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## Editorial

by Veronika Albrecht

Welcome to the 30th edition of our biannual newsletter, showcasing the breadth and diversity of current research projects and developments at WasserCluster Lunz.

The research featured in this issue spans an extraordinary range of scales. Perspectives extend from DNA and chemical elements to microorganisms, fish, and ultimately, whales. These selected examples from the work of our scientists illustrate how curiosity, interdisciplinary collaboration, and sustained commitment generate knowledge that advances our understanding of aquatic ecosystems, helps safeguard their functions, and provides the scientific foundation for the responsible stewardship of our water resources.

Equally important is ensuring that scientific knowledge reaches society and contributes to education. Through a variety of projects, WasserCluster Lunz develops interactive learning materials and embraces helpful citizen science approaches to explore innovative forms of science communication. Collaborations with regional and international partners, together with our in-house sustainability initiative, reflect our conviction that sci-

ence has its greatest impact when it engages people and invites them to participate in understanding and shaping a more sustainable future.

The past few months have also brought many reasons to celebrate. We are proud of the career milestones and achievements of our colleagues, whose dedication and scientific excellence continue to strengthen the international visibility and reputation of WasserCluster Lunz.

We also warmly invite you to visit our research institute in Lunz and experience our work firsthand:

At this year's **Open Day**, you will have the opportunity to explore our experimental facilities, laboratories, and research methods. **On Saturday, 19 September, from 10:30 a.m. onwards**, our two WasserCluster buildings on the eastern and western shores of Lake Lunz will be open to visitors. A water shuttle operated by the Leichtfried family's sightseeing boat will provide transport between the two locations throughout the day.

**Save the date – We look forward to welcoming you!**



Photos: eDNA-Filter; Sampling activities at Lake Lunz

✉ [trident@wcl.ac.at](mailto:trident@wcl.ac.at)

🦋 [profile/trident-wcl.bsky.social](https://profile/trident-wcl.bsky.social)

Funding: Federal Environment Agency & Biological Station Illmitz

<sup>1</sup>Macroinvertebrates:

Small aquatic invertebrates that are visible to the naked eye (typically larger than about 1 mm), including snails, aquatic insects and their larvae, worms, mussels, and crustaceans.

<sup>2</sup>Mitochondrial DNA (mtDNA):

Mitochondrial DNA is a circular, double-stranded genome found in the mitochondria—the cell's "powerhouses." It is essential for cellular energy production (ATP).



Link: [eLTER-Longterm-monitoring](#)



**Bettina Thalinger & Theresa Reichenpfader | TRIDENT**

**eDNA** (environmental DNA) is one of the most promising molecular methods for studying and monitoring biodiversity. Animals and other organisms constantly leave tiny traces of DNA in water bodies. By collecting and analyzing water samples, scientists can detect which species occur in a lake without having to catch them directly. However, collecting eDNA samples can be challenging and standardization efforts, for example within the eLTER long-term monitoring framework, are hard to accomplish. **Lenti-DNA** will help to resolve this problem.

The TRIDENT Team will optimize eDNA water sampling for lakes leading to a standardized lake-eDNA-protocol that can be carried out at all lentic eLTER sites in the future. This will allow researchers to compare results between locations.

But what which species are we looking for? The project focuses on fishes, macroinvertebrates<sup>1</sup>, and diatoms as these groups are also suggested in the eLTER long-term monitoring framework to identify ecological changes over time.

Lenti-DNA sampling is carried out at Lunzer See and Neusiedler See. Water samples are collected three times throughout the year (spring, summer, fall) at different locations around each lake, including the shoreline, the surface, and various depths. For the sampling procedure, specialized eDNA filters are used. Three liters of lake water (or less for the very turbid Neusiedler See) are filtered directly on site. During this process, tiny DNA fragments from the water remain on the filter. After field sampling, the process continues in the eDNA laboratory of the TRIDENT group. There, the eDNA is removed from the filters and prepared for further analysis under “clean-room” conditions.

