EGEA ANNUAL CONGRESS 2023

Water in a Changing Europe:
an SDG Perspective

CONGRESS REPORT

Dear EGEAns and readers,

This year, we had the privilege of organising the Annual Congress 2023, an incredible event and experience for all of us.

This event that we consider a great achievement was made possible by our great association EGEA, that supported and connected us from all over Europe to this Congress. We, as main organisers, can't stop thanking all of you participants that joined us, all external supporters and sponsors from various organisations, universities and companies who gave us their support through knowledge, donations, time and finances, all workshop and training leaders, our precious helping hands but also, and most importantly, our amazing organisation team, that since October of 2022 made this Congress possible, and made history by being the most international Orga Team ever.

Throughout these 11 months, the AC organisation bestowed upon us a myriad of emotions as we conquered various challenges on our way and now, we can profit from a wealth of new knowledge that will forever enrich our personal and professional lives.

We are proud of our hard work that made this congress possible and now is matched by our excitement to present the AC23 report. This document encapsulates some of our best memories and provides insight into the congress.

We sincerely hope you will find the report as enjoyable to read as you found our congress to be.

See you soon somewhere in Europe

Micol and Alex


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1. Our Congress

By Micol Alessandri (Malta)

From the 4th to the 9th of September of 2023, the EGEA annual congress took place in Austria, close to the lake Attersee, in Salzkammergut.

In this report you will be able to learn all about our congress. Starting some data's to show joined us, arriving to the program and ending with our sponsors and friends that made possible our event.

The biggest part of this report will be focusing on one of the most important aspects, our workshops. Our scientific topic was "Water in a Changing Europe: An SDG Perspective,". The Agenda 2030 for the Sustainable Development Goals was central in our process of choosing our topic, since it represents what we all can do for the planet and the population, but especially what all our countries could and should do. Exploring the SDGs most connected to our Scientific team with the workshops leaders tried to do their part and raise awareness on the topic.

The soul of this event, as always, are the people, who joined us and who created this congress. The Orga team was composed by 17 EGEAns, and 5 helping hands, with a total of 11 different entities combined!

Figure 1: The orga team of AC2023

2. Our Participants

By Jenni Honkanen (Oulu) and Carolin Stief (Augsburg)

150 people were participating in the Annual Congress 2023 and willing to learn about water in a changing Europe as well as connecting with each other. Additionally, 20 people from the Orga team and Helping Hands were present to make the congress work.

Registration

Right after registration opened, the entities with the most applications were Zagreb, Mainz and Ljubljana, followed by Marburg and Hannover (Figure 2).

Figure 2: Entities with the most applications

In total, 55 entities, from 20 different countries were present at the AC 2023 in Weißenbach am Attersee, Austria. Germany being the most common country of origin. At the congress, the most registered people were from Hannover (7) and Budapest, Halle, Warsaw, Zurich (each 6) as well as Bamberg, Bochum, Osnabrück and Zagreb with 5 each on third places (Figure 3). Including the Orga Team, Augsburg was represented by 10 people (4 Orga, 2 Helping Hands, 4 participants).

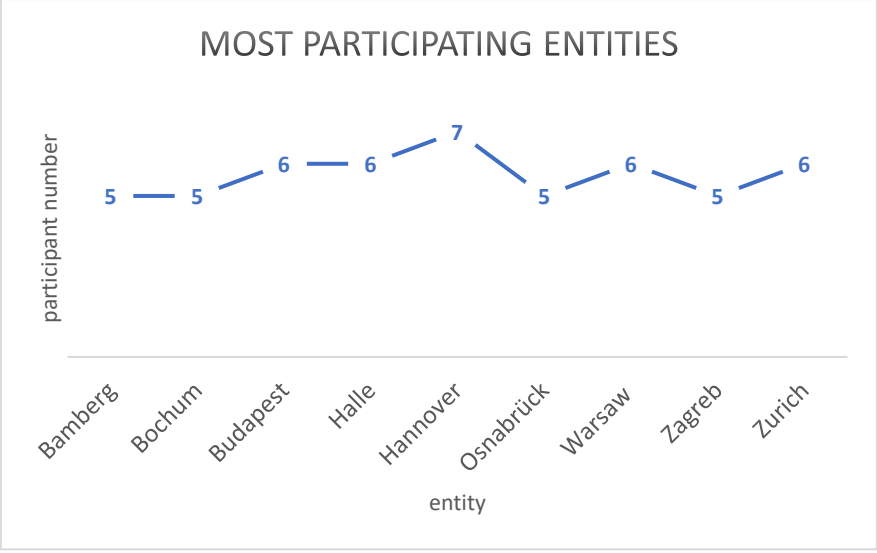


Figure 3: Entities with the most participants

Age

Comparing the ages of all participants, the youngest participant was born 2004 (19 years old), whereas the oldest participant was 28 years old (born in 1994).

Spread of the sickness

As we may remember, many of the participants got sick during the congress. According to the statistics provided by Céline & Wanja, EGEA Zürich, even 84 % of the participants, who filled in the survey (N=122) were sick at the end of the congress. Most common symptoms were sore throat, cough, and runny nose. Bungalows 1, 3, 4, 5, 9, 11, and 12 had the highest percentage of sick people, since even 90-100% of the people staying in those bungalows got sick, whereas the lowest percentage of sick people was in bungalows 7 and 8. However, none of the accommodations was disease-free at the end of the congress.

Figure 4: Group pic on day 1

3. Our Programme

Leisure & Evening Activities

Nathan Grech (Malta)

During the inaugural day of the congress, it was important for us to set a lively tone amongst the participants in order to get them to integrate and get to know one another. To do so, we set up some dynamic team building/ice breaker activities, strategically designed to foster these positive connections among participants. Whilst the first half of these activities were more relaxed and slower paced, the second half set about a more competitive dynamic. After this session was over, all the participants left talking with people they had never event met before. Other activities were curated during the congress at dedicated times such as yoga, sports tournaments, documentary screenings and more to help diversify the congress's offerings whilst also keeping it engaging

Figure 5 Ice-breaker activities on the first day of the congress

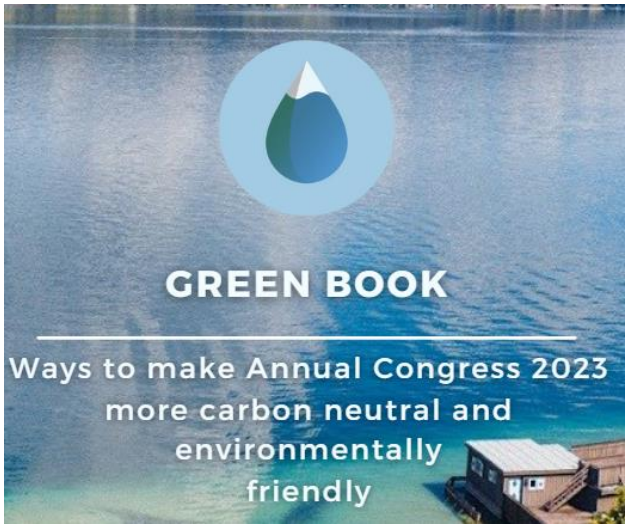
Of course, evenings came about as a time to unwind. Each evening was specially curated to ensure participants would have fun after a long congress day. For the first evening, we once again wanted participants to get to know and engage with more people and so another ice breaker activity was set out which was focused around getting to know the orga-team members and their respective countries. Following this event was the Eurovision party which took centre stage for the evening. As night fell, the congress transformed into a Eurovision Night celebration, marked by a sophisticated black and white dress code. The Motto Party commenced with an air of excitement and style, as participants adhered to the classy dress code. The evening's festivities were centred around the Eurovision theme which concluded with participants hitting the dance floor, celebrating the successful commencement of the congress with music and joy.

This of course was the first of our many themed evening activities. Such themed evenings include the “Aqua evening” which took place on the third night. This was a more relaxed evening the in which we showed a water themed movie in the main hall, which was later transformed to allow for board games to be played. For the penultimate evening we encouraged participants to dress up for a 90s style party with era appropriate music. In tandem with the main party, a karaoke room was set up in order to help. Additional nights included the highly anticipated cultural fair, where all the different entities get to showcase their countries and regions through a culinary lens for everyone to experience, and of course the farewell party during the final evening.

Figure 6 Some of the creative costumes worn at the aqua motto-party

4. Our Green AC

By Agnes Rosenberg and Marie Johanna Univer

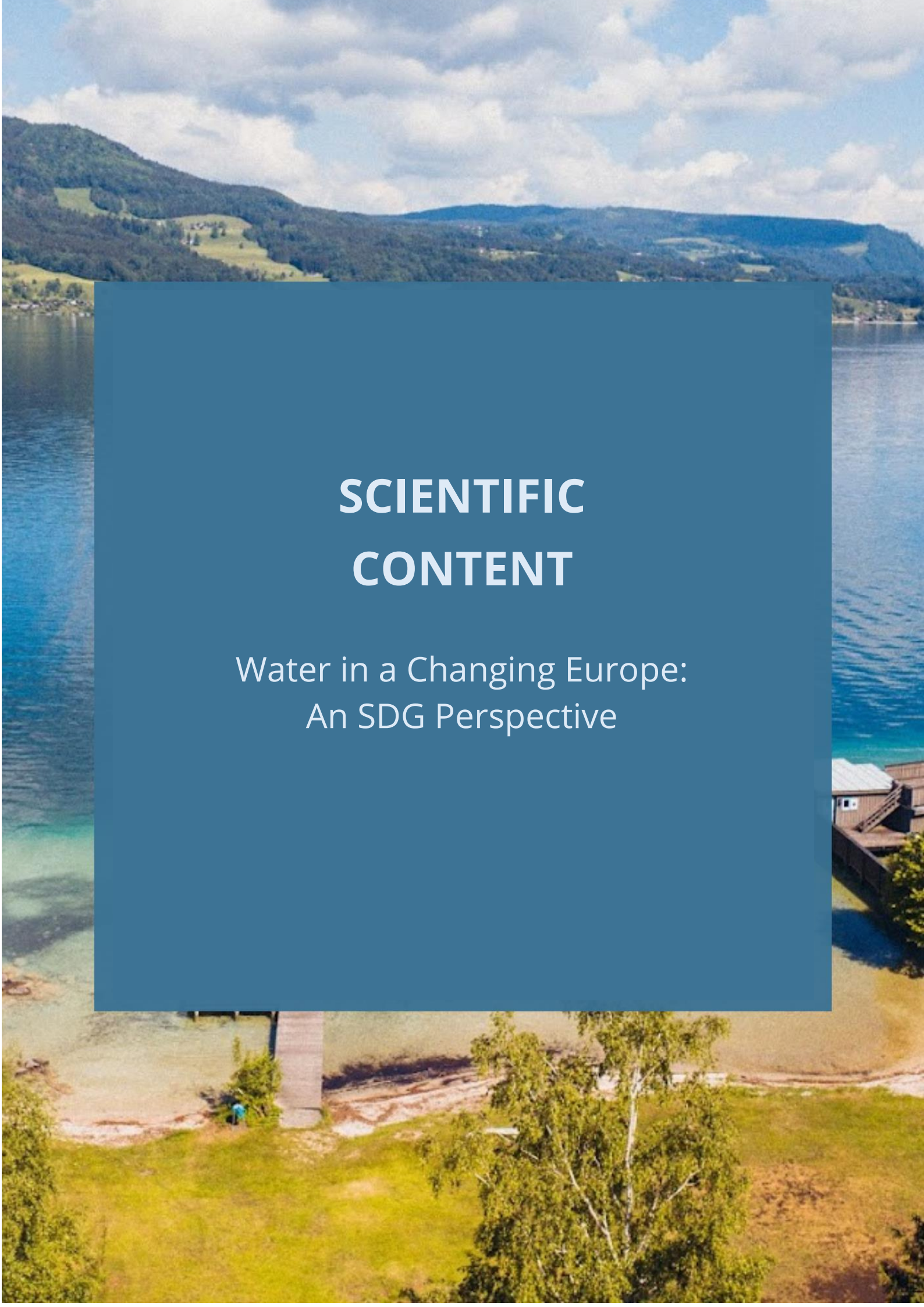


To make AC 2023 as environmentally conscious event as possible, the Green Team put together a "Green Book" (see Figure 7.1) to make it easier for both organisers and participants to follow the guidelines and reach set goals. For an event to become sustainable, it should start as early as planning one's journey to the venue. Therefore, we came up with a slow-travel-bingo which was both inclusive and engaging as it was possible to fill it out using various means of transport and a various number of people. The slow-travel-bingo (see Figure 7.2 below) consisted of small activities that didn't require much of an effort nor time, but nevertheless made a journey more enjoyable. To everyone who successfully managed to fill the bingo card, a small gift was given at the AC23 venue.

Figure 7 AC Green travel bingo layout

At the venue, vegetarian and vegan meal options were provided and smaller portions handed at first to reduce food waste. In case of a remaining hunger, more food was always possible to ask. Recycling was also a core theme so different bags for separating waste was put up in all the buildings (e.g. bottles, paper, plastic packages, etc.). As tap water was available, carrying around reusable water bottles was recommended as well as loaning reusable plastic cups for evening activities. The orga-team T-shirts were made of organic cotton and the text on them was printed in a company not far from Austria which prevented the need for a long-distance courier. Finally, the main organiser Micol Alessandri sold hand-made crochet bottle/cup holders which made carrying around reusable cups or bottles easier between those different buildings at the AC23 venue. In total, 58 people had signed their confirmation that the Annual Congress 2023 was in fact a sustainable event.

Figure 8 An excerpt from the Green Book cover



SCIENTIFIC CONTENT

Water in a Changing Europe:
An SDG Perspective

5. The Workshops

By Mareike Oelrichs (Augsburg) and Franziska Sendl (Augsburg)

The scientific focus of the congress was "Water in a Changing Europe: An SDG Perspective," with a particular emphasis on three key thematic areas. Firstly, the congress delved into the ecosystems and biodiversity both underwater and on land, exploring the intricate dynamics at play in these environments. Secondly, attention was given to local, regional, and transboundary water usage and management, shedding light on the complexities of water governance. Lastly, the economic benefits derived from water resources were scrutinized, highlighting the multifaceted dimensions of the economic aspects related to water.

To facilitate in-depth discussions and knowledge exchange, six workshops were selected through an application process. The workshops, tailored to accommodate 15-20 participants, were strategically scheduled within four time slots, totalling 6.5 hours of intensive exploration. Some participants were tasked with preliminary assignments to be completed before the congress, ensuring a proactive engagement with the workshop topics. Additionally, to the water-themed workshops, one training focussed on handling stressful situations in life was offered by two EGEAns.

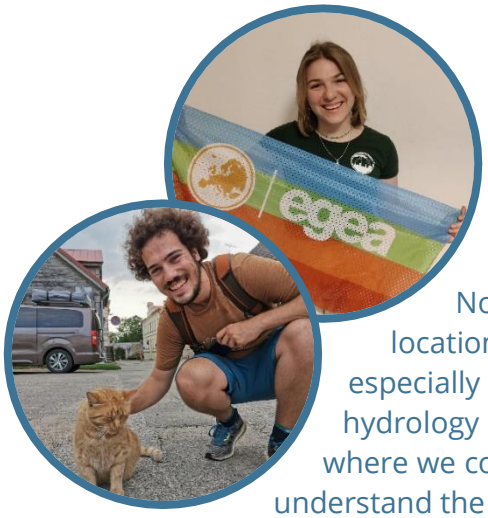
The workshops were designed to encompass various methodologies, providing participants with diverse perspectives on the chosen themes. Throughout the sessions, participants collaborated in different ways to analyse and synthesize information, contributing to a comprehensive understanding of the scientific subjects at hand. The Science Team was quite pleased with the outcomes of the workshops, as participants successfully met the challenge of generating presentable results within the session formats.

An important component of the congress' scientific part was the final day's presentation, where participants showed and disscussed the findings of their respective workshops with all other participants. The science coordinators expressed gratitude to the training and workshop leaders for their instrumental role in achieving the congress's scientific objectives. Their dedication and effective facilitation greatly contributed to the success of the congress in delivering valuable insights into the complex issues surrounding water in a changing Europe from the perspective of Sustainable Development Goals (SDGs).

Figure 9 Themes of potential workshops and their link to the overarching congress topic

5.1 Water is changing Europe: a methodological approach

Tabea Kottek (Augsburg) and Job Stopar (Lubljiana)



The aim of our workshop titled "Water is changing Europe: a methodological approach" was to explore the different ways in which water has changed the landscape of the Northern Limestone Alps and the Attersee – the congress location, in detail. We achieved that through both theoretical but especially practical research of the geomorphology, geology and hydrology of the area of the lower part of the Weissenbach valley, where we conducted both fieldwork and water testing, which helped us understand the landscape and the role of water in it better.

Geomorphological part

During the first session of our workshop we had a theoretical introduction about the alpine orogeny in late Mesozoic and early Cenozoic when the Eurasian tectonic plate got subducted beneath the African tectonic plate. During this process thick layers of sedimentary rocks, which were formed before the orogeny in the Tethys Sea between Laurasia and Gondwana in Mesozoic, were uplifted and folded. The main geomorphological factors in the last 2 million years were exogenic forces, especially denudation, river erosion and glaciation in the Pleistocene (Pfiffner et al., 2019). According to geology, the Alps how we know them today can be divided into three parallel belts:

1. The French limestone Prealps, Swiss limestone Alps and the Northern Limestone Alps
2. Central Alps
3. South limestone Alps

During our workshop we focussed on the Northern Limestone Alps as the Congress took place right next to them. They extend from Bodensee to the Vienna Woods and are 20 to 50 km wide (Trümpy 2006). The prevalent rocks there consist of Mesozoic, especially Triassic limestones, but also dolomites and marl in often very thick layers due to the location of this area on the SE passive continental margin of Eurasia, where layers of sediments were being deposited in the sea. In Quartenary, glaciation heavily transformed the area (Husen, 2003). When the glaciers retreated at the end of the last main glacial period (the Würm), the steep and often vegetation free surfaces were left exposed, leading to mass movements such as rockfalls and landslides, creating debris cones, with the largest rockfalls occurring in limestone areas.

Regarding the Attersee regions the main influence on the region were Pleistocene processes like glaciation. During the Pleistocene glaciation, only the highest peaks, ridges, and crests above 2000–2500 m rose above the glacier surface during glacial maxima. There were many ice stream tongues in the area of the Salzkammergut, with the Western

Traun glacier covering the area of the Attersee. These glaciers formed distinct terminal moraines and adjacent outwash plains developed further north. The latter were dominated by permafrost and the deposition of loess due to dry and cold climatic conditions. In the late glacial dead ice remnants in the south and the moraine wall in the north blocked the outflow, creating a lake with a level of about 550 m above sea level. The lake Attersee emerged. The slow deepening of the Ager into the terminal moraine lowered the lake level to today's level. After the ice ages, more or less the modern geological composition of the region came to be (Husen, 2003).

