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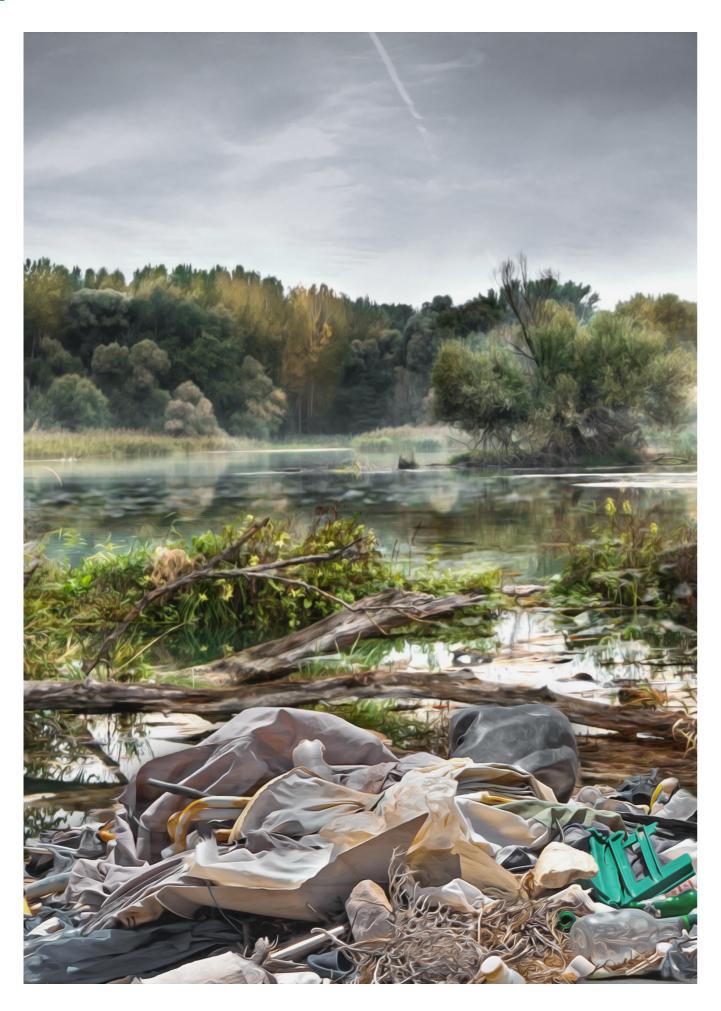


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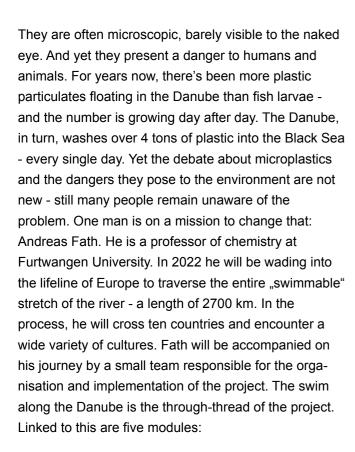


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The project

4 tons of plastic – every single day

Andreas Fath is swimming 2700 km - for a plastic-free Danube.



- A campaign for clean waters and the avoidance of plastics
- 2. An educational workshop programme
- A mobile knowledge workshop and locally-organised informational programmes
- A research programme with exhaustive water analyses
- 5. A documentary



The project in detail

1. Andreas Fath swims the length of the Danube

In spring 2022 Andreas Fath will set off on the Danube, swimming from the Black Forest to the Black Sea. He will be in the water almost daily for about 2 months and aims to garner media attention.

2. The campaign

We will accompany the tour with our press work and activate local networks as well as partner organizations that support and contribute to our campaign.

Regular posts on our social media channels and project website will help attract additional attention.

Every stage of Andreas Fath's odyssey will be tracked live via a GPS tracker. In high-profile campaigns, local players such as nature conservation organisations, municipalities, educational institutions as well as sports clubs will play their part, giving our cause added interest and urgency.

