

A man and a woman, both wearing outdoor jackets and gloves, are crouching on a grassy bank next to a river. They are looking at a small object in the water. The background is filled with lush green trees and foliage. The scene is reflected in the calm water of the river.

FreshWater Watch: Citizen science in the Evenlode catchment

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earthwatch
EUROPE

Overview

- What is citizen science?
- Earthwatch Europe
- Freshwater Watch
- Water quality monitoring in the Evenlode catchment

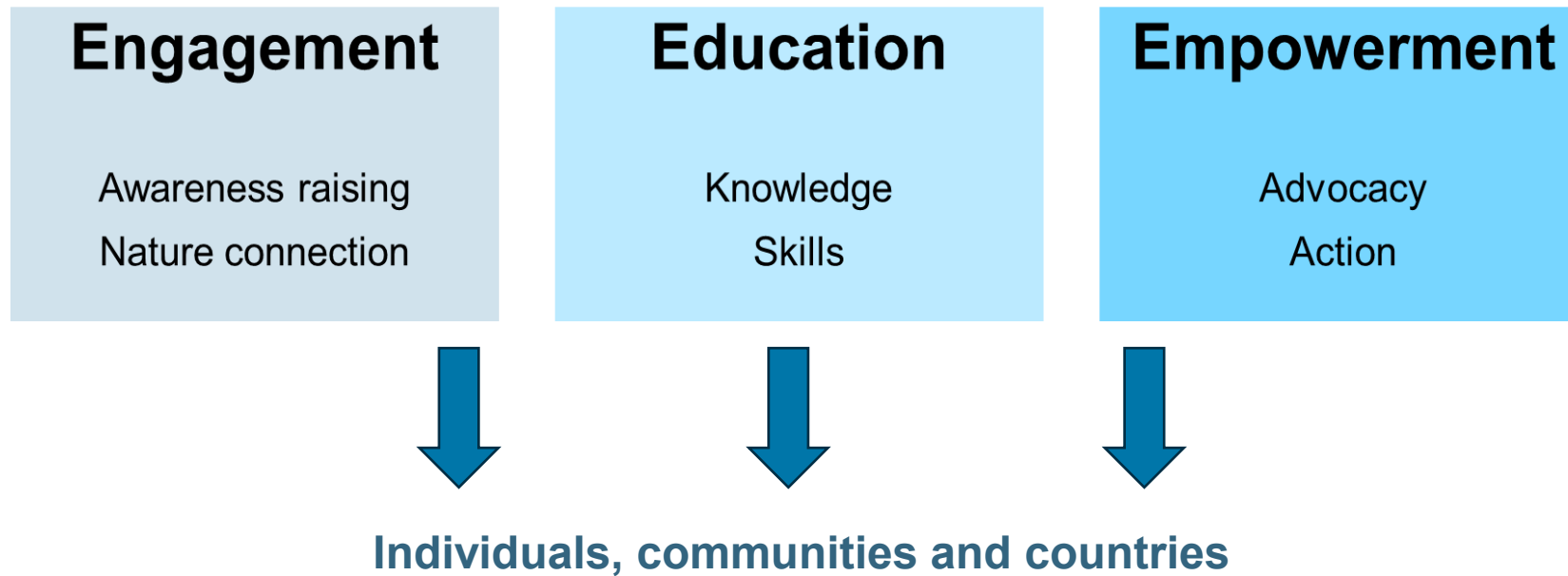
What is citizen science?

Citizen science is the **active involvement of non-scientists** in the scientific **research** process



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Citizen science is the **active involvement of non-scientists** in the scientific **research** process



Collaborative knowledge co-creation in an engaged social ecological systems framework

South Africa

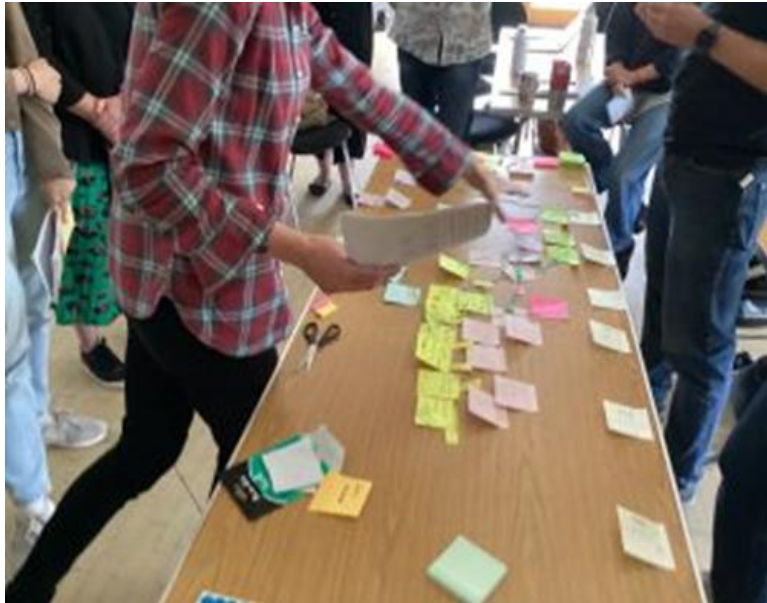


England





South Africa



England



Earthwatch Europe

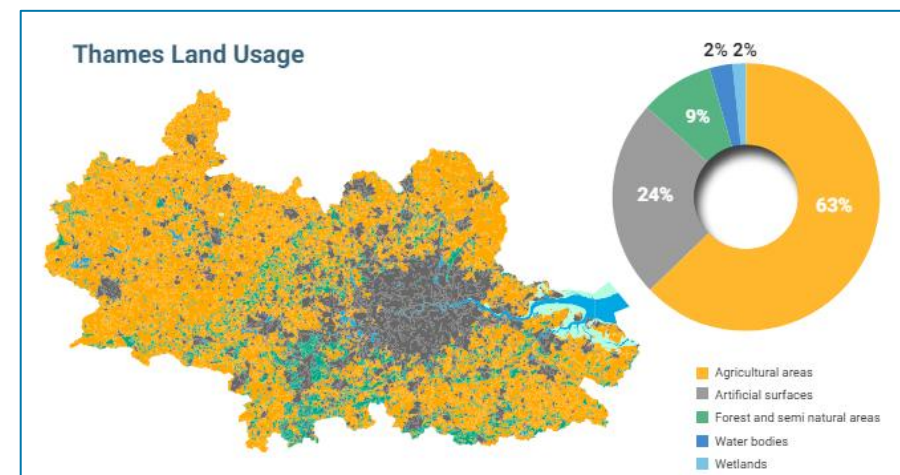
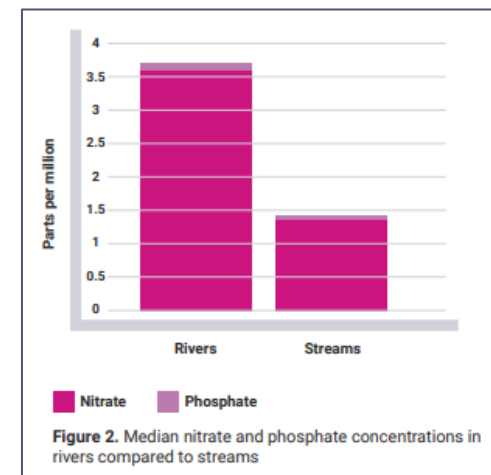
Earthwatch Europe is an environmental charity with science at its heart

We connect people to nature and provide them with the tools they need to fight for the planet



Earthwatch Europe policy

1. Enforce the law
2. Make pollution unprofitable
3. Focus targets
4. Embrace nature-based solutions
5. Empower and engage communities
6. Make citizen data count



Earthwatch Europe: Freshwater



Impact: Improve the health of our water by providing people with the tools to monitor and advocate for their blue spaces.

