Thank you to everyone who took part in Earthwatch’s first ever Pan-European WaterBlitz. Alongside our ninth Thames WaterBlitz, Paris, Luxembourg and Dublin all had their own WaterBlitz events. Read on to find out why we are collecting data and what we are doing with it.

Why are we measuring?

Most of our rivers, ponds, lakes and other waterbodies across Europe are not of ‘good status’, meaning they are suffering from the effects of pollution and other human impacts. Many waterbodies are not regularly monitored. There aren’t enough scientists to carry out the level of monitoring needed, which is why we have asked you, the people who rely on these waterbodies, to help us understand and protect them.

What are we measuring?

The most common pollutants in European fresh waters are the nutrients nitrates and phosphates. These nutrients can cause algae and certain species of plants to grow very quickly, leading to decreased levels of oxygen in the water, reductions in biodiversity, and, in extreme cases, large-scale fish kills. By measuring these nutrients alongside some other basic indicators of ecosystem health, we can start to build a detailed picture of where our water is being affected by pollution and where there are clean waterbodies that we need to protect.
How do we use your data?

In our four areas, Earthwatch volunteers are working with scientists, governments, and agencies to monitor water quality all year round. These people are working together to answer specific questions about local freshwater issues. Your measurements have helped us to provide a large amount of data to each of these local research projects, allowing a much more detailed picture to be built about water quality across Europe. Here we have displayed our initial findings, made using your data.

What did you measure?

![Images of riverbanks, stream edges, ponds, and lakes]

What was around you?

- Forest
- Urban Park
- Urban Residential
- Grassland/shrub
- Agriculture
- Other
- Industrial

Who had the least litter?

- Luxembourg: 8%
- Thames: 14%
- Dublin: 34%
- Paris: 38%

Least litter recorded
* % of records where litter was observed

Your data is now available to anyone who wants to use it. In the past, data from our WaterBlitzes and from our regular FreshWater Watch monitoring has been used to write scientific papers on a variety of topics and to help empower local communities to understand and change water quality issues in their areas.
Many volunteers taking part in the WaterBlitz observed floating algae. Floating algae growth can be caused by high levels of nutrients in the water. The excess nutrients allow algae to multiply very quickly, which blocks out the light for other plants. As the algae die and decompose, the decay process uses up the oxygen that animals living in the water need to breathe.

Dublin had the lowest measurements of pollution, but floating algae was reported in the highest percentage of sites. This could mean that the waterbodies in Dublin are naturally more vulnerable to nutrient pollution than the other areas monitored.
What did you tell us about your findings?

Villagers in Oxfordshire took measurements to show the importance of their heritage watercress beds in improving downstream water quality. This area is not normally monitored so this data can be used to help protect these valuable ecosystems.

One Thames WaterBlitzer took measurements at each of the points where the river Glyme enters and exits the Blenheim Park lakes. They found that water leaving the lakes had almost no nitrate compared to the other measurement points.

During the Dublin WaterBlitz, local councillors took measurements on the River Boyne (County Louth) before and after heavy rainfall on Saturday. They observed huge differences in phosphates and nitrates after the rain. Our research partners at Dublin City University suspect this will be echoed across the city, and would like to use the data to convince local authorities to adapt their monitoring strategies accordingly.

Spotted some very black water while doing the #WaterBlitz. @Earthwatch.Eur kits are designed to measure invisible phosphates and nitrates, but visible incidents like this can be very serious. I reported it and the @EnvAgency are now on the case. #CitizenScience to the rescue!
The Thames Valley WaterBlitz

In the Thames Valley, the population is growing, leading to increases in sewage works and inputs into the water systems. These changes are having a big impact on water quality.

*High nutrient concentration is classed as any site which had nitrate levels above 5mg/l and phosphate levels above 0.5mg/l.
**Low nutrient concentration is classed as any site which had nitrate levels below 0.5mg/l and phosphate levels below 0.05mg/l.
***Medium concentration refers to any other combination of nitrate and phosphate levels.

The data from this WaterBlitz (shown above) suggests that most waterbodies in the Thames catchment have medium or high nutrient concentrations, with a few low measurements between Oxford and London. In recent years, much work has been done to reduce nutrient concentrations throughout the Thames. Progress is being made, but it is clear that much more still needs to be done in this area to improve water quality.
The Thames Valley WaterBlitz

This was the ninth WaterBlitz in the Thames Valley. Thanks to the ongoing commitment of WaterBlitz volunteers, we now better understand some of the issues in the catchment. Using WaterBlitz data gathered over the years, we can compare different areas to see what is changing the water quality for better or worse, and to inform management strategies that will help to improve water quality in the future.

Of the sites measured during this WaterBlitz, 22% had also been visited in past WaterBlitzes. Nitrate status showed a change from previous measurements in 44% of these sites. Phosphate status changed in 62% of these sites. Now that these sites with changes have been identified, Earthwatch scientists can begin to more closely examine the causes for these changes.

Over the last six months, volunteers from Wild Oxfordshire have been measuring water quality in the River Evenlode every month. Data from this WaterBlitz will be used alongside their monthly monitoring data to better understand phosphate pollution in the catchment.