3. Mobile knowledge workshop

A knowledge workshop will be used flexibly and set up at various staging points. It consists of stations designed to educate the public on the issue of plastics in water. The target audience include local spectators and passers-by as well as participants in the educational programme. Clearly arranged informational boards

will also provide knowledge on the Danube as a water microcosm, detailing the causes of pollution in the river and concrete actions that can be taken to prevent plastics from getting into the river.

4. Educational programme

A modularised educational programme aims to enhance the skillsets of young people along the project route so they can take actions to avoid plastic pollution. The workshops cover topics such as "the river and microcosm of the Danube" and "plastic pollution and how to avoid it". The educational programme is aimed primarily at young people between the ages of 14 and 25, and will be implemented locally with the cooperation of local initiatives and organisations. We welcome interested institutions to participate.

5. Research

In the research arm of the project, we plan to take and analyse water samples on a regular basis to provide a comprehensive overview of the degree of pollution along the entire Danube. Among other activities, we will be analysing and comparing microplastic pollution, phosphate and nitrate contamination, conductivity, pH value, COD value (organic pollution, e.g., pesticides and antibiotics), oxygen content and turbidity. The key results of the analyses will be made accessible and easy to understand to the online public during

6. Documentary

the course of the project.

A film following Andreas Fath on his journey will allow the findings to have an impact, time and scopewise, beyond the project itself. Representatives of local projects will be given the opportunity to present their concerns. The film will be shown in cinemas along the Danube. Andreas Fath and/or representatives of the AWP plan to take part in the events and report on their experiences of the cleandanube project.

Strong cooperation partners underpin the transnational project

The AWP is a nonprofit association based in Freiburg im Breisgau. Since 2017, it has initiated

nature conservation projects in the Danube region. In 2018 and 2019 it successfully implemented two international environmental education projects along the Danube.

Andreas Fath is a professor of chemistry at Furtwangen University. He has published numerous articles based on his research on microplastics in scientific journals and textbooks.

Through his athletic performance as the "swimming professor" and practical knowledge transfer, he has

"

"Andreas Fath, as the "swimming professor", arouses enthusiasm for water conservancy with his projects".

aroused intense interest in water conservation in various projects. Furtwangen University is a co-organiser of the project: It will supply a mobile I aboratory, conduct PR work and provide doctoral students. More than 50 organisations from the various Danube countries have agreed to give their support.

These include not only the offices of large and well-known environmental protection agencies but also medium-sized and small local NGOs, universities, educational institutions, schools, municipalities and

"

"Over 50 organisations from the different Danube-adjacent countries have agreed to cooperate within the framework of the project".

cities, as well as supra-regional networks and public institutions.

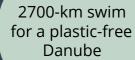
The project is financially supported by the Baden-Württemberg Foundation and the Postcode Lottery as well as by the key sponsors: Hansgrohe, Menschen brauchen Menschen e.V. and Arburg.



Facts & Issues

10 countries - One goal: A Danube free of plastic

In spring 2022 Andreas Fath is set to swim 2700 km – for a clean river free of microplastics.



The 2857-kilometre-long
Danube crosses ten
countries - from the Black Forest
all the way to the
Black Sea: Germany, Austria,
Slovakia, Hungary,
Croatia, Serbia, Romania, Bulgaria,
Moldavia, Ukraine.

The transnational project cleandanube sets out to provide the people along the Danube with the skillset to act in an environmentally sound manner in order to preserve a unique riverscape whose pollution by macro- and microplastics is neither adequately understood nor effectively prevented.

10 countries







Plastic particulates | > Fish larvae

Plastic particulates outnumber fish larvae in the Danube



Health hazards

At numerous places along the Danube, swimming is hazardous and discouraged because the water is so heavily contaminated.



4 tons

The Danube washes over 4 tons of plastic into the Black Sea - every single day.



Lack of awareness

A lack of information and education leads to the lack of motivation and action c ompetence among the populaces.