To analyze the eDNA of fishes, macroinvertebrates and diatoms, we use a so-called metabarcoding approach: a short fragment of mitochondrial DNA<sup>2</sup> is amplified via PCR (Polymerase Chain Reaction). Next, the generated PCR products undergo high-throughput sequencing. This generates millions of identifiable DNA sequences which are bioinformatically processed and culminates in a list of detected species for each eDNA sample.

In a final step, these species lists are used to identify an optimized sampling strategy that maximized the recovered biodiversity from as little eDNA samples as possible. Starting in 2027, this strategy will be used for eDNA-based monitoring efforts at eLTER sites with lentic waters. 📍



Photos: Laboratory tests  
Photo at top right:  
©weinfranz

## Project CASPAR – Removing Phosphorus from Water Sustainably

Gabriele Weigelhofer | FLUVICHEM

Agriculture and water management face a major challenge: phosphorus is an essential nutrient for plant growth, yet natural reserves are limited. At the same time, excess phosphorus from agricultural land enters rivers and lakes, harming the environment—for example, by causing excessive algal growth.

Funding: [GFF Lower Austria](#)




<https://www.gff-noe.at/forschungsfoerderung/details/FTI25-G-003/>

Our new applied research project **CASPAR** (led by the Austrian Federal Agency for Water Management and funded by the Province of Lower Austria) is working on solutions to this problem. The goal is to remove phosphorus from water pathways—either within the catchment area or directly from water bodies—and reuse it as fertilizer in an environmentally friendly and cost-effective way.

To achieve this, special materials such as biochar or LECA pellets are being tested. These materials can bind phosphorus to their surfaces (through adsorption). They are first studied under controlled laboratory conditions and later tested in real-world settings, such as streams or at field edges. This allows researchers to evaluate how effectively different materials capture phosphorus and under which conditions they perform best. The phosphorus-loaded materials could then be reused as fertilizers, creating a circular system in which less phosphorus is lost and less pollution reaches our waters.

CASPAR is an important step toward sustainable phosphorus management in Lower Austria. What makes the project particularly innovative is its combination of laboratory research with real-world testing. This approach helps develop practical solutions that can be applied on a larger scale in the future.

In short, CASPAR supports smarter phosphorus use, protects the environment, and contributes to more sustainable agriculture. 



Photos: Experimental Setup in the Fish Lab; on the right: Young trout ©Mickaël Péron

**Mickaël Péron** completed his PhD at the University of Western Brittany, France. Over the coming years, he will be conducting research within the SciFish group on the naturalisation of rainbow trout in Austrian pre-Alpine streams, with a particular focus on the factors driving the successful establishment and persistence of self-sustaining populations.

**Funding:** FWF | Esprit



[www.fwf.ac.at/en/research-radar-10.55776/ESP3976425](http://www.fwf.ac.at/en/research-radar/10.55776/ESP3976425)



wasser  
cluster  
lunz



### Mickaël Péron | SciFish

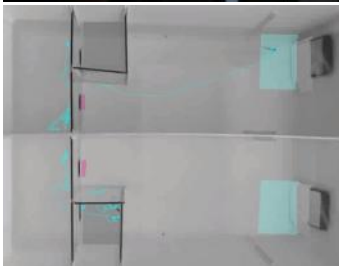
Communities of aquatic organisms in European rivers and streams are degrading due to global environmental changes and spread of non-native species. Rainbow trout is a non-native fish with high potential to cause ecological damage to local biodiversity. Yet, it has been stocked for decades across numerous European waters including in Austria to support recreational fishing. This has often been done under the assumption that the species cannot reproduce in European streams.

However, in recent years we have seen a sharp increase in self-reproducing populations of this trout that are independent on further supplementary stocking. Paradoxically, we still do not understand how the rainbow trout gain the capacity to reproduce in Austrian streams and if it will spread any further.