The high ridge of the Höllengebirge built out of Wetterstein Limestone, Wetterstein dolomite and Steinalm Limestone, so main units of the Attersee area are:

1. Wetterstein Formation (Thenius, 1974)
    - Late Triassic
    - around 250-150 million year old deposits of the Tethys Sea prehistoric ocean
    - is composed of mostly reefal limestones and dolomites
    - numerous fossils of corals, sponges, bivalves, gastropods and other marine groups indicative of a shallow marine carbonate platform environment deposited at the northern end of the Tethys Ocean
    - the Wetterstein limestone tends more towards karstification than the Wetterstein dolomite. Of the typical superficial large forms, dolines are very common. They are often based on geological faults and form so-called doline alleys, such as in the Haselwaldgasse. The dolines mostly have a diameter between 5 and 10 meters.
2. Steinalm formation as a sub-unit of the Wetterstein Limestone (Thenius, 1974)
    - light, massive, gray and grey-brown micritic (limestone constituent formed of calcareous particles ranging in diameter up to four μm formed by the recrystallization of lime mud) or sparitic (crystalline matrix) algal limestone
    - Underlain by the Guttenstein formation and overlain by the Wetterstein formation
    - The lower hills and valley behind the ridge on the left bank of the Weissenbach built out of Main Dolomite (Tollmann, 1976)
    - The Main Dolomite reaches higher thickness than underlying dolomites in Alps, therefore it is considered as more important "Main"
    - medium bedded dolomitic layers often with characteristic stromatolitic lamination (layered sedimentary formations (microbialite) that are created mainly by photosynthetic microorganisms such as cyanobacteria, sulfate-reducing bacteria, and Pseudomonadota)
3. Wetterstein Dolomite (Thenius, 1974)
    - Wetterstein dolomite is rarely as bituminous as typical Main Dolomite and therefore tends to be much more pure and brighter-coloured
    - Small outcrops of the Guttenstein formation (Thenius, 1974)
    - includes black, gray and brown, bituminous limestone with mostly thin layers, white calcite veins and also dolomitic inclusions
    - two main types of facies: an algal biosparite , which was formed at shallow depths in moving water, and a micrite , which was formed at a slightly greater depth.
    - Macrofauna fossils like ammonites, crinoids and brachiopods

After the final disappearance of the ice and the formation of the Attersee, extensive delta deposits were accumulated at all major tributaries. The delta sediments of the Äußeres

Weißenbach fill the entire Weißenbachtal with a thickness of around 100 m. But also at the mouths of the streams on the east side of the Attersee, extensive delta bodies have formed due to the high debris load. The silting up of the lake basin in the Attersee is slower than in the other large lakes in the Salzkammergut, since the Mondsee, the Fuschlsee and the Zeller See are upstream of it as sediment storage and sludge traps (Behbehani et al., 1986).

During the first part of our fieldwork, we observed the landscape of the delta of the Weissenbach. We could clearly make out the former, natural channel in the landscape, which together with the straightened and fortified riverbanks clearly denotes the practice of channel straightening, which was very common in the Alps from the mid-19th century onwards. A study which analysed 143 largest Alpine rivers found that channel straightening caused over 500 km of loss in river length, which constitutes about 4,3% of the historical extent. More importantly, multi channel stretches, which the Weissenbach probably was according to historical maps, today represent only 15% of their historic extent, while in total, 45% of the larger Alpine rivers have been either intensively channelized, as is the case with the lower flow of the Weissenbach, or turned into reservoirs (Hohensinner et al, 2020).

During a small hike we discovered a core drinking water protection zone. Water protection zones in Austria are areas designated to safeguard water resources and ensure the quality of drinking water. The rules and regulations governing these zones may vary by region, but they generally aim to prevent pollution and maintain the ecological balance of water bodies.

Here's a general overview of water protection zone rules in Austria:

Definition of Water Protection Zones: Water protection zones are areas around water bodies (e.g., rivers, lakes, and reservoirs) that are subject to specific regulations to protect the quality and quantity of water. These zones are designated by local authorities, often in collaboration with regional and national agencies (Wasser OÖ).

Zoning Categories: Water protection zones in Austria are typically categorised into three zones, namely:

- Zone I: This is the most critical zone closest to the water body, where stringent regulations apply to prevent any activities that could endanger water quality. Usually, construction is highly restricted or prohibited in Zone I.
- Zone II: This is a transitional zone with slightly less stringent regulations compared to Zone I. Some controlled development may be allowed, but activities must not pose a significant risk to water quality.
- Zone III: This zone is farther from the water body and often subjected to fewer restrictions. Land use and development may be more flexible, but still subject to water quality protection measures.

Activities in Water Protection Zones: Common activities regulated or restricted in water protection zones may include:

- Construction and development projects.
- Use of fertilizers, pesticides, and chemicals.
- Waste disposal and sewage treatment.
- Agricultural practices.
- Storage of hazardous materials.
- Logging and forestry activities.
- Industrial operations.

Monitoring and Enforcement: Local authorities are responsible for monitoring and enforcing regulations within water protection zones. Regular water quality testing and inspections are conducted to ensure compliance (Wasser OÖ).

Permit Requirements: In many cases, landowners and developers may need permits or approvals from local authorities to undertake activities within water protection zones. These permits often come with specific conditions to protect water quality (Wasser OÖ).

Public Awareness: Public education and awareness campaigns are often conducted to inform residents and businesses about the importance of water protection and compliance with regulations (Wasser OÖ).

Legal Basis: Water protection zone rules in Austria are primarily governed by regional and local laws and regulations. These can vary from one region to another (Wasser OÖ).

To obtain the most up-to-date and specific information regarding water protection zones in Austria, it is recommended to contact the relevant regional or local authorities responsible for environmental and water management. They can provide detailed information, regulations, and resources to ensure compliance with water protection measures in a specific area.

Our last stop was the river Weissenbach where we collected rock samples to create a geological map to touch. From different landslides and also transported by the river we think we found a wide variety of different types of limestones and dolomite. We tested the samples by cracking the rocks with a geological hammer to get a fresh cut. On this cut we've put some hydrochloric acid (10%). If it's limestone it fizzes, if it's dolomite it barely fizzes.

The reaction between limestone (calcium carbonate, $CaCO3$) and hydrochloric acid (HCl) is a classic example of an acid-base reaction that produces carbon dioxide ($CO2$), water ($H2O$), and calcium chloride ($CaCl2$) as products. Here's the balanced chemical equation for this reaction:

$$CaCO3\ (s) + 2HCl\ (aq) \rightarrow CaCl2\ (aq) + H2O\ (l) + CO2\ (g)$$

In this reaction:

- Limestone ($CaCO3$) is a solid (s) reactant.
- Hydrochloric acid (HCl) is an aqueous (aq) solution.
- Calcium chloride ($CaCl2$) is a soluble salt that remains dissolved in the solution.
- Water ($H2O$) is produced as a liquid.

- Carbon dioxide (CO2) is produced as a gas, and it is often observed as bubbles when the reaction occurs.

Hydrogeographical part

In the second part of our workshop, we explored how the geology and other characteristics of the area of the congress impact its water resources. Our goal was to get a better insight into the hydrological landscape of the Weissenbach area by using simple water testing methods to determine not only the influence of the landscape on the water quality, but also to find out possible anthropogenic influences on the water sources. We decided to test four different water sources in the immediate vicinity of the congress location - the Weissenbach, one of the waterfalls in its upper course, tap water at the campsite and the lake water of the Attersee.

The latter is the largest body of water in the Salzkammergut region with a surface of 45,9 km² and a volume of 3944,6 x 10^6 m³, which makes it the second largest lake in Austria by volume, only behind Lake Constance. With an average depth of 84,2 m and the maximum depth of 170,6 m, it is also the third deepest lake in Austria behind Lake Constance and nearby Traunsee (Dokulil, Teubner, 2002). The hydrological catchment area of the Attersee has a total area of 464 km² and it represents the final link in the chain of lakes stretching from the Fuschlsee in the southwest and Irrsee in the northwest via the Mondsee, which is connected to the Attersee through the 2,9 km long Seeache, which presents 58% of the total inflow to the lake. One important feature of the Attersee is its long water renewal time, which with 7 years presents the highest theoretical water exchange rate of all Upper Austrian lakes. Another characteristic of the Attersee is its strong stratification, making it a so-called dimictic lake with the water completely mixing in spring and fall, while being deeply stratified in summer in winter, which heavily impacts the physical, but also biological and chemical properties of the lake (Behbehani et al, 1986; Atterse (Kammersee), 2023). The Attersee has a very low concentration of nutrients and is therefore considered an ultra oligotrophic lake. The reasons for that are especially the lack of industry and large scale intensive farming in its basin, one of the first sewage systems in the region and the location of the sewage treatment plant outside of the lake's catchment,and the Attersee's location at the end of a chain of alpine lakes, which in practice act as sediment storage and sludge traps (Jagsch, Gassner, Dokulil, 2002; Atterse (Kammersee), 2023). The workshop took place in the lower flow of the Weissenbach, one of the many tributaries, which flow into the lake from the Höllengebirge massif. The catchment of the stream extends over 8,12 km² of mostly limestones and dolomites with Cambisols and Leptosols as the prevailing soil type (Seidl et al, 2018).

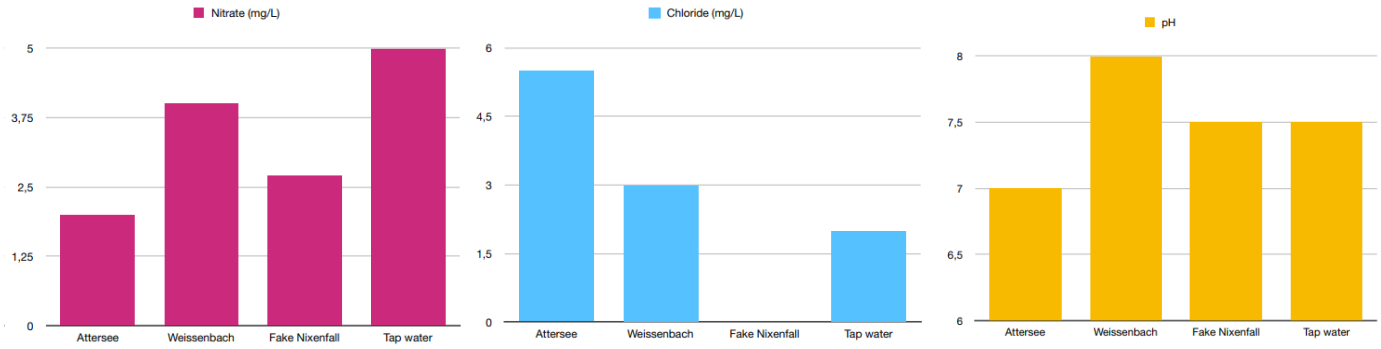
To showcase the hydrogeographical characteristics of the landscape and to find out more about how the landscape affects the water, we decided to conduct simple water testing, using lab kits kindly lent to us by the Physical Geography Laboratory at the Department of Geography at the University of Ljubljana. We tested four different distinct water samples: water from one of the waterfalls at the source of the Weissenbach, the Weissenbach itself in its lower reaches right next to the Europacamp, the top layer of the Attersee at the Europabad and the tap water at the camp site. The results of the testing are noted in the table below (two remarks: The site "fake Nixenfall" denotes the water

sample from one of the waterfalls at the source of the Weissenbach which was thought to be the famous Nixenfall, but ended up being a different waterfall. Also, this sample along with the tap water sample, was not tested for temperature and water conductivity since the samples were not collected fresh):

Water is changing Europe - measurement results

	Temperature (°C)	Conductivity (µS/cm)	Nitrate (mg/L)	Phosphate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	pH
Attersee	22,2	271	2	0,01	0	5,5	7
Weissenbach	10,9	276	4	0	0	3	8
Fake Nixenfall	-	-	2,7	0	0	0	7,5
Tap water	-	-	5	0,0001	0	2	7,5

The results were also shown using graphs (created by Adela Husakova and Merle Hünniger):



If we start with temperature, there were significant differences in temperature between the lake and the stream. The temperature of the surface lake water at 22,2 was near the highest values measured at Attersee (Atterse (Kammersee), 2023), which we can probably attribute to our measurements taking place in September after a very hot summer and after a week of intense sun and very warm temperatures. On the other hand the temperature of the Weissenbach is characteristic of a typical alpine stream with loads of water mixing and aeration processes originating at higher and colder altitudes. Water temperature plays a major role in all biological, chemical and physical processes in the water, including the dissolution of gases, self-cleaning abilities, pollutant solubility etc. (Temperature and Water, 2019). Next up, we tested the electrical conductivity of the stream and a lake using a simple handheld conductivity meter. Electrical conductivity is cause by water soluble compounds called electrolytes, which can either be nutrients, pollutants etc. Temperature has an important effect on this parameter, usually meaning that at higher temperatures, the ability of water to conduct electricity is higher. A higher conductivity does not necessarily mean pollution, but is most often connected to the geology of the drainage basin. In basins made up of silicate rocks, the water conductivity usually only reaches a couple 10 MicroSiemens/cm, while on carbonates, conductivity can reach hundreds of MicroSiemens/cm. This parameter is useful since any change in long term values in a certain drainage basin can signify pollution (Queen Mary University of London, 2023). In our case, the conductivity of both samples was around 275

MicroSiemens/cm which is explained by the carbonate composition of both drainage basins and their location in the Northern Limestone Alps.

We then measured the nitrate concentrations in all four samples. Nitrates are one of the primary nutrients and are necessary for primary production in water. They can occur naturally, for instance as a product of the anaerobic decomposition of carbon or can be brought into the water anthropogenically, which can be problematic, especially in summer when the discharge is lower and water temperatures are higher. The main source of nitrogen compounds is runoff from agricultural surfaces, while industrial runoff is also a significant source (Nitrate in drinking water, 2023). The most nitrates, 5 mg/L were interestingly measured in the camp's tap water which is probably a result of water treatment and the value itself is still half the required nitrate threshold. Next up with 4 mg/L was the Weissenbach where these are probably a result of natural processes in the soil, since they also occur in significant figures at the source. The lowest concentrations were found in the lake itself which is probably a result of the watering of the nitrogen affluents, which are already less prominent than they used to be due to better sewage systems and the extensification of agriculture (Jagsch, Gassner, Dokulil, 2002). Another needed nutrient is phosphorus, which can occur naturally from rocks or anthropogenically through urban and household waste, especially due to cleaning liquids. One of the major sources of phosphorus is soil erosion (Phosphorus and Water, 2016), which has in the past locally caused extremely high levels of phosphates in the Attersee. In the flysch zone on the lakes northern, northwestern and northeastern shores, smaller landslides are not rare. When they occur, they expose a lot of phosphates, which are present in the softer, absorbable and water-bearing rock layers within the sandstone, which in turn get washed into the streams which can locally and on a short timescale have phosphate values of over 100 mg/L. In the 1970s, due especially to increasing intakes of fertilisers, the lake experienced phosphate pollution which led to eutrophication processes, especially at the mouth of the Seeache which contributed to around 50% of all phosphate intake. With remediation measures and the extensification of agriculture, these values soon dropped and in 1986, the limit for ultra-oligotropha was reached. Average phosphate concentrations in the 90s reached around 2 to 3 mg/L (Moog, 1984; Behbehani et al, 1986) while we observed significantly lower values, with the highest being those of the Attersee, which makes sense. Sulphates on the other hand are not necessary for water organisms and often signify pollution. They can also occur naturally due to volcanism, mineral weathering or the decomposition of organic matter. Human activities can majorly increase sulphate concentrations either through atmospheric pollutant, mining, fertilisers and industrial wastewater. Climate change especially is altering sulphate concentrations, increasing them especially because of wetland drying, more intensive rainfall, rising sea levels which penetrate the groundwater with sulphate rich seawater (Suplhate in Water Bodies, 2023). Generally in the Alps, high sulphate levels would probably indicate some sort of industrial pollution but thankfully we did not find any sulphates in any of our samples. We also tested our samples for chlorides. One of the main anthropogenic sources of chlorides in colder climates are road salts which flow into the water sources and pollute them. A study in the USA found that up to 78% percent of salt used on roads gets transported either into groundwater or rivers and lakes (Novotny, Murphy, Stefan, 2007). Another source of chlorides are water softeners, especially in

carbonate water sheds, where chlorides are applied to water to soften it and prevent hard water spots. Water treatment plants are often not designed to process salt, therefore these chlorides end up untreated in rivers (Chloride, 2023). Chlorides can also appear in the water naturally in geologies where salt is present, or even more commonly in places

where salt mining takes place. Examples of these are nearby Traunsee and Hallstattersee, where chlorides were seeping into the lakes from industrial tailings from the salt mines or from accidental leaks, such as the one that occurred in Hallstatt in 1978. Chloride concentrations in these lakes sometimes even reached up to 85 mg/L, while Attersee was often taken as a reference site for these two lakes with background values of around 3 mg/L being reported as normal (Wunsam, Kamenik, Schmidt, 2002). The value we found for the lake was 5,5 mg/L, which might indicate a sort of smaller pollution, possibly stemming from fertilisers or water softeners. We can say similarly for the Weissenbach, where values should generally be lower than in the lake and the resulting 3 mg/L might be a result of the intake of water softeners from the upstream quarries and rock cutting facilities, since the value cannot be explained naturally, as the value of chlorides at the source presented 0 mg/L. The 2 mg/L in the tap water are most probably a result of the water being treated.

Last but not least, we also tested the pH of all water samples using simple pH testers. The pH can be impacted by many factors, but mainly geology, respiration and photosynthesis, agricultural runoff etc. More nutrients in the water generally mean increased rates of vegetation growth, meaning higher rates of photosynthesis and an increased CO2 consumption, in case making the pH higher. pH can also affect the solubility of toxic materials, with lower pH generally being more suitable for those processes to take place (pH and water, 2019).The pH of all of our samples was somewhere between 6 and 8,5, which generally means pH most suitable for water organisms. The highest pH at 8 was found in the Weissenbach which generally makes sense due to the highly carbonate watershed and the location of the sampling site downstream where the photosynthesis has a larger effect. In turn, the pH at the source of the river was 7,5, the same as in the tap water, while the lake had a pH of 7.

All in all we can say that the water sampling methods proved effective to demonstrate the effects which the landscape has on the water quality, but also the anthropogenic influences which were at the heart of this year's congress scientific theme. Through these we also highlighted the SDG 6 - clean water and sanitation and connected it to SDGs 13 - protect the environment, and 14 - life below water.

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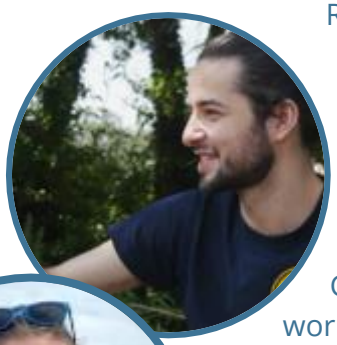
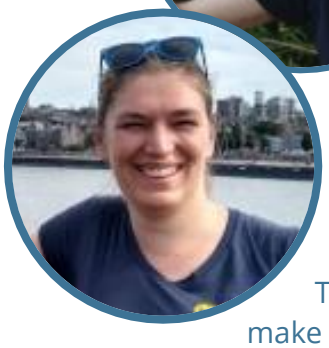
5.2 Water governance challenges around the Attersee

Rhune van Cleemput (Leuven) and Dennis Wilke (Osnabrück)





The following workshop report gives an overview over the goals, methodology, results, and conclusions of the workshop "Wat'er you? – A scientist! – Water Governance Challenges around the Attersee" during the the European Geography Association's Annual Congress 2023. During this workshop, 15 geography students designed and conducted their own research projects, utilising different methodological approaches, in order to explore prevailing challenges of water governance in relation to the Attersee, where the congress took place.

The Attersee comprises an area of 46 km², of which protected areas make up 13.834 ha. With a depth of 169 m, it is one of Austria's deepest lakes (Leitner et al. 2022). It has an extremely low nutrient load and, with visibility depths of up to 20 m, is the clearest lake in the state of Upper Austria (OGW 2011). Of the lakeshore, only 13 % are accessible to the public, while the remaining part is privately owned. Accordingly, 39 % of the lakeside properties are secondary residences, which are often uninhabited for more than half of the year (Leitner et al. 2022). This situation lead to numerous conflicts up to now.

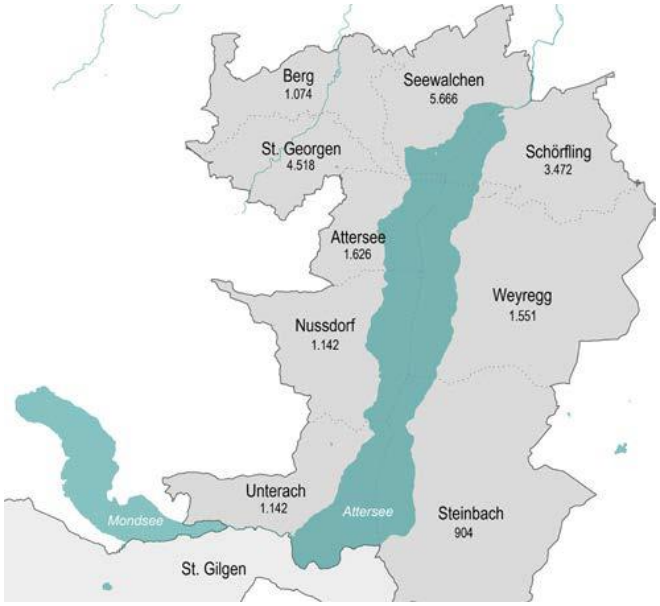


Figure 10 Municipalities and their inhabitants around the Attersee (Leitner et al. 2022, 17).