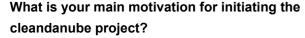
Brief profile

Interview with Andreas Fath

Andreas Fath is Professor of Chemistry at Furtwangen University. In his research on microplastics, he has published a wealth of articles in scientific journals and textbooks. Through his athletic prowess as the "swimming professor" and practical knowledge transfer, he has generated a great deal of support for water pollution control through various projects.

The passionate swimmer has previously swum the Rhine and the Tennessee River. For the cleandanube project, he will swim the entire Danube from the Black Forest to the Black Sea in spring 2022. He will be in the water for 2 months, almost daily, to garner media attention.

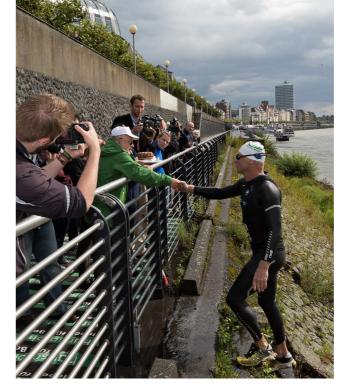
The association for wildlife protection (AWP) is coordinating the tour, supporting Andreas Fath organisationally and designing the accompanying project modules.



— The Danube is the lifeline of Europe and endowed with a unique biodiversity and diverse river habitats. The Danube washes over 4 tons of plastic into the Black Sea every day. Some Danube countries have neither functioning bottle-return systems nor effective waste prevention strategies. Plastic bottles, plastic bags and other macro-plastic waste gets washed up onto the riverbanks as well as imbedded in the river bottom. Microplastic is a serious problem. Researchers have found more plastic particulates in the Danube than fish larvae. In numerous places, swimming is discouraged because the water is so contaminated



that it is hazardous to health and well-being. As a result, people are deprived of the opportunity to experience the riverscape in its full splendour. This is another reason why the Danube water world is not sufficiently appreciated by the general public. It is alarming that these problems receive so little attention in public discourse, especially across national borders. In addition, the lack of information and educational opportunities has led to a lack of motivation and action competence among people to initiate grassroot changes and to work towards social and political changes. Through cleandanube, we aim to draw attention to these urgent issues, create awareness among the populace and contribute to a clean, plastic-free Danube.



Who is the project aimed at?

One focus of our work is on environmental educational initiatives and the strengthening of local civil social structures. Above all, our focus is on the various peoples living along the Danube. Here, we want to specifically impart skills for environmentally-sound action to preserve a unique riverscape. We strive to build networks, create synergies and save endangered species from extinction throughout the world. Our mission is to preserve biodiversity and, beyond that, create a society that is aware of its importance and committed to its protection.

What are the various stages of the project?

Danube, a distance of over 2700 kilometres, from the Black Forest to the Black Sea. To this end, I will be in the water almost every day for about 2 months and, during this time, hopefully attract media attention. The association for wildlife protection (AWP), which has designed and is implementing the different modules of the project, will be present all along my journey.

The AWP will be accompanying me with a campaign and a travelling knowledge-sharing workshop, which will be deployed flexibly and held at the various stages of the swim. They are aimed at local spectators and passers-by. Here, information about the Danube's water world and the causes of its pollution as well as what actions can be taken to avoid plastic

will be shared. Participants will be invited to take water samples themselves, analyse and compare them with the findings of earlier analyses. In this way, pollution will be made tangible and real.

In the research part of the project, we will take water samples on a daily basis, which, after their scientific analysis, will provide a comprehensive overview of the level of pollution along the entire Danube. They will form the basis for a scientific study that will be completed and published subsequent to the project. Furthermore, a modularised educational workshop will



be provided to equip young people living along the project route with the skillset to put a stop to plastic pollution. The workshop is primarily aimed at those between 14 and 25 years of age and will be implemented with the help of local initiatives and organisations. Following the completion of the project, a film will be released documenting the cleandanube project.