The FWF-ESPRIT project **MetaboRain** aims to investigate this question. The answer may lie in the way their physiology (growth, oxygen consumption, energy production) and their behavior interact with the quality of their diet. In nature, fish must rely on wild prey rather than the rich, pellet-based diets provided in fish farms. Many of the essential nutrients found in hatchery feed (particularly omega-3 fatty acids) are scarcer in natural environments, especially during warm seasons when the diet of fish depends more on terrestrial insects and leaf litter. These nutrients are crucial for brain development, energy metabolism, and behavior, and may influence how well trout can hunt, avoid predators, and reproduce.

The project combines field studies in Austrian streams with controlled laboratory experiments to explore how physiology, behaviour and diet interact in rainbow trout. MetaboRain will also investigate how climate change, by warming alpine rivers and reducing the availability of omega-3 fatty acids, affects rainbow trout physiology and behaviour.

Together, these results aim to reveal the mechanisms that determine whether rainbow trout can successfully reproduce and spread in new environments. ☐



## Will fish survive the increased low-oxygen events under current global changes?

Alycia Valvandrin | SciFish

Photos: top left | A. Valvandrin in the fishlab @weinfranz  
top | Experimental setup for assessing the cognitive abilities of fish  
top right | Egg of a three-spined stickleback;  
both: ©Alycia Valvandrin

**The three-spined stickleback** is a well-known fish found throughout Europe, Algeria, North America, and North Asia, in both still and flowing waters. During the breeding season, it exhibits very distinctive and easily observable behaviors, making it an important model organism for behavioral research and contributing to its central role in the development of modern ethology (behavioral biology).

**Alycia Valvandrin** is a Ph.D. candidate at the University of Turku in Finland and is currently working as a visiting researcher in the SciFish group.



As the climate of our planet is changing, aquatic organisms are not only struggling with rising water temperatures but also with increased events of oxygen depletion. So-called hypoxia (low oxygen concentration in water) is expected to become more common and severe in the near future and may cause strong physiological stress for wild fish populations. This may even lead to mass mortality in water bodies, which could threaten their persistence. Aquatic organisms, like fish, will have to cope with such events to overcome the significant challenges posed by them. When migration is not possible, fish must adjust in the moment or adapt over generations. While we know about how fish handle hypoxia within their life, little is known about how they handle it across generations and how these two strategies work together.

In my PhD titled *“The impact of hypoxia within and across generations on three-spined stickleback’s behavior, cognition, and brain”*, I aim to understand the developmental and evolutionary mechanisms underlying fish responses to hypoxia. Specifically, I explore how hypoxia changes fish behavior, problem-solving and learning, and brain. I am focusing on their: sociability, risk-taking behavior, and potential for these traits to evolve; capacity to solve problems, to learn and memorize the right solution; brain volume and ability to create new neurons. So far, we’ve observed that when individual fish experience hypoxia, it seems to reduce the ability to evolve of their behavioral traits, which could severely limit how resilient they are to current and future global changes.

The scientific evidence collected will provide crucial insights for policymakers and stakeholders to help them make informed decisions to effectively protect freshwater biodiversity facing accelerating environmental changes.

This project is funded by the European Union’s Horizon Europe research and innovation programme under a Marie Skłodowska-Curie Actions grant and by the University of Turku. 📍



Photo top left: Mosquito larvae in a natural pond (red circles) ©T. Schwingshackl  
 Photo top right: Measuring water physiochemical parameters in the field ©Zoë Lindhorst  
 right: Mosquito larvae (*Ae. albopictus*) in the binocular ©Sven Dragon

## City Invaders



Mourine Yegon & Thea Schwingshackl | TRIDENT

The days are getting longer, the sun stronger, and summer is just around the corner. While many of you may be looking forward to the season, not everyone is quite so excited about the return of mosquitoes. Yet despite their negative reputation, without them many aquatic and terrestrial ecosystems would not function effectively. By filtering nutrients from the water, mosquito larvae contribute to water purification. Later, when they emerge as adults, mosquitoes become an important food source for many terrestrial animals such as bats and birds.