Scientific Goal: Generate a dataset on freshwater pollution that is too significant to ignore.

Policy Goal: Incorporate citizen science data into official monitoring by the Environment Agency (UK) and SDG reporting (globally).



Pollution sources

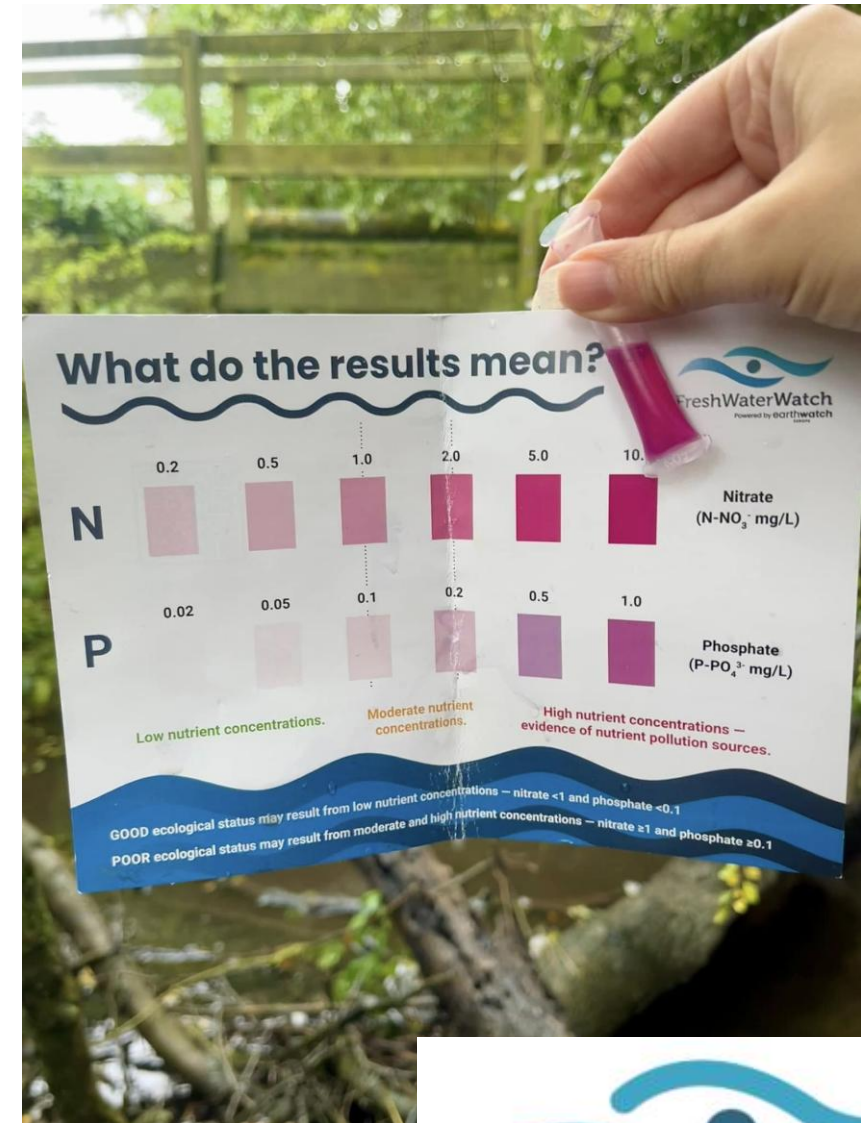


Urban wastewater contributes the majority of phosphate pollution (around 80%) and about 25-30% of nitrates.

The Environment Agency estimates that agriculture is responsible for 50-60% of nitrate and 20% of phosphate entering UK waterways.

FreshWater Watch

- **Global** citizen science project
- Nitrate, phosphate, turbidity and observations
- **Simple** protocols for observing and measuring
- **Phone based form** for guidance and data/info recording
- **Simple results:** good, moderate, or poor water quality status
- WFD thresholds
- Results appear on FWW platform in **real time**
- Data is **open access**



FreshWater Watch - Global



Total number of
datasets collected

79,652



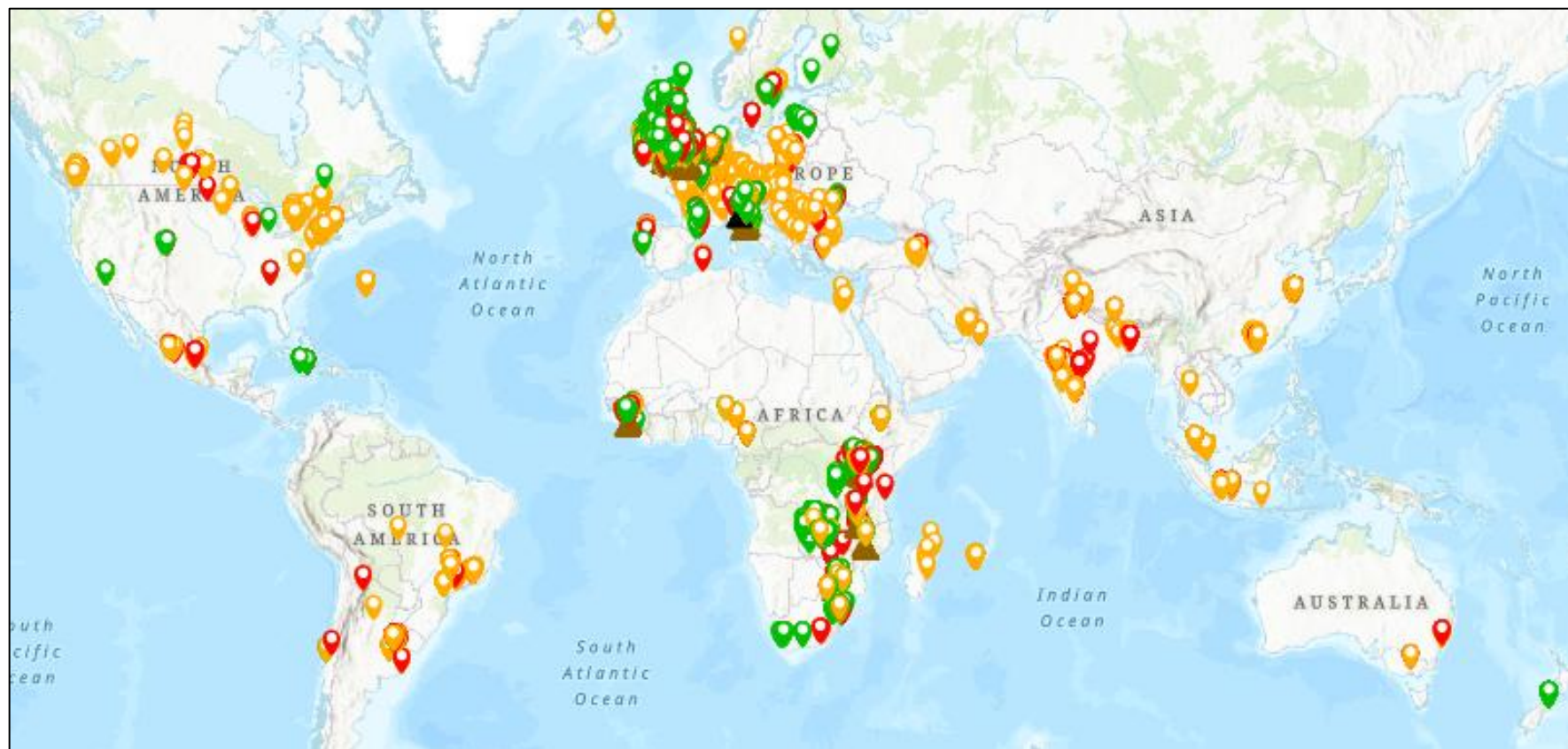
Low nutrient concentration,
good ecological health