The documentary tracking my journey will allow the results to have an impact beyond the project itself and ensure greater reach into every sector of society. Representatives of local projects related to our topics will have the opportunity to present their concerns. The film will be available online, provided free of charge to project partners and other environmental initiatives, and shown in at least 5 cinemas along the Danube.



Danger

At numerous places along the Danube, swimming is hazardous and, so, discouraged as they are seriously contaminated.



The documentary will be shown in selected cinemas.



Over 50

Organisations from the different Danube-adjacent countries have agreed to collaborate on the project. These include not only large and well-known environmental protection agencies but also medium-sized and small local NGOs, universities, educational institutions, schools, municipalities and cities, as well as supra-regional networks and public institutions.



What are the central messages you want to convey to the people along the Danube?

— We want to show people that every individual can make a vital difference to protecting the Danube and its biodiversity.

The aim is to provide the populations along the river with the skills to act in an environmentally-sound manner for the sake of its unique riverscape, whose pollution by macro- and microplastics is currently neither adequately perceived nor effectively prevented.

An awareness of the immense importance of clean flowing waters is to be created. Such approaches are vital for sustainable development, especially if we are to reach people who have no idea this is happening.

Who are the key players in the project?

My team and I are supported by the AWP,
 Furtwangen University and other partners. The AWP
 - association for wildlife protection e.V. is a nonprofit based in Freiburg im Breisgau. Since 2011, it has been supporting species protection, nature conservation and educational projects worldwide.

Since 2017, it has successfully initiated environmental education projects in the Danube region and built up a

comprehensive and resilient network of NGOs on the ground. Furtwangen University of Applied Sciences is co-organizer of the project, and supporting it with a mobile lab, public relations work and PhD students and undergraduates who will be incorporating the findings into their thesis works.

The Karlsruhe Technology Centre has agreed to analyse the water samples while the University of Vienna will be analysing samples on site.

Moreover, successful joint ventures have already been implemented with numerous other agencies in the Danube Region, while many organisations have agreed to lend a hand. These include, for example, the ICPDR, the Council of Danube Cities and Regions (both across the Danube Region), offices of the WWF (Austria, Hungary, Serbia, Romania, Bulgaria), various Lions Clubs, the cities of Furtwangen and Donaueschingen, the Danube Office, the Ulmer Schachtel, the Mooseum, the Wasseramt Donauwörth, the Auenzentrum, the Haus am Strom, Same Oceans (all Germany), Generation Blue, BOKU and University of Vienna as well as the Schwimmverein Wien (all Austria), Valyo (Hungary), Europahaus Vukovar, Youth Peace Group Danube and Zeleni Osijek (all Croatia), NGO Podunav, Super Zeleno, Trash Hero (all Serbia) Mai Mult Verde, Comana Nature Park, Act for tomorrow (all Romania), Greenpeace Bulgaria, Za Zemiata (Bulgaria) as well as the Association of Ukrainian Regions "EU Strategy for the Danube Region" and EMBLAS from Ukraine.

What will be taking place locally?

The project and the attention it will attract are intended to be a platform on which a lively programme with as many local partners as possible is being developed and implemented.

Currently, we have received many ideas and finalised plans, such as joint swimming events, riverbank cleanups, receptions with talks, speeches and musical accompaniment, nature walks, individual educational workshops and the accompaniment of kayakers.

And, of course, participation in our education program.

We continue to be very open to ideas and initiatives for

participation and involvement in our project.

What comes after cleandanube? Do you have additional actions planned?

Sure, but no swimming. After the Rhine project I was on the road a lot, giving over 300 lectures at all kinds of educational institutions. Always with me was a suitcase full of materials and objects to enliven scientific presentations and make them "tangible". This is hard work and time-consuming.

I think it makes much more sense to have the large and small educational modules in one place, present the experiments and findings on water bodies and rivers, explain them and make them accessible. The best thing would be a "house of water" or, even better, a floating water laboratory.