Workshop goals

The workshop aimed towards reaching several goals regarding further education and capacitation of the participants on the one hand, as well as research on the other: First, we aimed to gather further insight into local water governance challenges, and to water governance in general. Therefore, the first part of the workshop primarily consisted of a thematic input regarding water governance theory, and a group work, in which the

participants were given different texts regarding water governance challenges around the Attersee. A focus was laid on the challenge that comes from multiple conflicting interests towards the same resource.

Second, the participants should gain a deeper understanding in terms of theory and application of social science research. This was first pursued by a theoretical input regarding social science research methods. In the further course of their workshop, the participants could pick methods that were adequate for researching their specially formulated research question, and apply them in order to collect the data required for answering their questions. Thereby, the participants could broaden their scientific competences through conceptualising and conducting their own min-research projects.

Third, the research conclusions aimed not only to have a solid scientific basis and be of a high quality, but also be oriented towards solutions. The results should contribute to the current state of research and help tackle some of the challenges explored.

Fourth, the research focuses specifically on contributing towards the following sustainable development goals:

SDG 6: Clean water and sanitation

One of the workshop's focuses are the lake's riparian zones. Such areas are important ecosystems, which the whole lake system can benefit from, if they are in a natural state. Furthermore, the anthropogenic usage of the lake for several activities affects its water quality, one of the key targets of SDG 6. Another one is the implementation of integrative water resources management, which is based on cooperation and equity.

SDG 11: Sustainable cities and communities

One of this goal's targets is the protection of natural and cultural heritage, which the workshop strives towards. Furthermore, affordable and sustainable transport systems are important in this context, as problems were identified in research.

SDG 16: Peace and justice, Strong institutions

Opportunities for improvement in contributing towards this SDG are identified regarding inclusive, responsive, and representative decision-making. The results of this workshop can simultaneously contribute towards making local institutions more effective and transparent.

SDG 17: Partnerships for the goals

One of the SDG's targets is sharing knowledge and cooperation for access to science, technology and innovation. This is attacked through an international group composition, as the members bring different backgrounds and scientific perspectives into the

workshop. Furthermore, the integration of local stakeholders and academic and political actors ensures an integration of local and scientific knowledge.

Research questions

The overall workshop followed to main explorative research questions:

- What challenges in water governance exist around the Attersee?
- How can social science research methods contribute towards solving these challenges?

Furthermore, in the course of the research, the participants formed four small groups differing by distinct topics of interest. Each of these groups focused on contributing towards exploring a special local water governance challenge, and therefore formulated their own research questions:

- How are public spaces managed and how can they be protected?
- To what extent does the legal property contribution framework contribute to local land-use conflicts?
- What tourism challenges exist around the Attersee?
- How do municipalities around the Attersee cooperate, or compete for sustainable tourism?

Theoretical background

In order to research water governance challenges, first an understanding of the concept of governance is detrimental. Then, this theoretical concept will be applied to the context of the Attersee.

Governance is defined as "[...] the patterns that emerge from governing activities of social, political and administrative actors. These patterns form the emerging' outcome [...] for day-to-day efforts at governing" (Kooiman 1993, 2). Governance processes are essential in any society and can take many different forms. They can facilitate the generation of collaborative learning, knowledge generation, conflict resolution, monitoring and evaluation and solving complex environmental problems (Bodin 2017; Pahl-Wostl 2019, 8).

Within governance, various elements can be recognised. **Actors** can be the state, civil society, economy, public sector, cultural sector, citizens. Between these actors there are various **interactions**. These interactions occur through the existing structures and processes which enable the actors to **make decisions and share power**. **Management processes** are in place to react on societal problems. These processes are characterised by formulation, implementation and evaluation of the measures. **Institutions** shape laws and formal rules on a specific social or political issue. And lastly, **social norms** are informal rules followed by actors. These are highly dependent on the resources available to them (Folke et al. 2005, 444; Pahl-Wostl 2009, 2019).

As a resource, water is very distinctive. First, it connects both societies and ecosystems. Hence, they are often studied through the lens of social-ecological systems (SESs).

Accordingly, water is not only characterized by its physical properties, but also by a complex interplay of its vitality for ecosystems, its multiple forms of usage by humans, as well as the necessary social and governance processes and structures, which its usage entails (Redman et al. 2004). Second, water is defined as a common-pool resource (CPR). This term arose as a third classification within the debate around public or private control of resources. CPR was mainly promoted by Elinor Ostrom through her seminal work Governing the Commons (Ostrom 1990), challenging the dogma that communities were not able to govern their natural resources by themselves, but rather had to allocate their rights to either public or private actors (Dobbin 2013). According to Bakker, CPRs "[...] are those from which it is difficult to exclude individuals, and for which use by one individual can reduce benefits for others" (Bakker 2010, 170). Therefore, private property rights are complicated to establish, and challenges often manifest themselves in local contexts (Wade 1987).

State of research: Water governance around the Attersee

In water governance, typical challenges revolve around the quality, quantity, availability, and allocation of water. However, Austrian water governance knows its own specific challenges. With plenty high-quality water available, the typical challenges other countries face are not relevant here. Leitner et. al, 2022 explain how instead, tourism, soil sealing processes, and intense development of lake shorelines threaten riparian ecosystems, as well as equal accessibility of many Austrian lakes.

Climate change exacerbates this through droughts and heatwaves in summer pushing people to seek cooling at the lake and increasing the over-usage of the waterfront. Furthermore, the increased frequency of storms and floods might lead to a need for adaptation in terms of water management to increase local infiltration and decrease instant runoff.

Regarding the specific case of the Attersee, various governance challenges could be identified:

First, there are only few public accesses to the lakeshore. Many of the adjacent properties are secondary residences owned by people from other parts of the country, which generates conflicts between the owners of these properties and local people (Leitner et al. 2022).

Second, as most of the lakeshore is in private hands, there are only few intact riparian zones left (Leitner et al. 2022). While continuous natural areas have great ecological importance, it is challenging to establish such areas. As every stakeholder has their personal interests, the creation or perseverance of natural ecosystems is often neglected. Such natural areas become particularly important in the context of climate change, as they provide possibilities for water infiltration and groundwater recharge, whereas sealed surfaces increase heat stress (Leitner et al. 2022).

Third, touristic activities can negatively affect the lake system by deteriorating water quality through excessive bathing, while soil sealing can be intensified through construction of new tourist sites. The multiplication of the individuals present in the region due to tourism can in turn stress the region's water balance.

Fourth, agricultural activities in the region can negatively affect water quality through excessive nutrient use. The nutrients applied on fields can filtrate into the groundwater or runoff into rivers, which in turn end up in the lake.

Methodology

The workshop flow is characterised by four main sections. Firstly, the participants gained basic knowledge about water governance, the phrasing of good governance research questions, and different research methodologies. Secondly, they used this knowledge to phrase their own research questions and design their research approach. Thirdly, they executed their research by conducting interviews or surveys, realising further literature research or analysing geospatial data. Lastly, the results were gathered and conclusions were drawn.

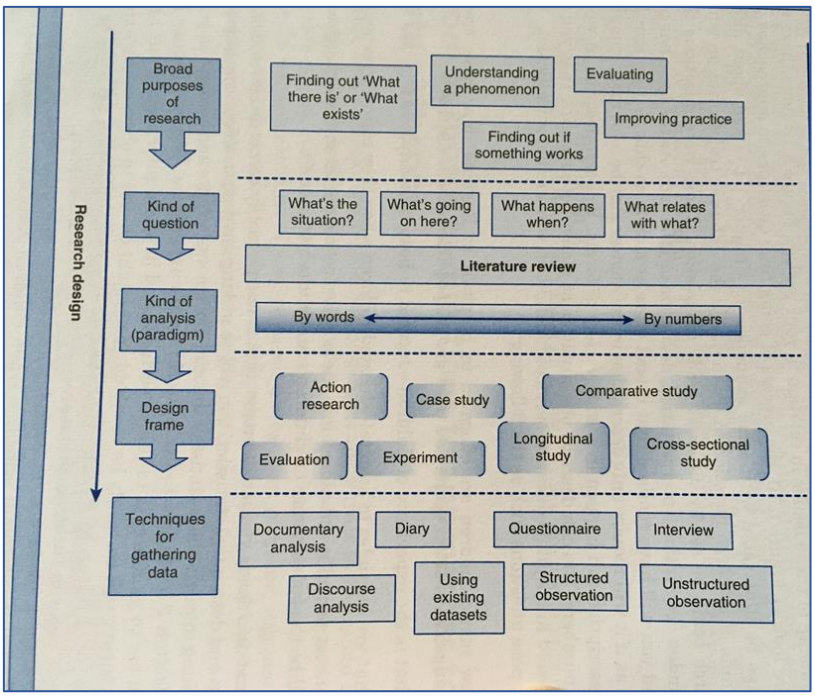


Figure 11 Given overview over research design possibilities

For the conduction of qualitative expert interviews, three local experts were invited for interviews during the workshop:

- Rudi Hemetsberger, Mayor of Attersee am Attersee
- Judith Leitner, spatial planner from Vienna Technical University
- Angelina Eggl, head of Attersee-Attergau Tourism Agency.

Furthermore, the staff of the Europacamp, the congress site, served as further experts interviews were conducted with. Additionally, one group interviewed people at Europacamp's lake access point, which functions as a public bathing spot for local inhabitants and tourists. On some of the excursions that took place in the course of the congress, the participants also had the chance to interview locals and tourists, and make observations.

For the research of the legal framework, one group reviewed Austrian law texts, next to the literature that was provided to the participants at the start of the workshop, the

"Zukunftsdialog Über Seen" report, as well as other brochures. A land use analysis was conducted using publicly available geospatial data, including open access points to the lakeshore and areas of interest.

Results & Discussion

The results of the workshop are summarised on Figure 2 and detailed out further along the four research questions outlined above. Furthermore, they are contextualised into the state of research.

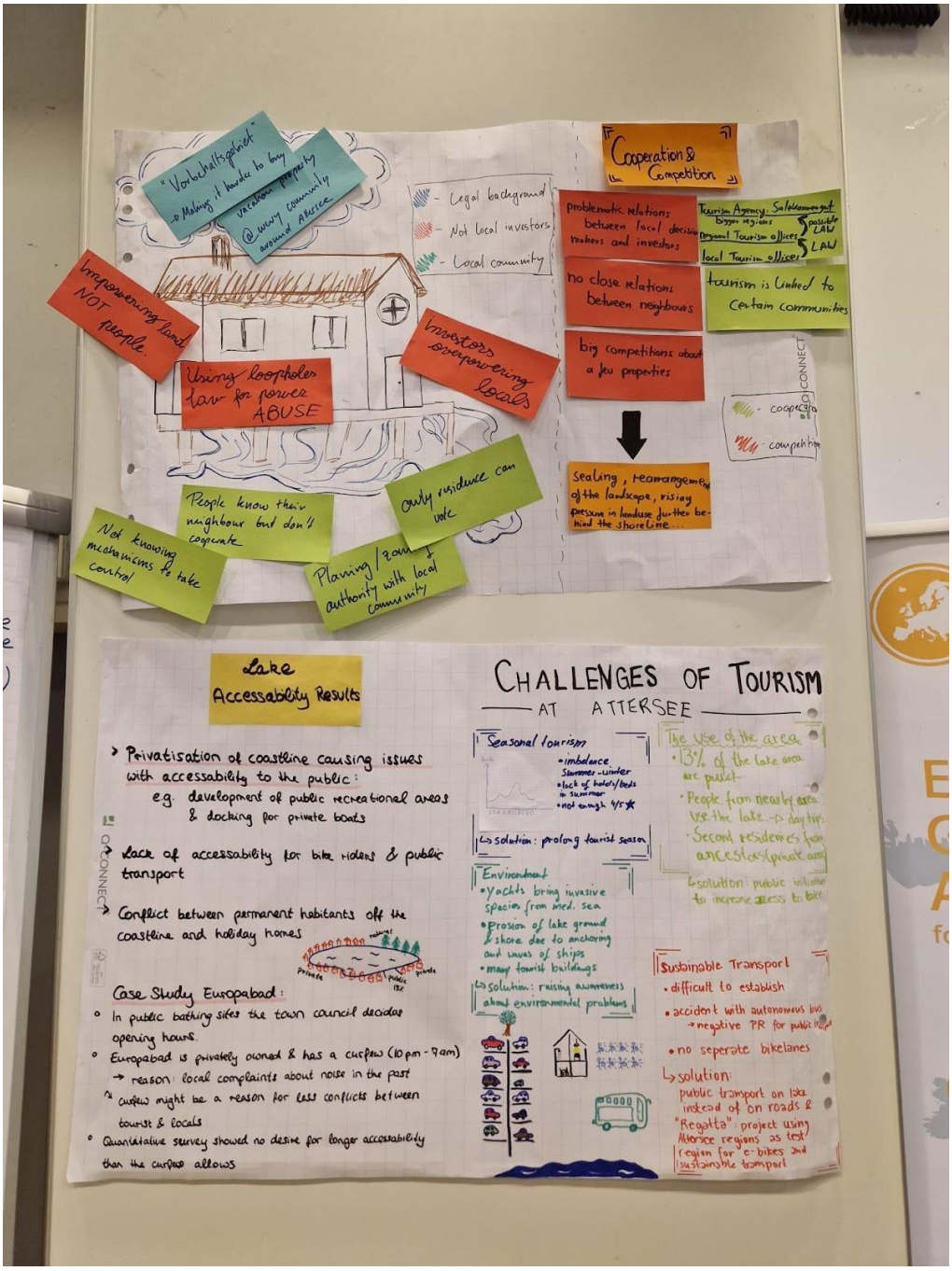


Figure 12 Workshop results as presented by the participants

Public space management and protection

This section looks into the interplay between accessibility and privatisation, and details some potential conflicts of interest in preserving the lake's public spaces.

Lake Accessibility

Both through expert interviews and local surveys it was found privatisation of the lake's coastline threatens public accessibility strongly. Already today, there is only 13% of the shoreline remaining as public space. This process is not only taking place on the land-side of the shore but also on the water itself: privatisation of docking facilities hinders public access to the shore from the water. Aside from direct access to the shoreline, a general lack of accessibility of the lake by public transport as well as cyclists has been observed. Attempts to improve cycling infrastructures proved difficult. Furthermore an accident involving an autonomous bus during a pilot project negatively impacted public transport perception. Other obstacles were faced with attempts to install a schoolbus. There is a significant lack in general transport infrastructure, which also impedes the sustainable development of tourism in the area. A possible solution for this could be to look at the water for public transport possibilities, instead of the strongly privatised shore. However the section “Tourism challenges” will elaborate on challenges in this front also. Meanwhile Regatta, the regional development union (Regionalentwicklungsverein), is looking at the Attersee to be a pilot-region for sustainable transport development strategies they are developing currently.

Case Study: Europabad

A more detailed look was taken at the Europabad facilities. This is a campground situated in Weissenbach am Attersee and has a private access to the lake shore for its campers. Unlike some recreational areas in Attersee am Attersee, the bathing site has a curfew between 10 pm and 7 am. The imposition of a curfew (10 pm - 7 am) is a response to previous noise complaints. A survey amongst inhabitants revealed that this curfew aligns with the preferences of the local community and may help mitigate conflicts between tourists and residents. Furthermore, campers indicated they didn’t feel the need for longer accessibility to the shoreline. The hypothesis was put forward that the curfew might have also impacted the type of tourists seeking their accommodation at the Europabad camping ground. This might be a subject for further research.

Legal framework and conflicts

Through literature review of Austrian property law, some interesting observations were made regarding the impact of the legal framework on exacerbating and resolving conflicts, for instance in the residential/touristic purposes of property acquisition. A first observation is the influence the status of "Vorbehaltsgebiet" has, making it more difficult to buy property.

Furthermore, expert interviews highlight the complexity of power-relations between (non-)local investors, local, regional and national policymakers and how it influences the local

privatisation process strongly. Firstly, large investors, often from outside the region, make intelligent use of the policy making power vested in the local governments, playing different towns out against each other in the landing of a deal for the development of their investment-project. In this process, the interests of local residents are overshadowed by the promise of economic gain for the town at hand, thereby intensifying existing local conflicts within the community.

This local community on the other hand is characterised by a relatively low level of internal collaboration and advocacy for their interests. This could partly be explained by a limited understanding of mechanisms to take control, as observed in the survey.

However, there is one important power reserved for the local residents, namely the democratic power of voting. In Attersee am Attersee, it has also been this democratic process which managed to halt investors significantly. The current mayor of Attersee am Attersee ran his campaign promising to tackle the privatisation and pressure from external investors. Upon winning the election, largely due to this unusual strategy, the mayor and the local government then sought assistance from the national government to implement protective measures for the town's spatial development and address local concerns. This resulted in legislation aimed at limiting possibilities for holiday houses significantly. The intricate interactions between legal frameworks, non-local investors, and the local community underscore the complexity of water governance in this region.

Tourism challenges

The tourism landscape around the lake presents a range of challenges for sustainable development. This section examines the seasonal imbalances, utilisation of the lake area, environmental issues, and the pursuit of sustainable transportation, all of which impact the management and long-term sustainability of tourism in the region.

An imbalance in tourism between the summer and winter seasons has been noted (fig. 4). This is compounded by a lack of hotels and beds during the summer months, particularly in the 4- and 5-star categories. One potential solution proposed is extending the tourist season. However, due to the already discussed complexities between local residents and tourism development, more in depth research is required to advise optimal management

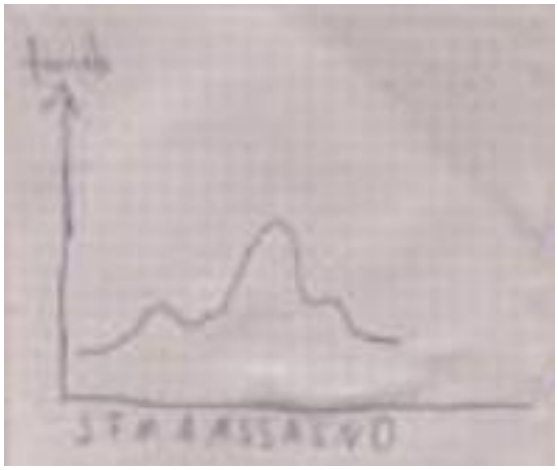


Figure 13 Seasonal changes in tourism intensity showing peak in summer months.

Furthermore, the aforementioned strong privatisation of the lake shore also strongly endangers the remaining riparian zones around the Attersee. Riparian zones are known for their high biodiversity as well as their crucial ecosystem services to humans, such as water quality improvement and storm buffering. In addition, erosion of the lake's bottom and shoreline due to anchoring and ship-generated waves impact the ecosystem. Aside from the threat posed on the remaining natural shoreline, also within the lake itself the ecosystem is threatened. The geographical location the Attersee next to the highway makes it a great pausing location for yacht-tourists returning from a holiday at the mediterranean sea. These yachts then introduce invasive species into the Attersee due to the short time outside of the water, and often the omission of washing the ship thoroughly in between. Public awareness campaigns could be a first step in improving care for the remarkable ecosystem present.

Cooperation/competition for sustainable tourism

As discussed above, cooperation and competition are driving forces within the development of the Attersee region. Some specific observations can be made in this regard. The interplay between decision-makers, policy makers, investors and the local community has been discussed above already. Intense competition for a limited number of properties has exacerbated this. This competitive atmosphere has led to considerable neglect of ecosystem protection and advocacy of local community interests. For example, soil sealing, rearrangement of the landscape and the rising pressure in land use further behind the shoreline have been noticed.