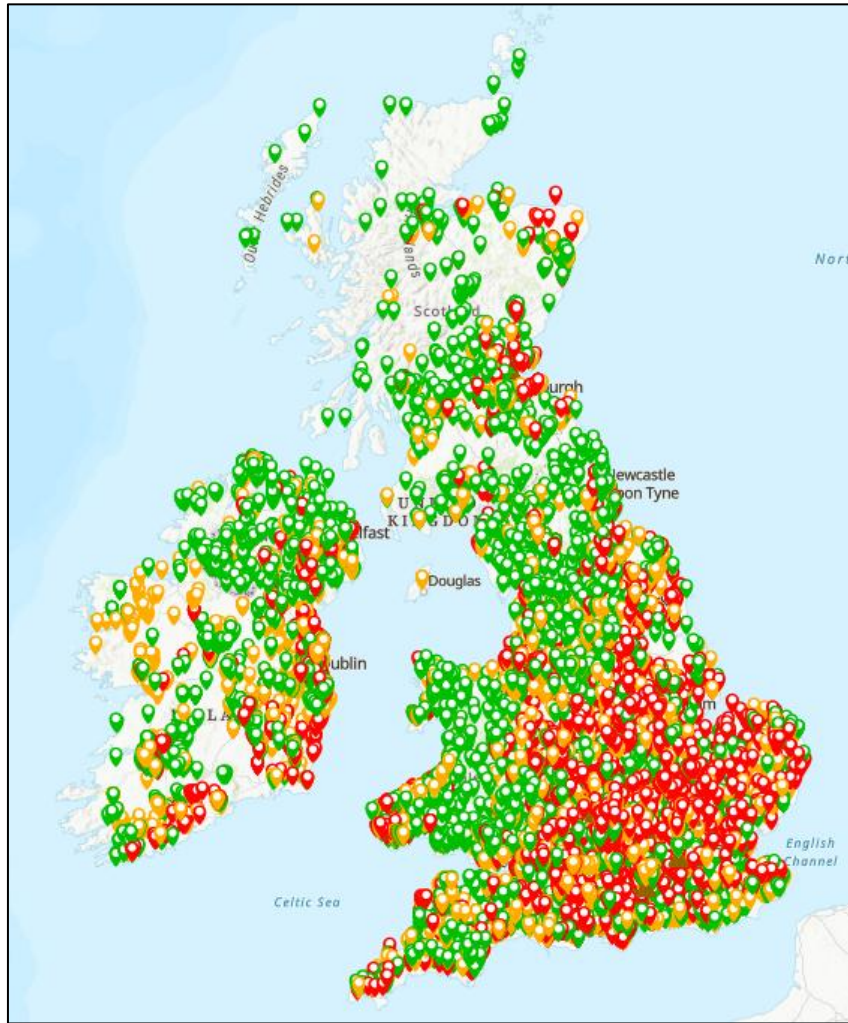
Moderate nutrient
concentration



High nutrient concentration,
poor ecological health



Freshwater Watch – United Kingdom



Biannual Great UK WaterBlitzes over a weekend in April and September - a public event *initiated* by Earthwatch

Next Great UK WaterBlitz is
16 – 19 April 2027

Monthly Community Group sampling – typically initiated by local concerns and *supported* by Earthwatch – **e.g. the ECP**

The Great UK WaterBlitz – April 2026

The Great UK WaterBlitz

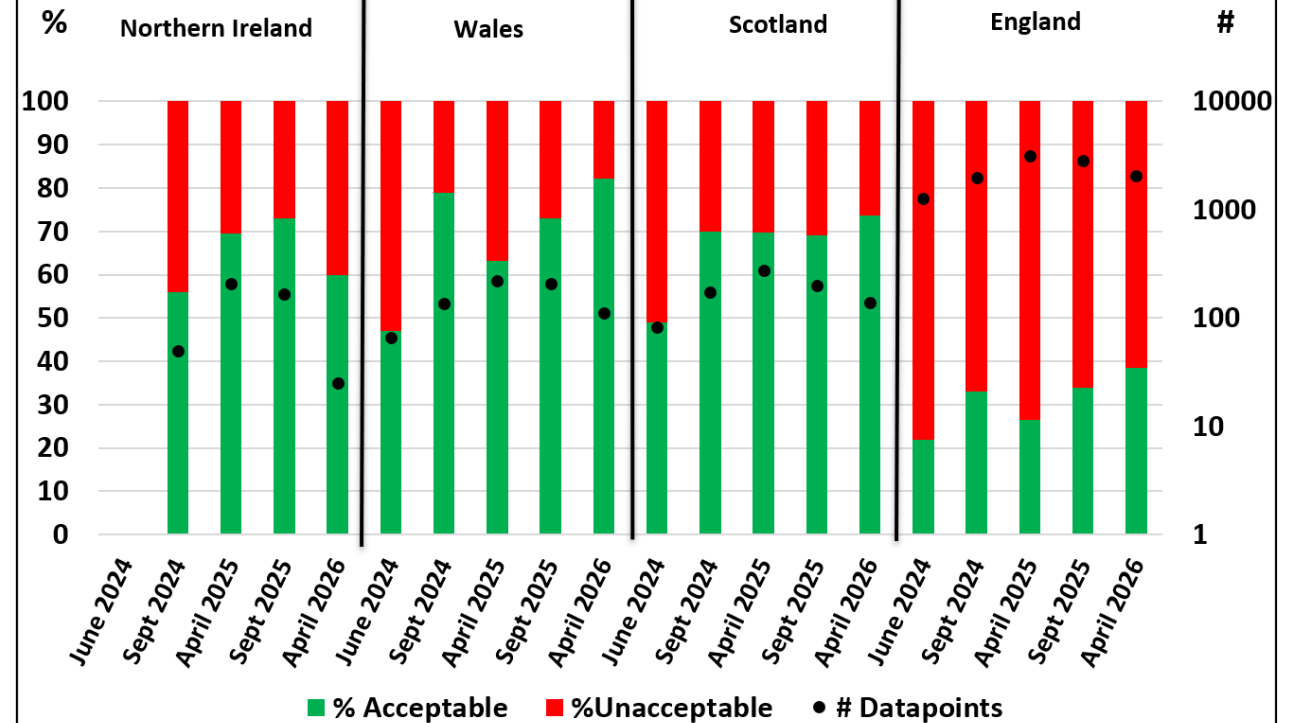
4677
Citizen Scientists

2315
Measurements

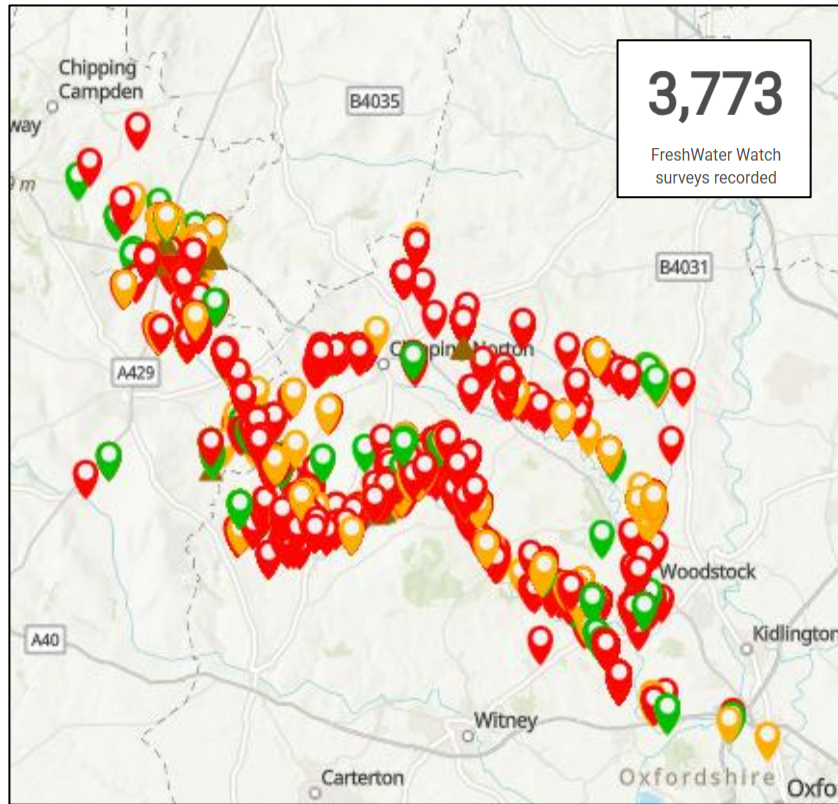
57%
Freshwater sites show
poor water quality