“Earthwatch will be working with Wild Oxfordshire, the Evenlode Catchment Partnership, and Thames Water to put together all of the data collected in the Evenlode and across the Thames Valley. Together, we will use this information to help water managers to improve ecology and water health.” – Dr. Isabel Bishop, Freshwater Research Manager, Earthwatch
In this WaterBlitz, Dublin had a higher proportion of waterbodies with low nutrient status than some of the other areas, but nutrient status was still mostly medium. Higher proportions of sites where floating algae was observed may indicate that Dublin’s freshwater ecosystems are more sensitive to excess nutrients than the other cities.
In Dublin, there was a heavy rain event over the WaterBlitz weekend. Often, Dubliners expect to see increased signs of nutrient pollution after heavy rainfall as phosphates are flushed out from storm drains into rivers. The timing of the rainfall on the WaterBlitz weekend allowed us to investigate this.

Immediately after the rain during the Dublin WaterBlitz, phosphate levels across the city decreased. This was probably due to a dilution effect caused by increased water levels. However, researchers at Dublin City University found that nutrient concentrations in rivers increased within 24 hours of the rain. These findings can now be used to inform future water monitoring and management strategies in the city.

In partnership with RBC and Dublin City University, citizen scientists in the Backdrop project are monitoring water quality in Dublin on a regular basis, including before and after rainfall events. If you want to get involved with the project you can email waterinstitute@dcu.ie for more info.

“There’s been a lot of attention recently on the state of our water here in Dublin. This survey of our watercourses and water bodies will give us a clear picture of the health of our water, detailing how clean or polluted it is.” – Prof. Fiona Regan, director of the DCU Water Institute
Luxembourg has experienced a large population increase over the past 20 years, leading to an increase in built up areas and pollution, negatively impacting biodiversity and water quality.

Most of the waterbodies measured in the Luxembourg WaterBlitz were of medium nutrient status. Most of the measurements showing high nutrient status came from the more heavily populated areas, particularly around Luxembourg City.

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The Luxembourg WaterBlitz

Much like most of Europe, there are many more small streams and ponds in Luxembourg than there are bigger rivers. These small habitats can support a lot of wildlife, but are generally not considered in legislation, nor are they monitored regularly. In Luxembourg, researchers are using the FreshWater Watch method to understand what impact we are having on these smaller waterbodies.

WaterBlitz data suggests that nutrient concentrations are higher in rivers and streams in Luxembourg than in still waters like ponds and lakes. The smaller waterbodies – ponds and streams – had lower nutrient concentrations than their larger counterparts. This data will help researchers gain insights valuable for the management of smaller waterbodies.

Citizen scientists taking part in the University of Luxembourg and RBC’s Nexus Futures project are monitoring small streams in Luxembourg City once a month, trying to learn more about their importance to nature. If you want to join them, please email Karl Pickar: karl.pickar@uni.lu

“Together with the citizen scientists, we are learning more about smaller streams in Luxembourg, allowing us to investigate the effects of environmental conditions on nutrient levels throughout the country” – Karl Pickar, University of Luxembourg.
Paris is one of the densest cities in the world with a population of 2.2 million people living within just over 105km². Many of Paris’ lakes and ponds have been heavily impacted by urban activities and the loss of green buffer areas. As a result these areas have seen frequent algal blooms.

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All of the measurements taken during the Paris WaterBlitz showed low or medium nutrient concentrations, although some waterbodies had higher concentrations for just one of the two nutrients. Although these data have helped to build a picture of water quality in Paris, more measurements are still required. See next page for details of how you can help.
In Paris, researchers at Ecole Des Ponts are monitoring algal blooms in small ponds and lakes across the city. They are combining WaterBlitz data with regular monitoring data from both citizen scientists and professional researchers to try to understand how urban ponds respond to excess nutrient concentrations.

50% of the ponds in Paris measured during the WaterBlitz had green water, which is an indication of algal blooms. Most of the ponds had low measurements for Nitrate (NO\textsubscript{3}-N) and Phosphate (PO\textsubscript{4}-P). This could indicate that ponds in Paris are more sensitive to nutrient inputs that other waterbodies. This information is an important first step towards working out how to improve the health of urban waters in Paris.

Volunteers from the Royal Bank of Canada are working with researchers from Ecole des Ponts to regularly monitor nutrients and algae in urban ponds across Paris using FreshWater Watch. If you want to join them, please email waterblitzparis@gmail.com

“This project will provide valuable data for researchers and local managers on the nutrient dynamics of lakes and ponds, helping to address algal blooms that occur very frequently on small urban lakes” – Dr. Brigitte Vinçon Leite, École des Ponts ParisTech
What happens next? Take action!

Protect your drains and bin it! Find out more on how to dispose of food waste, oil, wet wipes and sanitary products responsibly [here](#).

Think about your food – buy local and organic, buy less packaged food and waste less wherever you can.

Think about what you buy and where you buy it from, buy second hand, or [better quality](#) where you can, so less is ending up in the bin.

Cut your plastic footprint by following our [advice](#).

If you have a garden or outdoor space, [ditch the pesticides](#) and [take action for wildlife](#).

Keep helping us monitor and take action on water quality issues in your area.

Register your interest for our next [WaterBlitz](#) [here](#).

Help us to make our next Blitz even better by taking our [feedback survey](#).