Yet, we have very little information about their lives in the larval stages. The **City Invaders Project** tries to remedy this situation. In large urban areas, dense populations, international trade, and traffic can facilitate the introduction and establishment of non-native mosquito species such as the Asian tiger mosquito (*Ae. albopictus*) or the Korean or Asian Bush mosquito (*Ae. koreicus*, *Ae. japonicus*). Some of these species, though not all, can act as disease transmitting vectors and their monitoring is becoming increasingly important for risk management. For instance, if an infected traveller returns from a tropical region, the presence of competent mosquito vectors may increase the risk of local transmission. Careful surveillance therefore plays an important role in risk management and public health preparedness.

In the City Invaders Project, we investigate mosquito life stages in the city of Vienna, which serves as our pilot area. Here at WasserCluster Lunz, we develop environmental DNA (eDNA) assays to detect species faster, at lower densities, more efficiently. By identifying mosquitoes already in their aquatic stages, we can gain valuable insight into their ecology, distribution, and seasonal dynamics. So next time you hear the familiar buzz of a mosquito, remember that these tiny insects are more than just a summer nuisance. 📷

Funding: WWTF



Link: [more information about this WWTF-project](#)





Abb. Wetland Fresk  
©Restore4Life

Funding: EU



LINK:  
[Restore4Life digital-toolbox](#)



LINK:  
[Resources on ZENODO](#)

## Restore4Life: Interactive wetland education materials

Gabriele Weigelhofer | FLUVICHEM

Wetlands are among the most endangered ecosystems on the planet. In our Horizon Europe project **Restore4Life**, we created educational materials to help students understand the importance of wetlands for humans.

Our materials use the 5E learning model, which focuses on student-led learning. This approach encourages active participation by connecting students' prior knowledge to new ideas. The five phases of this model are:

- Engage** – where we spark interest and check what students already know;
- Explore** – where students conduct hands-on activities in labs or outdoors;
- Explain** – where students share their findings;
- Elaborate** – where they apply what they learned in a broader context; and
- Evaluate** – where students assess their understanding.

Though our materials target students aged 12-16, they can be easily adjusted for younger or older learners.

In addition to the main teaching materials, the project created the online game “**Blue-Green Space4All**” and a dynamic Wetland Fresk. We also provide a manual and a video with step-by-step instructions for building a simple treatment wetland.

The **Wetland4Life App** lets users check wetland status in the field.

All these resources are available for free online (Zenodo) and have been successfully used in classrooms. Together, the Restore4Life materials give teachers a strong set of tools to explain why intact wetlands are important for human well-being. ☑



Photos: ©C. Amorim

Fig. 2. Diagram showing the flow of biodiversity across fishpond metacommunities through dispersion (left), and the potential threats to biodiversity (right). The figure on the left was modified from Google Maps and Copernicus Global Land Cover.

Funding: FWF



[Link \(UWK\): Further information about the project](#)

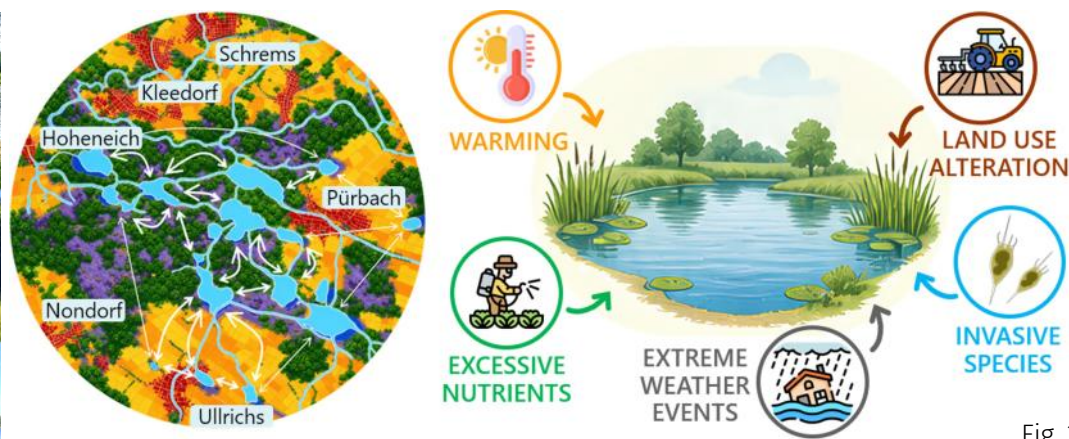


Fig. 2

## METAPONDS: Revealing the Relevance of Fishponds for Biodiversity Conservation

Cihelio Amorim | LIPTOX

The Waldviertel carp pond farming system is the first and, to date, only aquaculture system in Europe to be designated a Globally Important Agricultural Heritage System (GIAHS). Beyond their role as an integral part of the region's landscape and cultural identity, these ponds are also of considerable importance for biodiversity.