Water quality year on year



Evenlode Catchment Partnership

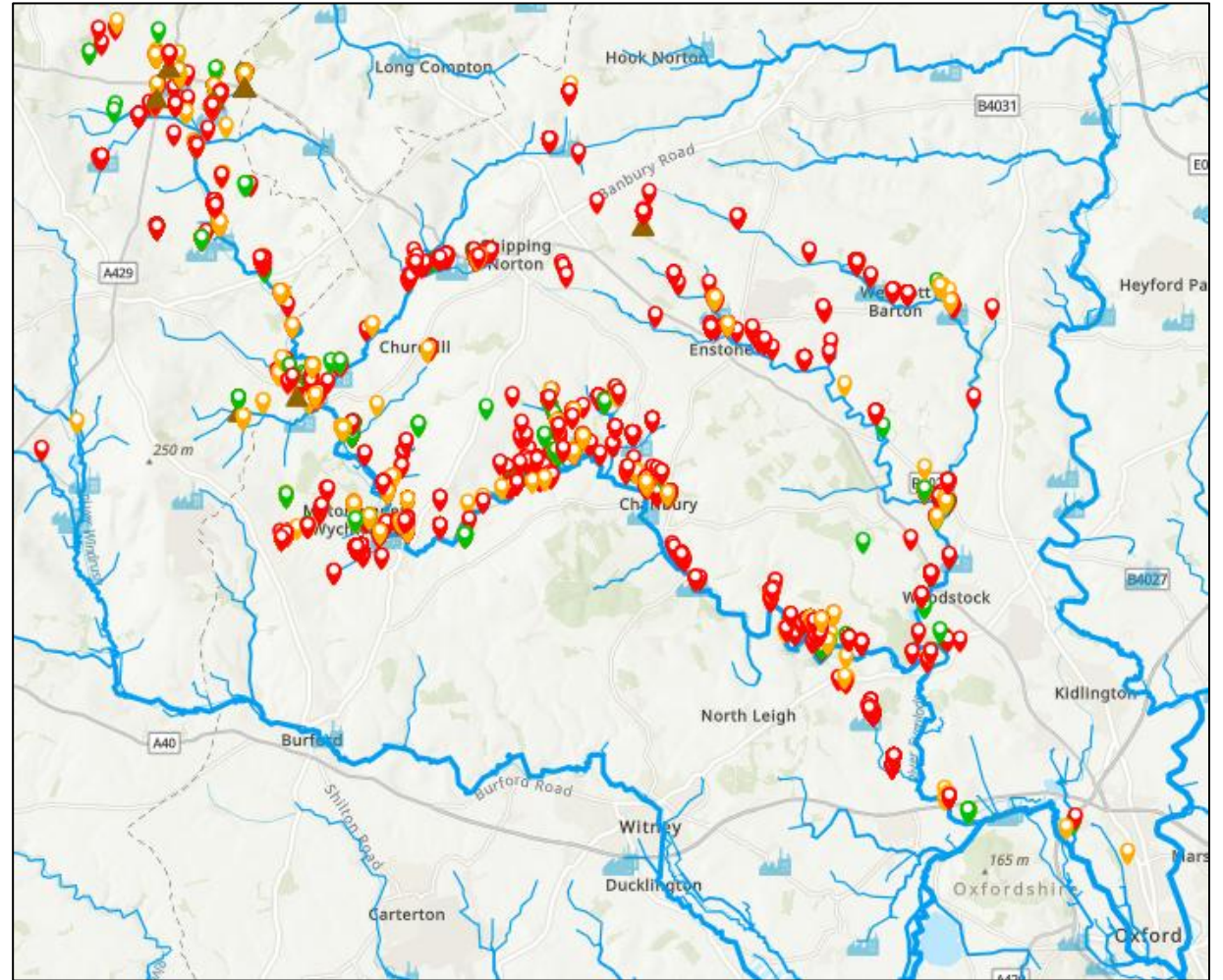


- Founded in 2014
- Hosted by Wild Oxfordshire: 20+ partners *including*
 - Cotswold National Landscape
 - Natural England
 - Cotswolds Rivers Trust
 - Berks Bucks and Oxon Wildlife Trust
 - NE Cotswold Farmer Cluster
 - Blenheim Palace
- Water quality aim: *To return the 16 waterbodies to good ecological status*
- ~**60** citizen scientists conduct around **800** Freshwater Watch surveys at over **150 sites every year**
- This ***significantly*** exceeds EA monitoring coverage

