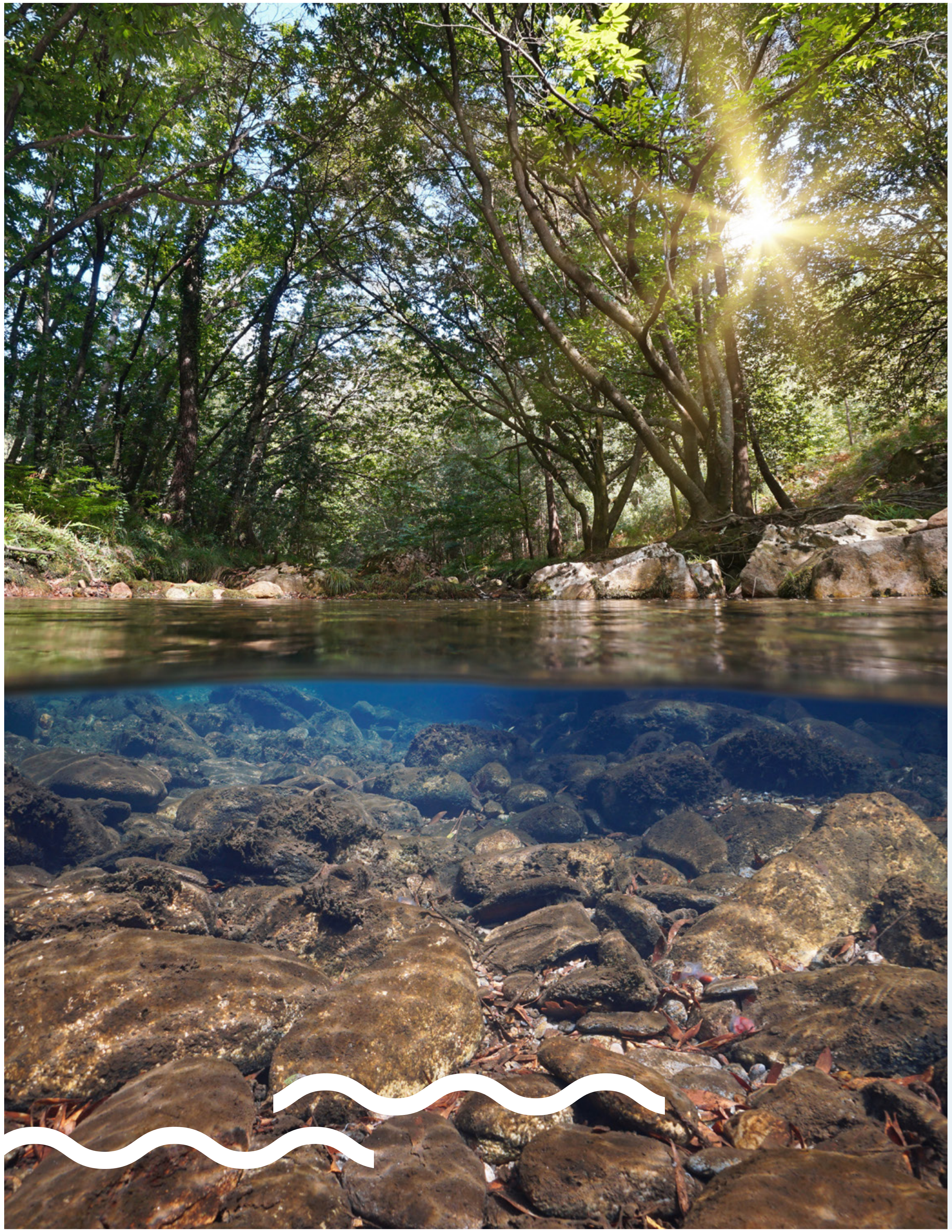
Great UK WaterBlitz Spring 2026 Report



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Thank you to all the participants of the **Great UK WaterBlitz** who made this report possible.

Executive summary

Water sustains all life on our planet. Our world depends on an adequate supply of fresh, clean water. Despite this, the UK's freshwater ecosystems are failing. The seriousness of the situation has been unclear due to incomplete or missing data.

This is where citizen science comes in. The strong public concern for the health of the UK's water resources was clearly demonstrated by the early uptake of the 3000 test kits available for the April 2026 Great UK WaterBlitz, and the more than 75% completion rate.

The challenges to many waterbodies in the UK are due to the complex and interconnected range of pollution sources: sewage discharge, agriculture and urban runoff. Historically, our rivers have been stressed by farming and are now being pushed closer to the brink by outdated and inadequate sewage treatment works. There is an urgent need both for **improvements to wastewater treatment processes** and for **more sustainable agricultural practices**, to reduce their cumulative impact on vulnerable freshwater systems and species.

Earthwatch Europe champions citizen science. Through the biannual Great UK WaterBlitzes we enable the wider public to become citizen scientists, gathering standardised, accurate information on water quality at a local level to provide a national snapshot of nitrate and phosphate concentrations over a single long weekend. These nutrients indicate the presence of other pollutants, both chemical and biological. Through the FreshWater Watch programme, Earthwatch Europe empowers community groups to regularly gather water quality data, adding to the weight of evidence regarding the nitrates and phosphates that are present in both agricultural runoff and urban wastewater, complementing official monitoring efforts to ensure compliance from all types of polluters.

We strongly call on authorities to continue working with us to engage communities and integrate citizen science into national freshwater monitoring frameworks. At the same time, we encourage citizen scientists to continue their essential work in monitoring and championing the health of their local rivers, lakes, ponds, and streams.

Key Findings for the April 2026 Great UK WaterBlitz

- **4677 citizen scientists, including nearly a thousand children**, surveyed **2315 sites** across the UK between the 24th and 27th April, measuring **nitrate** and **phosphate** concentrations as indicators of water quality.
- Over **6000 KS2 learners and their teachers** learned about freshwater through a linked “Live Lesson” webinar hosted by the Earthwatch education team.
- **pH** was also measured, as an initial step towards using citizen science data to better interpret phosphate concentrations relative to UK site-specific thresholds.
- **57%** of datapoints across the UK showed poor water quality, with unacceptable levels of nutrient concentrations.
- **Wales had the best national result of any WaterBlitz**, with only **18%** of sites showing unacceptable water quality.
- By contrast, **England has had the worst water quality in every Great UK WaterBlitz**; In April 2026, **61%** of sites tested in England had unacceptable levels of nutrient concentrations.
- **Western Wales** river basin district had the **best** water quality with only **22%** of surveys picking up **poor** water quality. By contrast, the **Anglian** river basin district had the **worst** water quality in the UK, with **78%** of measurements showing **unacceptable** levels of nutrient concentrations.
- In terms of sub-basins, the **Lune** and the **Kent & Leven** river basins in the **North West** river basin district of England showed **100% good** water quality, as did the **Welsh Severn Uplands** river basins in the cross-border **Severn river basin district**.
- The counties of **Powys, West Glamorgan, City of Aberdeen** and **Merseyside** had the best water quality, with **100%** of measurements indicating **acceptable** water quality.
- **The counties of Bristol** and **Rutland** had the **worst** water quality in the UK, with **all** measurements indicating **unacceptable** water quality.

An introduction to pollution

Why are nitrates and phosphates so important?

Nitrates and phosphates are nutrients that occur naturally in the environment and are essential for plant growth. However, overly high nutrient concentrations in freshwater bodies can trigger excess plant and algal growth, a process called **eutrophication** in which high levels of organic matter and bacterial activity lead to a decrease in oxygen levels. This negatively impacts freshwater ecosystems. The Environment Agency[1] estimates that agriculture accounts for 50-60% of nitrate pollution in the water environment, whilst sewage effluent contributes about 25-30%. Conversely, for phosphates, **urban wastewater** contributes 73% of total phosphorous to watercourses, while agriculture contributes only 20%[2].

You can learn more about nitrates and phosphates **here**.

How is water quality officially monitored?

Taking England as an example, the Environment Agency monitors many elements of a waterbody, (including phosphate) as well as the characteristics of the surrounding catchment. Waterbodies are assigned one of five classes – high, good, moderate, poor, or bad through the Water Framework Directive (WFD), based on a minimum of eight samples taken over three years. The Ecological Status class of a water body is determined by the class of the worst (lowest) scoring element (the one-out-all-out approach. Whilst the Environment Agency does not include nitrate in the determination of ecological status of fresh surface water WFD classification, they do apply different standards to different types of rivers, based on their varying levels of ecological tolerance to nutrient concentration. This is linked to wider factors, such as altitude (highland or lowland rivers) and pH due to geology.

What is the link between water treatment and freshwater quality?

In terms of nutrient pollution, our rivers have been historically stressed by farming and are presently worsened by urban wastewater (or sewage). Sewage is a mix of domestic wastewater, wastewater from industry, and rainwater run-off from roads. Every day in the UK, 347,000 kilometres of sewers collect over 11 billion litres of wastewater. This is treated at about 9,000 sewage treatment works, and then discharged to inland waters, estuaries and the sea[3]. Wastewater treatment involves settling out the solid matter (primary treatment), using bacteria to break down the organic substances (secondary treatment), and – at *relatively few* treatment works – removing **nitrates and phosphates** (tertiary treatment) through sand filtration, activated carbon filtration, and chemical oxidation. However, the technology still in use was not originally designed to deal with the large numbers of modern chemicals present in urban wastewater. This includes commonly used substances such as pharmaceuticals, personal care products, pesticides including pet tick and flea treatments, and household cleaning products.