Within the sphere of tourism development, some cooperation can however also be witnessed. As tourism is only linked to certain communities, local tourism offices were merged into regional tourism offices. It is currently in discussion if these regional offices will be merged into a tourism agency covering all of Salzkammergut. However, even though cooperation strategies could alleviate some pressures imposed by the competitive atmosphere motivated by investors, it is still a question if such a strong degree of merging will prove beneficial for the region. As research has indicated, a local character of the management strategies can prove crucial in the sustainable development of a community.

Conclusions

Figure 5 shows the workshop conclusions as summarised by the participants.

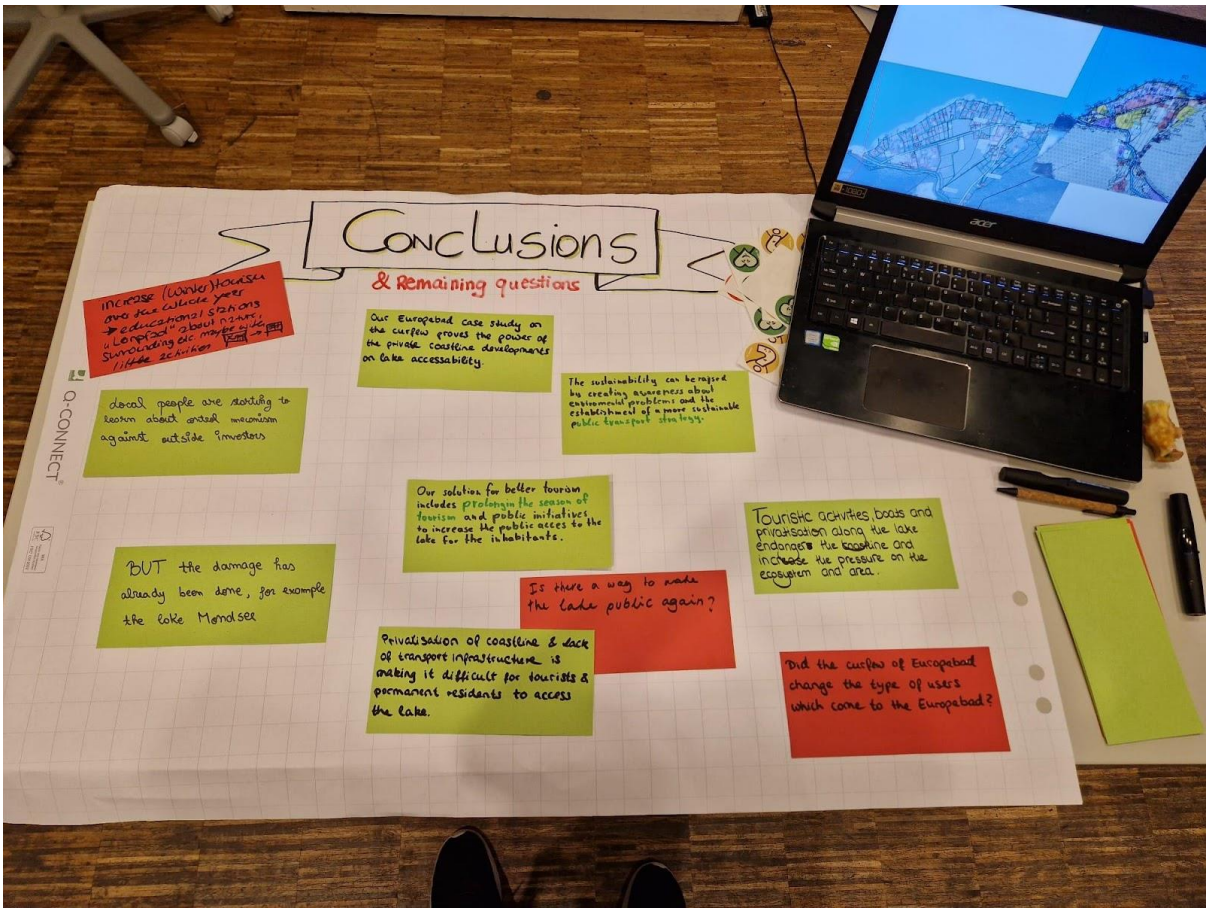


Figure 14 Workshop conclusions as presented by the participants

During this workshop at the Annual Congress of EGEA, on the topic of water governance around the Attersee, several complex challenges and opportunities were identified. The interplay of factors in public space management and protection highlights concerns about privatisation, shoreline accessibility, and transport infrastructure. Legal frameworks impact property acquisition, with external investors manipulating local governance structures, underscoring the intricacies of water governance. The tourism landscape presents issues of seasonal imbalance, environmental preservation, and sustainable transport, necessitating further research and careful planning. Cooperation and competition are fundamental drivers, with intense competition for properties and some cooperative efforts in tourism development. Striking a balance between sustainable tourism development, environmental preservation, and local community interests is essential. The insights gained from this study provide a foundation for future research and policy considerations, offering a path towards more equitable and sustainable water governance in the region. However, many questions remain open for further exploration. More extensive research is needed to gain a fuller understanding of possible water governance solutions to address some of the challenges identified here.

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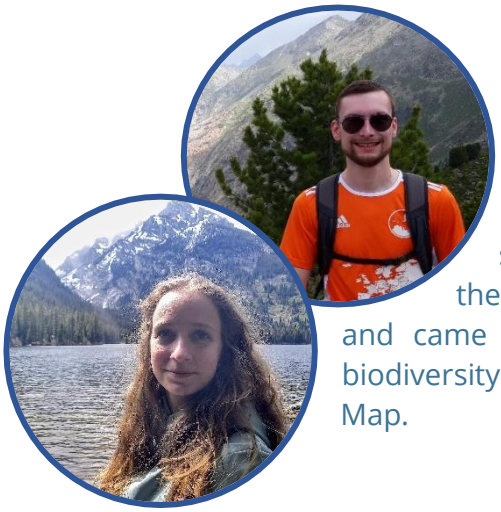
5.3 Mapping the story of biodiversity with GIS

Constantijn and Ismene (Nijmegen)



The workshop contained three parts: first the participants used aerial images to take a look at the Attersee-lake and its surrounding landscape. Second, after analysing this region, they made a SWOT-analysis about the biodiversity in the area and came up with possible solutions to preserve or enhance the biodiversity. The third part consisted of presenting the results in a Story Map.

Mapping biodiversity using GIS and open data.

Biodiversity is "the variety of ecosystems that include the community of living organisms within their particular habitats, and the physical conditions in which they live" according to E.O. Wilson (1992). Landscapes consists of different ecosystems on different scales. To map biodiversity we can analyse the land cover of a certain area. By mapping the land cover of a certain area we get a better understanding of the different kinds of vegetation which are present. Vegetation makes habitats were species live and grow. And so we can understand the species richness of a region and hence the level of biodiversity.

An easy way to get an idea and map the land cover is to take a look at aerial images. Nowadays aerial images are available as open data. Open data is available for everyone and is provided by governments, private companies etz.

The open data can be downloaded in different data types: for example, shapefiles, tiff, klm, gdb, gml... A second data type are services which can be imported into GIS-software like QGIS, ArcMap and ArcGIS Pro. Several types of services exist: WMS, WFS, WMTS, Mapservice, Featureservice, OGC API, ...

GIS-services work like following: the GIS-user does a request in his GIS-software on his PC (client). The request is transferred via the GIS-service (WMS, WFS, Mapservice etc.) to the web server the web server wil send it's query to the GIS-server, who will send the query to the GIS-database. The GIS-database responds with the result. The result will follow the same path back to the client: the GIS-user can now see the result of the request.

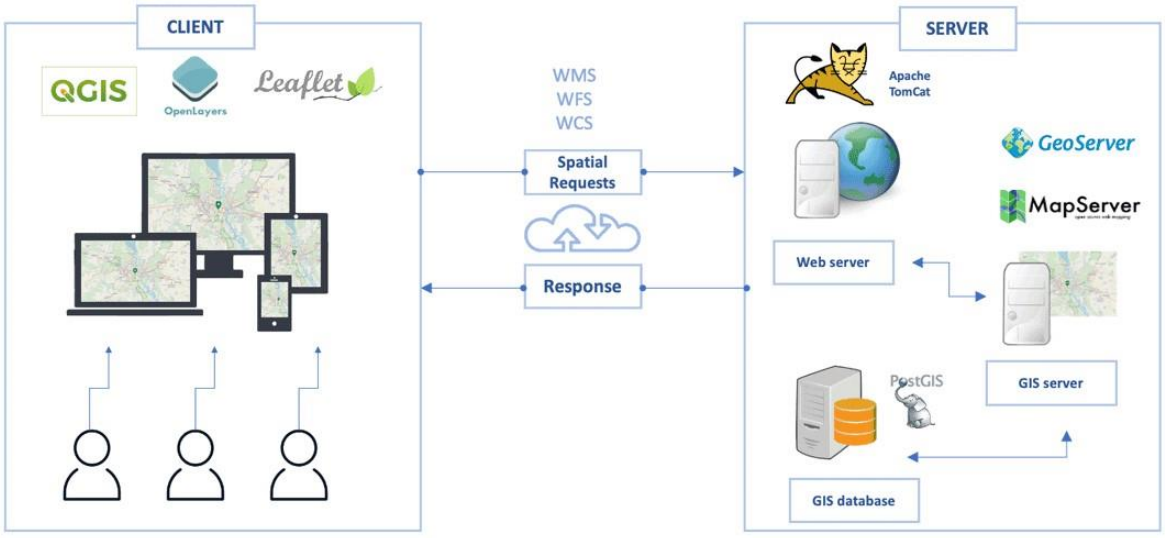


Figure 15 Graphical explanation how GIS-services work

We decided to focus on the Attersee-lake and the surrounding area. We divided the participants into groups of 3-4 persons based on the laptop availability and their level of GIS-experience. Three groups focused on the northern part of the lake and two groups on the southern part. The participants brought their own laptops and they were free to choose which GIS-software they wanted to use: QGIS, ArcMap or ArcGIS Pro. We let the participants quite free and encouraged them to explore the possibilities of services, open data and GIS-applications by themselves. The workshop leaders were all the time present to assist and help if there were any questions or problems.

After the participants explored the region around the Attersee-lake using open data and aerial images, they mapped the landcover of their given part. After the mapping, they could start with the SWOT-analysis about the biodiversity of their part. SWOT is short for Strengths, Weaknesses, Opportunities and Threats. Strengths and weaknesses are internal to the subject of the SWOT-analysis. Opportunities and threats are external factors. Strengths and opportunities are seen as positive to the subject. Weaknesses and threats are perceived as negative. Finding internal weaknesses of biodiversity was difficult.

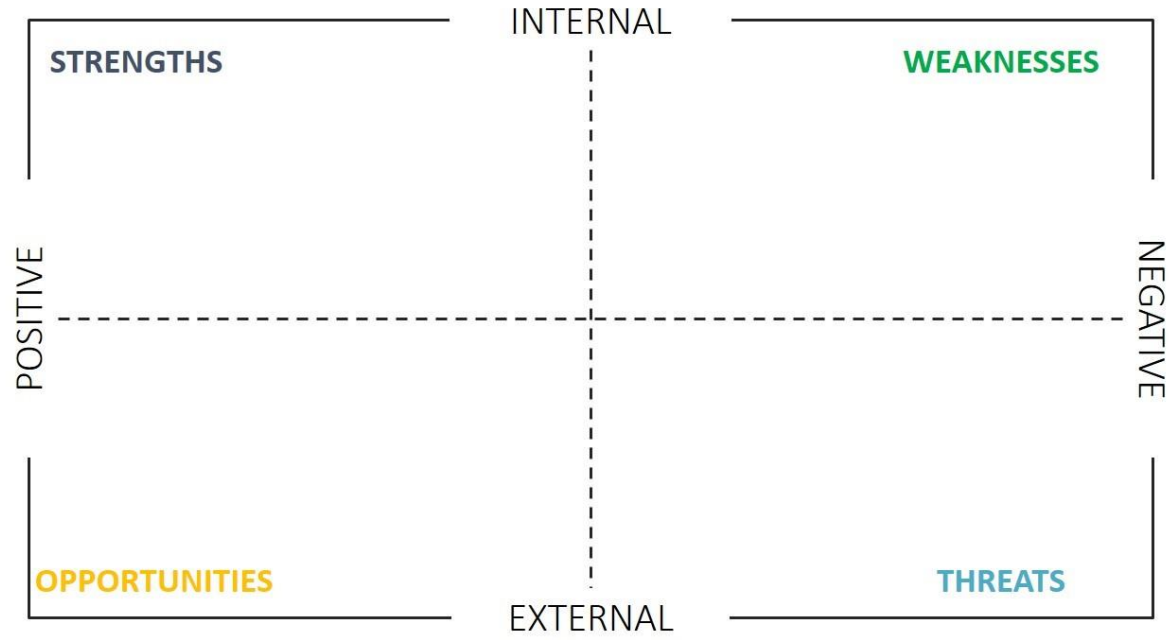


Figure 16 SWOT-analysis-structure

As part of the workshop the participants thoughted about possible solutions, based on their previous made SWOT-analysis, which could be implemented in their part to preserve and enhance the biodiversity. They could be quite creative with the solutions.

Presenting results using GIS and Story Maps

Finally, the results of this hard work could be presented by making a beautiful Story Map. We used ESRI Story Maps, but there are also other options like Google MyMaps, Mapbox and Instant Apps. A Story Map is a web-GIS-application on the internet and includes dynamic maps. It's useful in presenting spatial data. The weblink to the storymaps-website and examples can be found under sources.

The participants contributed greatly to the workshop and the workshop leaders would like to thank them all: Andrej Jovanovic (Beograd), Anita Cipak (Zadar), David Benedict (Heidelberg), Hannes Rottgardt (Kiel), Hannes Hoyer (Bamberg), Joris Heine (Halle), Kimberly Henke (Greifswald), Klemen Baronik (Ljubljana), Leon Puljevic (Zagreb), Luka Lesic (Zadar), Manca Bohinec (Ljublana), Maria Prundis (Berlin), Michael Maier (Graz), Moses Peter Gordon Wani (Izmir), Niko Zivanovic (Zagreb), Nimrod Szabo (Budapest), Theresa Steinert (Augsburg) and Zoe Gyr (Zürich).

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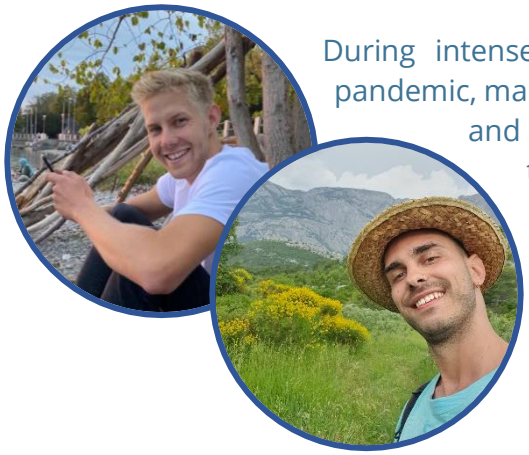
5.4 Stress Less, Live More:

Lucas Bevanda and Dominik Knabe



During intense periods of student life, especially now after the pandemic, many students have difficulty dealing with stress, pressure and feelings of isolation. Therefore, the motivation is to teach techniques and methods of stress reduction, relaxation and relief to help students deal with the psychological challenges they face in their daily lives. The goal is that participants will be able to use the resources acquired in this training in any challenging situation in their lives.

In detail, participants learn:

- Theory of the nervous system
- Understanding the mechanisms and connections of body and mind
- Body awareness and relaxation techniques
- Building healthy stress management mechanisms and resilience
- Theory - The Traffic Light Model

The training is based on the "stress traffic light model" presented by Dr. Gert Kaluza in his book on stress management:

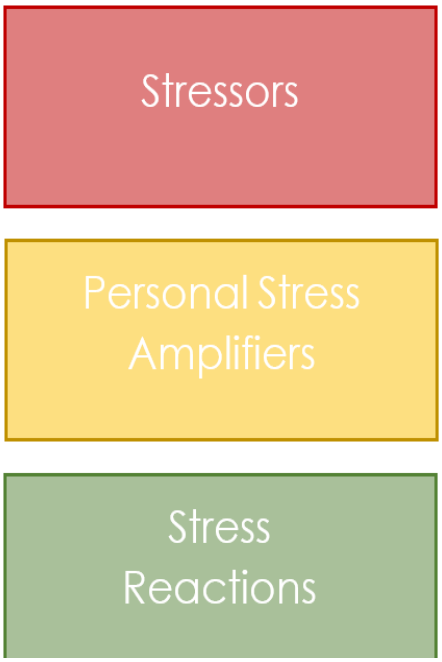


Figure 17 Stress traffic light model according to Dr. Gert Kaluza

Stressors are the external stressful situations and conditions that we encounter in our daily lives. These can be, for example, performance pressure, too much work, social conflicts, time pressure or other disturbances.

The Personal Stress Amplifiers describe the Individual inner motives, attitudes, and evaluations with which the individual approaches the potentially stressful situation and which often co-decide whether and how severe stress reactions occur in these situations. These evaluations are the links between the stressors in the outside world and the stress reactions. Examples of this are

perfectionism, striving for control, difficulties in accepting help or self-exertion.

Stress Reactions are the physical and psychological **responses of the organism to stressors. These include physical, emotional, mental, and behavioral responses** and activations (Kaluza, 2018).

Stress originates in the brain

The perceived stressor causes a deviation from the basic balance of the system that cannot be compensated for by the available routine responses. The neuronal process is described below:

1. The sensory information transmitted from the sensory cells (in eyes, ears etc.) initially converges in the thalamus. This is where a first, still very inaccurate picture of the situation is produced.
2. When danger is perceived, activation then spreads to the amygdala, which plays a central role in the generation of emotions (fear, sadness, anger)
3. Further, nerve fibers stimulate nerve cells that produce the neurotransmitter norepinephrine. The release of norepinephrine then causes the activation of the sympathetic nervous system, a part of the autonomic nervous system responsible for releasing adrenaline and Cortisol. It basically puts the body in fight and flight mode (in contrast to the parasympathetic nervous system, which is active when we feel safe) (Kaluza, 2018).

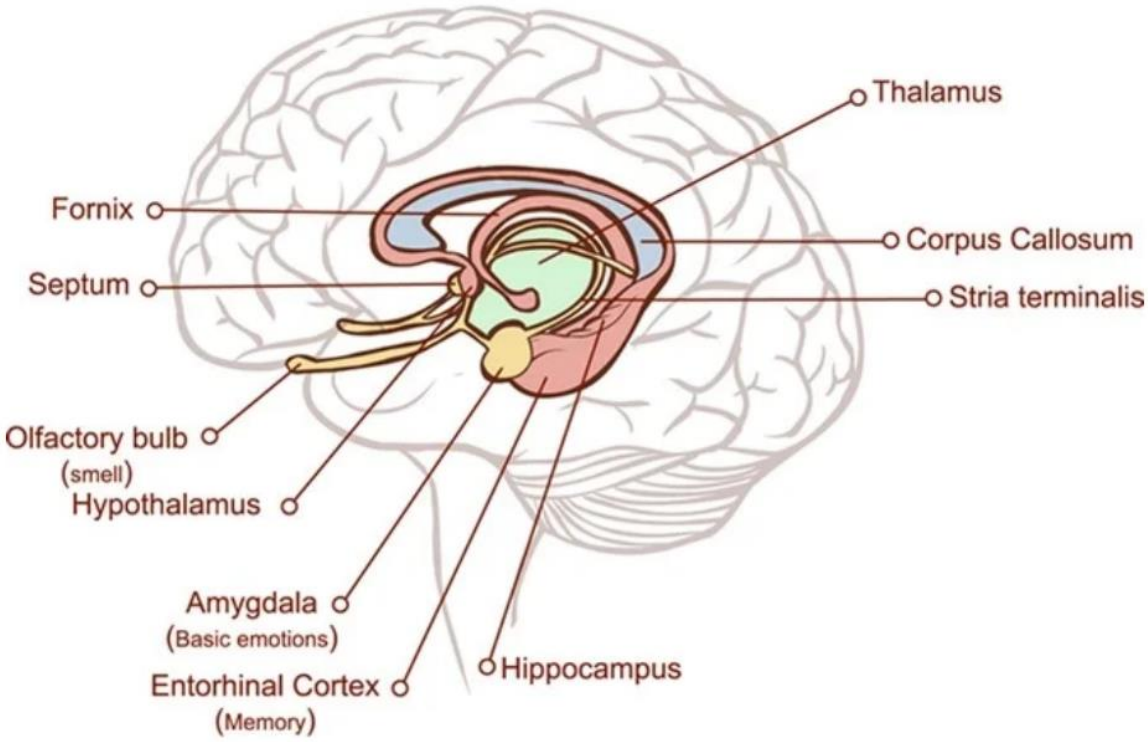


Figure 18 The Limbic System (Dutta, 2021)

Consequences of Stress

In the short term, this is not harmful in itself. It even positive consequences such as a performance-enhancing and motivating effect and is therefore perceived as pleasant.