What are the main causes of water pollution? What are its consequences and what can be done about it?

Water bodies are mainly polluted by wastewater from large cities (especially hazardous are hospital wastewater and pharmaceutical residues from private households), agricultural (fertilizers, in particular) and industrial run-offs. The result is environmental pollution, destruction of natural habitats, species extinction, health risks and antibiotic resistance.

Microplastics also play a major role, mainly as a result of tyre and asphalt abrasion, but also from plastic waste that ends up in the river, where it is broken up into microplastics in the riverbed. And, of course, chemicals are a big problem, with its treatment being the main issue.

On the other hand, without chemicals there would be no technological progress, lower life expectancy, food shortages, lower standard of living. As long as chemicals are kept out of the reach of people and the environment, it's not a problem. We drive petrol-fueled cars and, because of what it would do to the human body, make sure these molecules don't get into the passenger compartment.

However, many chemicals end up in the water,



"Microplastic Hedgehog"

Pollutants in water are attracted to microplastics like iron filings to a magnet. The result resembles a "microplastic hedgehog", which is ingested by fish and shellfish, and subsequently by all kinds of sea creatures, whose protein is then consumed by 3/4 of the world's population. Microplastics are not only harmful in themselves but they are carriers of contaminants and hazardous substances that endanger our health in the long term.



3 - 6 km

Daily swim practice is adequate training

Up to 8h

Being alone in the water every day means mental relaxation while daily worries are washed away by the water



2 months

Length of the journey in the river

negatively impacting water quality and the ecosystem. The effects are a loss of biodiversity in water bodies, increasing costs for drinking water production and deterioration of the protein food sources residing in water bodies.

So, we need to reduce or eliminate the input of these so-called POPs (persistent organic pollutants). With the use of the 4th treatment stage in wastewater treatment plants, we are acting centrally and taking a step in the right direction. However, it would be more efficient and cost effective to keep the pollutants where they are produced, where the outflow pipe starts instead of where it ends.

The advantage: smaller volumes of water are processed. The pollutant concentration is higher with a lower chemical mix and wastewater. "Start of the pipe" is not diluted by rainwater since the remedy to pollution is not "dilution".

You are scientifically engaged in microplastics - what exactly do you do?

For one, I am involved in the screening - what kind of microplastics is found in which part of the river, where does it come from, where is it going (e.g., examination of fresh and fish that's been preserved over decades in the Tennessee River at the TNACI in Chattanooga)?

I examine the properties that make microplastics dangerous. Microplastics collect pollutants in the river the way a magnet attracts iron filings.

This "microplastic yolk" is ingested by fish or shellfish, and later in the ocean by all sorts of sea creatures, which is where 3/4 of the world's population gets its protein from. The microplastic transports the 'iron filings' into our body via seafood, only that they are not iron filings, but substances that are harmful to health.

The capacity of pollutants to accumulate on the surface of microplastics can, of course, also be used in a positive way. By producing microplastic particles from plastic waste in a targeted and controlled manner, and then using them as filter material to screen out pollutants

from wastewater. My current topics of research include determining which types of plastic with which size distribution best bind which pollutants and how microplastic filter material can be regenerated.

How do you prepare yourself athletically for your assignment?

— Just staying fit and trying to get in the water every day, especially to make up for the training time lost due to the pandemic. Swimming 3 to 6 km every day is enough. A marathon runner doesn't need to run a marathon every day to prepare for the race.

What physical effects do you expect during your 2 months in the water?

— So far, I've only had attempted this within a one-month period and observed an adaptation of my body to the daily strain. In the first and second week, physical performance plunges, but then it turns around and starts to surge.

Results from the effort become noticeable. I, actually, have no idea how things will look beyond 4 weeks. It will be important to protect the skin preventively and meticulously from infections, which can spell the end to everything in a flash.

How do you mentally deal with being alone in the water for up to eight hours every day?

For one, at the beginning it will be a mental respite to have to worry about only one thing, since day-to-day woes are washed away by the water.