During heavy rainfall the capacity of sewers can be exceeded, which may overload sewage works and heighten the risk of sewage backing up into peoples' homes. To reduce this risk, **combined sewer overflows** (CSOs) bypass the treatment works and **discharge untreated sewage directly into the receiving waterbody**, introducing excess nutrients, particularly phosphates. CSOs become more frequent and place additional stress on rivers and streams when, for example, ageing infrastructure allows groundwater ingress to pipes and tanks, and when storage and treatment facilities have lagged behind what's needed to serve the current (and growing!) population.

What did Citizen Scientists measure?

Nitrates and phosphates

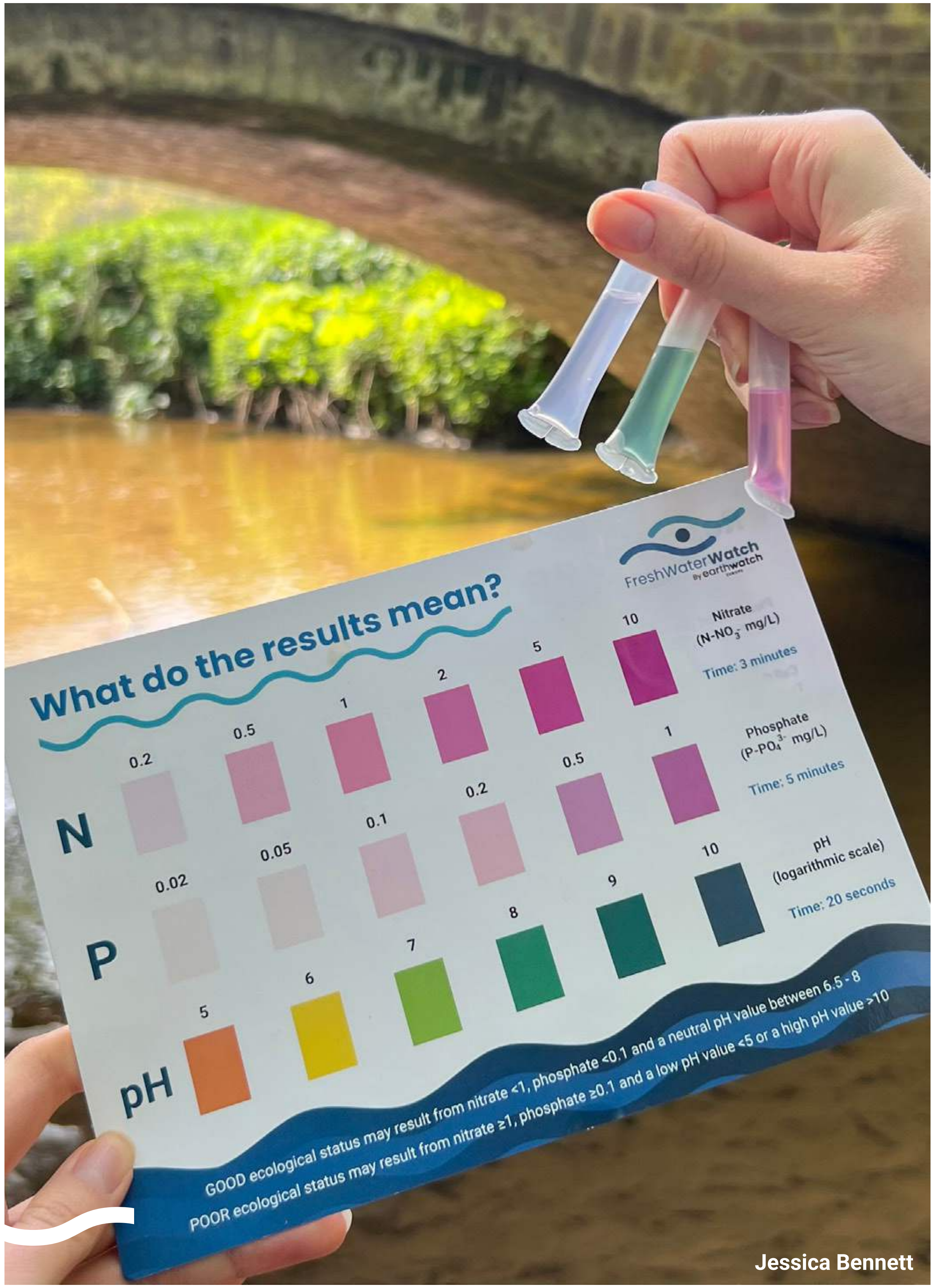
In the Great UK WaterBlitz, citizen scientists measured the range of nitrate (N), and phosphate (P) in their local river, stream, pond, lake, ditch, canal, or other freshwater body. During data analysis, we determined water quality by combining the measurements of nitrate and phosphate recorded at each site. Waterbodies with **acceptable** water quality show evidence of **low** nutrient pollution (<1.0 ppm N and <0.1 ppm P). Waterbodies with **unacceptable** water quality show **moderate to high** levels of nutrient pollution (>1.0 ppm N *or* >0.1 ppm P) (Figure 1). The limit for nitrate aligns with widely-accepted research, whilst that for phosphate aligns with the WFD[4]. We apply the same criteria **nationally**, without taking site-specific standards into account.

pH

pH provides an indication of the acidity of a waterbody on a logarithmic scale, with pH 7 being neutral. Most freshwater in the UK has a pH between 6 and 9, but each river has its own "normal" range within which its ecosystem has developed and can thrive. The Environment Agency uses alkalinity and elevation to set site-specific environmental quality standards for phosphate.

The pH of freshwater bodies is influenced by several factors, including the daily cycles of aquatic plants, daily and seasonal changes in temperature and rainfall, the amount of decaying organic matter present, and pollution. During daylight, for example, photosynthesising plants and algae consume carbon dioxide, which increases pH. At night, plants and algae respire carbon dioxide, decreasing pH. The pH of a river or stream reflects these cycles but is mainly influenced, or "buffered", by the surrounding geology. Rivers in areas dominated by igneous rocks are likely to have a lower pH (be more acidic), while those dominated by chalk or limestone rocks are likely to have a higher pH and higher alkalinity.

With the help of the these measurements gathered during the April 2026 Great UK WaterBlitz, Earthwatch is embarking on a pilot study, in consultation with the Environment Agency. Our aim is to find out whether the pH data collected by citizen scientists can be used, together with publicly available elevation data, to better interpret phosphate results relative to UK site-specific thresholds. These findings will be published soon, but a first look at the pH data is provided later in this report.



Jessica Bennett

National results

An overview of freshwater quality across the UK

Citizen scientists uploaded 2315 datasets of nitrate and phosphate concentrations over a four-day period (24th to 27th April 2026). Participants were asked to select the type of freshwater body they were investigating from a pre-determined list. Our data show that across the UK, most participants tested rivers and streams (Figure 2). Waterbody types with more than 5 datapoints are shown.