However, if the stress lasts longer or even permanently the consequences for the system can be severe. This is because in earlier times physical stress reactions served to prepare the organism for dangerous situations by fight or flight. They were thus brought to their natural end. Today, however, physical attack or flight is hardly an appropriate response to the stressors of modern life and many of today's stressors in the interpersonal or professional sphere are characterized by the fact that they persist over a long period of time or recur again and again. Therefore, no energy is consumed, which can lead to serious health problems. For example, fat, sugar and clumped platelets can clog the bloodstream. A complete blockage (infarction) can occur in the heart, lungs or brain. Furthermore, the necessary time for recovery and relaxation is often missing. Finally, the organism's ability to adapt breaks down. A wide range of serious organ diseases can occur.

On the psychological level, chronic stress causes a massive decrease of mental health and well-being. Symptoms include constant restlessness, inability to switch off and difficulty concentrating on tasks. Many depressions are a result of permanent stress (Kaluza, 2018).

Exercises

Progressive Muscle Relaxation

The first exercise used in this training is called Progressive Muscle Relaxation (PMR). This is a mindfulness exercise that teaches you to relax your muscles and release tension. You start by tensing a certain muscle group firmly and holding the tension for a few seconds. In the next step you release the tension while observing how it gradually leaves the muscles and they relax. In this way, you move along the body and gradually tens all the muscles, from the legs and feet to the center of the body, the arms and hands, all to the facial muscles. It is particularly important to pay attention to how the individual muscle feels after it is relaxed.

This exercise helps to shift the focus from the thoughts to the body, to gain a better awareness of the body, and ultimately to reduce overall tension and stress levels (Anxiety Canada, 2023).

Belief Sets

Different people react to the same situation in different ways. What unsettles one person does not bother another. Where one person suffers from anxiety, another senses an opportunity. The quality of a situation as a stressor depends primarily on its individual evaluation. This means people are not passively exposed to the stressors in their environment, but actively relate themselves to given situations. An important way, therefore, to cope with stress is to recognize and mindfully perceive one's own stress-amplifying thoughts and then gradually change them. That is what this next exercise is about. Using a questionnaire, the participants identified their personal active beliefs and thus brought them to consciousness. Now it is possible for them to work on these.

For example, someone may have the belief that they must always do everything perfectly and thus cause themselves extreme overwork through perfectionism. Here it is then a matter of establishing new beliefs such as "I am allowed to make mistakes", "Less is sometimes more", "I take care of myself" or "I distinguish between important and unimportant" (Kaluza, 2018).

Shiatsu

Finally, we applied techniques from the Japanese body art Shiatsu. The characteristic, mindful and rhythmic pressure on the body and its energy pathways provides a clear and lasting sense of spaciousness and wholeness. Muscular blockages and tensions are released and participants regain their natural ability to self-regulate and balance stressful life circumstances. They find their way back to deep calm and relaxation and are able recharge their batteries. This makes Shiatsu a particularly suitable means to accompany people in stressful phases of life (Shiatsu Gesellschaft Schweiz, 2023).

Conclusion

I would like to use the conclusion to share the feedback given by the participants. The entire group reported that their physical and emotional well-being, as well as their mood and stress levels, significantly improved after the training. Some stated that the techniques they experienced here made them feel more relaxed and balanced than they had been in years and that they will definitely incorporate them into their daily lives in the future.

It becomes clear how fast we move in today's society and always have the next goal in mind. We completely forget to listen to our needs and have forgotten how to relax. This deprives our body and mind of the possibility and ability to regulate. In the long run we become unhappy and sick.

For this reason, it is incredibly important to strengthen the awareness of our body and to reconnect with ourselves. Only those who feel themselves and are in dialogue with themselves can react well to their needs, live sustainably healthy and feel the joy of living.

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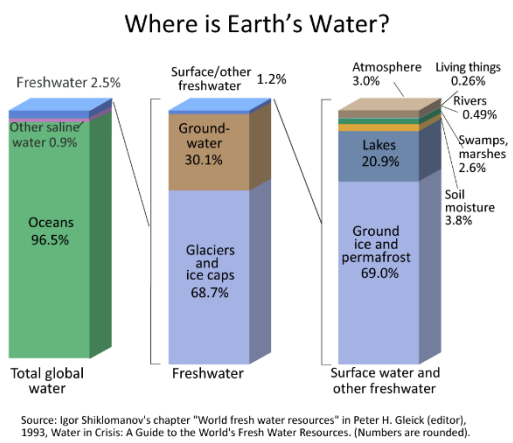
5.5 Managing Water for All: Addressing social inequalities in water management

Juliette Abbt and Seline Daumal

For the Annual Congress 2023, we organized a workshop about international water management and its connection to social inequality. The aim of this workshop was for the participants to understand the importance of water management and its link with the society respectively people and be able to put themselves into different stakeholders' positions. Further, we wanted to create within the workshop a platform for scientific discussions. In conclusion the participants successfully explored different stakeholder positions and learned how to argue for international water management.

Insights on Water on Earth

When studying water management, first, one needs to understand how much of the resource water is available. This can be illustrated with the following example: If the Earth were scaled down to the size of a basketball, the volume of its water would be small enough to fit inside a tennis table ball (Figure 1b). Further, only about 2.5% of all water on Earth is freshwater whereby only 1% of the freshwater is easily accessible as surface water, as seen in Figure 1a (Shiklomanov, 1993). Exploring the broadness where freshwater is needed allows one to imagine its high demands and that water is a limited resource. These and other questions have been tackled in group discussions, as seen in Table 1. Further complexity is created by the unequal distribution of fresh water across the globe. As well as its access is not always granted or can be limited due to environmental or political constraints (Caretta et al. 2022). Changing climate is further stimulating this process and makes water governance even more urgent and complex. According to the IPCC assessment report 6, anthropogenic climate change causes weather events such as floods and droughts to increase and become more severe. Additionally, the hydrological cycle is intensifying and therefore increasing pressure on people facing water-related vulnerabilities (Caretta et al. 2022). Understanding more of these processes and its impact on different stakeholders was the main research aim of this workshop.



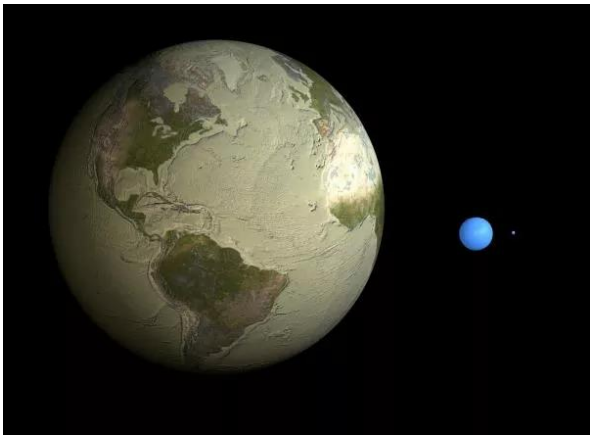


Figure 19 a (left) distribution of water on earth (Shiklomanov, 1993), b (right) size comparison of volume of earth and water (Israel, 2019).

Structure of the Workshop

The workshop was divided into a total of four sessions. Whereby, the first session was used for team building and a theoretical input. As a part of the theory, participants discussed about water availability, where water is needed, what natural hazards are related to water and ultimately how climate change is affecting water availability. A goal of the workshop was to encourage everyone to exchange their scientific knowledge in a comfortable setting, thereby the theoretical part was discussed during small group work and ultimately summarized in plenum. A summary of the discussions can be seen in Table 1.

Table 1 Participatory investigation on water management

Where is water needed?	**Water-related hazards**
Agriculture & farming **Tourism & leisure** **Drinking water & storage** **Transportation** **Hydropower & renewable energies** **Industry (construction, manufacture…)** **Climate change adaptation** **Natural habitats** **Health & sanitation**	Floods & landslides Droughts Tsunamis Snowstorms Monsoons Lahars Water pollution Glacial-related events Fires Salination processes Technical disasters (e.g., dams)
What type of water governance is needed?	
1st session	**additional suggestions from 4th session**

• Financial support from the government • Control mechanism e.g., for equal water distribution, prevention of pollution • Invitation to all stakeholders for a discussion • Consider scale (local, international, cross-country management, who will affect others downstream, etc.) • Full privatisation of water vs. governmentally owned water-related institutions • Research on capacities and parameters (amount of freshwater, pollution…)	• Global issues need international regulation • Consideration and inclusion of local • parameters • Involvement of all and diverse stakeholders • Stakeholders' transparency • Need for expertise and counselling • Control mechanism implementation & respective penalties

In the second session the participants got introduced to the main output of the workshop and thereby got split into groups who each represented a stakeholder related to water management (Table 2). We had beforehand defined groups of stakeholders to set examples for our workshop participants. They chose from these examples and had to define their positions in consideration of the following points:

- What their main goals and needs are as a stakeholder.
- What kind of water management they need including the necessary infrastructure, desired regulations, and restrictions,
- The scale of action and the level of emergency of their needs.
- Possible collaboration with other stakeholders.

The third session served on one hand for the participants to exchange about their observations during their scientific excursions (which happened the day before and is part of the EGEA congress) and how these were related to the topic of water management. On the other hand, each stakeholder groups split up and met with other stakeholders to hear their position and debate about potential conflict of interest and collaborations. The critical interaction with other stakeholders ultimately allowed each group in the last session to formulate a revised statement on their goal & needs and finally what kind of water governance they desired.

Stakeholder	Goal	Action
Regional governors	Alliance of coastal regions dealing with submersion/floods without relocation of communities	Costal defence with sea walls, dykes, dunes, etc. Adaption measurements such as controlled flooding, adapted homes. Creation of emergency plans and early warning systems.

Industry leaders	Become a leader in the sustainable fashion industry	Reduce water consumption and pollution in manufacturing processes, committed to corporate responsibility. Build local fashion factories and collaboration with local stakeholders.
Fish farmers' cooperative	Alliance for responsible and sustainable fishing practices to ensure healthy aquatic ecosystems and food security.	Implementation and observation of international regulation. Limiting license for fishing. Regulation tourism. Assure continued financial support from government & private companies
Urban planners	Help cities with water management projects and infrastructures	Implementation of policies to reduces greenhouse effect and efficient absorption of excess water in case of flooding. Providing clean water for inhabitants. Efficient recycling of grey water.
Community representatives	Creation of a sustainable and resilient community at Attersee	Creation of sustainable energy production. Regulation to limit local pollution of industries and private persons. Collaboration with local stakeholders.
Environmental NGO representatives	Address ecological concerns and advocate for social equality through integrated approaches. Being the voice of nature.	Education of relevant stakeholders. Representing the "under-represented" local stakeholders. Assuring financial support form government and private companies for sustainable projects.

Throughout the workshop the participants were able to critically engage with a specific stakeholder position. As seen in Table 1 their position covers a broad spectrum and range from stakeholders representing a private sector to government, from local communities to regions, from human to nature focused. No group choose to focus on a marginalised group therefore our engagement with the questions of social inequality were short cut. Looking at the different implementation of regulation and infrastructure there are some common themes as all the participants were in favour of sustainable development and inclusion of local perspectives & solutions. No group choose a role which would represent an unsustainable development towards the future. As the stakeholders were so diverse in their needs and focus there was almost no conflict of interest but rather the groups were eager to seek collaboration with each other.

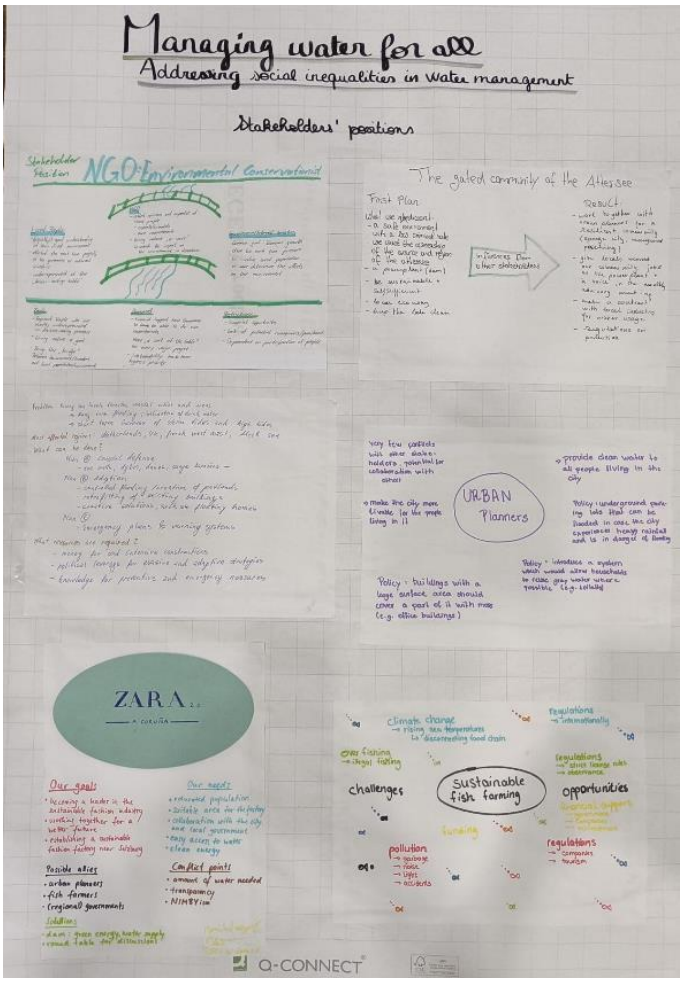


Figure 20 Stakeholders' positions

What type of water governance is needed?

In plenum we revisited the question from the first session on what type of water governance is needed. We stressed the need to engage all stakeholders in decision-making processes, advocated for transparency in corporate actions, and highlighted the importance of global regulations for addressing climate challenges. Additional points mentioned by participants included the necessity of monitoring organizations, ensuring the involvement of non-western perspectives, and imposing restrictions and penalties on companies that failed to meet demands.

These goals can however only be achieved through education and continuous financial means. Further there is a need for understanding local conditions and insights and ultimately, acknowledging the role of experts and counsellors.

Conclusion: Limits and Considerations

Looking back, we understand that it could have been better to narrow down the stakeholder position to one common region or need. Despite the broadness of the stakeholder positions we managed to ask critical questions and carve out the possible impacts on marginalised communities. This workshop overall strengthened our understanding of different positions and how decisions in water management made by a small part of society will impact a lot of people. Our job as geographers is to give decision makers all the keys to understand what is happening to their people, their neighbours, their planet's co-habitants.

Nevertheless, we are glad about the results, the active participation we got from our participants (Figure 19) – they allowed us to evolve and shape the workshop throughout the congress (so thank you all!), and we are happy to have reached the goal of promoting scientific debate at an EGEA congress.

Figure 21 Group picture with the workshop participants

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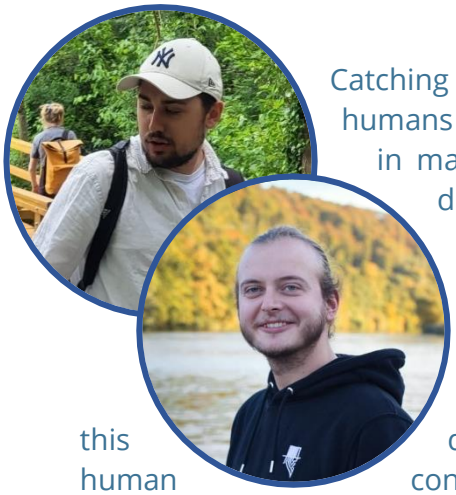
5.6 How to farm a Fish

By Lukas Jensen (Hannover) and Simon Schulze (Göttingen)



Catching Fish has always been one of the main nutrient sources for humans in coastal regions. While this never changed, only advanced in many ways over the course of the centuries, in the last few decades the practice of farming fish in therefore designed facilities has grown more and more popular. While the number of captured fish has been more or less stagnant around 90 million tonnes in the last 30 years, the number of farmed fish has quadrupled from 21.8 to 87.5 million tonnes in the same timeframe (FAO 2022). Main reason for this development might be the ever-rising demand of seafood for human consumption. Especially in developing countries fish is simultaneously the cheapest source of protein available and one of the more valuable goods for trade (FINEGOLD 2009). Consumption does however also increase in all other parts of the world. Asia, having always been a pioneer for inclusion of rather large amounts of Seafood in the common diet, is however still the main Region of production as well as consumption of Fish and other Seafood (FINEGOLD 2009).

Catching Fish in these vast quantities does naturally have a huge impact on the global fish populations. By now a continued practice of overfishing, often illegal and unmonitored on the high seas, has depleted over one third of global fish stocks (HUGHES 2019). In combination with the overall state of the ocean, regarding threats like eutrophication, acidification, ocean warming and plastic pollution already straining the bounds of the ecosystem, it is clear that further expanding fishing of wild stock is not an option. Certainly not a sustainable one (UN 2023). Therefore, increased amount of fish can only come from farmed fish in Aquaculture to meet global demands and feed a still for the foreseeable future growing human population.

Unfortunately, large fish-farms also do not go unnoticed by the environment they are placed in. Aside from the often-astronomical increase in the level of pollution at the sites there is also a way higher risk for the spread of diseases and parasites among the fish population (CARROLL 2010). Fish which escape captivity may also disrupt the ecosystem, especially if they are from a non-native species. Additionally, if the fish to be farmed is carnivorous, it requires caught fish beforehand to then use as feed for the fish farm. In 1997 it still needed up to three tonnes of fish as feed to produce one tonne of salmon (CHO 2016). While this has been made more effective in the last few decades it is still a matter of concern regarding the sustainability of aquaculture.

There are a few options to make fish farming more sustainable. Most farms are floating net pens placed and fixed in the open ocean or other large bodies of water. Moving the farms to closed system indoor tanks reduces the amount of nutrients, fish waste, medicine and pesticides expelled into the environment. However, in that case the water needs to be circulated, resulting in huge energy costs for filtering and reprocessing the water or alternatively large quantities of wastewater. Outdoor inland farms like fishponds

or farms integrated in running natural bodies of water are also an option, while here the environment most likely gets a fair share polluted again. It is hard to find a perfect balance between costs, production amount and environmental care. In some cases, of course, when resources are limited, there is no real choice at all for the way the fish is farmed.