The **METAPONDS** project will explore the tiny life forms that inhabit these fish ponds: plankton drifting in the water, microscopic aquatic plants, animals, and microbial species that form the basis of the food web. Plankton is essential for maintaining the ecological health of fish ponds, supporting fish such as carp, and reflecting the state of the ecosystem.

This investigation is relevant because it assesses how biodiversity and ecosystem health respond to various pressures, including landscape modification, global warming, pollution, and potentially invasive species.

Approximately 60 fishponds will be surveyed in Waldviertel to measure the impacts of stressors on fishpond ecosystems, plankton communities, and stability. Experiments to determine the effects of individual and simultaneous stressors on ponds will be conducted, as pressures rarely act in isolation. The outcomes of those approaches, coupled with modelling, will identify conditions that support a robust and diverse plankton community.

The concept of connecting the ponds into a network, the 'metacommunities,' is an important aspect of this project. Anything that occurs in one pond may have consequences for other ponds because they are connected through rivers and the landscape; hence, conservation should not be limited to individual ponds.

In Waldviertel, fishponds are often the only standing bodies of water over long distances, making them important for aquaculture and biodiversity. Sustainable management can maintain this balance. METAPONDS aims to place fishponds at the forefront of the Biodiversity Strategy Austria 2030+, highlighting the relevance of aquatic communities for conservation planning. Through intensive science communication and outreach, we aim to bridge the gap between science and society, valuing the cultural heritage of Waldviertel fishpond managers, who have built precious local knowledge over the centuries. 📍





## Putting Science on the Menu

Martin Kainz | LIPTOX

Scientific publications in peer-reviewed journals are a key driver of research. They serve as an important platform for communication and critical discussion among colleagues within scientific societies, ensuring that research findings are scrutinized and debated within the scientific community’s “ivory tower.” However, science should ultimately benefit society as a whole.

In the recently completed **TeichFit** project, funded by the Province of Lower Austria, the LIPTOX Research Group and the *EcoHealth Research Lab* at the University for Continuing Education KREMS collaborated with the Federal Agency for Water Management in Gebharts and the Institute of Meteorology and Climatology at BOKU University Vienna to investigate pond landscapes in the Waldviertel region and their effects on human health. In the previous newsletter (#29), Cihelio Alves Amorim highlighted in this recent study<sup>1</sup> the exceptionally high biodiversity of these fishponds.

Further analyses revealed that carp from the Gmünd district contain more than 500 mg of high-quality omega-3 fatty acids per serving (approximately 200 g) after preparation in local restaurants. Carp produced through the sustainable pond aquaculture systems of the Waldviertel therefore provide the daily intake of omega-3 fatty acids recommended by the WHO for cardiovascular health support.

The next step was to transfer these findings to the public. We were able to partner with a local restaurant in Gmünd, which agreed to feature this information on its menu in a concise and accessible way. Guests can now use a QR code printed on the menu to learn more about the fish being served and, if interested, even download the final **TeichFit** project report.

Feeling hungry? Give it a try here:



**Wir sind Kooperations Partner der Donau Uni KREMS Partnerschaft zur Untersuchung vom gesunden Lebensmittel „Waldviertler Karpfen“**

**Die Ergebnisse zeigen:** Karpfen aus der Region oberes Waldviertel sind besonders gesund. Eine Portion Karpfen, wie sie im Stadtwirtshaus Hopferl zubereitet und serviert wird, enthält über 500 mg Omega-3-Fettsäuren. Damit liefert eine Portion mehr Omega-3-Fettsäuren als die Empfohlenen 300–450 mg pro Tag.