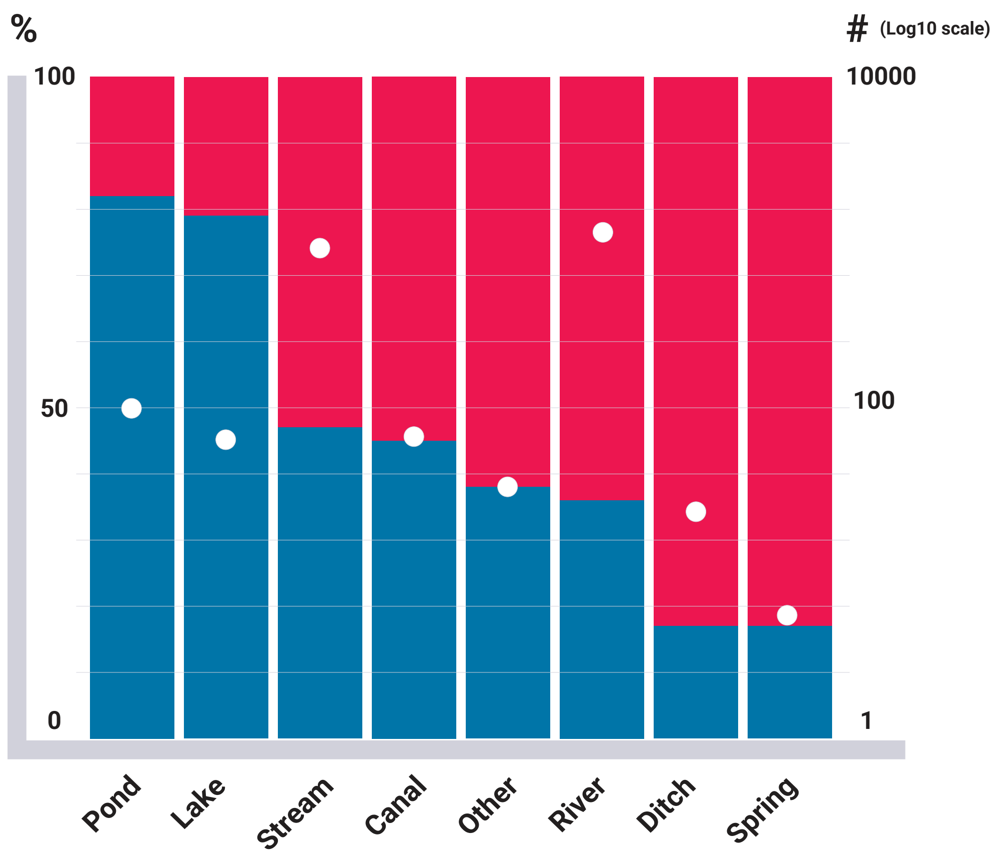


Figure 2. Water quality across the UK's freshwater bodies

We tend to focus on flowing water in the landscape, sometimes overlooking the importance of lakes and ponds, but their value to the environment is evident – ~80% of "still water" surveys showed good water quality. It is also interesting to note that springs – which we might assume to be fresh, pure water sources – were equal to ditches as waterbodies with the poorest quality. In both springs and ditches this was due to high nitrate concentrations, suggesting that agriculture rather than wastewater was the cause. Well done to the citizen scientists for representing such a range of waterbodies with their sampling!

How has water quality changed over time?

The Great UK WaterBlitz takes place in both Spring and Autumn, because seasonal differences affect the national water quality snapshot provided by each four-day sampling window. Thanks to the continued effort of citizen scientists, a representative picture is steadily building up that allows UK-wide comparisons to be made over time. Previous WaterBlitzes have shown at best 40% (September 2025) and at worst 25% (June 2024) acceptable water quality (Figure 3). In April 2026, only 43% of surveys across all waterbodies in the UK showed acceptable water quality. While the data from repeated WaterBlitzes confirms a *slight* improvement, it remains a disappointing picture of freshwater health across the UK.

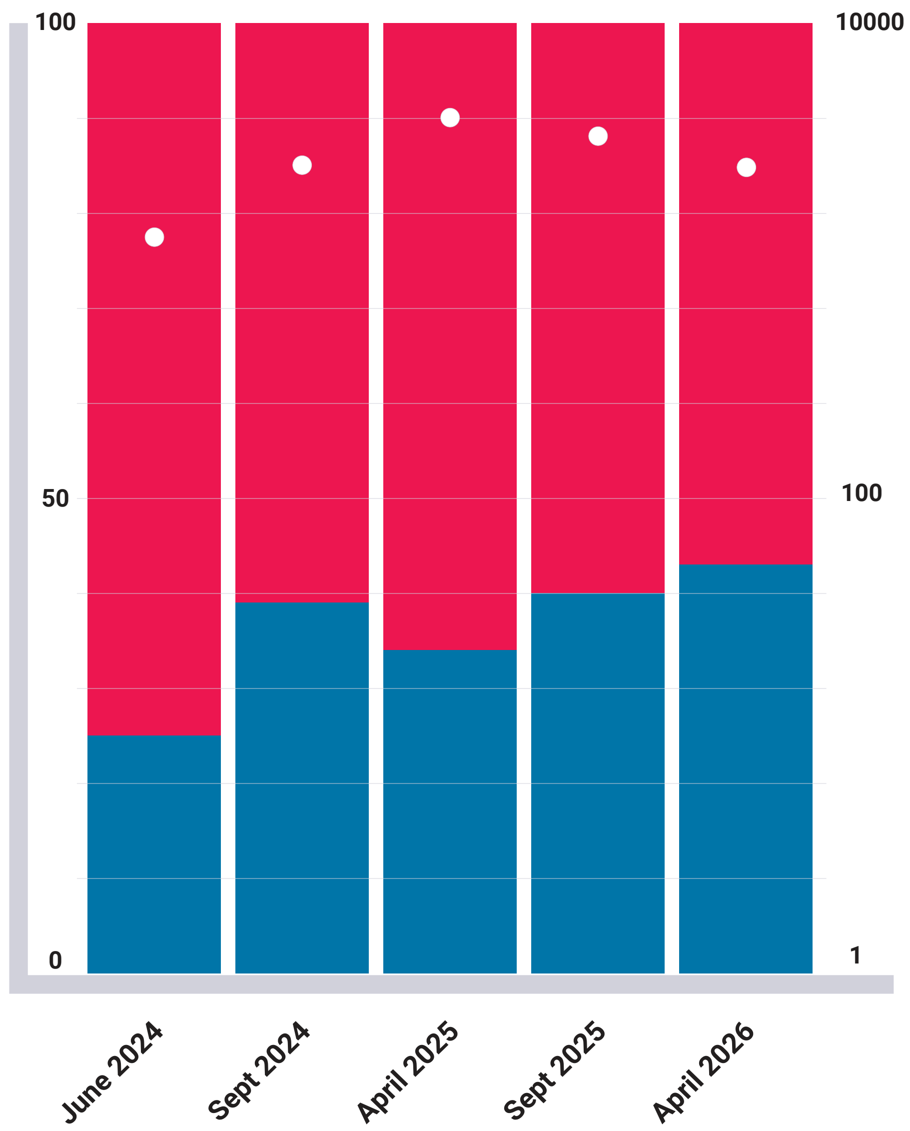


Figure 3. National overview of water quality

Which countries have the best water quality?

In June 2024 Scotland's water quality was the best in the UK (Figure 4). Since then, Northern Ireland and Wales have traded pole position between them. For these three countries, the percentage of surveys showing acceptable water quality has never been less than 49% and was typically around the 70% bracket.

Wales excelled in April 2026 with an all-time national high: 82% of surveys showed acceptable water quality against Scotland's 74% (another personal best) and Northern Ireland's 60% (the only country showing a downward trend against recent results).

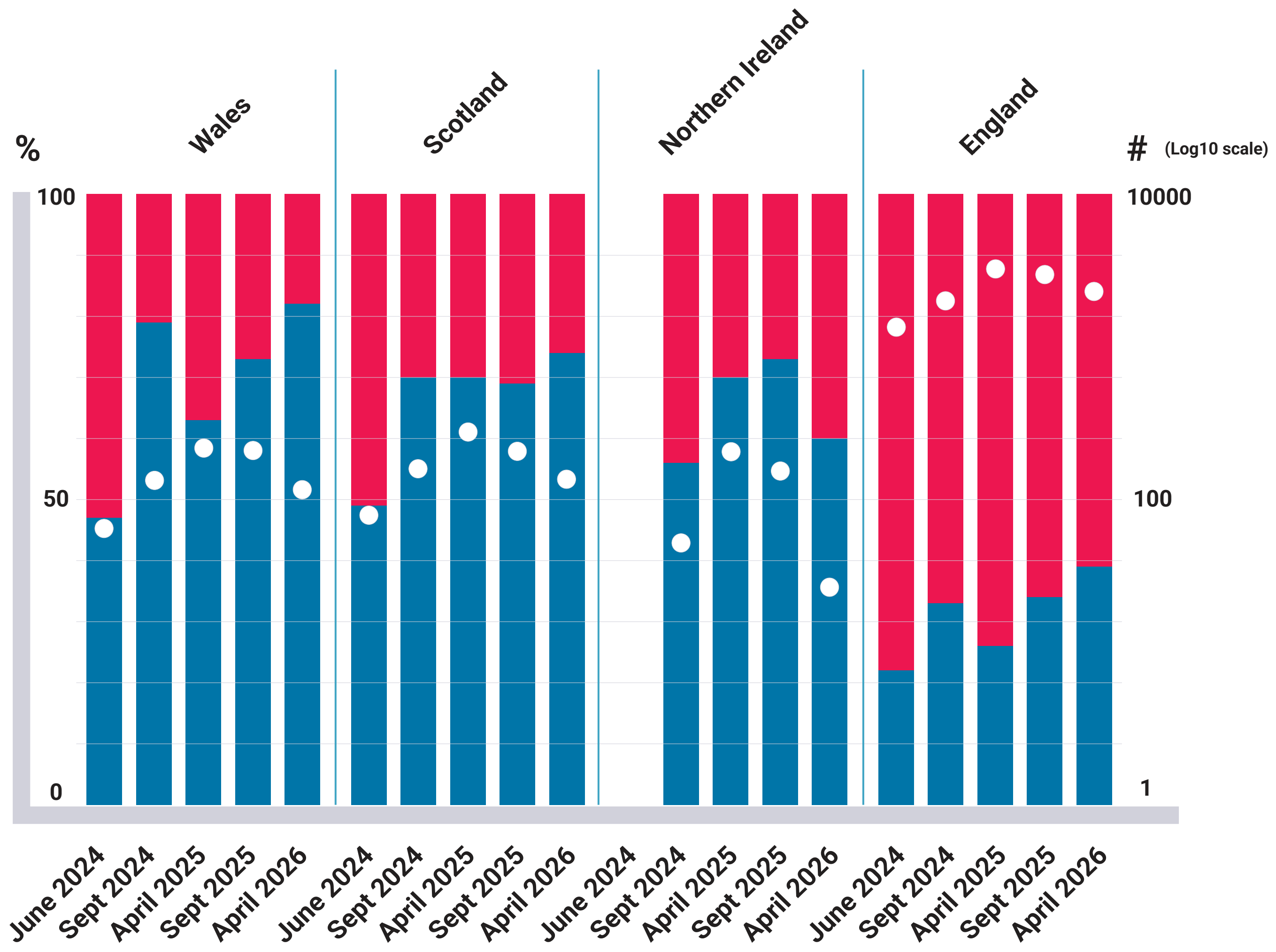


Figure 4. National overview of water quality over time

Acceptable Unacceptable # Datapoints

England, however, has always trailed in **last place** by quite some margin. Here, the percentage of surveys showing **acceptable** results has ranged from only **22%** in June 2024 to April 2026's high of **39%**. In other words, other nations' worst water quality has always been better than England's best water quality! There is a great deal of room for improvement.