Over time, it gets tedious and I'll be happy for every little change: geographically, architecturally or fellow swimmers, that comes my way.

And how do you motivate yourself over a 2-month period?

a journey in the water with an unparalleled perspective. The certainty that no stroke is taken in vain, bringing me steadily closer to the goal, can be euphoric. In the water there is no limit, no up or down, and certainly not to thoughts and ideas that arise.

I will make my way through the water until exhausted and in the evening, I can put those thoughts and ideas down in the diary. Besides, at every stop I know I will be met by new people with a positive attitude, otherwise they wouldn't be there waiting for me.

How is the project financed?

The project is financed by donations and grants. In addition to AWP backing, the Baden-Württemberg Foundation and the Postcode Lottery are lending their support.

No less important are our main sponsors Hansgrohe, Arburg and the association Menschen brauchen Menschen, which in turn is financed by funds from DVAG (Deutsche Vermögensberatung).

Other supporters include VEGA, Furtwangen University and Macherey-Nagel, who will be providing us with comprehensive test kits for water analysis. In addition, we have managed to inspire numerous Lions Clubs along the Danube, who are vital to the financing of the project.









Root cause research

More plastics than fish in the Danube

is the reason for the pollution in Europe's second longest river.

Tons of plastic get washed up in the Black Sea - every single day

Countries - 1 goal: A Danube free of plastics

> The young generation, in particular, must be made aware of the issue their actions and behaviour are absolutely crucial for the future of the Danube as a viable habitat.

Education & paradigm shift

changes be brought about.

Next Generation

Only through education and a pa-

radigm shift can social and political

Preserving biodiversity

Only transnational cooperation can save Europe's watery lifeline and preserve its unique biodiversity.





nature:



Pollution of water bodies such

as the Danube has far-reaching

consequences for humans and

The combination of pollutants and

microplastic contaminants can lead

to a nutritional problem - 75% of the

world's population meet their daily







protein requirements from the sea. Many of the chemicals discharged into the waters attach themselves to microplastics, which are then ingested by shellfish, fish and other marine animals. During the digestive process, these chemicals detach

from the microplastic and remain

in the organism, while the microplastics are excreted. Humans, at the end of the food chain, ingest these hazardous chemicals.





Approx. 2700 km

Andreas Fath is set to swim in the spring of 2022 to bring awareness of this issue to the populace residing along the Danube.





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Root cause research

Reasons for pollution in Europe's second longest river

The pollution of water bodies such as the Danube has far-reaching consequences for humans and nature: the combination of pollutants and microplastic contaminants can lead to a nutritional problem - 75% of the world's population gets their protein from the sea.

Many of the chemicals discharged into the water bind to microplastics, which are then ingested by shellfish, fish and other marine animals. During the digestive process, these chemicals detach from the microplastics and remain in the organism, while the microplastic is excreted. Humans, at the end of the food chain, ingest these hazardous substances.





Of the world's population meet their daily protein requirements from the sea.

Chemicals

Humans at the end of the food chain ingest them, thereby perpetuating the cycle.