**Bitte QR-Code scannen und Informieren**

Unser Einsatz für Nachhaltigkeit und Ökologischer Fußabdruck  
Der nächstgelegene Harrabruck Karpfenteich befindet sich 300 m vom Hopferl entfernt

\* \* Regionale Fische aus dem Waldviertel \* \*

Waldviertler BIO-Karpfenfilet, = (praktisch grätenfrei)



<sup>1</sup> Amorim, C. A., and M. J. Kainz. 2025. “Shifts in Assembly Rules and Loss of Zooplankton Functional Diversity Across Hypereutrophic Fishponds.” *Ecology Letters* 28, no. 12: e70289. <https://doi.org/10.1111/ele.70289>



Additional restaurants are expected to join the initiative, providing the public with greater access to research on native fish species on the menu. ☐



Photo: Mourine Yegon, PhD  
©Elmira Akbari

Mourine Jesire Yegon's  
PhD project:



[https://  
short.boku.  
ac.at/  
kam544](https://short.boku.ac.at/kam544)

ORCID iD: M. J. Yegon:



[https://  
orcid.org/  
0000-0001-  
5379-325X](https://orcid.org/0000-0001-5379-325X)



# The shredder insect mealplan

Bettina Thalinger & Mourine Yegon | TRIDENT

Ever wondered what happens to the huge quantities of leaves that are washed into streams each fall? Wonder no more! Much of this leaves becomes food for aquatic insects, particularly those belonging to the "shredder" group. These tiny stream dwellers chew leaves into smaller pieces, helping to break down organic matter and release nutrients that fuel the stream food web. In her PhD research, Mourine Yegon discovered that not all leaves are equal when it comes to feeding shredders. Different leaf species provide different nutritional benefits, but alder leaves turned out to be the ultimate shredder "superfood." Insect larvae grew better, gained more nourishment, and consistently preferred alder over other leaf types.

As shredders feed, they do not consume every piece. Fragments are lost during feeding, and additional fine particles are produced through their faeces. These tiny particles become food for other stream organisms, creating important links in the aquatic food web. Mourine's

experiments also revealed that the size of these particles depends on both the type of leaf being consumed and the shredder species doing the feeding. Some shredders produce larger fragments than others, likely because of differences in their mouthparts. Size and age matter too: larger species process more leaves and generate larger particles, while younger larvae feed more actively and produce greater quantities of fine organic matter. Together, these tiny insects play a surprisingly large role in keeping stream ecosystems functioning.

Update:

After successfully defending her dissertation on May 8, 2026, Mourine worked on the City Invaders project (see page 6), helping to develop eDNA tests to detect non-native and/or invasive mosquito species. Now we are especially delighted for her as she takes her next major career step:

The Austrian Science Fund (FWF) has awarded her an Erwin Schrödinger Fellowship to support her project, *Warming & Pollution Effects on Macroinvertebrate Ecology*. As part of the fellowship, she will spend two years as a postdoctoral researcher at the University of Oxford in [Michelle Jackson's](#) research group, before returning to Libor Závorka's SciFish group at WCL for a third year.

Congratulations, Mourine, and we wish you every success!

## Successful Habilitation

On 17 June 2026, **Katrin Attermeyer**, leader of the CarboCrobe research group, successfully delivered her habilitation lecture and accompanying student lecture at the University of Vienna.

Her lecture, titled "*Greenhouse Gas Dynamics and Organic Matter Transformations along the Aquatic Continuum*" marked the final academic requirement in the habilitation process. Following its successful evaluation, she is now eligible for appointment as *Privatdozentin* in Aquatic Biogeochemistry.

The entire WCL team warmly congratulates Katrin on this significant achievement and wishes her continued success in her academic career.