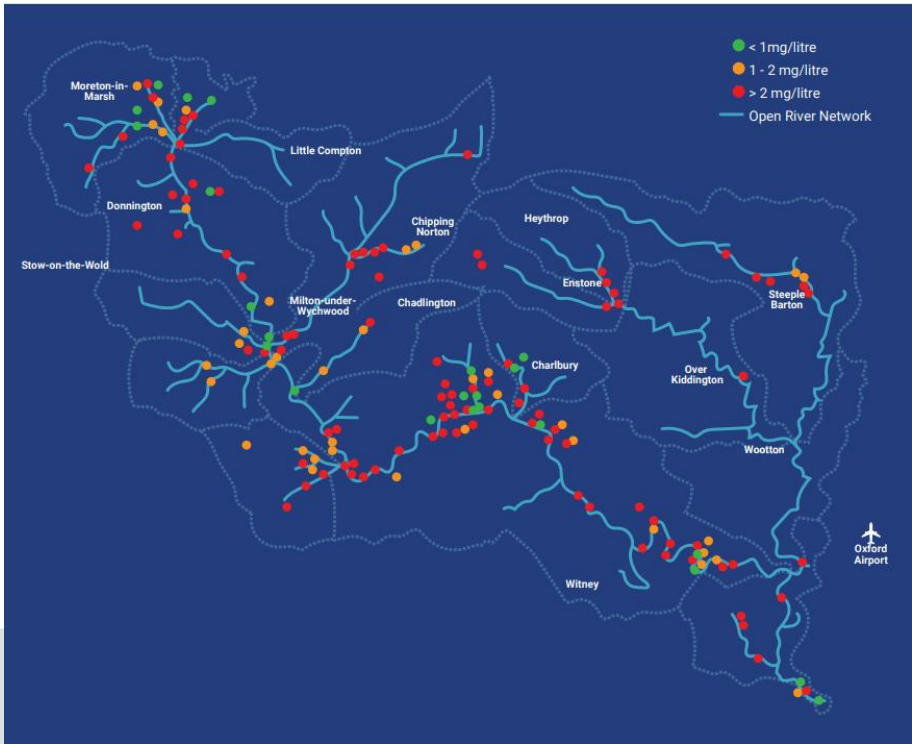
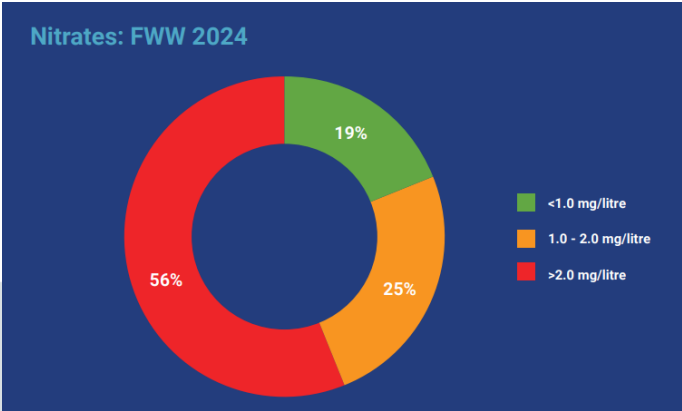
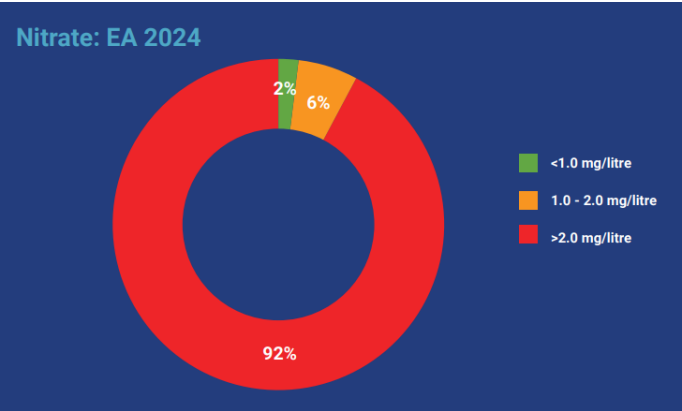
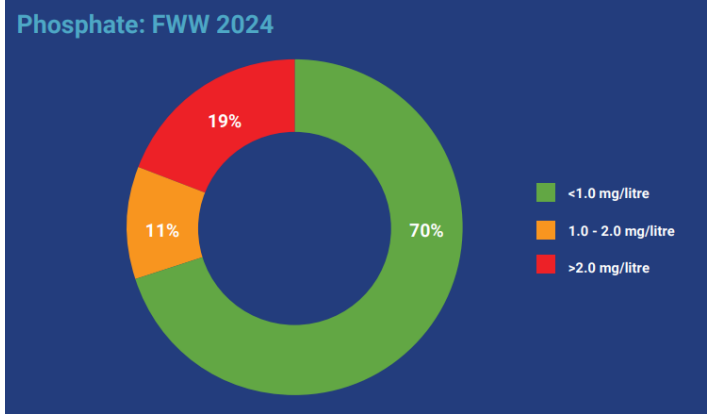
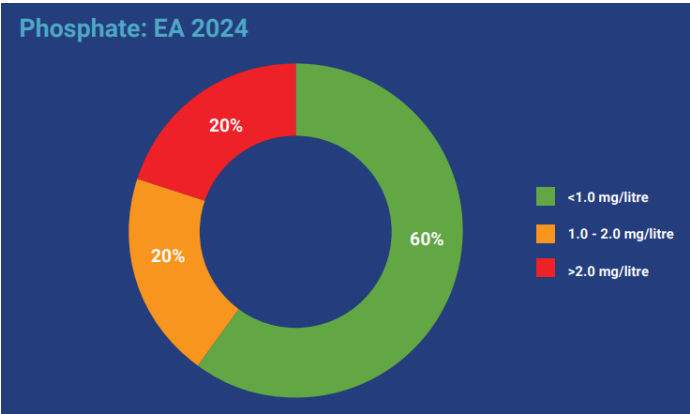
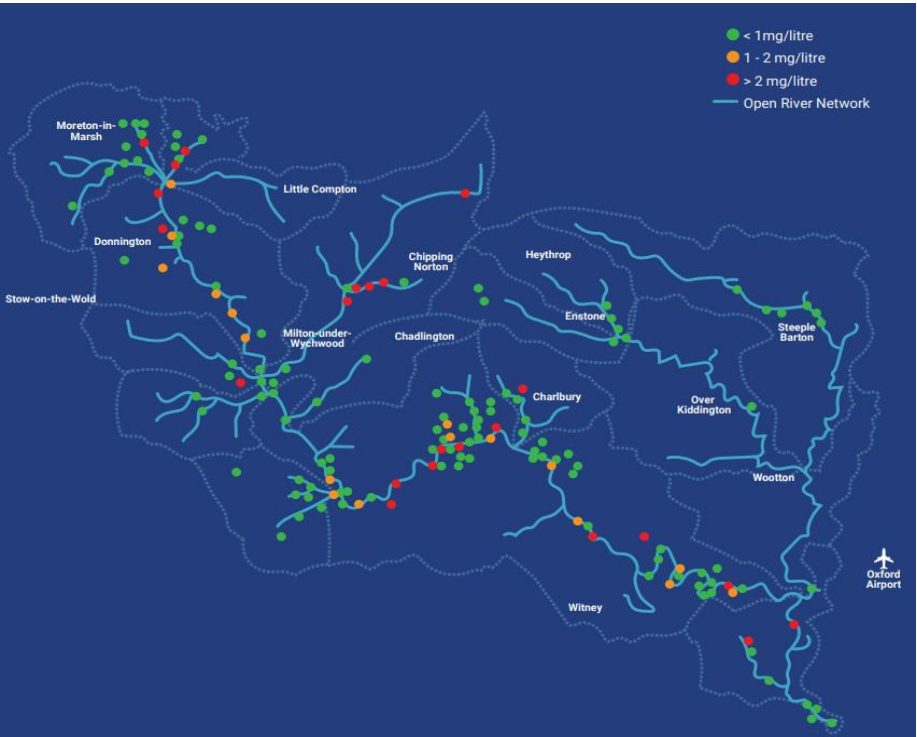
Pollution concerns