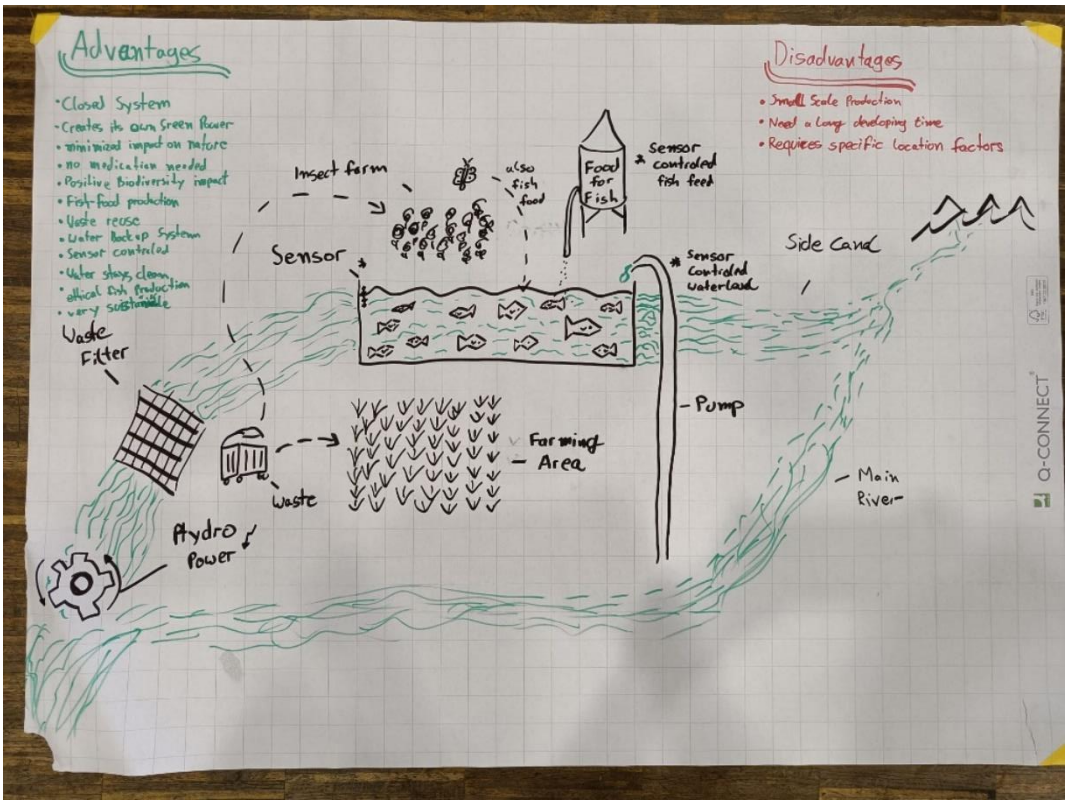


Figure 23 Farm schematics of working group 1 at the end of the design process

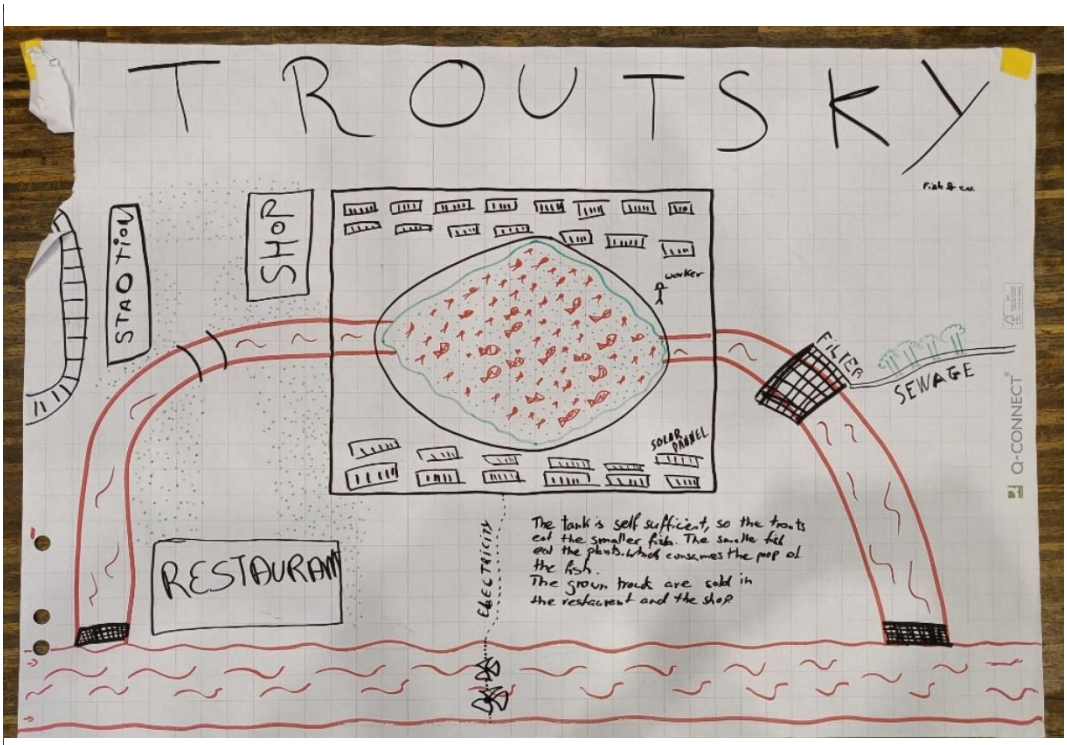


Figure 22 Farm schematics of working group 2 at the end of the design process

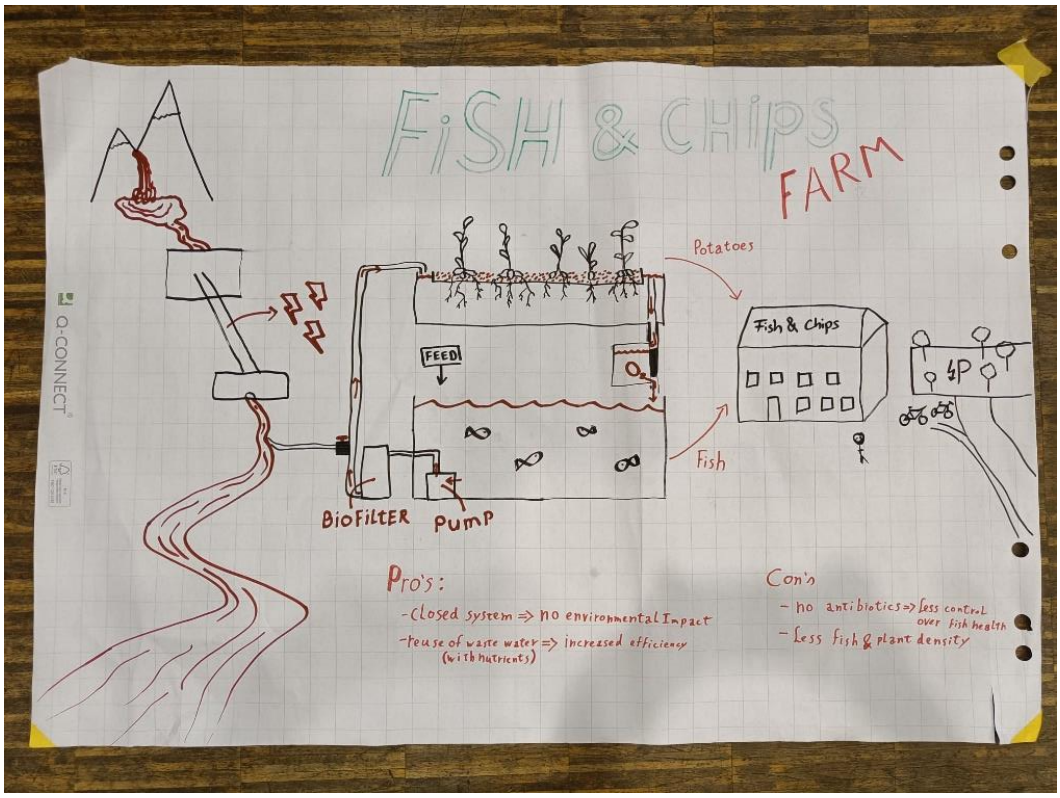


Figure 24 Farm schematics of working group 3 at the end of the design process

While it seems universally agreed that aquaculture has a lot of benefits and may be necessary to feed the populace and grant economic opportunities (NOAA 2020), there is no agreement on the absolute best way to farm fish. In our Workshop we investigated this dilemma, talking about the different types of fish farms, namely the open sea fish pen, the pond system, the flow through system (utilising running bodies of water) and the recirculating aquaculture system, which is being found in controlled indoor farming facilities. In groups the participants discussed what they thought to be the best and most of all the most sustainable fish farming option.

The three group works resulted in three very different approaches and farm designs. The first approach was a rather close-to-nature lake farm, isolated and with an own functioning sustainable ecosystem. Included plant life would feed small fish which in turn feed the larger fish the farm is intended to grow. The second approach was a more holistic one, not only including a flow-through fish farm with downstream filter system but also a separate pond for breeding new fish stock. Furthermore, the river flow was diverted into a separate arm to try isolating the effects the farm might have on the ecosystem. The farm design went even further and added a restaurant and sale establishment to sell the farmed fish as regional as possible. The third and last approach was more technical. Indoor ponds for breeding the fish are isolated and constitute a controllable environment. The wastewater from those is split and on the one side connected to a separate potato farm, which uses and filters the water organically. The second part of the wastewater is led through a machine filtering system, after which it flows back to the fishponds together with what is overshot from the potato farm. These initial designs were shared with the entire workshop and individual strengths and weaknesses of the approaches were

discussed. After this the groups went back to the design table and tried optimizing their farms with the newfound information. This process was then repeated once more after which the groups were certain they had finished their designs and the fish farm of their dreams. After the second optimization the three designed farms were a lot more similar to each other.

There are a few things all final farms have in common: They all either have plants incorporated in the process of filtering water while supplying the plants with all the nutrients they need to grow, or they capture the waste in other ways and then use it as fertilizer in a second step. Furthermore, all farms made sure to minimize the amount of waste and other byproducts that end up in the adjacent ecosystem. As a bonus, all farms have incorporated a renewable energy supply. With these factors in place, the negative impact on the environment as well as the energy cost should be minimal. Of course, these designs do not include all the things that would be necessary to build the farm, like quantitative calculations of the costs, production or material. However, they come close to the to date most sustainable farm, one using an aquaponic system.

Figure 25 Fish farm utilizing an aquaponic system (HEMATHILAKE & GUNATHILAKE 2022).

The idea of an aquaponic system is to have a closed system for farming fish and suitable plants simultaneously. In this the fish produce fertilizer for the plants while the plants purify the wastewater of the fish and make it reusable. As it is a closed and highly controllable environment it is suitable for all year-round farming and most fish species. However, the additional component of the hydroponic plants complicates the fine-tuning of the nutrients and feed added to the fish tank.

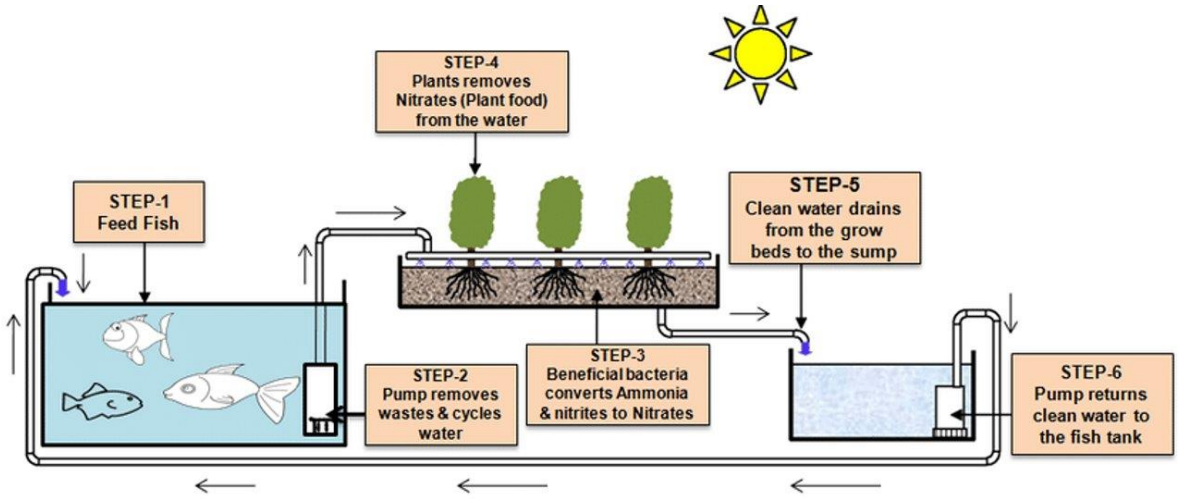


Figure 26 Schematics of a fish farm utilizing an aquaponic system (GENTOS MEASUREMENT & CONTROL CO., LTD. 2020).

The results of the groupwork were surprisingly diverse in the beginning and very close to the optimal farm in the end, being nearly completely self-sufficient and only needing feed as an input from outside. For further optimization the designed farms could try to further reduce produced waste and decrease the amount of power consumption. Additionally, at the current state, the aquaponic fish farms are less suitable for large scale production than open cage farms in ocean environments. It must be considered that the biggest drawback of a sustainable fish farm is a lower amount of harvestable fish per invested cost. Until the sustainable farm designs are suitable for large scale production it is vital to balance the human populations need for large amounts of fish for nutrition with the oceans capabilities to endure pollution.

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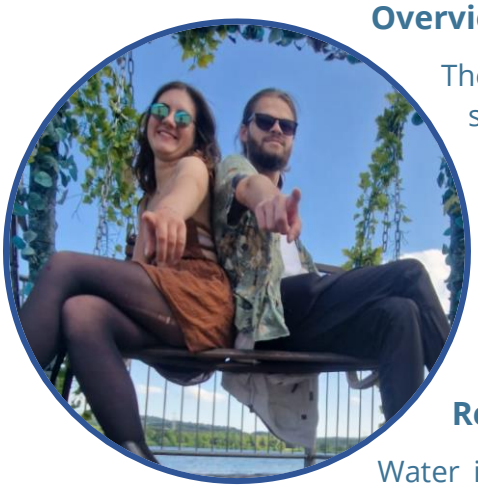
5.7 The art of sharing a river

Marius & Alina



Overview

The aim of this workshop was to find a common European solution concerning the water management of the Danube. Therefore, a discussion was held where five countries, located in the Danube River Basin, had a representative who had previously learnt about their country using fact sheets and information that was given to the participants during the first two workshop sessions.

Relevance

Water is important to all of us since it is a vital resource for everyone. Nonetheless, only 71% of the world population have access to safe drinking water and 80% of the world's wastewater is left as it is, meaning it goes into waterways untreated. Also, as the following facts also show, there is only 39% of world population with safe sanitation. In 2015, 4.5 billion people lacked safely managed sanitation services and 2.3 billion people lacked even basic sanitation.

As the workshop was a lot about individual goals, like the country's own ideas and the different SDG's approaches, it became even more clear that working together as a unity on these different aims is essential. Europe needs to improve on working together with all the countries to achieve a more sustainable future by implementing shared water management plans between them.

The Sustainable Development Goals

In the beginning of the workshop, the workshop leaders gave the participants an overview of the relevant SDGs that were numbers 6, 11, 12, 15 and 17.

The participants learned that SDG 6 is about clean water and sanitation, meaning that its main achievement would be to have safe and affordable drinking water for all by 2030. Due to the climate crisis we find increasing water scarcity and there's a need to invest in adequate infrastructure and sanitation facilities. Transboundary water management is also gaining importance now that working together on a national level is required, which is why this SDG could be implemented well into the workshop. There were some specific targets of SDG 6 that the participants were introduced to since they seemed to match the workshop's theme: "By 2030, achieve universal and equitable access to safe and affordable drinking water for all". "By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation". "By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate". "Support and strengthen the participation of local communities in improving water and sanitation management". So, using SDG 6 for the workshop wasn't only about seeing that clean water and sanitation is important but also seeing that transboundary cooperation is crucial for achieving an improvement on the current water situation in Europe.

SDG 11 is about sustainable cities and communities, aligning well with what SDG 6 said about transboundary water management. By 2050, two-thirds of the world population will be living in urban areas and it is unavoidable that our cities become more sustainable. In order to achieve sustainability career and business opportunities can be created in the cities, housing can be safe and affordable, resilient societies and economies should be built, there could be investments in public transport as well as green public spaces and urban planning should be improved in participatory and inclusive ways.

Selected targets of SDG 11 are "By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries" and "By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global GDP caused by disasters, with a focus on protecting the poor and people in vulnerable situations"

SDG 12 targets Responsible Consumption and Production.

It is the responsibility of us all to manage our shared natural resources, toxic waste disposal and pollutants efficiently. To achieve that we need to encourage industries, businesses and consumers to recycle and reduce waste and support developing countries to move towards more sustainable patterns of consumption.

Considering that only three percent of the world's water is fresh and of all the human freshwater use, 70% is used for agriculture, especially in this sector improvements regarding groundwater pollution etc. need to be implemented.

Selected targets are: "By 2030, achieve the sustainable management and efficient use of natural resources". "Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle" and "By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature".

SDG 15 "Life on Land" aims to reduce the loss of natural habitats, biodiversity, support global food and water security and mitigate and adapt to climate change. Selected targets to achieve that goal are: "By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services", "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world" and "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world"

The last sustainable development goal chosen for the workshop was SDG 17 "Partnership for the goals". Sustainable development only functions on an international scale. Countries need to work together to achieve the goals proposed by the UN. The SDG aims

at strengthening the means of implementation and revitalise the global partnership for sustainable development. For a coherent partnership between countries each country must respect every other country's policy space and leadership.

On the other hand, multi-stakeholder partnerships and public, public-private and civil society partnerships need to be encouraged to mobilise knowledge, technology, financial resources and experience out of the society.

The countries

In order for the participants to get to know each other better but also to get into the topic of the Danube, they were asked by the workshop leaders to stand in a line either further to the left or right than the others depending on how far from their entity city the next Danube spot would be so that as a result one would have a person living really close to the Danube on the left and one living far on the right. The workshop leaders then corrected the line and also talked a little about the participants' origin countries. Afterwards, they got to choose one out of five pre-chosen countries that play an important role in the Danube River Basin (Germany, Austria, Hungary, Serbia and Romania).

Germany has 9.4 million inhabitants in the basin, which makes 11.6% of the population of the entire Danube Basin. Germany is an interesting country regarding the Danube since the river's source is located in the Black Forest as it is a confluence of the Brigach and Breg. However, the Danube loses half of its discharge to the Rhine Basin. It is also linked to the Rhine by the Main-Danube Canal. Economically, the Danube is used for automobile and machine industries in Germany, as well as agricultural activities. Germany invests largely in wastewater treatment plants and generally contributes to improving the water quality.

Austria has 7.7 million people living in the Danube River Basin and the Austrian territory accounts for 10% of the total Danube Basin. Due to its mountainous landscapes, the Danube is way steeper in Austria than it is in Germany or Hungary. One can also find two natural highlights within Austria, one being an UNESCO World Heritage Site in Wachau. The Wachau valley, or rather its evolution, is well preserved since prehistoric times, especially the vine cultivation. The other highlight is a large floodplain area of the Danube with a huge diversity of habitats, plants and animals. It's called Donau-Auen National Park and is located between Vienna and Bratislava.

One of the most interesting facts about Hungary regarding the Danube is that the entire territory of the country is found in the Danube River Basin. Hungary is a landlocked country with rivers entering the countries from the west, north and east and flowing to the south. There also are two natural highlights, the lake Balaton, which is the largest lake in the Danube River Basin and the Danube-Dráva National Park, which contains one of only few remaining natural Danube floodplains.

As for Serbia, 92% of the country lies within the Danube River Basin and almost 90% of Serbia's accessible water has its origin outside of the country, which makes it very important to Serbia to ensure that there's a good connection to the other countries concerning water management. Serbia is not an EU member but already a candidate state so it's currently trying to harmonise its very first river basin management plan with the EU water framework directive. In general, Serbia adapts its legislative system to the EU water legislation. Also regarding the connection to other European countries, all rivers in Serbia are directly or indirectly linked to the Danube which also means that they are linked to the European inland network. Those rivers combined are a 1700 km inland waterway

network in Serbia. Natural highlights in the territory would be the Iron Gates (Djerdap) National Park and the Gornje Podunavlje Special Nature Reserve which is the most significant wetland in the upper part of the Serbian Danube. Serbia doesn't have many wastewater treatment plants so far and suffers from high to very high pollution as well as hydromorphological pressures.