Figure 4 shows that the situation is changeable: We need more data to confirm these apparent trends. It is important that we continue to empower citizen scientists to take part in our biannual WaterBlitzes to further improve national coverage, support robust, longer-term analysis of the UK's water quality, and improve public engagement and understanding of the issues.

Taking the average across all five WaterBlitzes, 69% of measurements in **Wales, 66%** in **Scotland** and **65%** in **Northern Ireland** indicate good water quality. In comparison, **31%** of measurements in **England** indicate good water quality (Figure 5).

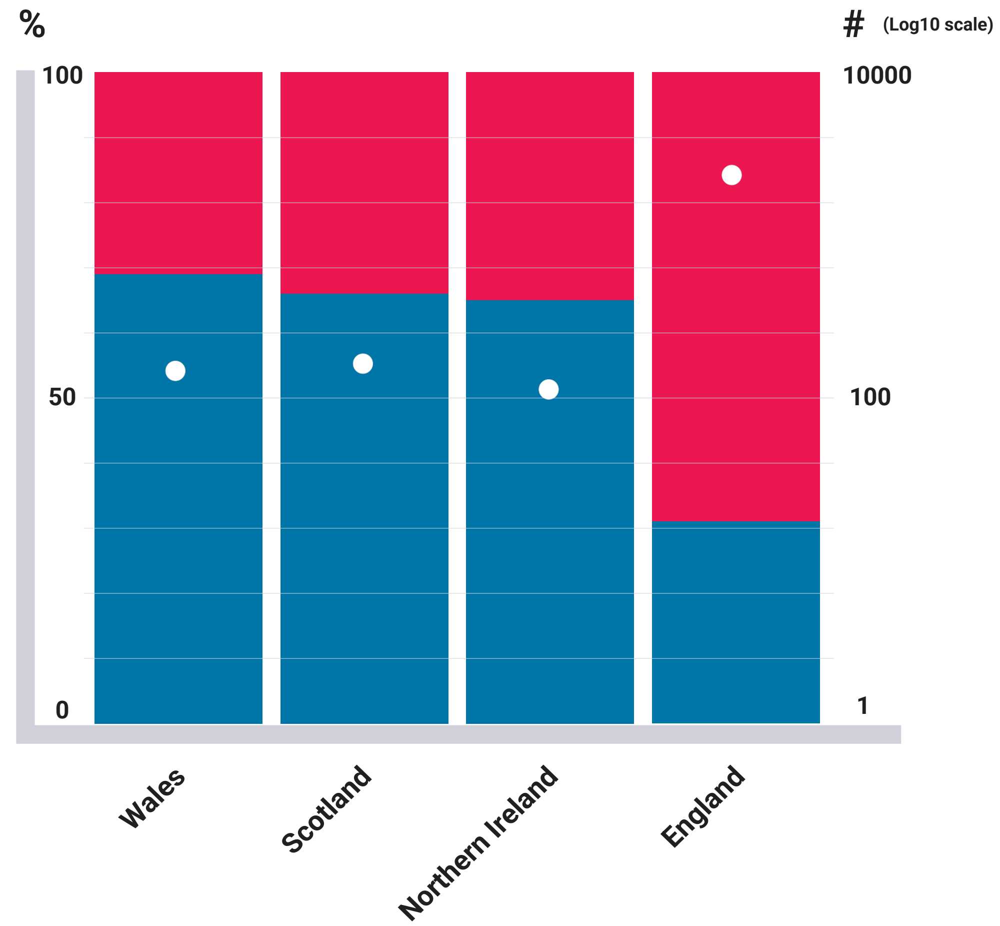


Figure 5. Average national water quality over time

Acceptable Unacceptable # Datapoints

What about participation?

We planned a smaller, more focused WaterBlitz for April 2026. So, although fewer people took part than in the previous two WaterBlitzes, the completion rate (surveys recorded per kits sent out) was the best yet, echoing the deep public concern for the health of the UK's waterways. Of the 2315 surveys collected, the majority (2038) were collected in England; 140 were collected in Scotland; 112 measurements were taken in Wales; and 25 datapoints were gathered in Northern Ireland. We estimate that over 4600 people joined in over the sampling weekend, of whom nearly a thousand were children. There is more about participants' experiences later in the report.

A more detailed picture

Which river basin districts are worst hit?

A river basin, also known as a drainage basin, is an ecological term for the area of land around a river from which all water is drained. A river basin district includes one or more river basins (Figure 6). Each river basin district has a river basin management plan that outlines the objectives, standards, and measures for managing water. River basin districts with more than 10 datapoints were included in this part of the analysis (Figure 7).