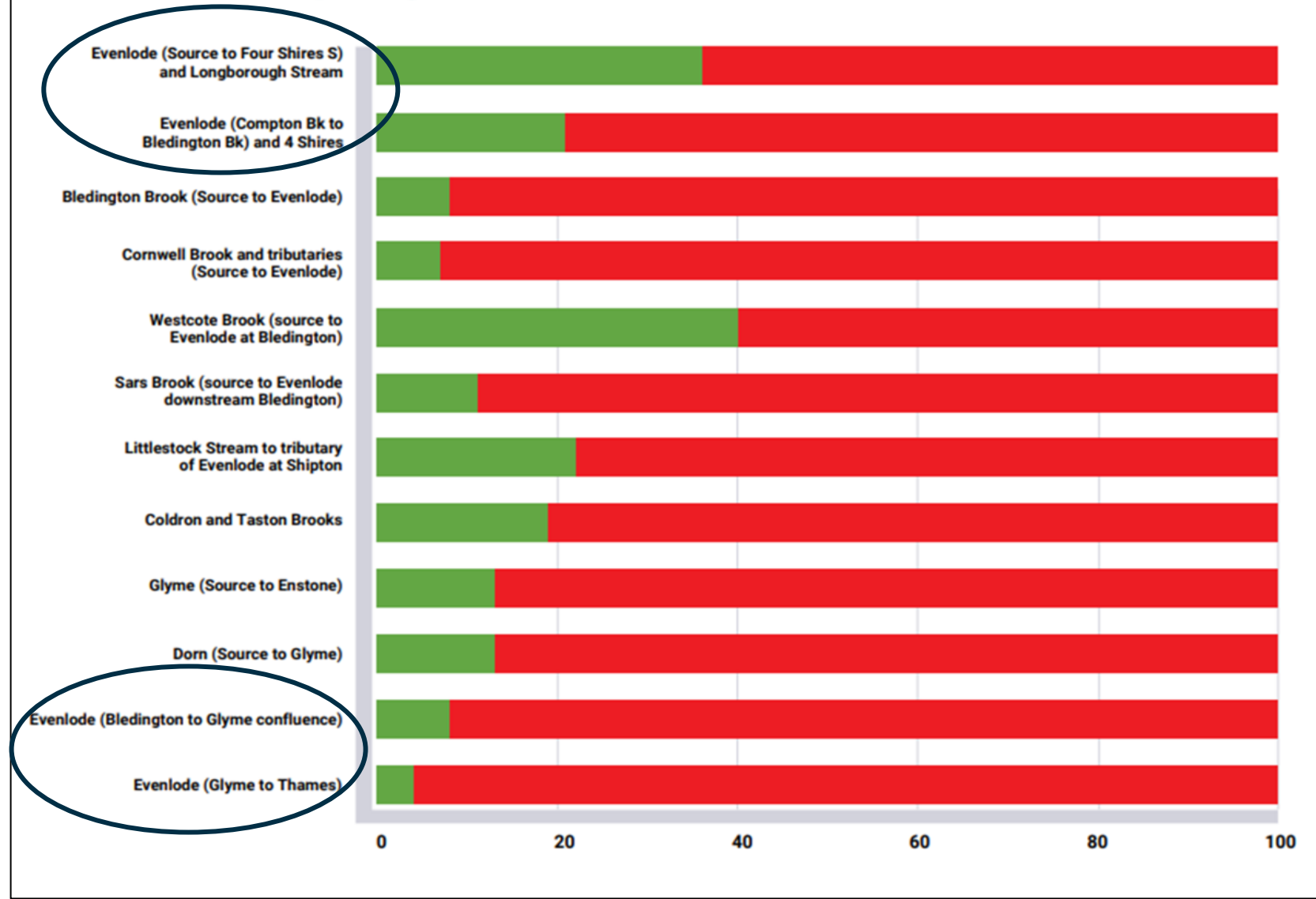
- Citizen scientists find persistently **high nitrate concentrations**, predominantly from **agricultural** sources;
- **Elevated phosphate** concentrations are clustered **downstream of the 19 STWs** in the catchment



ECP and EA data

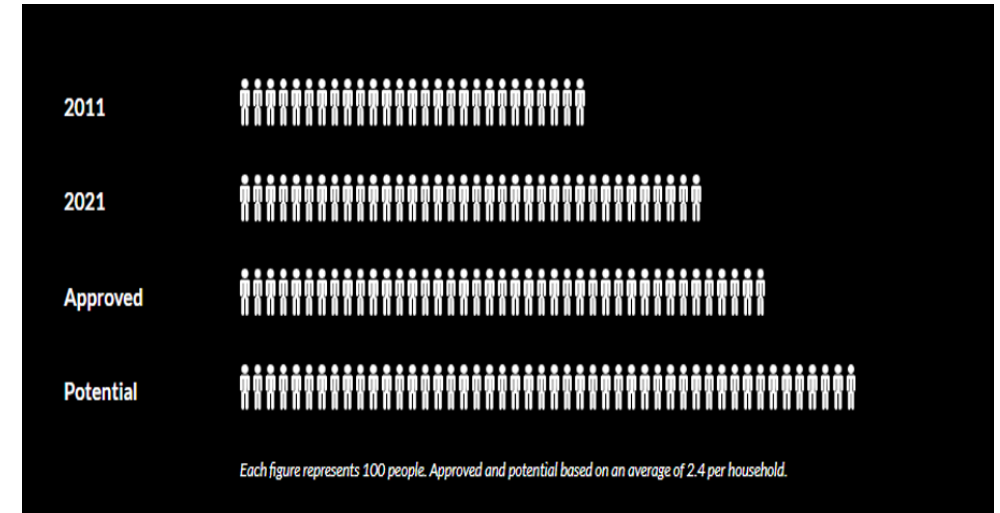


FWW water quality 2024



Hanborough water quality investigation

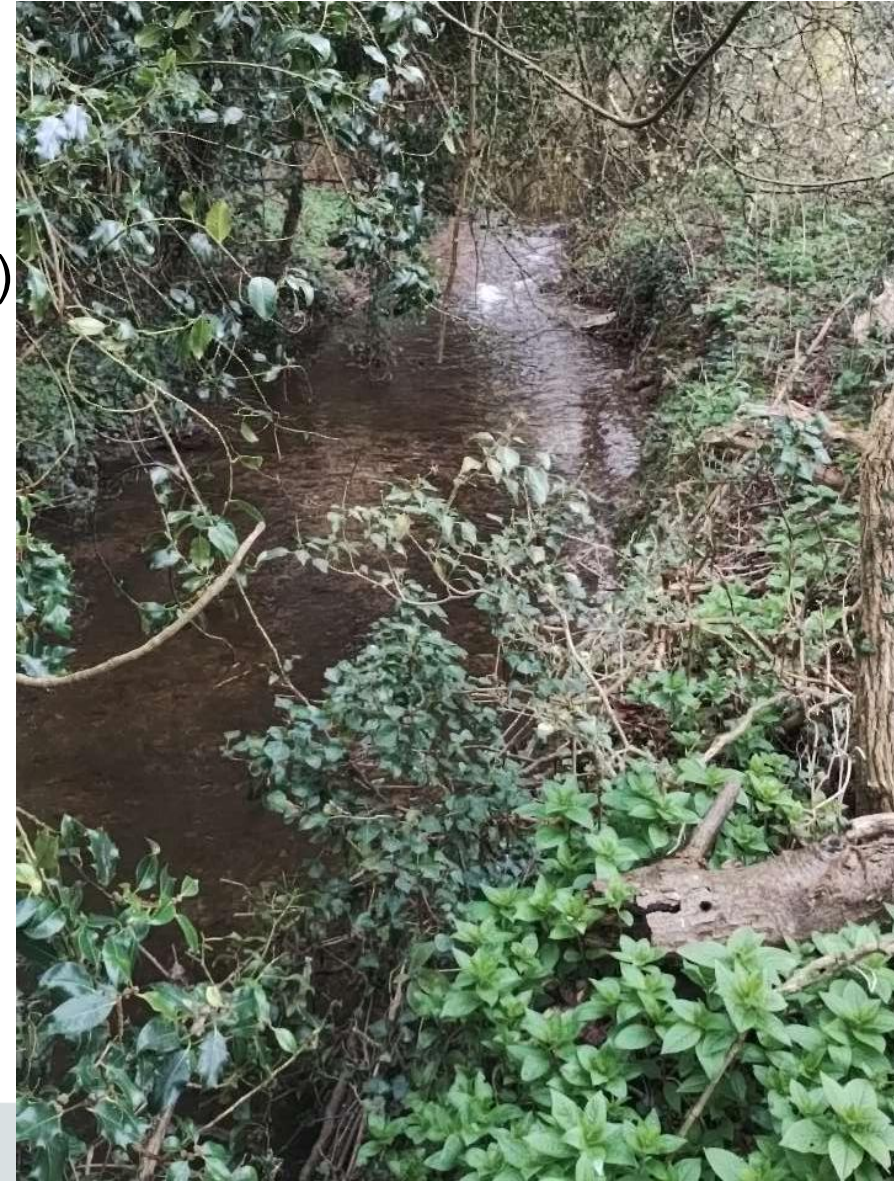
- Church Hanborough STW currently serves ~6500 people around
 - Long Hanborough
 - Church Hanborough
 - Freeland
 - Blenheim Palace
- 150 new homes have been approved for Long Hanborough North
- There are proposals for
 - 300 new houses in Long Hanborough
 - 600 new homes near Hanborough station