| | What gets into the Danube? | How does it get into the Danube? | What are the consequences for people and nature? | What can we do about it? |
|---------------------|--|--|--|--|
| ि Industry | Chemicals (e.g., fluorinated surfactants, phosphates, heavy metal ions, salts, detergents, flame retardants, bleaching agents, sweeteners, corrosion inhibitors, etc.). Microplastics (granule loss) | Industry wastewater discharged directly or indirectly from treatment plants, Ground water, Surface water, Exhaust air, Precipitation, Transport, Loading and unloading, Industrial accidents | Quality of drinking water declines, Cost of drinking water production rises, Animal populations decline and plants die, resulting in biodiversity loss, Swimming prohibited | Impose limits and monitor wastewater generated by the chemical industry (not implemented for all substances in the EU), Use water filters at home, Self-regulation in the sense of sustainably operating companies Sustainability must be made an economic factor Better water filtration, wastewater monitoring |
| 4 | Fertilisers, Plant protection products (insecticides, pesticides, fungicides, herbicides), Urea Nitrates, Antibiotics, Hormones | Groundwater, Rain, Surface water | Genetic alteration in animals, Disturbed reproductive cycles, Mutations, Algae blooms | Reduce use of fertilisers, Use better biodegradable pesticides, Use natural plant protection, Monitor wastewater, Better water management in the fields, Connect surface water to sewage system |
| Agri- culture | | | | |
| Towns & Villages | Medication + degradation products – painkillers, anti-epileptics etc. Hospital wastewater – antibiotics, X-ray contrast materials, MRI contrast materials, Household wastewater, detergents, dishwater detergents, Macro- and microplastics, Cigarette butts, Municipal wastewater, Hormones, UV protection agents, Artificial sweeteners, Cosmetics and personal body care products Fertilisers, Dyes, Paint thinners | Wastewater, Deficiencies in wastewater treatment plants, Heavy rainfalls (bypass), snowdrifts, surface water, floods Littering in green spaces, Grinding of macroplastics into microplastics by road and rail maintenance equipment | Antibiotic resistance, Health-damaging water pollution, Threats to wildlife and plants | Improve wastewater treatment plans (enhancement to treatment stage 4), Purify all wastewater, Do not dispose of medication in toilets and sinksUse sustainable and natural products, Avoid plastics and microplastics, Separate and recycle waste, Do not dispose of plastics in nature, Implement end-of-pipe technologies, Treat wastewater from hospitals, care facilities and private households |
| Micropla- stics | bottles, bags, packaging material, tyre particulates, asphalt particulates, sports field granulates, mp from beauty products, mp from textiles through waste, disposal, incineration, air dispersal, weathering of outdoor plastic products street cleaning (green waste) | tyre and asphalt particulates washed in by rain and wind beauty product and detergent residue via urban wastewater disposal plastics are pulverized into micro- plastics by rocks in the riverbed (erosion) particulate residue from manufacturing | 4 tonnes of plastic end up in the Black Sea every day and remain there for years to come microplastics end up on our plates in the meat we consume we eat about 1 credit card of microplastics every week animals die because of the indigestible plastics causing blockage in their stomachs sea creatures get trapped in plastic | avoid using plastics dispose of plastics properly practise trash separation step up the rate of recycling drive less promote circular economy (as opposed to throwaway economy) follow the 3 R's rule: reduce, reuse, recycle reject single-use plastic products – do |



Partner

How is the project financed?

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Partner organisations





Main sponsors











Funding institutions

who support the project financially





Sponsors

- VEGA (cash donation)
- Macherey-Nail (supplying rapid tests
- and instruments)
- Furtwangen University (monetary donation)
- A number of Lions Clubs (monetary donation)

Partner organisations

- Schiltacher Flößer (raft specialist building our raft)
- ICPDR
- Technology Centre Water
- Tennese Aquarium
- Tourism associations
- WWF offices
- Greenpeace
- Cities and municipalities (Furtwangen, Donaueschingen, Ulm, Vilshofen)
- Council of the Danube Cities and – regions
- Donauakademie
- Lions Günzburg
- Universities

(Ulm, Vienna, BOKU...)

- Mooseum
- Water agencies
- Swim clubs
- Valyo Budapest
- NGO Podunav
- zeleni Osijek
- **YPGD**
- Europe House Vukovar
- Trash Hero Serbia
- May Mult Verde
- National Parks
- Za Zemiata
- Act for tomorrow
- Association of **Ukrainian Regions**
- EMBLAS
- and others



Mario Kümmel - AWP

Project manager and contact person

Project manager and contact person

Mario Kümmel (Master's in Nonprofit Management) has been with the AWP from its inception. He has developed, planned and implemented numerous international projects.

He successfully oversaw two environmental education projects on the Danube and built an extensive and resilient network.



