



## The Project PlasticFreeDanube

**Plastic waste** has become a **global environmental hazard**. Around 80% of plastic polluting the world's oceans are transported via rivers. However, sources and input pathways of plastic into the rivers and its environmental impacts remain widely unclear.

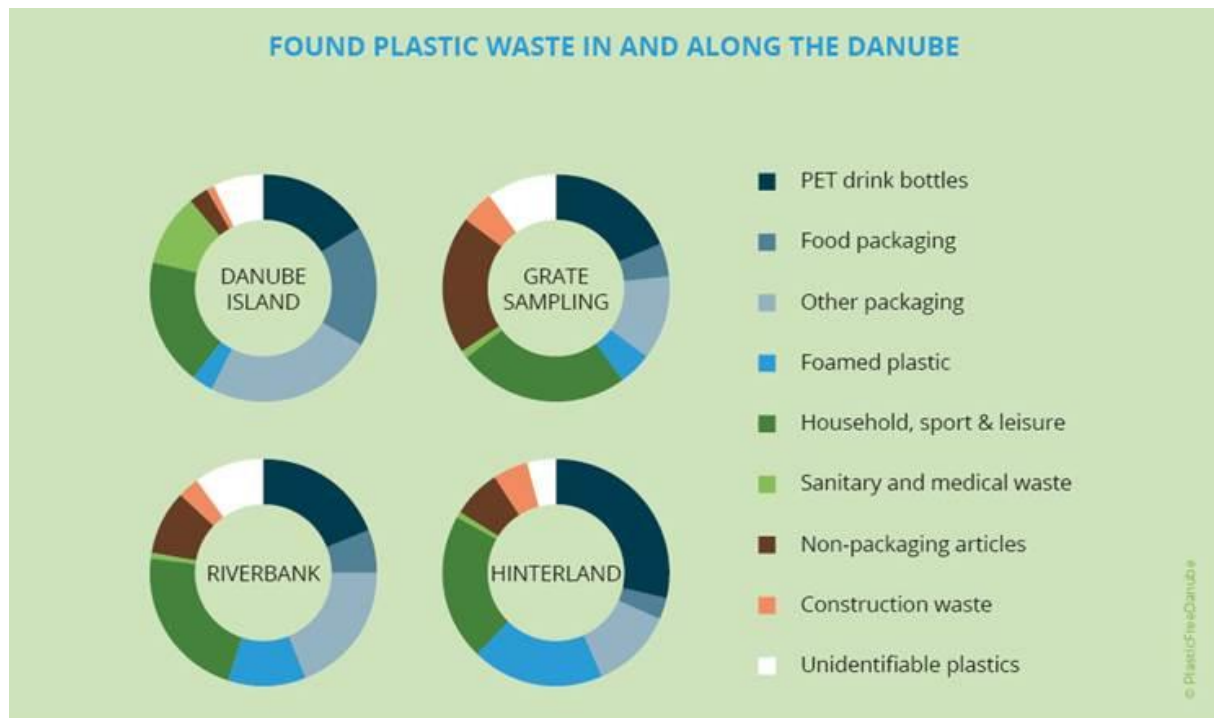
**PlasticFreeDanube** focused on **macro plastic waste (> 5 mm) in and along the Danube river**, between Vienna (Austria) and the hydropower plant in Gabčíkovo (Slovakia). The overall aim of the project was to establish a scientifically sound knowledge base as well as a methodological approach on plastic waste in and along the river in terms of entrance points, quantities, transport patterns, and environmental threats. Awareness raising and the derivation of possible measures against pollution were further goals. With a duration of 3.5 years (1 October 2017-31 March 2021), the project is now approaching its end and we would like to present some results.

## Sorting analysis

In order to determine sources and origin of plastic pollution in and along the Danube, **2,000 kg of collected plastic waste was sorted and analysed**. The collections took place mainly under the coordination of the Donau-Auen National Park and with the help of volunteers.