<https://www.hanborough.org.uk/>

Pollution concern

- In 2024 raw sewage was discharged into Hanborough Brook
 - 158 times for 2,026 hours (there's only 8,760 hours in a year!)
 - That's 2.81 months
 - OR 3 times a week, on average





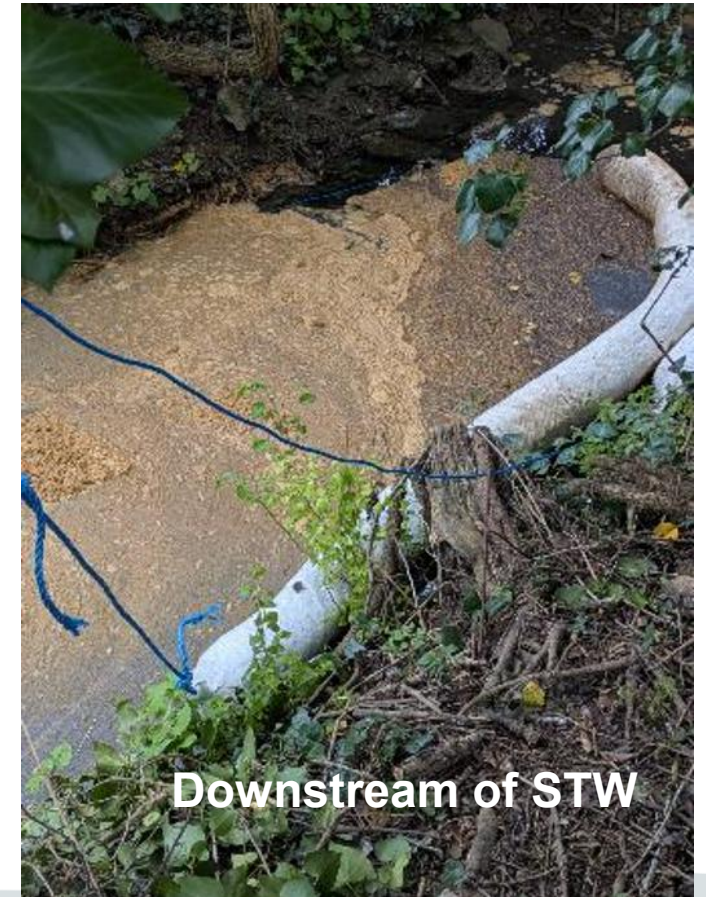
Upstream of STW



Downstream of STW

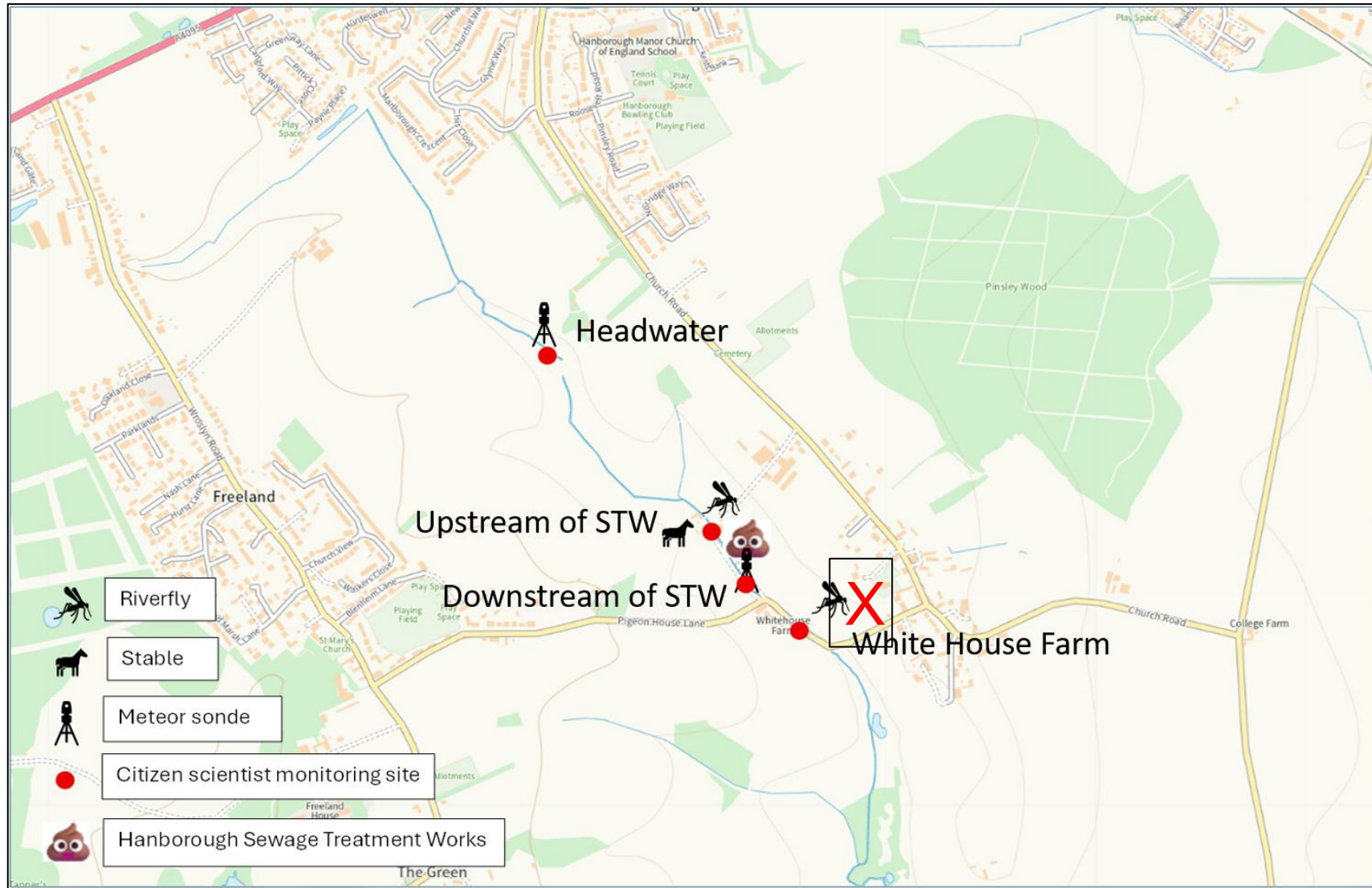
Early April 2026

“...the foam generated from the ASP was considered to be a polluting substance that had entered the watercourse. While there was evidence of a pollution, the environmental impact was assessed as minimal, and the incident did not meet the threshold for classification as a serious pollution event.”