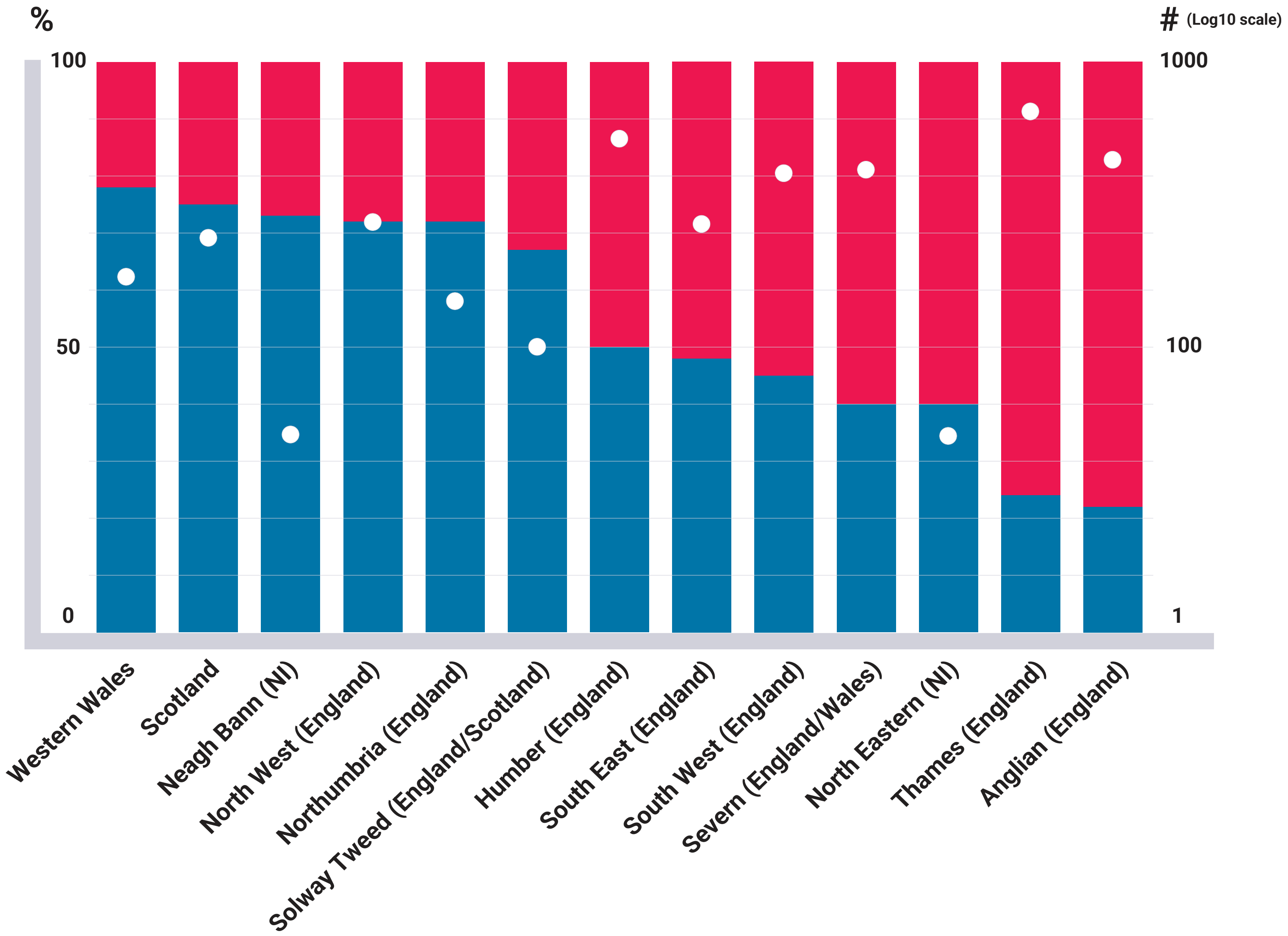


Figure 7. Water quality by river basin district

Acceptable Unacceptable # Datapoints

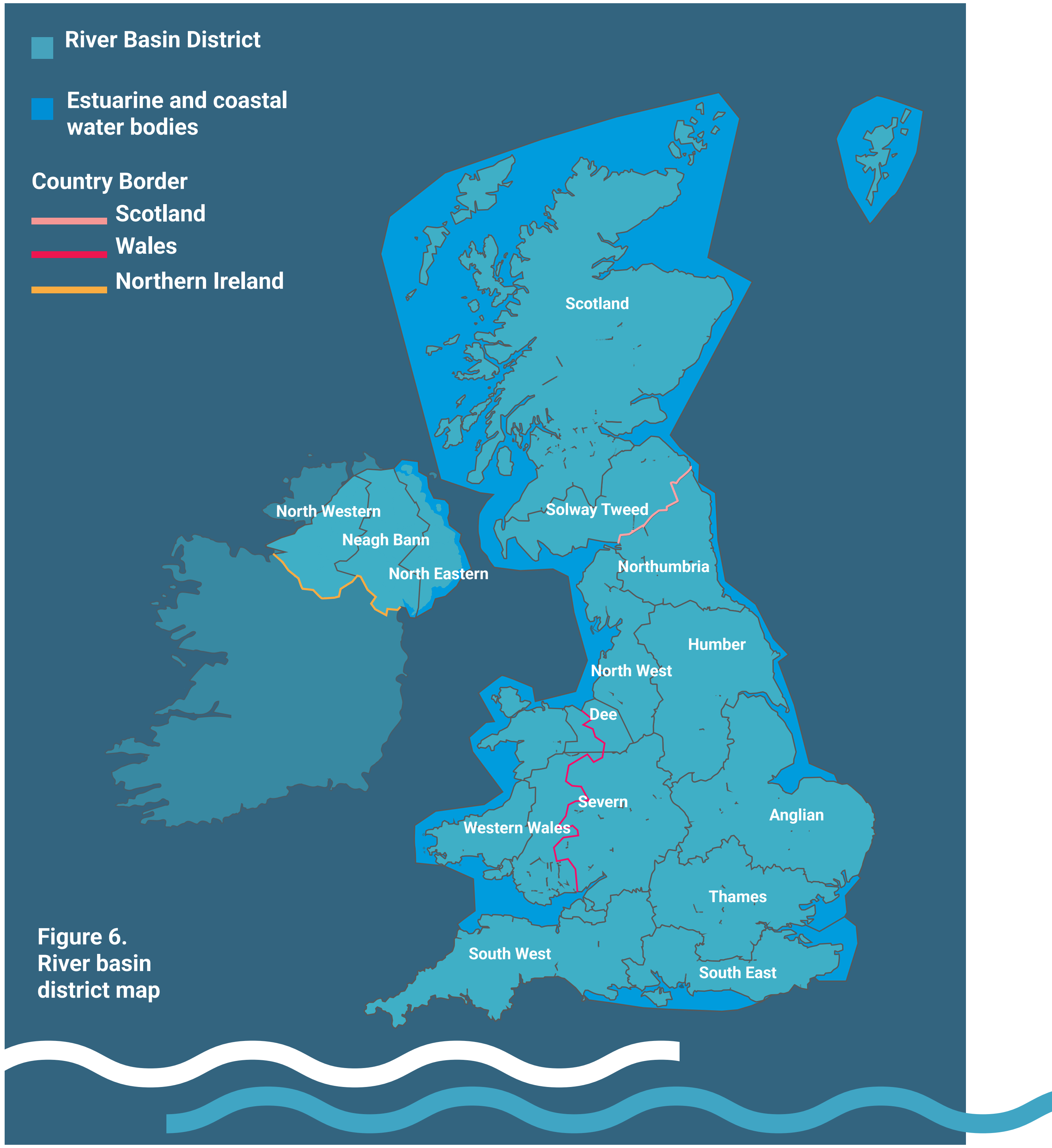


Figure 6. River basin district map

The results shown in Figure 7 suggest that the **Western Wales river basin district had the best water quality in the UK**, with 78% of the 72 measurements indicating low concentrations of nutrient pollution.

Thames and **Anglian** have been the two **worst** performing river basin districts in **every WaterBlitz**, and for the third time, **the Anglian river basin district had the worst water quality in the UK**, with only 22% of measurements showing good water quality (based on 307 datapoints).

Which river basins are most polluted?

Each river basin district is made up of many smaller river basins, or sub-basins. We kept the river basin district order from Figure 7 and ranked the sub-basins where at least 5 datapoints were collected within their river basin districts (Figure 8).

At the positive end, all six river basins included in the **Western Wales** river basin district had at least **70%** good water quality measurements; In the **North West** river basin district of England, surveys from the **Lune** and the **Kent & Leven** river basins showed **100% good** water quality, as did the **Welsh Severn Uplands** river basins in the cross-border **Severn** river basin district.

By contrast, seven out of the eight river basins sampled by citizen scientists in the **Anglian** region had **30% or less** surveys indicating good water quality. This pattern was echoed in the **Thames** river basin district for ten of the fifteen river basins sampled.

However, results varied widely across river basin districts. For example, **100%** of the surveys taken in the **Idle & Torne** and the **Louth Grimsby & Ancholme** river basins in the **Humber** river basin district showed **unacceptable** water quality. Yet in that same river basin district, six of the fourteen sub-basins were above the national average, and **80%** of the surveys in the **Wharfe & Ouse Lower** sub-basin showed **good** water quality.

This is why citizen science water quality data is so valuable – no formal water quality sampling programme equals this detailed UK-wide coverage provided by ordinary people who are concerned about their local waterbodies.

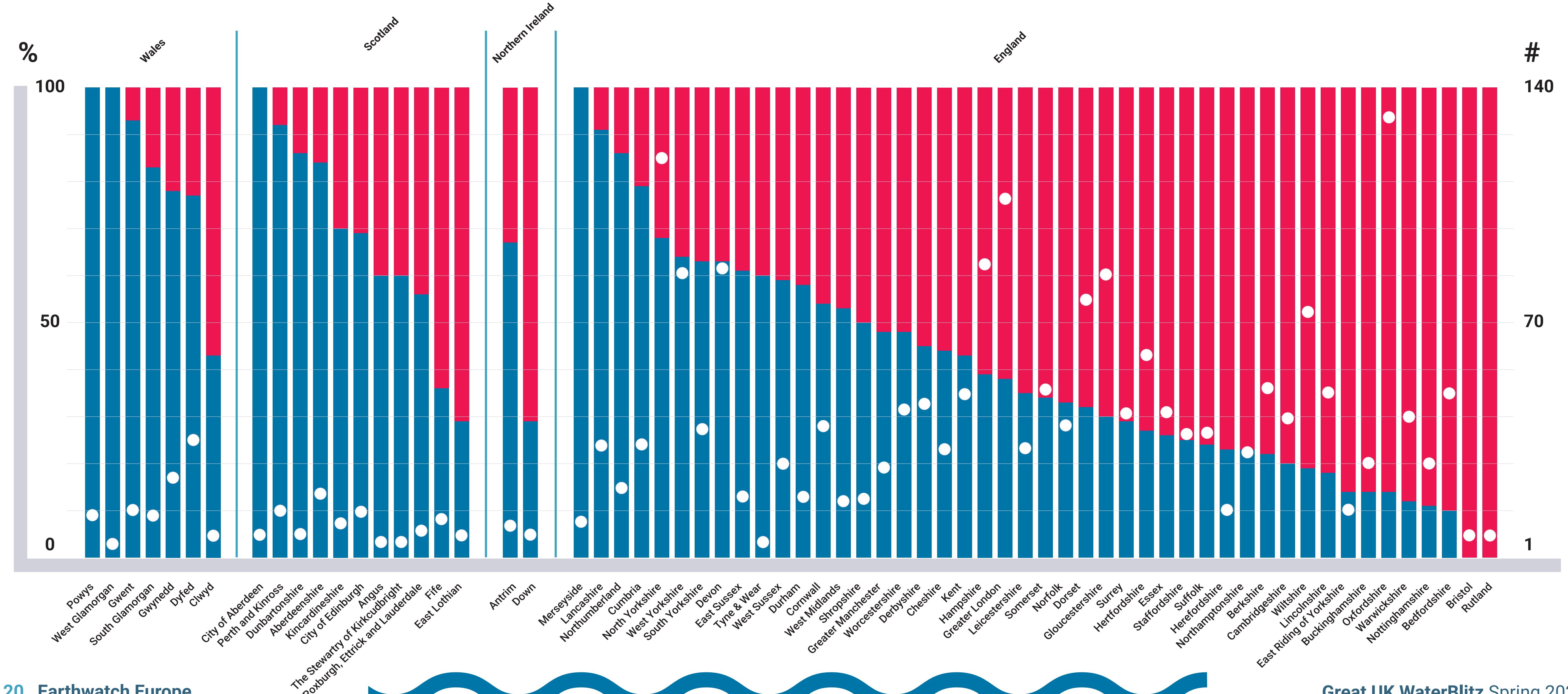
May Lau

Figure 8. Water quality of river basins in river basin districts

How healthy is freshwater in your county?