## Theses and Dissertations

### PhD defenses:

**Pratiksha Acharya**, WasserCluster Lunz/University of Vienna, April 27, 2026:

*"Influence of resource and consumer diversity on the quality and microbial processing of fine particulate organic matter during leaf breakdown in streams."*

**Mourine Yegon**, WasserCluster Lunz/BOKU, May 8, 2026:

*"Linking Consumer – Resource Biodiversity to Leaf Litter Decomposition, Particulate Organic Matter Dynamics, and Fatty Acid Assimilation in Streams."*

### MSc defense:

**Florian Prinz**, University of Vienna, June 3, 2026: *"Fatty acids in hypertrophic carp ponds in Lower Austria."*

Photo: ©P.Acharya



## Editor in Chief

Since May 2026, **Martin Kainz**, Head of the LIPTOX research group, serves as Editor-in-Chief of *Aquatic Diversity and Ecology*, a newly established international open-access journal, together with Shunping He of the Institute of Hydrobiology, Wuhan, China. The journal is positioned as a global platform for interdisciplinary research at the interface of aquatic biodiversity, ecosystem functioning, sustainability, and environmental change.

By bringing together leading scientists, policymakers, and practitioners from around the world, it aims to advance scientific understanding of aquatic ecosystems and foster innovative solutions to emerging global challenges, including biodiversity loss, climate change, water security, and ecosystem degradation. Through the publication of high-quality, cutting-edge research, the journal seeks to strengthen the science–policy interface, support evidence-based management and conservation strategies, and contribute to the sustainable stewardship of aquatic resources worldwide. 📧

Photo M. Kainz: ©UWK\_Walter Skokanitsch




Editorial: He, S., **Kainz, M.J.** (2026): Launching aquatic diversity and ecology – New frontiers for a sustainable future. *Aquat. Div. Ecol.*, <https://doi.org/10.1016/j.jade.2026.100001>





Gerti Steniczka at the celebration marking the fifth anniversary of the WCL Sustainability Initiative

 [Info about the CO<sub>2</sub>-Calculation-Tool ClimCalc](#)

Achieving climate neutrality by 2035 is a strategic goal for universities in Austria. As pioneers, they must contribute to binding interim targets. (Hochschulgovernance of BMFWF)

WasserCluster Lunz is not currently required to conduct greenhouse gas accounting; nevertheless, we are committed to implementing and further developing this process voluntarily.



# Our first Greenhouse Gas Inventory

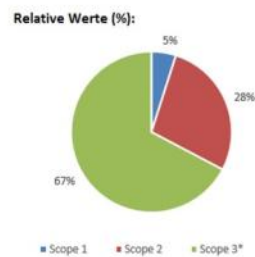
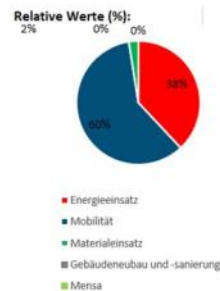
**Absolute Werte (t CO<sub>2</sub>-eq.):**

Emissionskategorie	2022 (final)
Energieeinsatz	45
Mobilität	70
Materialeinsatz	3
<b>Hauptmodul</b>	<b>117</b>
Gebäudeneubau und -sanierung	0
Mensa	0
<b>Gesamtsumme</b>	<b>117</b>

**Absolute Werte (t CO<sub>2</sub>-eq.):**

Scope	2022 (final)
Scope 1	6
Scope 2	33
Scope 3*	79
<b>Summe</b>	<b>117</b>

\* inkl. Gebäudeneubau und -sanierung & Mensa



Scope 1 – Direkte Emissionen (z.B. Fuhrpark, Heizung)

Scope 2 – Indirekte Emissionen aus Energiebezug (z.B. Strom)

Scope 3 – Sonstige indirekte Emissionen (vorgelagert z.B. Materialeinkauf, Pendeln der Mitarbeiter; nachgelagert z.B. Entsorgung von Abfällen – derzeit noch nicht erfasst)


## Gertraud Steniczka & Veronika Albrecht | Sustainability Initiative

At WasserCluster Lunz, societal responsibility as our "third mission" is an integral part of how we work. As part of our sustainability initiative, which focuses on a different theme each year, we recently turned our attention to greenhouse gas accounting. To enable targeted, evidence-based emission reductions, our core sustainability team—supported by colleagues from across the organisation—prepared our first pilot greenhouse gas inventory for the 2022 reporting year. The process generated valuable insights while laying important groundwork for future data collection and reporting.