Romania counts 19.5 million inhabitants within the Danube River Basin and more than a third of the Danube's length is located in the country. In total, 97.4% of Romania's territory is part of the Danube River Basin. Therefore, the Danube has also played an important role in shaping Romania as it is today. Besides the relatively small part of the Ukraine that is in between, Romania is the end carrier of all wastewater discharges flowing into the Black Sea through the Danube delta. The Danube Delta Biosphere Reservation extends largely in that area and stretches across the Ukrainian border to the north. Due to many anthropogenic changes which also include agricultural activities, increased urban land use, developments in floodplains, embankments and deforestation of large areas and also the heavy rainfalls, there is a lot of flooding in Romania and it also struggles with pollution in the Danube that comes from the upstream countries as well.

The discussion

Finally, the information given and the group work done by the participants led up to the main focus of the workshop, a "roleplay-discussion" where every country group sent one of their members to the front in order to represent their countries' thoughts and ideas on how to sustainably manage the Danube in the future while working together with the other countries. The workshop leaders were moderating the discussion and taking minutes for the end results.

At first, each country representative got to introduce the results of their group work and talked about what their country focuses on the most and what kind of contribution to the common water management they would like to see from other countries as well.

After the presentations the following discussion aimed to come up with solutions regarding a transboundary management of the Danube and at the same time consider and adjust the individual sustainability concepts.

Surprisingly the discussion went a different path and political and economic discrepancies especially between the representatives of Serbia on the one side and Germany and Austria on the other were in the focus.

It was visible that the idea of a shared water management was wanted by all the representatives but the economic power of Germany and Austria and the lack of financial resources by the other countries to put their concepts into reality was a real problem.

Without the financial means, projects proposed by Serbia, Hungary and Romania would not come into reality. But using the money from Germany and Austria, their influence in the national concepts would be to big and the eastern countries would not have much to say anymore.The discussion ended after roughly 45 minutes without a real solution to the problems discussed.

The result

On the last day the workshop group created a poster where the main ideas of each countries management concepts were put on together with some ideas of the group regarding the improvement of the transboundary management of the Danube.

The group essentially came up with the idea to create a governing body and shared fonds where each country lying in the danube river basin can present their projects on sustainable water use. A neutral council will then decide wether or not the project will get funded.

As the already existing danube commission does not have any governing power, this would be an essential step to really start improving the Danube water management.

Another important part would be the further improvement of relations between eastern and western europe together with the intake of Serbia into the EU.

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EXCURSIONS

6. The Excursions

6.1 Easy Hike

Ricardo Göhler (Berlin)

Even though the Easy Hike might sound like an easy excursion, it doesn't mean it was less exciting. It consisted of a relaxing hike of 11km through the scenic valley of Weissenbach.

With a group of motivated EGEAns we started our tour from the congress venue and followed the Artist Path alongside the little river that created the valley. Along the way, on our right and left hand side we saw quarries who use for example the stone of the valley for gravel production.

Figure 27 View of a quarry from the mountain side

One of the highlights of the tour was the Nixenfall. This precious waterfall reaches up to 50 meters and carries a little amount of water. During the snow melting it has its peak in water runoff. The Nixenfall is surrounded by a legend. The legend says that a mermaid lived in the Attersee lake and that she gave the people living there a lot of presents, but because of greed and mischievousness, she decided to leave and never came back. A little statue at the waterfall presented us with an image of her. From there we continued our voyage through the vast forest of the valley of Weissenbach, where we could also learn about other legendary figures and the local types of trees.

Figure 28 Group picture at the Nixenfall

The middle part of the hike led us to a little observation point that we reached after ascending a couple hundred meters. The group was very heterogeneous and besides learning the word squirrel in 10 different languages, we made a lot of stops to enjoy the warm weather and the fresh air in the forest.

After a while, we reached our turning point which was a riverbed with a lot of white gravel. When the snow is melting, the river contains a lot of water and flushes the biggest part of the river banks. The rest of the year, however, it is possible to sit on the river banks. We took advantage of this and had our lunch there, enjoying the very warm and pleasing sunlight.

Figure 29 Enjoying a break by the river

After recharging our batteries near the river, we headed on the way back to our starting point. This time we took a different route that has led us to the more hidden part of the valley. When we walked the first part of the track, we could see the street that follows the river. In the trackpart for the return, we faced a more calmed environment with a lush vegetated forest and a lot of different smells.

For our last break on the way, we chose a little hideout with a little woodhouse and a few benches. It was a very picturesque place in the middle of the forest with tall trees giving shade but also allowing little spots of sunlights through the treetops. Exactly next to our little hideout everybody could hear the swooshing of the tiny stream close by. While we walked further, the whole group had to step over a bridge and catched a glimpse of the stream that was next to us. After giving the participants the last information about the landscape and the valley, we went to our end destination at the event location. Everybody enjoyed the little hike and could learn a bit more about the Attersee region.

6.2 Hard Hike

Emil Hühn (Augsburg)

The second hiking option besides the easy hike was the hard hike. Quite self-explanatory in its name, this route was a touch more ambitious than its alternative. At around 09:30 o'clock, starting from the campgrounds of Europacamp at an elevation of roughly 490 meters above sea level, the group of around 20 motivated Egeans set off on their way up the mountains, their target being the Mahdlgupf. Standing at around 1200 meters of elevation above sea level, the Mahdlgupf boasts a spectacular view over the adjacent Attersee and its surroundings. The chosen route can be seen in the following image. The total distance being a touch over 8 km with a total elevation gain of more than 700 m.

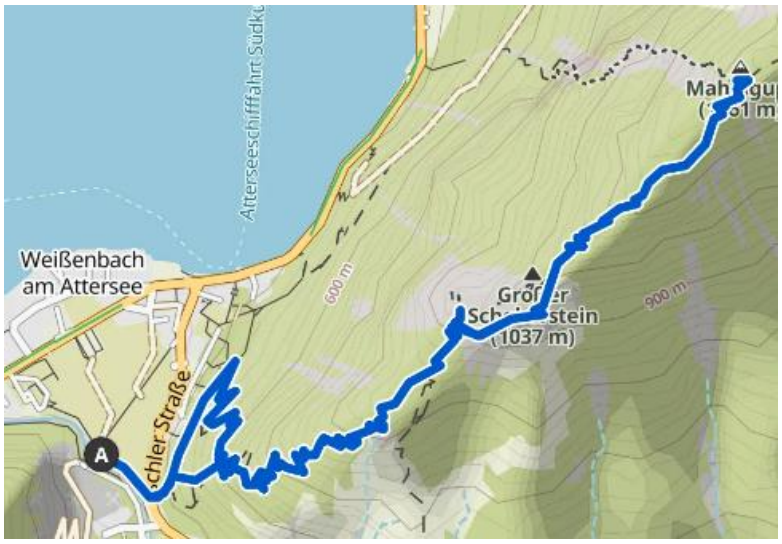

Figure 30 Hiking route of the hard hike to Mahdlgupf

The Attersee being Austria's largest lake located entirely within the country's borders with a total water surface area of more than 46 km^2. At its deepest point the Attersee measures a depth of 169 m, making it Austria's third deepest body of water, only being surpassed by Lake Constance with a maximum depth of 251 m and the Traunsee with a maximum depth of 191 m. Just like most other alpine lakes, the Attersee has also been formed by glacial formations during the ice age.

Like many other parts of the northern alps, geologically this region's bedrock is mostly characterized by cretaceous rock and clastic sedimentary rock. Curiously, the mountain ridge of this mountain range almost perfectly marks the border between these two kinds of bedrock. The former being found north of the ridge and the latter making up the southern part.

After a short walk to the base of the mountain, the group was ready to start their ascend. The first section up to the Kleiner Schoberstein led through sprawling vegetation. Reaching the peak of the Kleiner Schoberstein at circa 11:00 o'clock, it was time for the first break. Here Egeans could refuel, relax, and enjoy a first panoramic view over both the Attersee, and the adjacent valley from a height of 990 m above sea level – circa 500 m above the lake's surface. Below the reader can find a picture of said view.

Figure 31 Panorama looking down at the Attersee

Freshly reenergized after a 20 minute break the group continued onward to their target – the summit of the Mahdlgupf. Now, past most of the vegetation, the sun really started to make itself noticeable, relentlessly burning down. The clear skies offering little to no relief from the sun's radiation. Reaching the Mahdlgupf almost an hour later, with minor hiccups, everyone in the group reached the top well. Now atop the summit, everybody had time for an extensive break – time to take pictures, have a picnic, and some chit-chat. A celebratory group picture next to the summit cross was in order. Said picture couldn't be found though, unfortunately. The view from the top of the Mahdlgupf was especially interesting, because of the stark contrast between the flat landscape north of the Attersee and the mountainous landscape that starts right next to the lake, going down south, as hinted at by the view from Kleiner Schoberstein.

After almost an hour of break time, it was time for the descent. From then on, it all went downhill. Pun very much intended. On the halfway point between Mahdlgupf and Kleiner Schoberstein, one of the participants injured their knee. Unable to walk unassisted, the injured knee was stabilised. Not to hold up the others, the group split up, with three people joining the injured Egean to offer their assistance. Other than that, the descent was rather uneventful. Everybody made it back to camp by 16:00 o'clock. The injured hiker was promptly taken to a physician.

6.3 Renewable Energy Discovery: From Research Studio to Hydroelectric Power

FRANZISKA SENDL (AUGSBURG)

The excursion titled "Renewable Energy Discovery: From Research Studio to Hydroelectric Power" unfolded in the scenic city of Salzburg. The journey commenced with a bus ride to Salzburg, carrying 20 eager participants ready for exploration. The highlight of the day was the visit to the Sohlstufe Lehel hydroelectric power plant, operated by Salzburg AG. The participants were treated to a captivating tour led by the plant's management, offering valuable insights into the intricacies of hydroelectric power generation.

Dr. Markus Biberacher from the Research Studio accompanied the group during the hydroelectric plant tour. Following the visit, he provided a brief presentation at the Research Studio, offering an overview of their work and the current status of renewable energy in Salzburg and Austria. To bridge the gap between the hydroelectric plant and the city center, the group embarked on an walk along the Salzach River, taking in the lunchtime scenery by the riverbank.

The walk provided a unique perspective on the settlement structure along the river, with various hills and elevations of Salzburg visible in the distance. Upon reaching the city center, the group hiked to the Nonnberg viewpoint. There, in groups, they engaged in an Actionbound on the topics of ecology and urban ecology in Salzburg, generously provided by Dr. Angela Hof, University of Salzburg. After some free time to explore the city center, the participants collectively made their way back to the bus, eventually covering many kilometers throughout Salzburg.

The excursion provided a substantial and insightful journey, offering many participants their first-ever experience inside a hydroelectric power plant. The feedback from all participants was overwhelmingly positive, highlighting the success of the excursion in providing intriguing inputs and insights into the realm of renewable energy in Salzburg. A heartfelt thanks were extended to all partners who played a pivotal role in making this enriching excursion possible.

6.4 Water in Salzburg

Mareike Oelrichs (Augsburg)

Together with the other excursion to the city of Salzburg, we embarked the last bus leaving our accommodation at Lake Attersee. Unfortunately, the journey took longer due to road construction and accidents, forcing us to drive around the northern part of Lake Attersee, but this provided an opportunity for some EGEAns to catch a few extra moments of sleep. Upon our arrival in Salzburg, our first task was to explore the city on foot to reach the starting point of the excursion. This allowed us to gain an initial impression of the hilly terrain and enjoy beautiful views of the valley below.

Our plan included a meeting with Mr. Uhlir, a former lecturer at the University of Salzburg and an expert in water management in Salzburg. Due to his delay, we had extra time for a leisurely lunch break and to relax in the summer sun. Our excursion officially began at 11:30, led by Mr. Uhlir, who guided us through the city at a brisk pace, sharing insights into Salzburg's history from its early settlements to the present day. We learned about the city's water sources, the challenges in supplying large urban areas, and the water bodies that continue to sustain the city.

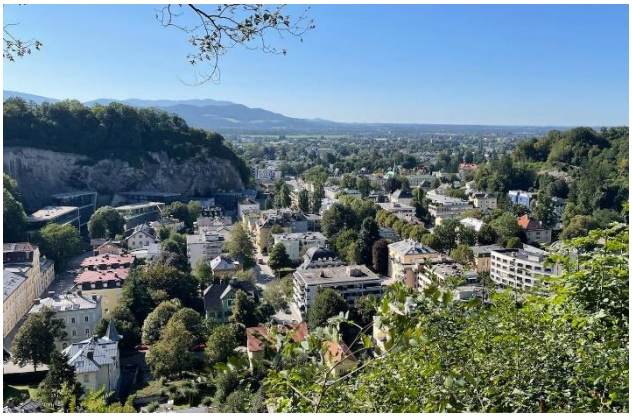

Figure 32 View of Salzburg

Figure 33 Learning about the history of water supply in Salzburg

In the afternoon, we rejuvenated ourselves with Almdudler or coffee, before venturing into the WasserSpiegel Welt, or Water Mirror World. The Water Museum, located in the reservoir on Mönchsberg, offers a multimedia exploration of the history and processing of drinking water in Salzburg. The WasserSpiegel, a part of the Mönchsberg reservoir with a capacity of 25,000 m³, plays a crucial role in supplying water to the city of Salzburg. Spanning 500 square meters, this interactive museum provides information on the past and present of water supply, including its origin, quality, and the necessary technology.

After changing from summer shorts into warm sweaters (as the reservoir is at constant 12°C) we started off our museum tour with a water tasting experience, perfectly fitting to the AC congress topic 'water in a changing world'. Following this we received an interesting tour, exploring different artifacts associated with water management throughout history, making the visit an entertaining and educational experience. The Water Museum, established in 1998 and operated by Salzburg AG Tourism, is situated in the renovated spaces of a disused water reservoir from 1929.

Overall, the excursion not only enriched our knowledge of Salzburg's water management but also offered a delightful blend of historical insights and contemporary practices. Sadly, due to the delays we did not have the time to further explore the inner city of Salzburg with its many sights. However, we thank the university of Salzburg for providing us with an Actionbound trail and associated information about the different sites!

6.5 Overtourism in Hallstatt

Sascha Ferling (Mainz)

During the 45-minute bus journey, we came into contact with the concept of overtourism for the first time, as two weeks before our excursion, the access road in one of the tunnels was blocked by the residents of Hallstatt in protest against tourism. Fortunately, the tunnel was clear again when we arrived and we reached Hallstatt at around 9.00 am. But it was at our first stop, the arrival point for the coaches, that we got our first impression of tourism in Hallstatt. We were impressed by the number of coaches arriving after just a few minutes. However, as we learnt later in the day, there used to be significantly more coaches than there are today. However, the behaviour of the tourists doesn't seem to have changed: Everyone jumps out of the buses, runs to the lake and takes their first Hallstatt photo. Another characteristic seems to unite a large number of tourists: they probably come from Asia. We will find out why this is the case later in the day.

We then continued towards the cable car, where we finally discussed specific topics of overtourism that we were to observe in Hallstatt during the course of the day. The aim was to look at how tourism has changed and shaped Hallstatt, what Hallstatt would look like without tourism and how the things will change in the future.

Now it was time for all the excursion participants to head towards the centre of Hallstatt. First observation: tourists everywhere! No wonder with only about 750 inhabitants and almost 1 million tourists a year. Would we even meet anyone from Hallstatt here? At least the sellers of tourist materials seem to come from the region. This is where the love-hate relationship between the local residents and the tourists, which has been with us all day, first became apparent: they need the tourists and at the same time they are groaning under the masses. Particularly noticeable were the many warning signs that Hallstatt is not an open-air museum and that the people living here should be respected. These signs were mostly in English and Chinese. Information boards about Hallstatt were often placed right next to them, but these were often only in German (picture 1). This seems to be a clear indication that the tourists are probably less interested in the history or information about Hallstatt.

Figure 34 Warning signs and information boards in Hallstatt

At the end of our walk through the centre of Hallstatt, we finally seem to have found the most important tourist site in Hallstatt: A simple street directly in front of residential buildings on which, in turn, posters criticising tourism are displayed. The reason for this location is the ubiquitous postcard motif of Hallstatt, which can be photographed from this position. Tourists seem to gather here around the clock to take the best possible photo of Hallstatt (picture 32). No wonder that local residents are particularly critical of tourism at this location. But how exactly did this overtourism in Hallstatt come about? We finally discussed the answer to this question and a lot of background information on the development and future direction of tourism in Hallstatt with Mr Alexander Scheutz, the mayor of Hallstatt, who kindly invited us to Hallstatt Town Hall at the end of our excursion (picture 33).

Firstly, he told us about the dilemma for the people of Hallstatt, which has already been mentioned: They need the tourists, but nobody in Hallstatt seems to be really happy with the current situation either. Tourism is a problem for many Hallstatt residents: There are large posters on the walls asking people not to shout loudly or listen to music. Signs such as "Everything for the tourists, nothing for us!" - hang on some balconies.

Figure 35 Postcard photo of Hallstatt (own photo Sascha

The mayor also believes that several thousand visitors a day are too many. Measures have already been taken. Hallstatt has had a slot system for large coaches for several years now. Only those who book in advance are allowed to park. Instead of up to 90 coaches per day in the past, only half of them now come. But the cars and minibuses also cause problems. They drive up even when the 350 small car parks are already full. Specially assigned municipal staff then try to turn these guests away, often without success. Many then park illegally without further ado. These are mostly day tourists who are only staying in the city for a few hours for the obligatory selfie.

However, the mayor also explains that tourism also has enormous benefits for the mini village in the Salzkammergut. Despite their short stay, guests spend a lot of money when they eat schnitzel in restaurants, buy Hallstatt mugs or pay admission. The car parks alone generate a profit of several hundred thousand euros per year. Without the income from tourists, the people of Hallstatt would have to do without many things. There would be no afternoon care for primary school children, no all-day kindergarten, no meals on wheels for the elderly and also no council housing, of over 30 flats, with square metre prices of five euros. In addition, young people can be kept here because of the tourists and the associated jobs.

Another important point was the background to this Hallstatt hype. Here the mayor explained to us that the origin of this Asian love for Hallstatt is presumably a South Korean Netflix series, "Spring Waltz" from 2006, which was partly filmed in Hallstatt. Since then, many have wanted to see the place in real life. The fact that the Austrian village, including the lake and market square, was recreated in China, which the mayor only found out about after it was completed, has made it even more famous. And now thousands of Hallstatt selfies on social networks are adding to the hype. The rush is unbroken. Tourists now come all year round and not just in summer. On peak days in the high season, there are up to 10,000 guests a day, who suddenly change the actually tranquil idyll of Lake Hallstatt at around 8 o'clock in the morning.

In conclusion, Mr Scheutz emphasised once again that although some Hallstatt residents see the benefits of the tourists and others feel disturbed by the noise and annoyance, everyone ultimately agrees that things cannot go on like this. Large groups are currently discussing how many tourists Hallstatt can cope with. What the final figure will be and whether it will be called the upper limit is currently completely open. He has also announced that he will ask the state for help and get the neighbouring communities on board. After all, everyone would benefit from Hallstatt's world fame, which is why we must now stick together.

Figure 36 Group Picture with the mayor of Hallstatt (front row, forth from left)

6.6 Neopalitic settlements at lake Attersee

Julia Franke (Augsburg)

The excursion group left the campsite at 8 o'clock as the first group and took the public transport to the meeting point in Seewalchen at the Attersee. There the group met up with underwater archeologist Henrik Pohl from the pile dwellings curation in upper Austria, who gave the EGEAns a three-hour guided tour. Mr. Pohl gave the excursion group many insights how and why humans lived in pile settlements in the alpine lakes in Austria. Nowadays it seems like an odd choice to live in a pile village in a lake, but back that the landscape looked different. Thick forests and swamps made building settlements extremely hard. For that reason, it was easier to build houses on top of wooden piles, that are easily pushed into the soft lake ground. As an underwater archeologist he showed us replications of findings from the bottom of lake Attersee as well as two reconstructions of wooden boats, formed from one large tree trunk, floating in a nearby harbour.

Figure 37 Learning about pile settlements

Figure 38 Lunchbreak with beautiful view of the Attersee

The pile settlements at lake Attersee are part of a UNESCO world heritage site, called "Prehistoric pile dwellings around the Alps" and is conserved as such. Conservation of the pile dwellings is important because modern ship traffic with their motorized propellor and the ship buoys damage the piles. The soil on the lake bottom is removed or sinks have formed, and the piles are not covered anymore, causing faster decay.