Not everyone can name which river basin they live in, but (especially at election time!) most of us know our county. In this report we have used ceremonial counties, because local governmental legislation counties are continually updated, with boundaries that change over time. Again, only counties with more than five datapoints were included in this part of the analysis (Figure 9).

Figure 9. Water quality by county ■ Acceptable ■ Unacceptable ○ # Datapoints



We have ranked counties by country and by water quality so that you can see the percentage of unacceptable water quality measurements taken in your county, and how it compares to others.

Our analysis shows that the counties of **Powys** and **West Glamorgan** in **Wales**, **City of Aberdeen** in **Scotland** and **Merseyside** in **England** had the **best** water quality in the UK, with **100%** of measurements indicating **good** water quality and low nutrient concentrations (based on 12, 5, 7 and 11 datapoints respectively).

A shout out to the residents of Oxfordshire, who took the greatest number of measurements – 131!

The county of **Rutland**, for the third time, had the **worst** water quality in the Great UK WaterBlitz, with all seven measurements taken indicating poor water quality, in equal last place with **Bristol**.

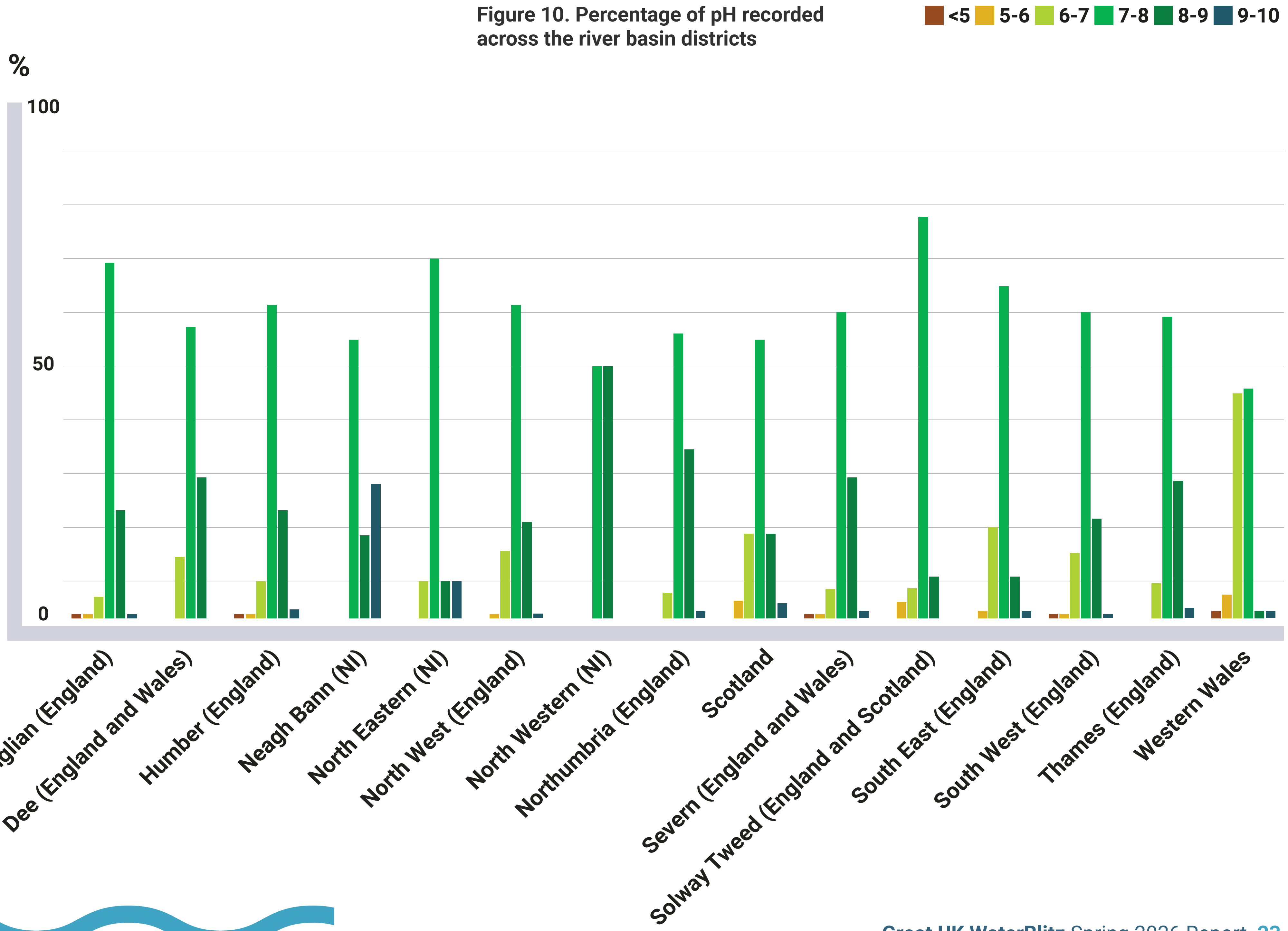
Note that while there is a *possible relationship* between the number of datapoints and unacceptable water quality, this is likely due to larger volumes of data being collected where there are naturally more people; in urban areas where there are fewer green spaces and more pressure on sewage treatment works.

A first look at the pH results

Collecting pH data during the April 2026 Great UK WaterBlitz was the initial step towards investigating whether regular testing could add useful insights into site specific phosphate thresholds. We sorted the pH data according to the river basin districts (Figure 10).

As expected, pH 7 – 8 was the most frequently recorded, but some interesting regional differences can be seen in the spread of pH values recorded in the river basins districts, probably due to the dominant geologies. However, rock types and other influences can vary considerably within river basin districts and even within a single sub-basin, so much depends on the site of each sample.

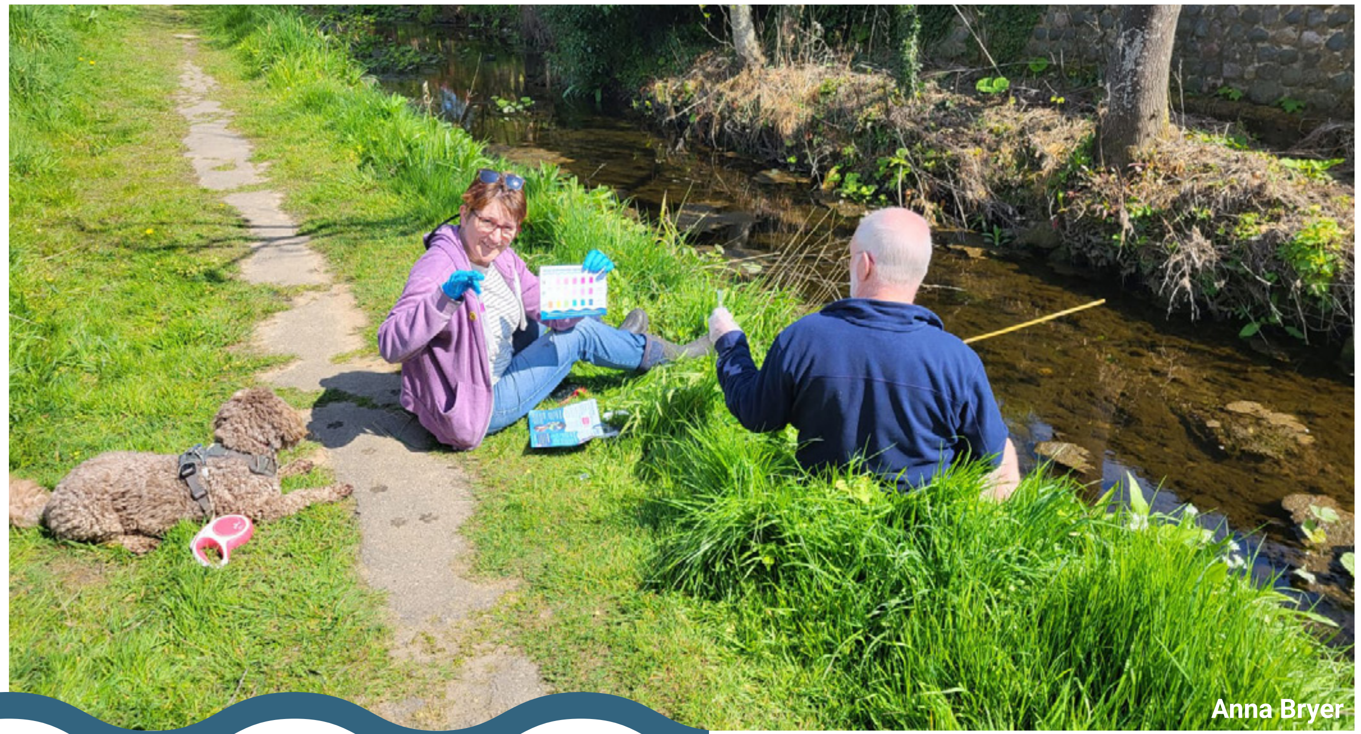
Figure 10. Percentage of pH recorded across the river basin districts



What do we know about our participants' experience?

