses are touched. Our eyes cannot get enough of the billowing sea of pink birds. Our ears receive the busy sounds of the birds during joint food intake. Our skin feels the merciless heat that flickers over the lake. We taste the salt in the dust, which is stirred up by the movement of the air. Our nose absorbs the corrosive scent of soda, decomposing food algae and feces of the birds" (quote from the book, loc. cit. p. 76). It quickly becomes clear that this natural spectacle is by no means self-evident and that the flocks of birds have to migrate between the lakes in search of food and rest for breeding. This requires, however, alternative, adequate habitats that need to be protected in the long term. For ornithologists, especially in the tropics, the fascination of such a natural spectacle may already be a wealth of experience - yet for those readers, the book may be an enrichment, as it is written from the perspective of a freshwater ecologist.

How do you get close to the Lesser Flamingo? By looking at their food – i.e. studying the microphytes from the bird habitats macroscopically and microscopically. The author is fascinated on several occasions - by the monumental natural spaces, the diversity and beauty of the bird life and the striking algal flora. His observations at a watering hole are meant to illustrate his "conflict of interest". A beautiful Violet-hooded Turaco, "has settled on the mud. Close to him, dirty blue cyanobacteria and green Chlorella grow on the wet surface. Should I concentrate on birds or algae? Despite the fascinating charisma of the bird, I have remained true to the algae, but I have been able to combine the pleasant with the useful by embarking on the food relationship of the Lesser Flamingo with the microphytes." (loc. cit. p. 193). So, the book is actually written from the experience of an internationally respected phycologist. An environmentally interested reader may benefit from the author's perspective. Lothar Krienitz describes the many facets of limnology of soda pans, from the physics and chemistry of different types of these extreme environments to the ecology of fascinating living forms of algae and cyanobacteria and other water biota. The reader learns that a delicate diversity of different phytoplankton and flamingo food taxa can hide behind the green, blue-green or other pigment spectra, and, that closely related species compete with each other and quickly redistribute in the optimal habitats. In this context, modern satellite observations on the habitats of the flamingos are mentioned as being helpful, but cannot replace in-situ measures totally. Profound interpretation of ecological surveys still calls for taking field samples by gearing up in rubber boots and walking to the hot and often inhospitable muddy soda lakes.

The "take-home message" of the book is that these unique habitats of soda lakes are vulnerable structures of nature, few microorganisms can live in these niches, and, after long adaptation, these microscopic extreme habitat colonizers are precisely what is needed as the main food source of the Lesser Flamingo, the flagship species of these environments. The author thus provides a broadened-up perspective on the ecology of the soda lakes and their microscopic world of algae, also delights us with his photographs.

The book not only shows individual snapshots of the life and the areas of incidence of the Lesser Flamingo, but also reports coherently over a period of 15 years (2001 - 2015). Hence, the reader can also grasp the book as a contemporary history of habitats and changing living conditions of the Lesser Flamingo for more than a decade. The author also provides personal insights of travelling to the many remote sites of soda lakes. Reading the book, it is easy to follow the author's own observations, descriptions, results and interpretations, in addition to selected references to many other sources of previous observations, facts and figures. Thus, the reader can easily find more details. The book shows how many ecological, but also human-social or cultural themes intersect the world of the Lesser Flamingo, and it takes a position to preserve this unique bird on behalf of many animals through the protection of its habitat. It draws attention to the fate of habitats of the Lesser Flamingo and other endangered wetland ecosystems. Although the book is primarily aimed at describing the habitats in Africa and India, the author provides textual anchors to episodes in his homeland and elsewhere in the world, and thus promotes thinking globally.