After a quick lunch at the beautiful turquoise lakeside, the group made their way up, deeper into the region Salzkammergut for a short hike. Using public transport again, the two hour hike started in Kogl and led up to a viewpoint over the region on mountain Lichtenberg. After 200 steps up on the tower, the group enjoyed a fantastic overview over the lake Attersee and the closeby alps. At around 17 o'clock the excursion ended back in the campsite.

Figure 39 Group Picture at the top of the viewpoint on the Lichtenberg

6.7 Journey through Salzkammergut's natural heritage: nature museum & lake offense exploration

Hannah Kötterl (Wien)

Figure 40 Exploring the nature museum

The excursion to the nature museum started on Wednesday morning around 8:00 am together with the excursion to the saline. After being dropped off at the museum, the excursion started with a few photos with the museum director and tour guide, the 17 participants and the local press. After the welcome, we were taken to the group/conference room of the private museum. After a short refreshment with the snacks provided, a short presentation on the Salzkammergut, the Salzkammergut lakes, special creatures like the Toplitzsee worm as well as endemic species like the "Riedling". In addition to endemic fauna species, there is also endemic flora that can only be found along Lake Hallstättersee and Lake Traunsee.

This is the "eastern devil's-bit". Furthermore, the lecture was extended by the visit of the diving pioneer Gerhard Zauner, who donated many of his finds to the museum. (Laserer, 2023).

After the lectures, we were guided through the museum, which had many of the local species on display. It was emphasised that none of the animals had to die for the exhibition, they were found or donated. We were able to get to know the region and its species very well, since the museum had to floors consisting of natural heritage from the Salzkammergut. After the museum we were picked up by the bus company and taken to the second stop of the excursion, Lake Offensee.

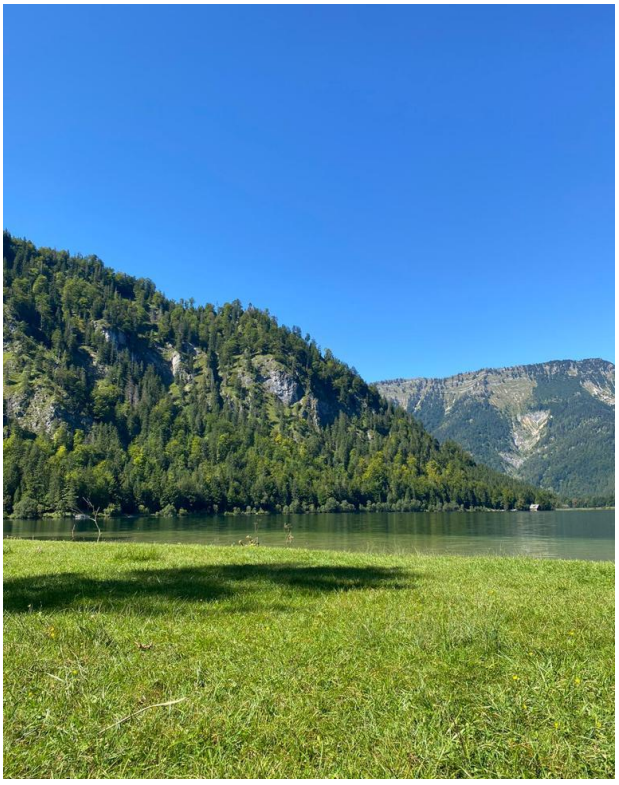

Figure 41 View at the lake Offensee

Lake Offensee is a mountain lake located at the foot of the Tote Gebirge mountain range in the Salzkammergut region of Upper Austria. The area is designated as a nature reserve. The short hike led to the "Seeau" snack station located at a bathing meadow directly on the lake. The lake has a maximum depth of 38 metres, and its width and length are about 900 metres each (Salzkammergut.at, 2018).

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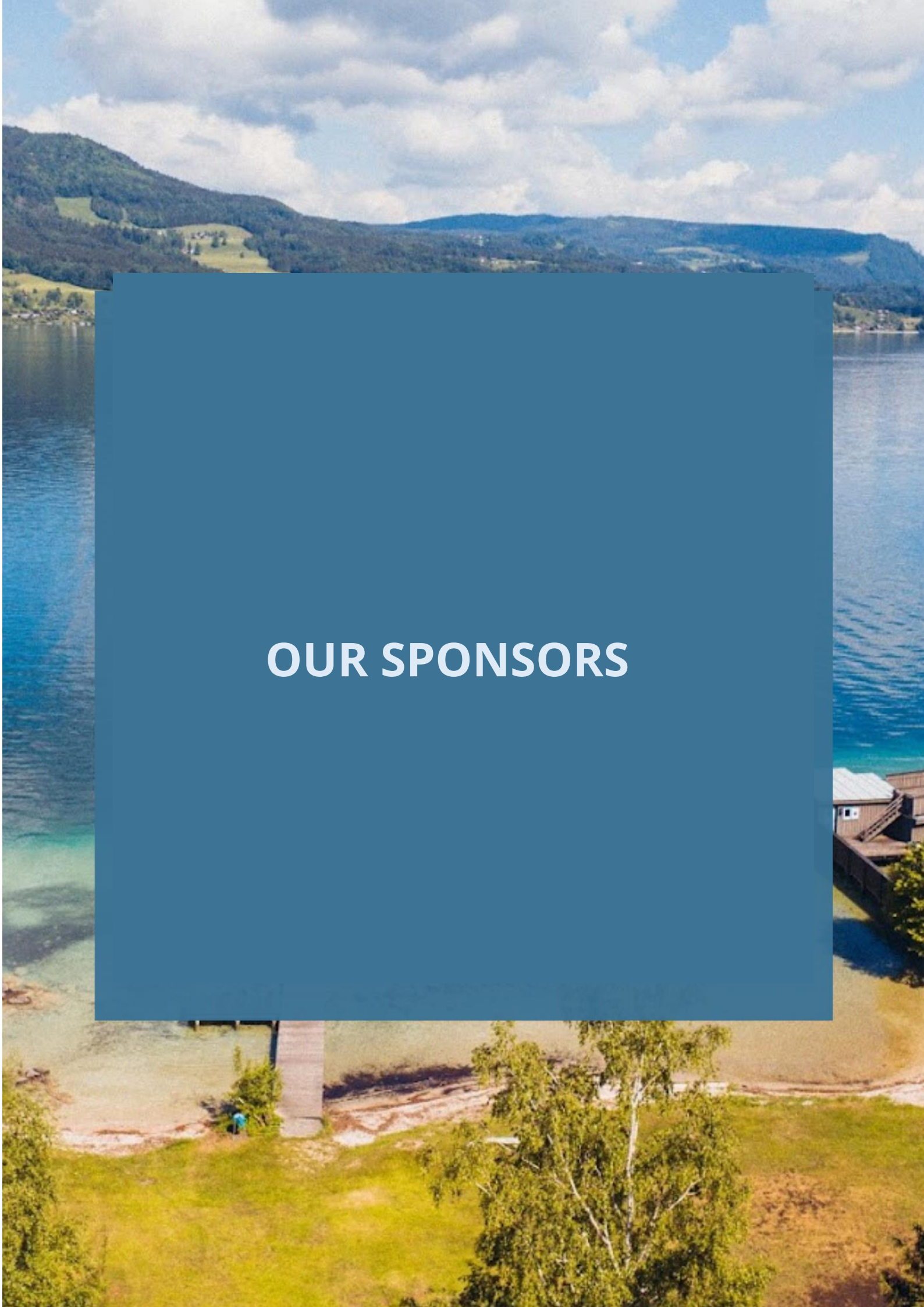

OUR SPONSORS

7. Our Sponsors

By Ricardo Göhler (Berlin) And Robert Schmaus (Augsburg)

AC23 not only thrived on the community and cooperation of all participants and external experts but was also significantly characterized by the generous support of our sponsors. Without their financial support and the provision of extensive information material and catering in the form of food and drink, the realization of this important geography congress could not have taken place on this scale.

Working in partnership with our sponsors not only gave the event financial stability, but also helped to provide participants with high quality resources and information. In this final report, we would therefore like to express our sincere thanks to all those whose generous support made a significant contribution to the success of the congress. In the following, we would like to introduce the individual sponsors whose commitment helped to make AC 23 a significant event in the geographic community.

We thank our sponsor **Institut für Geographie - Universität Augsburg** for helping us realize the AC 2023 in Austria.

All human activities take place in a geographical space of great diversity and constant transformation. The research and teaching activities at the Institute of Geography aim to better understand the causes and effects of global change and to develop approaches to solutions that enable sustainable development in the Anthropocene and lead to resilient structures. Geography is one of the first subjects at the University of Augsburg and has been established at the location for almost 50 years.

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Figure 42 Logo: conterra

We thank our sponsor **Con Terra** for helping us realize the AC 2023 in Austria.

con terra integrates intelligent Geo-IT solutions into the IT structures of its customers in the private sector and public administration agencies. This enables geoinformation to be put to profitable use, making company processes sustainably more efficient, cheaper and more transparent.

con terra cooperates with universities, participates in research & development projects and standardisation procedures, and plays an active role in committees and working groups of such organisations as ISO, GDI-DE, OGC, and INSPIRE. This puts con terra in a position to evaluate trends affecting the market at early stage and to play a role in shaping and incorporating them in the planning and implementation of IT solutions.

The company's focus lies on such markets as insurance, natural and environmental resources, telecommunications, trade, sdi and e-government and real estate, and its fields of activity include spatial data infrastructures and spatial data modelling & transformation. Its success is based on its more than twenty-five years of experience,

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con terra consists of more than 220 computer scientists, geoscientists, mathematicians, physicists, engineers, ecologists and other specialists, all working together across a wide range of fields and roles.

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Figure 43 Logo:

We thank our sponsor **blp Geoservices** for helping us realize the AC 2023 in Austria.

blp GeoServices Ltd. is an engineering company dealing with contaminants in soil, soil air, groundwater and buildings. They advise on contamination investigation, remediation of contaminated sites, land recycling and building demolition.

The team of blp GeoServices Ltd. consists of 29 employees. The company has a broad spectrum of scientific and technical education, which includes the following fields: Cultural Engineering & Water Management, Geography, Landscape Planning, Mechanical Engineering, Civil Engineering, Geoinformatics, Ecology and Geology.

The offices are located in Vienna and Linz.

Get more information under: https://blpgeo.at/en/

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We thank our sponsor **Stadt Augsburg** for helping us realize the AC 2023 in Austria.

Water makes history. Then. Today. Tomorrow.

Human ingenuity, pioneering engineering knowledge and magnificent world-class works of art: that is the recipe for success of Augsburg's water management system. Only rarely can you experience the intricate interplay of innovative spirit and technical masterstroke in a single place without gaps over eight centuries on the basis of a water system as impressively as in Augsburg.

The centre illustrates the complex water system in pictures and texts. It serves as the first point of contact for interested visitors to Augsburg's World Heritage Site, which, with its 22 objects, extends far beyond the city area and, with the Lech Museum in the Langweid hydroelectric power plant, also beyond. The thematic routes include, for example, the Maximilian Museum with the original bronzes of the three monumental fountains and the model chamber, as well as the Historic Waterworks at the Hochablass.

Get more information under: https://wassersystem-augsburg.de/de

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We thank our sponsor **Deutscher Verband Angewandter Geographie e.V. Regionalforum Schwaben** for helping us realize the AC 2023 in Austria.

The German Association for Applied Geography (DVAG) is an important platform for professionals and students of applied geography in Germany. It provides access to current topics, contacts and career opportunities. Students explore occupational fields, make contacts and find internships. Professionals expand their network and open up new fields of work.

The DVAG acts as a personal contact network, thematic information network and overarching network of interests. Volunteer work is the focus, participation is welcome. The association offers a variety of services such as magazines, events, mentoring programmes and online information events. Members have full access, some services are also available to non-members. DVAG promotes professional development in applied geography.

The DVAG Regional Forum Swabia was founded in March 2015 on the initiative of geographers. The Regional Forum Swabia sees itself as a platform for regular professional exchange on current spatially relevant issues and for networking professional geographers from the Swabian region and beyond.

In addition, we were also personally supported by Dr. Niklas Völkening and Dr. Bernhard Kräußlich, two experts in the field of human geography and transformation research, who together led an excursion on the topic of overtourism in Hallstatt (Austria, more details see chapter 0).

Get more information under: https://geographie-dvag.de/regionalforum-schwaben/

Or follow their social media:

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We thank our sponsor **Stefan Sendl Dipl.-Ing.(FH) Ingenieurbüro** for helping us realize the AC 2023 in Austria.

Stefan Sendl Dipl.-Ing.(FH) Ingenieurbüro is a consulting and planning engineering firm for energy technology systems. They have been successfully implementing and optimising energy technology projects since 1990. Their core competence is in the area of district heating supply. The company sees the integration and use of biomass and geothermal energy as important steps on the way to a sustainable energy supply. Together with their clients, they develop an ecologically future-oriented and economically viable solution.

They provide support from the first basic evaluation onwards and take over the design and implementation planning, as well as the construction supervision and final acceptance. Furthermore, they are at your side all the way to quality assurance during construction and operation. Take advantage of their experience and commitment for the successful development and implementation of your project. The firm looks forward to a constructive and responsible cooperation.

Get more information under: https://ib-sendl.de/

We thank our sponsor **Zukunftswerk eG** for helping us realise the AC 2023 in Austria.

Probably the most southern sustainability consultancy in Germany. If you want to do something to make your organisation sustainable, you have come to the right place: Zukunftswerk advises companies, municipalities, foundations and NGOs that want to improve themselves ecologically and socially. They are experienced, independent, eco-social, motivated, reliable and imaginative. If you value these qualities, they are a great fit.

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Zukunftswerk is happy to advise. In order to cover the versatility of sustainability, they offer you our active support. They can advise you on the Sustainable Development Goals, sustainability reporting and the future of work.

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We thank our sponsor **Universität Wien** for helping us realize the AC 2023 in Austria.

The University of Vienna, founded in 1365, is one of the oldest universities in the German-speaking world and is a renowned educational institution with an international reputation. With its rich history and tradition, the University of Vienna has made a significant contribution to the development of science, research and education.

The broad range of degree programmes on offer covers a variety of disciplines in the humanities and natural sciences, social sciences, law, economics and more. The university places particular emphasis on interdisciplinary research and promotes exchange between different subject areas.

The campus is spread across various historic buildings in the city center of Vienna, creating a unique and inspiring learning environment. The University of Vienna fosters international partnerships and offers students the opportunity to participate in exchange programmes and research projects worldwide. With a diverse and vibrant student community and highly qualified faculty and researchers, the University of Vienna offers an excellent education and shapes the future through innovative research and teaching.

Get more information under: https://www.univie.ac.at/

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ATTERSEE-ATTERGAU
salzkammergut

We thank our sponsor **Tourismusverband Attersee-Attergau** for helping us realize the AC 2023 in Austria.

We are happy to share their message from the Attersee to the world:

Holidays at Lake Attersee and in the Attergau region
Clear water - wide landscape
The water is relaxation, power and energy, the landscape idyllic challenge.

The Attersee-Attergau holiday region combines relaxation, sporting action, culture, entertainment, enjoyment and impressive experiences in nature. Here, well-being is pre-programmed and holiday dreams become unforgettable #attermoments! Experience a unique holiday at Lake Attersee and in the Attergau region in the Upper Austrian Salzkammergut.

The tourism agency was one of our main sponsors. We want to thank them not only for their generous funding, but also their contribution to help us to create excursions and give us valuable input about the region.

Get more information under: https://attersee-attergau.salzkammergut.at/
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We thank our sponsor **Biomichl oHG** for helping us realize the AC 2023 in Austria.

The Sendl family runs the organic supermarket Biomichl, which has specialised in organic food for decades. The family business consists of an organic farm in Peißenberg and a large organic market with BioBistro in Weilheim in Upper Bavaria. Their focus is on fair, fresh and regional products. Biomichl offers meaningful jobs to over 80 employees and trains 5 apprentices.

The market covers 900 square metres and offers comprehensive organic food and competent advice. The market is easily accessible, with parking in the underground garage and barrier-free access. Opening hours are Monday to Friday from 8am to 8pm and Saturdays from 8am to 6pm.

The farm was converted to organic farming in 1979 and is a pioneer in the region. They are involved in the Bioland growers' association and run an organic farm with a herd of cattle, which is the heart of the family business. The company values sustainability and social responsibility, as outlined in their first sustainability report. The Sendl family is proud of their team and strives for continuous improvements in ecological and social matters in order to offer their customers high-quality organic food.

The organic supermarket was one of our main sponsors. Biomichl provided us with all food apart from the regular breakfast-lunch-dinner. Both fresh fruits and vegetables as well as cookies and drinks were sponsored in best organic quality, so that we were always catered for outside of the regular meals. Their contribution to the congress with organic and fresh food cheered up everybody and gave the event a very healthy touch.

Get more information under: https://www.biomichl.de/
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We thank our sponsor **NBRC 2023** for helping us realize the AC 2023 in Austria. We are happy that they shared some of their spare fundings with us.

The NBRC 2023 - Baltic Sea(L) was an exciting event that took place from 2nd of May to 6th of May 2023 in Estonia. This unique congress experience was organized by EGEA Tartu and was dedicated to the EGEA theme year 2023 “Water”. The motto "Water for Life" provided the inspiring backdrop for the event.

This year, the focus of the congress was on the Baltic Sea. Nevertheless, there are strong thematic connections in between the North Sea and Baltic Sea region. This provided a unique opportunity to better understand and explore the impacts of climate change, such as sea level rise, the state of biodiversity, the transnational mobility of individuals as well as sustainable energy and geopolitical developments.

The NBRC 2023 promised to provide a fascinating platform for the interdisciplinary exchange of ideas and insights. By merging scientific curiosity, innovative approaches and an awareness of the challenges associated with the conservation of the Baltic Sea region, this congress became a significant event for students, researchers and interested parties alike. Participants were able to immerse themselves in the world of NBRC 2023 and discover how water shapes the life and future of our region.

Get more information under: https://egea.eu/event/2022/10/09/nbrc-2023-baltic-seal/

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8. Crowdfunding

In addition to the generous support of companies, the active participation of individual supporters also contributed significantly to the success of AC 23. By introducing the crowdfunding, we enabled individuals to make their financial contribution and actively participate in the success of our event. Supporters received a small token of appreciation in return. The rewards ranged from a personalised postcard, a song of their choice for the wake-up call, a congress T-shirt signed by the orga-team, an Austrian Mystery Box and even a private breakfast with the orga-team.

This wide range of commitment reflects not only the diversity of our supporters, but also the appreciation for their investment in our congress. All the people who supported the congress via crowdfunding were immortalised on a poster - the so-called "sprinkles of gratitude". This created an analogy to our congress theme of water, in which all supporters were visualised in the form of a raindrop.

The opportunity to not only generate funds through crowdfunding, but also to connect directly with individual participants and EGEA alumni, strengthened the community dynamic and contributed to the uniqueness of AC 23. We would like to sincerely thank every supporter whose commitment helped to make this congress an inspiring and inclusive event.

We would like to thank all sponsors who have made a significant contribution to the success of AC 23 through their involvement. We look back positively on the knowledge gained and hope for continued fruitful cooperation in future geographical events.

With the successful conclusion of AC 23, we take stock of an event that was made possible by the generous support of our sponsors. Their financial contributions and the provision of comprehensive information material as well as the sponsorship of food and drink for the breaks in between have helped to make the congress an important platform for the exchange of geographical knowledge.

Working in partnership with our sponsors has not only ensured the financial stability of the event but has also improved the quality of the resources provided. We appreciate the support of each sponsor, which has helped to strengthen the aims and content of the congress.

Our thanks go to all the sponsors and all the people who participated in the crowdfunding, whose involvement made a significant contribution to the success of AC 23. We look back positively on the insights gained and hope for continued fruitful cooperation in future geographical events.

Figure 44 Sprinkles of Gratitude – Visualization of Crowdfunding Suppor

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