4677 participants took part in the WaterBlitz and 67 responded to our questionnaire about their experience. 66% had taken previously taken part in a WaterBlitz event (thank you!) but almost a quarter of respondents not been involved in the environmental sector before the WaterBlitz (welcome!). Most people who responded had wanted to do something for the environment (88%) and many had a personal interest in a local waterbody (58%). As in previous WaterBlitzes, many participants agreed that their understanding of water quality issues and river health improved through taking part (73%). Overall, 93% of participants rated their experience as good or excellent, and 99% said they would take part in the Great UK WaterBlitz again.

WaterBlitz Story: Leeds



Anna Bryer

Anna Bryer, Stainley Beck, Leeds

I took part in the WaterBlitz because, as a horticulturist and amateur beekeeper, I am very aware of the worsening environmental situation around us. The Earth provides us with three essential natural resources, soil, air and water, and all three are being relentlessly polluted. Every form of life depends on these resources to survive, yet we continue to damage them at an alarming rate. To me, the WaterBlitz campaign is a brilliant initiative because it gathers hard evidence about the condition of our waterways and helps hold water companies accountable for the environmental damage that has been caused in pursuit of financial gain.

Clean waterways are fundamental to life itself. Without clean water, ecosystems begin to collapse and the delicate balance of nature is disrupted. The plants, insects, fish, birds and animals that live in and around rivers and streams all play a role in supporting wider biodiversity and maintaining healthy ecosystems. When waterways are polluted, the impact reaches far beyond the water itself, it damages the natural systems that all life on Earth depends upon. I find the destruction of these vital environments deeply concerning and difficult to comprehend.

In previous years, I tested the River Nidd, which runs through my village, but this time I chose to test Stainley Beck after friends who live nearby noticed it no longer looked as healthy as it once had. We often walk alongside the Beck together, and I also keep several beehives nearby, meaning the health of this small tributary to the River Ure directly affects the surrounding environment my bees rely upon. We were saddened and shocked by the results of the test, which reinforced just how important initiatives like the Great UK WaterBlitz really are.

WaterBlitz Story: Exmoor

Robin Shelley, Horner Water, Exmoor


Robin Shelley

I believe it's important for as many citizen scientists as possible to get involved in monitoring the quality of our natural waterways. I've taken part in the Great UK WaterBlitz before and wanted to do so again while I was on holiday, because the project provides such a valuable snapshot of river health across the country. One of the most striking things for me has been seeing the huge disparity between nutrient levels on Exmoor, which were excellent, compared with conditions back home on the Avon, where levels are extremely poor. That contrast really reinforced how important it is for all of us to understand the bigger picture. The WaterBlitz gathers a huge amount of instant data, helping to identify both the healthiest waterways and the places where urgent action and restoration work are most needed.

Clean waterways are the lifeblood of the wildlife and habitats that depend on them. Rivers and streams support not only the creatures living within them, but also the riparian flora and fauna that thrive along their banks. If we continue treating waterways as part of our effluent system, we stand to lose the precious ecosystems that make these landscapes so special. As a Water Guardian, it can sometimes be challenging to try to trace the many different sources of pollution, but I will continue to fight tooth and claw to ensure issues are directed to the right people and properly addressed.

I've been visiting Exmoor for nearly 20 years now and it has become my spiritual home. Knowing I would be there during the WaterBlitz test period, it felt like the perfect place to carry out my investigations. It was an idyllic setting in which to spend time testing and observing the waterway.

WaterBlitz Story: Manchester

Jessica Bennett

Jessica Bennett, River Bollin, Manchester

Participating in the Great UK WaterBlitz gave me a hands-on opportunity to contribute to freshwater monitoring in my local area. I really enjoyed collecting my water sample and seeing the colour-coded ecological status results for nearby rivers, so signing up again for the Spring campaign felt like a natural next step. Watching my sample appear on the live map was especially rewarding, as it made me feel that I was contributing to valuable environmental data being gathered by Earthwatch.

As a conservation student, I understand how vital healthy freshwater systems are for supporting local fauna and flora. When freshwater habitats decline, the wider ecosystem is affected too. Taking part in the WaterBlitz allowed me to connect my academic interests with practical action and contribute to a wider effort to better understand and protect rivers.

The sample I collected came from a river in my local park, a place that has personal meaning for me. I used to play there as a child, and now I regularly walk my dog there with family. Contributing to the project felt like a way of helping to protect an environment that is important both to wildlife and to the local community.

I also shared my experience online to encourage others to become citizen scientists. The more people who take part, the greater the positive impact of the data collected. Initiatives like the Great UK WaterBlitz not only support environmental research but also encourage people to connect with nature and with each other.

WaterBlitz Story: Berkshire

Bradfield College, Sixth Form, River Pang, Berkshire


Bradfield College

IB pupils in the Lower Sixth at Bradfield College, studying Biology and Environmental Systems and Societies, took part in the Great UK WaterBlitz to help monitor the health of their local waterway, the River Pang. The pupils are aware of pollution risks upstream, particularly from sewage treatment plant overflows during periods of flooding, and wanted to contribute to collecting, real-world data. They enjoyed working independently with the testing kits, carefully following the instructions, and being part of a wider citizen science project with meaningful environmental outcomes.

Clean waterways and rivers are essential for maintaining healthy ecosystems and supporting biodiversity. Taking part in the project gave pupils the opportunity to reflect more deeply on how pollution can affect river habitats, moving beyond classroom-based learning and prescribed lesson content. It helped them develop a stronger understanding of environmental responsibility and sustainability, and how individual and collective action can contribute to protecting natural systems.

The River Pang is located on the school site and is a familiar part of the pupils' everyday surroundings, but the WaterBlitz allowed them to experience it in a new and more observant way. During the testing, pupils took time to watch and appreciate local wildlife, including learning to identify birds both by sight and by birdsong. They also enjoyed speaking with members of the public about what they were doing, which helped connect their work to the wider community. With good weather on the day, the experience of being outdoors, engaged and active in their local environment made the activity especially valuable and memorable.


The STEM Hub
Canterbury Christ Church University
WHAT'S IN YOUR WATER?
LIVE LESSON WITH EARTHWATCH EUROPE
THU 12 MAR 2026 | 1.30pm - 2.30pm
BRITISH SCIENCE WEEK 2026 6-15 March
MS TEAMS LIVE* | FREE | KS2 Students

Join us with What's in your water? Live is an engaging, curriculum-linked live lesson for KS2 pupils that brings science and geography to life through real-world action. Developed by Earthwatch Europe, this interactive session immerses young learners in the world of fresh water, environmental threats, and the Great UK WaterBlitz a UK-wide citizen science project.

Aligned with national curriculum and timed to support British Science Week and Great UK WaterBlitz (24th-27th April) this session empowers pupils to become scientists for a day — and environmental champions for life

This live talk, aimed at primary aged students (most suitable for KS2), will be informative and engaging, and there will be the opportunity to ask questions.

*Microsoft Teams Live is a platform with safeguarding built in, including no enabled webcams or microphones and moderated chat function

BOOK YOUR PLACE

or visit thestemhub.org.uk/events for more information and to book.

STEM Ambassadors Partner South East | Funded by UK Research and Innovation | STEM Learning | earthwatch Europe

On March 12th, 6,356 KS2 students attended a free "live lesson" hosted online by the Earthwatch education team. It was well received (*We really liked the interactive parts of the live lesson* Fiskerton CE Primary School), and there were requests for more opportunities to learn about water quality and pollution (*More pupil-facing webinars like this one.* Baleares International School). As well as learning a lot about freshwater through the webinar, each class was awarded a certificate and their teachers received a school's pack with practical activities, so that they can continue to explore the freshwater theme with their pupils. You can find a range of freshwater educational resources here: Water

What else can you do?

There are many actions that we can take as individuals that will collectively add up and ease the pressure on our freshwater systems. Outside, a **water butt** connected to the drainpipes from our roofs can reduce the volume of rainwater running into the sewage system and help with garden watering in dry periods. Additionally, making our gardens and driveways more **permeable** allows surface water to soak into the ground rather than into drains. In built-up urban areas, rainwater runs off faster and has less chance to soak into the ground than in areas with more green spaces such as parks and pastures. Paving over lawns and flowerbeds to make driveways and patios adds both increased risk of flooding, and to freshwater health.