The book convinces with its clear, concise chapter design; its approx. 280 impressive photos, which are usually grouped thematically in graphic panels, complemented by tables, graphics and index, and its lively writing style. About 60% of the photos show natural scenic views of birds and bird habitats. Another large number of stunning photos (24%) illustrate algae and blue greens macroscopically building mats on lake shores or plankton in lake water, or are visualised as tiny organisms under higher magnification by light microscopy or scanning electronic microscopy, which all together may guide the reader in recognizing at least specific key microphytes at first glance.

Conclusion: The reader is offered a current, authentic ecological inventory of the flamingo habitats. The book is a stimulating treasure trove of topics for all limnologists and bird lovers particularly interested in the tropics and to whom trusting the power of interdisciplinary collaboration: together we should be able to secure the future of this emblematic bird, the likeness of the firebird Phoenix.

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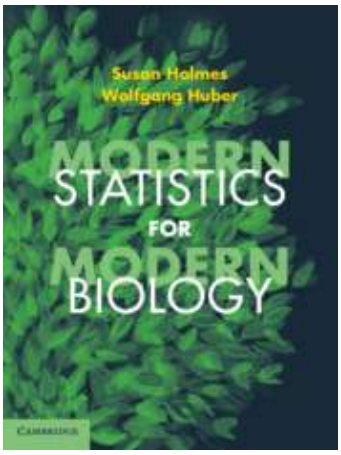

Susan Holmes and Wolfgang Huber MODERN STATISTICS FOR MODERN BIOLOGY. Cambridge University Press

Paperback: ISBN: 9781108705295, £ 49.99.
Online version freely available at web.stanford.edu/class/bios221/book/

This book covers basic and advanced topics for the analysis of high-throughput biological data. It is for the beginner, both in R and statistics. However, a supposed expert can find interesting parts as well. It is full of encouragements, a necessary aspect when facing the adventure of learning R and studying statistics. However as the authors state at the beginning, studying stats and R based on this book alone is challenging. In any case, ample references are provided for a more profound study of the topics presented at the end of each chapter. Remarkably, this book has a different approach to statistics than most books and this opens up new perspectives and provides interesting details. For example, probabilities are often explained with coin flipping; here, mutations (yes, no) are introduced. A large plus that comes in handy is the aspect of simulations in several chapters such as 2, 4, or 5. Most coding lines are not explained in detail and this forces the user to play with the code. Very instructive are the exercises with solutions provided. Resume: an ecologist will find some examples about DNA data confusing while scientists working with genetic data will find a common language with explanations trimmed to their needs.