Methodologies and standards for greenhouse gas accounting continue to evolve. To ensure a robust and transparent assessment, we used **ClimCalc**, an Excel-based calculation tool developed by a consortium comprising the Austrian Environment Agency, TU Graz, and BOKU University. We compiled data on emissions from energy consumption, mobility (employee commuting and business travel), and material use. At this stage, emissions associated with laboratory operations were excluded, as the tool's methodology for this application area is still under development.

The results identified electricity consumption and employee commuting as the principal sources of our greenhouse gas emissions. Our research infrastructure, particularly laboratory operations and the high-performance ventilation systems they require, accounts for a substantial share of electricity use. At the same time, efficiency measures have already delivered measurable improvements. For example, raising the operating temperature of our ultra-low-temperature freezers from  $-80^{\circ}\text{C}$  to  $-70^{\circ}\text{C}$  has significantly reduced electricity demand while maintaining sample integrity. These savings will be reflected in future greenhouse gas inventories.

Collecting mobility data also highlighted opportunities to improve our internal processes. Reconstructing business travel solely from financial records proved challenging, as travel routes and modes of transport could not always be determined retrospectively with sufficient accuracy. This experience has prompted us to refine our data collection procedures. Information on employee commuting was gathered through a dedicated mobility survey, which achieved an outstanding response rate of 86% across all staff groups, providing a reliable basis for extrapolation.

The lessons learned throughout this process have been incorporated into detailed internal guidance that will strengthen the quality and consistency of future greenhouse gas inventories. In the next issue of our newsletter, we will share how these findings are helping us implement targeted, data-driven measures to reduce our greenhouse gas emissions. 



Additional recent media coverage of WCL is available at: <https://wcl.ac.at/en/outreach/press>

Ovide, B. G., Rodriguez, L. K., Barbaccia, E., Niklas, R., Hobmeier, P., Iacono, A. G., Leahy, E., Villa, E., Lanfredi, C., Azzellino, A., Rasmussen, M. H., Thalinger, B. Environmental DNA Sampling from Whale-Watching Vessels for Cetacean Monitoring. *J. Vis. Exp.* (230), e70334, doi:10.3791/70334 (2026).

## Recommended Podcast (in German):

Bettina Thalinger, leader of the TRIDENT research group at WasserCluster Lunz, in conversation with host Andi Hollinger:

### *DNA-Spuren für Biodiversitätsanalysen*



Radiosendung:  
Sendereihe [Das Nationalparkradio](#)  
(Station Freequenns, das Freie Radio im Ennstal)



Podcast (without background music): [Nationalpark Gesäuse-Podcast #217](#)



A publication from the project featured in the programme—which focuses on population genetic analyses of whales using eDNA and involves Bettina Thalinger (see the information box)—is available here:  
DOI: [10.3791/70334](https://doi.org/10.3791/70334).

The link also includes a **video** accompanying the publication, demonstrating a scientific protocol for collecting environmental DNA (eDNA) samples from **whale-watching vessels**. It provides an engaging look at an innovative research project that highlights the valuable contribution of citizen science.

## Imprint

Execution:  
Veronika Albrecht

Photos:  
WasserCluster Lunz  
(unless otherwise stated)

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## SAVE THE DATE: WCL Open Day

On **Saturday, 19 September 2026**, from **10:30 a.m.**, WasserCluster Lunz warmly invites everyone to its biennial **Open Day**.

Visitors of all ages can look forward to an exciting programme at both of our locations, including refreshments and grilled snacks, as well as shuttle boat transfers between the two sites (departing from our main building at **Dr. Carl Kupelwieser Promenade 5**). Discover the fascinating world of freshwater research through:



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- Insights into the work of our five research groups
- Guided tours of our laboratories, including the fish laboratories
- Interactive hands-on activities
- A children's discovery rally and much more!

*The next WCL newsletter will be published in December 2026.*