The results show that the composition of the found plastic waste varies depending on the collection area: In the waste from littering on the Danube Island a lot of sanitary waste (especially cleaning tissues) and packaging was found. Samplings from the hydropower plant Freudenu contained higher amounts of plastic waste from households, sport and leisure activities as well as waste from ships (ropes, buoys). Washed-up waste on the riverbanks was characterized mainly by plastic from households and packaging but also by a large portion of foamed plastic. In the hinterland a high portion of PET drink bottles and foamed plastic was found.

A newly developed sampling and sorting protocol helps to compare the results.

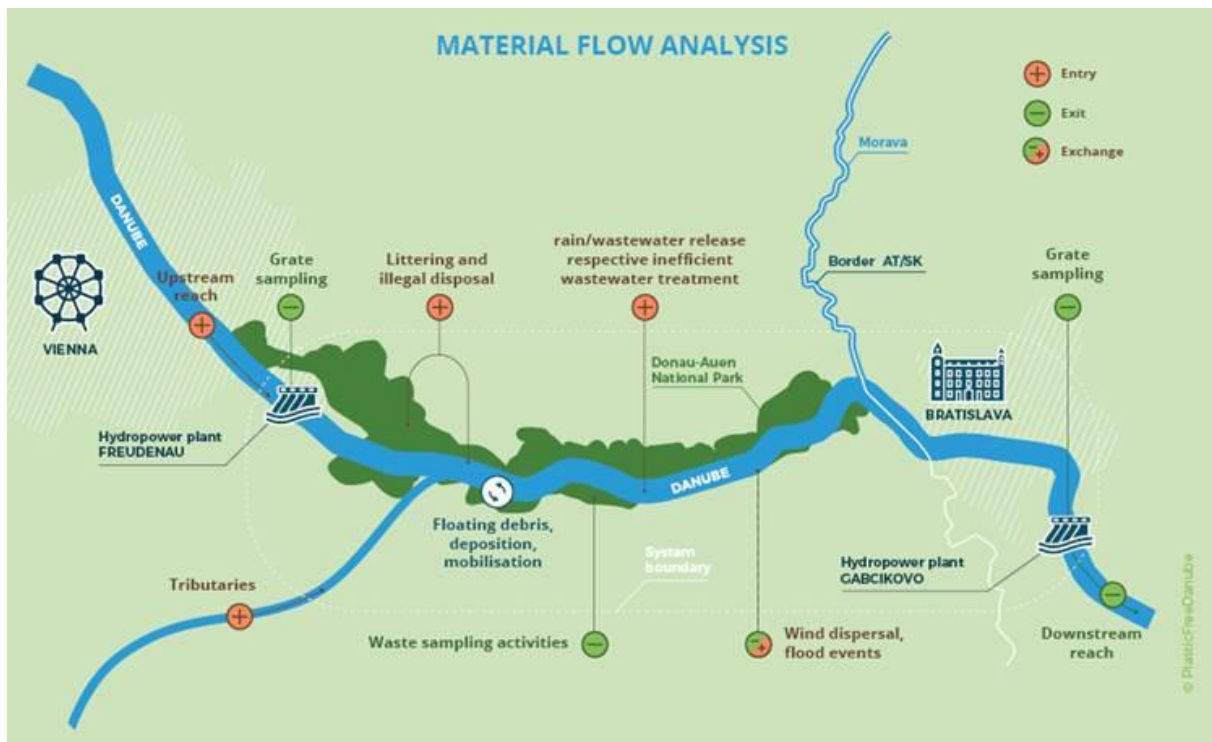


Regarding **chemical substances leaking from plastic waste**, a controlled experiment was conducted in which samples of plastic waste collected in the project area were shaken in water for one month. Chemical analysis of the water showed that detected organic substances were below the limit values for hazardous substances. However, an elevated concentration of antimony was detected in PET bottles (200 µg/l at a limit value of 5 µg/l for drinking water).

### Modelling the material flow

Pollutions are often not found at the source of emission. This is especially true for plastic deposits in the area of the Donau-Auen National Park. The low weight of plastics favours drifting by wind and transport with rainwater over long distances. In order to derive appropriate prevention measures, it is important to know the origin of plastic waste and how it enters the Danube.