The average person in the UK uses 142 litres of water per day, peaking during our morning and evening personal hygiene and cooking activities. Lowering overall water **consumption** puts less pressure on water resources, and using water at off-peak times helps the sewage system to cope better throughout the day. Being mindful of what we put down the toilet or pour down the drain reduces the risk of blockages, and can keep pollutants from entering freshwater bodies. For example, you can using eco-**friendly** cosmetic and cleaning products, avoid products which contain PFAS (including clothing and cookware), and avoid over-washing manmade materials like polyester. All these simple changes reduce chemicals and microplastics flowing into freshwater bodies. Remember, **what we pour down our sink cycles back to our drink.**

Where do we go from here?

Earthwatch Europe believes in the power of data for change.

We believe in open, transparent data. It's why all our graphs have been plotted to include the number of datapoints; so that you can see how large a dataset has been used to draw conclusions, and why all our data sources and methods are carefully documented at the end of this report. We want to see the same level of **transparency** and, indeed, **accountability** from all types of polluters: from agriculture, urban runoff and sewage overflows.

We want to see the **law enforced**, so that pollution from all sources – sewage, agriculture and road runoff – becomes **unprofitable**. We want to see government monitoring and mitigation focused on **ecologically sensitive areas** including protected nature sites and chalk streams; and for **nature-based solutions** to be prioritised. We want to see Government take action to **engage and empower communities** to monitor and protect their local freshwaters.


Teri Knight

Make citizen data count!

We know that citizen scientists can provide extensive, accurate, and timely information on local water quality with national coverage. We've shown that our participants can generate robust datasets, and reliable status reports on how seasonal variations can impact pollution dynamics and water quality. Earthwatch adheres firmly to the FAIR and CARE data principles, ensuring that the data that we curate on behalf of citizen scientists is:

- **Findable:** assigned unique identifiers.
- **Accessible:** retrievable through open, standard protocols.
- **Interoperable:** uses shared languages, formats, and vocabularies for integration.
- **Reusable:** well-described, licensed, and curated for future use.

With:

- **Collective Benefit:** use should support the self-determination and wellbeing of Indigenous peoples.
- **Authority to Control:** communities have the right to govern the collection, access, and use of their data.
- **Responsibility:** users must ensure that data are used ethically and with respect for Indigenous values.
- **Ethics:** Indigenous rights and cultural protocols must guide all data-related decisions.

The Environment Agency has shown support for citizen science through their development of the Technical Advisory Framework that aims to assure citizen science data quality. However, the White Paper that will shape the Water Reform Bill does not mention citizen science *even once*. Earthwatch adds their voice to the growing movement calling for government and regulators to take advantage of the Water Reform process and recognise the power of citizen science for freshwater monitoring at a national scale. **We believe that citizen-generated data should be integrated into statutory freshwater monitoring frameworks** to provide much-needed weight of evidence to assist the Environment Agency to identify and prioritise poor water quality hotspots for high-level compliance monitoring and enforcement.

A healthy freshwater future starts today, with each and every one of us being better informed through monitoring, and able to knowledgeably advocate for our local water bodies.

Please join us in September 2026 for our next Autumn WaterBlitz and continue the fight for healthy freshwater through citizen data.

Emily Downs

Methods

Participant recruitment and feedback

Citizen scientists were recruited through promotional campaigns on social media. Following the WaterBlitz, all participants were sent a follow-up questionnaire to report on their experience of the WaterBlitz and their knowledge, attitudes and behaviours towards nature.

Nutrient and pH testing

The FreshWater Watch measurements of nitrate, phosphate, and pH are made colourimetrically in closed tubes using a standard plastic cuvette for a fixed volume of 1.5mL. Colour development periods of three minutes, five minutes, and twenty seconds respectively are timed following the introduction of the sample. Nitrate measurements are based on the Griess reaction, with a reduction reaction using zinc, which reduces the nitrate ($N\text{-}NO_3^-$) to nitrite (NO^{2-}) and a colourimetric reaction for the determination of nitrite. $P\text{-}PO_4^3$ – is detected using 4-amino-antipyrine with phosphatase enzyme to produce hydrogen peroxide, which then undergoes a colourimetric reaction. pH measurements are based on a proprietary mixed pH indicator including thymol blue. All colours are compared to standard reference colour charts provided to the citizen scientists, assigning colour brightness to one of seven intervals.

Side-by-side measurements have shown an overall accuracy of 75% to 85% of the citizen scientist estimated PO4 concentrations compared to concentrations measured at the same site and day by professional scientists using standard laboratory analysis [6,7].

Participants submitted data via the ArcGIS Survey123 app, the FWW platform or via paper copy. All data uploaded from the 24th of April until 1.30pm on the 28th of April were included in the analysis (following quality control). Additional data uploaded outside of this period were not included in the analysis but can still be visualised on the public map and will form part of the overall FWW database.

Data analysis

On closing the survey, the data were exported, and quality control was undertaken. This included checking locational accuracy, with automated emails sent directly to participants to correct their own geolocation, as well as the removal of incomplete and duplicate records, and the removal of saltwater surveys as indicated through visual inspection of their location and in participant notes (e.g., “sea”, “harbour”, “tidal river at high tide” etc.). Each record/survey result was then enriched with nitrate and phosphate nutrient pollution ratings based on the measured concentrations, from which in turn the acceptable/unacceptable water quality classification was generated (based on the N and P thresholds mentioned earlier in the report). Lastly, our FWW narrative water quality feedback was generated for each survey, using a matrix based on the nitrate and phosphate measurements and the observed parameters. Citizen scientists were provided with qualitative information and feedback about their waterbody via email.

For the spatial analysis of the data points, we enriched our data set using geospatial layers including Open OS Boundaries, WFD (Water Framework Directive) for England and Wales, and SEPA (Scottish Environment Agency) for surface water catchments. Elevation data (for later use with pH to investigate site specific phosphate thresholds) was added using LIDAR Composite Digital Terrain Model – 1m produced by the Environment Agency in 2025.

Polygons for spatial analysis

The following polygons were used for spatial analysis:

- Country, from Ordnance Survey Boundary-Line™ consisting of the 'Country Region' shapefile and can be found at https://osdatahub.os.uk/downloads/open/BoundaryLine
- County, from
    - Ordnance Survey Boundary-Line™ consisting of the 'Boundaryline ceremonial counties region' shapefile for England, Scotland and Wales, which can be found at https://osdatahub.os.uk/downloads/open/BoundaryLine
    - 'Northern Ireland, County, Boundaries' shapefile. This data was collected by Ordnance Survey Northern Ireland and can be found at https://www.opendatani.gov.uk/ on the open data NI portal.
- River basin districts/management area (using RBID_NAME) field as defined by the WFD Surface water management catchments (Cycle 2) database.
- River basin (using MNCAT_NAME) field as defined by the Water Framework Directive (WFD) Surface water management catchments (Cycle 2) database, enhanced by Welsh sub-regions (field name ManCatID, and ManCatName) from WFD River Waterbody Catchments Cycle 2.
- Geolocation quality control: Using Building and ImportantBuilding shaped file polygons from OS Openmap https://osdatahub.os.uk/downloads/open/OpenMapLocal to determine points that were recorded at a building instead of a waterbody. This was then checked against distance from SurfaceWater waterbody shape file polygons and lines from the following sources – OS Open Rivers https://osdatahub.os.uk/downloads/open/OpenRivers OpenStreetMap https://www.openstreetmap.org/ and regional extracts fromGeofabrik https://download.geofabrik.de/europe/united-kingdom-latest.osm.pbf. Geolocations were then corrected accordingly.

Datapoints per polygon

The number of datapoints per polygon was determined to assess the representativity of the data. All datapoints were included in the overall and national analyses. River basin districts with fewer than 10 datapoints and river basins and counties with fewer than 5 datapoints were excluded from analysis at those levels. For example the Dee river basin district (England and Wales) had only seven data points and was excluded from the river basin district analysis, but the polygon for the Dee river basin in Wales had 5 datapoints and was included in the river basin analysis.

Of the 157 river basins defined by the WFD Surface Water Management Catchments Cycle 2 polygons (see *Polygons for spatial analysis* above), 124 were sampled, and 90 had more than 5 data points. These river basins contained 96.4% of the 2315 datapoints that were collected by citizen scientists during the WaterBlitz.

Of the 97 counties defined by boundary shapefiles (see *Polygons for spatial analysis* above), 84 were sampled, and 66 had more than 5 data points. These counties contained 87.8 % of the 2315 datapoints that were collected by citizen scientists during the WaterBlitz.

Data sources

- Earthwatch – Great UK WaterBlitz April 2026
- OS Open Boundaries Data source link
- OS OpenMap Local Data source link
- OS Open Rivers Data source link
- OpenStreetMap via Geofabrik Data source link
- SEPA River Basin Districts Data source link
- Water Framework Directive (WFD) River Basin Districts Cycle 2 Data source link
- WFD Surface Water Management Catchments Cycle 2 Data source link

Tools used

- ESRI ArcGIS Python API
- ESRI ArcGIS Online and Python Notebooks
  ESRI ArcGIS Pro
  Microsoft Excel (Microsoft Office 365)
- Microsoft Visual Studio Code
- Pandas library

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