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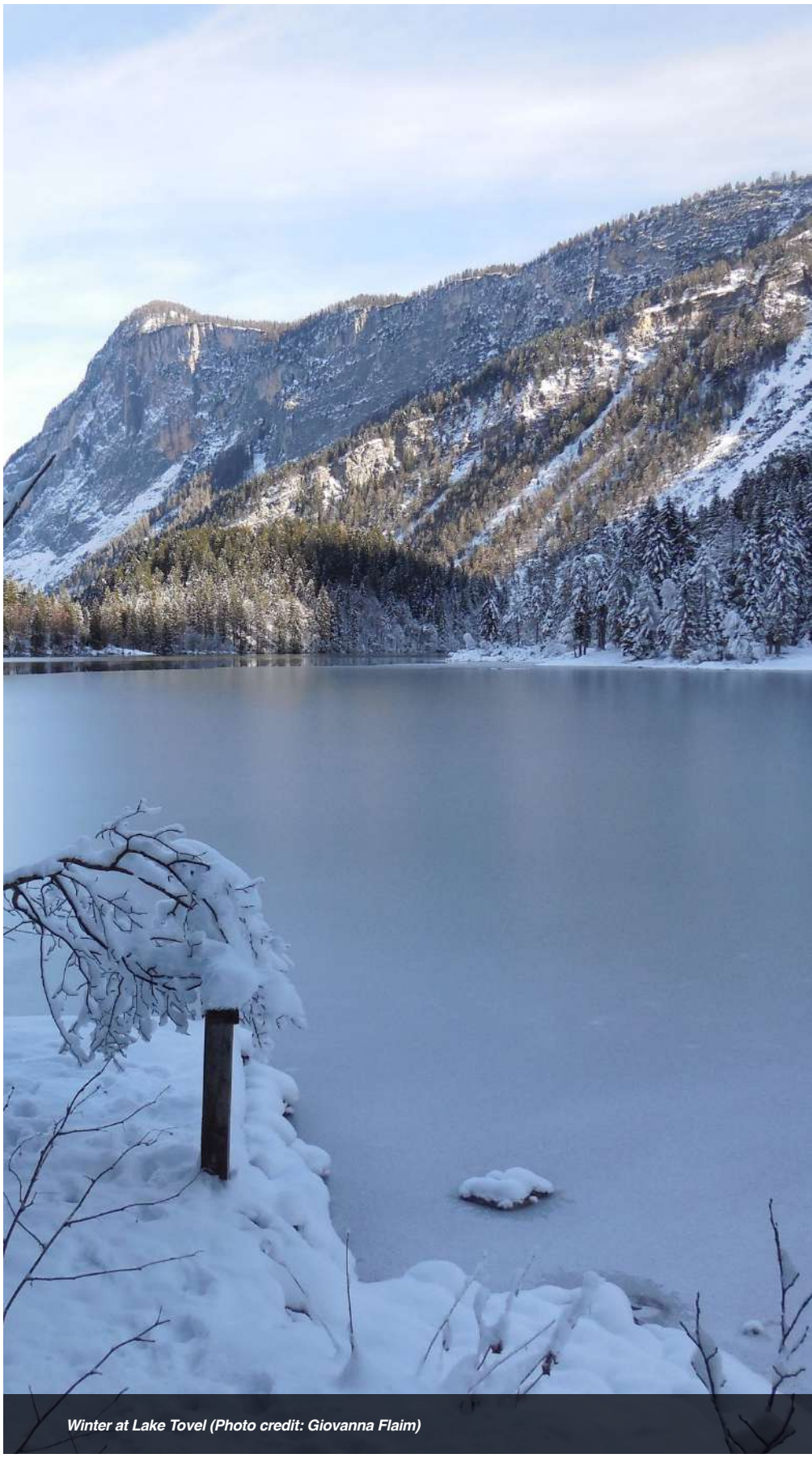

Winter at Lake Tovel (Photo credit: Giovanna Flaim)

Commemoration

Vyacheslav M. Rylov

1889-1942

This year is the 130th anniversary of the birth of Russian and Soviet aquatic ecologist Vyacheslav Mikhailovich (M.) Rylov. Rylov was among the first members of SIL. Although he took an active part in SIL congresses, his name in world hydrobiology is now, unfortunately, almost completely forgotten. Rylov's works that are most often cited today are those on systematics and faunistic studies of planktonic crustaceans, a field in which he was a renowned expert. His contribution to science as an ecologist whose ideas anticipated many modern concepts of aquatic ecology is much less known. In particular, Rylov was one of the first proponents of the so-called productional (trophodynamic) approach in hydrobiology.

Rylov was born in Kronshtadt into a family of teachers. He spent his childhood in the Kostroma province, where still a child, he developed an interest in observing and studying nature. In 1909, Rylov matriculated at the Department of Natural Sciences of the Saint-Petersburg University. In 1934 he was awarded a Doctor of Biological Sciences degree. From 1916 to the end of his life he worked at the Zoological Institute of the USSR Academy of Sciences (known as the Zoological Museum before 1934) where he was the Head of the Department of Crustaceans and Plankton from 1929 to 1942. During the Siege of Leningrad, Rylov fell seriously ill and unfortunately, for some reasons he and his wife (hydrobiologist Lidiya P. Rylova) decided to leave the sieged city too late. The harsh living conditions under the evacuation aggravated Rylov's illness and on 22 March 1942, the day of his birthday, V.M. died in an evacuation hospital at Manturovo railway station (Kostroma province); he was buried in a local cemetery.