With the help of a **material flow analysis (MFA)** this can be shown quantitatively. It shows sources, pollution hotspots, entry and discharge points of plastic waste into the Danube



## Plastic transport measuring

On the one hand, plastics can be carried into the river via tributaries such as the Danube Canal in Vienna. On the other hand, they can also get caught in the grates of the hydropower plants. To better **estimate** these **input and output paths**, measurements were carried out in the Danube downstream of the Freudenau power plant and at the end



Measuring of plastic transport with nets at the Freudenau harbour bridge

of the Danube Canal from the Freudenau harbor bridge using specifically developed trap nets. The nets covered three different depths (near the surface, in the middle of the water column and near the bottom) and had mesh sizes of 0.25 mm (250  $\mu$ m), 0.5 mm (500  $\mu$ m), 2.4 mm and 8 mm, respectively. At the Freudenau harbour bridge, the entire transverse profile was covered with five perpendiculars, at each of which sampling was carried out for half an hour.

## Tracking of macro plastics using GPS tracers

To track individual plastic parts, tests with GPS tracers were carried out on the Danube. For this purpose, different macroplastic parts that were frequently found in the Donau-Auen National Park during collection campaigns (e.g. PET bottles, PU foam, shoes, tennis balls) were colour-marked and equipped with transmitters and initially accompanied by canoes during the test phase.



Accompanying the tracers

Particles frequently stranded in sections defined as accumulation zones in the project through walk-throughs and riparian and backcountry collections. The paths traveled could be used to validate the hydrodynamic-numerical model built in the project

Particles frequently stranded in sections defined as accumulation zones in the project through walk-throughs and riparian and backcountry collections. The paths traveled could be used to validate the hydrodynamic-numerical model built in the project



## Awareness raising - become active together!

Raising public awareness towards the problem of plastic waste in the nature in general and in rivers in particular is the key to sustainable behaviour changes. Therefore, information events and workshops were organized as well as information materials for schools and other educational institutions were developed within the project.

The project also launched a **digital communication and information platform** that will continue to exist after the end of the project: [plasticfreeconnected.com](https://plasticfreeconnected.com)

On this platform all reports, brochures, flyers, teaching materials etc. developed in the project can be downloaded. Most of the materials are also available in German, Slovakian and English.

In addition, we have collected events as well as national, European and global initiatives where each individual can become active and contribute to the prevention of (plastic) waste.



**Do you know of any events and/or initiatives that are missing on our list?** Or maybe you organize events yourself that fit the topic? Then take the chance to exchange experiences and register them on the platform!

**More information at**  
[plasticfreeconnected.com](https://plasticfreeconnected.com)



## Save the date: Online final conference on 23 February 2021

For three and a half years the project **PlasticFreeDanube** has been dedicated to the topic of macro plastic pollution (> 5 mm) in and along the Danube and is now nearing completion.

At the end of the project we would like to present the results and give an outlook into the future. Unfortunately, current circumstances do not allow for an event with physical presence.



Therefore, the final conference will take place online on

**23 February 2021 from 9:00-13:00.**

A detailed program will be available and sent out in early Feb 2021.

***We would like to invite you to participate in the final conference!***

An email to [info@plasticfreedanube.eu](mailto:info@plasticfreedanube.eu) with "**PFD - Final Conference**" in the subject line and your contact details will be sufficient. The conference language will be English

## Read it now - the brochure with the project results is available!



The current project brochure summarizes the results of the **PlasticFreeDanube** project in a compact form.

The brochure is available for download in German/Slovak and English on the **digital communication and information platform** [plasticfreeconnected.com](http://plasticfreeconnected.com)

We would also be happy to send you the brochure by post. If you are interested, please contact us at [info@plasticfreedanube.eu](mailto:info@plasticfreedanube.eu)

### Contact:

BOKU – University of Natural Resources and Life Sciences, Vienna  
 Gudrun Obersteiner  
 Muthgasse 107/III, 1190 Vienna, Austria  
[info@plasticfreedanube.eu](mailto:info@plasticfreedanube.eu)



RepaNet o.z.

viadonau



PlasticFreeDanube is funded from the „Interreg V-A Slovakia-Austria 2014-2020“ programme ([www.sk-at.eu](http://www.sk-at.eu)) of the European Union and is co-financed by the European Regional Development Fund (ERDF).