The academic pursuit of Prof. Rylov had already begun in his student years with a collection of zooplankton from different water bodies of the Russian Empire. As a result, during his university studies V.R. has already amassed substantial material on the taxonomy of freshwater Crustacea (Copepoda and Cladocera) and his work with collections of the Zoological Museum allowed him to describe several new species in this group. Later on, Rylov used this rich factual material to address some fundamental problems in hydrobiology and limnology. The focal point of his research was the interaction between an organism and its environment.

In 1922 in a presentation at the First All-Russian Congress of Zoologists, Anatomists and Histologists, Rylov used the concept of a water body as a biologically unified entity to convey the idea that not only the environment influences organisms but organisms may also have effects on their environment. Today, this view seems self-evident, but it was less than obvious in the first quarter of the 20th century. As an example, Rylov pointed to the phytoplankton's influence on the gaseous regime of a water body. It is noteworthy that he continued to develop this idea in the following years using a quantitative approach. In 1925, in a presentation "Some aspects of biodynamics of limnoplankton" at the Third International Limnological Congress, Rylov introduced the biodynamic standard, a quantitative measure of phytoplankton metabolism. He transmitted the idea that "every planktonic organism is a unit of life with a certain physiological ability". Rylov drew attention to the fact that there is a proportional relationship between the quantitative development of plankton and changes in water chemistry. Likewise, an organism can manifest its potential productional ability only under certain conditions that are optimal for its life activities. According to Rylov, the so-called "individual physiological ability of the organism under a given environmental factor" is "a quantitative measurement of the latter per hour under optimal conditions for this organism". In presenting the results of physiological experiments, Rylov recommended normalizing measurements to unit area of the reactional surface. In his later works, he expanded on the idea of the environment-forming role of other organisms (in particular, macrophytes).

Rylov was therefore the first to introduce quantitative measure of the productional ability of phytoplankton, taking a crucial step from simple physiological experiments toward an actual method of measuring productivity, based on changes in the chemical composition of the environment over a certain period of time. Unfortunately, for some reason this idea was not further elaborated by Rylov and the views of other hydrobiologists on productivity were developed independently of his ideas.

Rylov was also interested in the problems of regional limnology. In particular, he explored the questions of relationships between the chemical composition of water in the water body and the characteristics of its catchment. Finally, Rylov studied issues related to feeding of aquatic organisms, for instance, the role of tryptone in crustacean nutrition.

Rylov's ideas were ecosystemic in nature and were ahead of their time; initially unnoticed, they have eventually been incorporated into our modern theory of functioning of aquatic ecosystems. But, as it is often the case, these ideas have become so common that the names of their initiators have gradually become forgotten.

This study was financially supported by Russian Foundation for Basic Research (grant No. 17-33-01046-ОГН). A more detailed review can be found in: Rizhinashvili A. 2019. Journal of the History of Biology doi:10.1007/s10739-019-09590-5.

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PRIZE FOR

Tropical Limnology

The Jean-Jacques and Berthe Symoens Prize for Tropical Limnology (kaowarsom.be/en/symoens) awards a monetary prize of 2,500 EUR for work of great scientific value on a subject related to tropical limnology.

The Prize was awarded for the eighth time in 2017 to **Mr Cédric Morana** (Faculty of Bioscience Engineering), Katholieke Universiteit Leuven, Belgium for his dissertation "Exploring the Carbon Cycle in a Large Tropical Lake (Lake Kivu, East Africa): From the Cellular to the Ecosystem Level".

Next awarding will occur in 2020. Information about this Prize may be obtained at:
Royal Academy for Overseas Sciences, avenue Circulaire 3, B-1180 Brussels, Belgium.
Tel. 32-2-790.39.02; **E-mail contact:** raos@kaowarsom.be.

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