Downstream of STW

Sampling sites



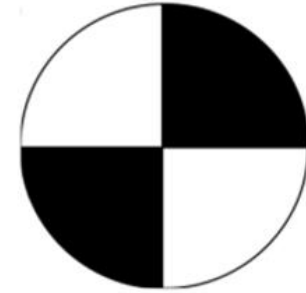
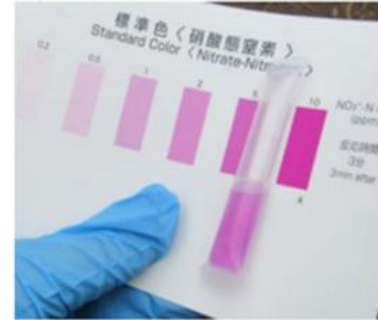
Citizen scientist training



Citizen science methods



Phosphate (2 ways)



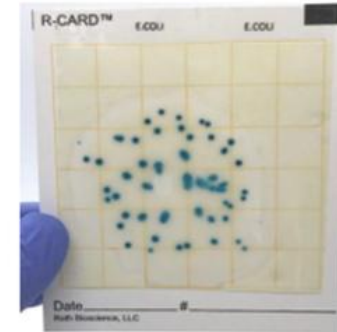
Nitrate, phosphate and turbidity (FWW)



Riverfly



pH, conductivity, temp (Eutech)



E coli (R Cards)

- Monitoring began in March 2026 at ~fortnightly intervals
- Ongoing

Instrumented monitoring



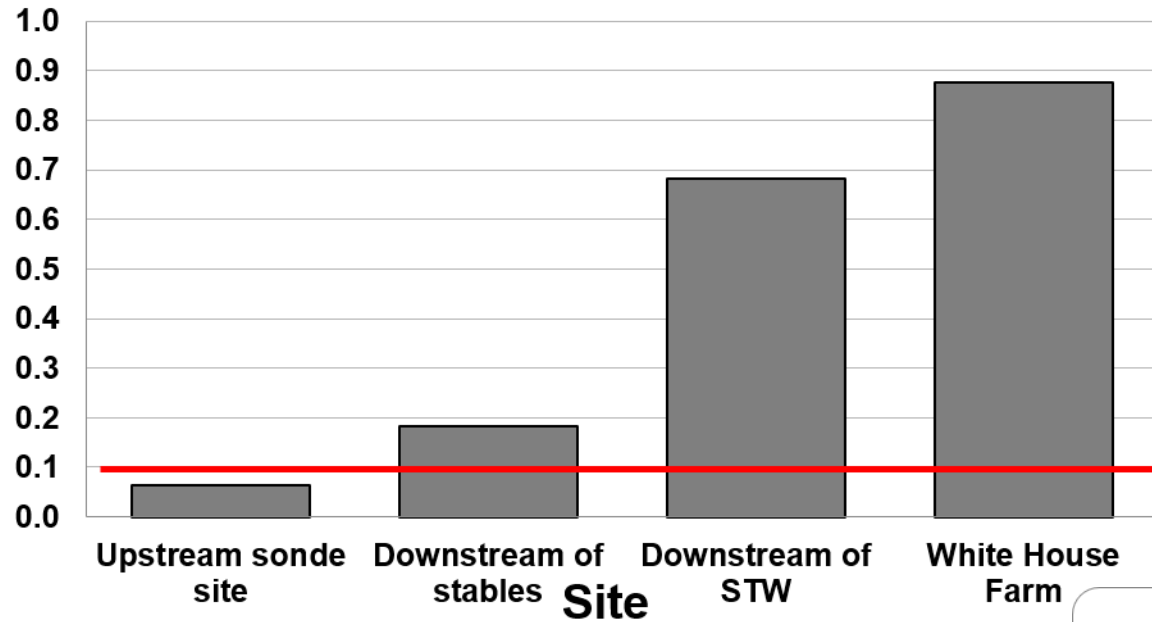
Upstream of STW



State-of the art phosphate monitoring downstream



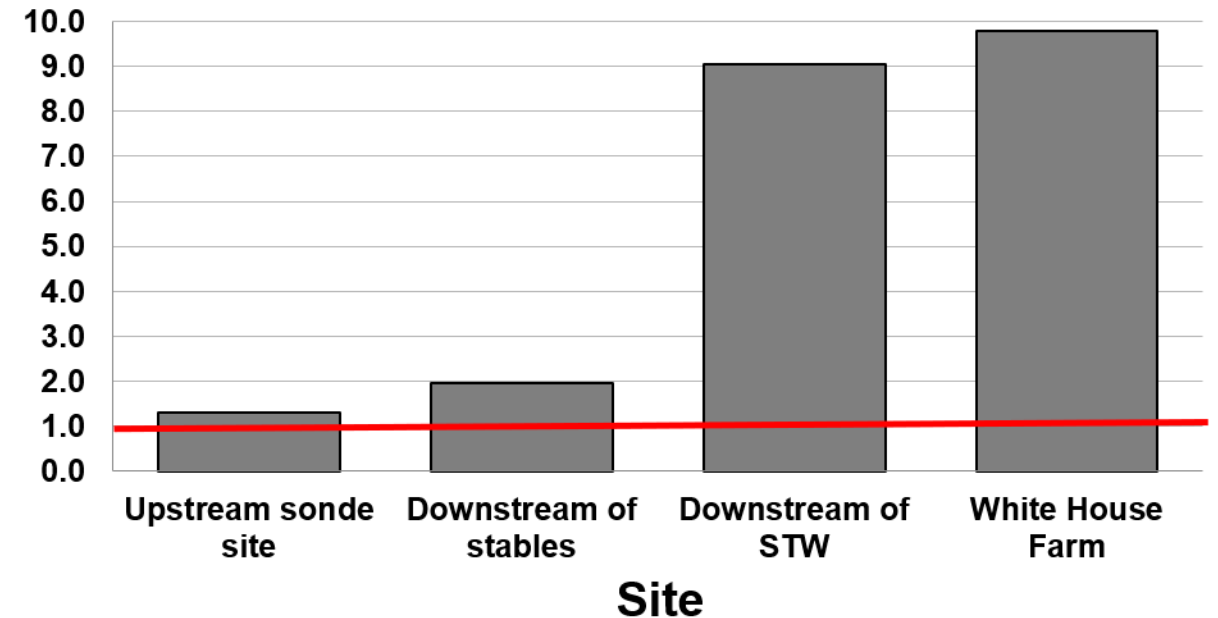
mg/litre Average FWW phosphate April - September 2026



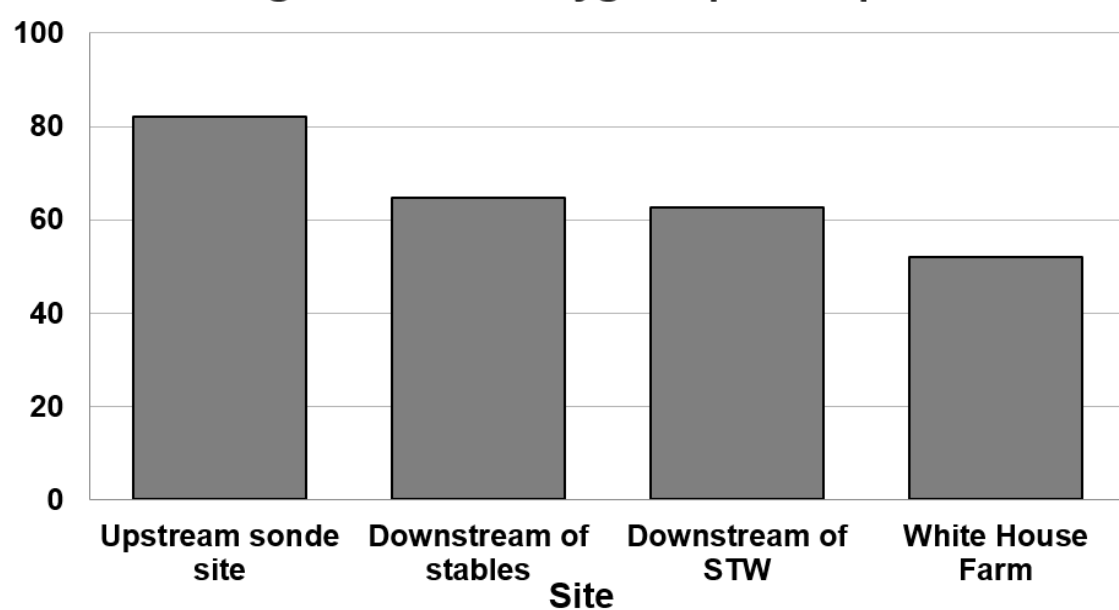
Some preliminary results

Spoiler alert: It's not the horses!!

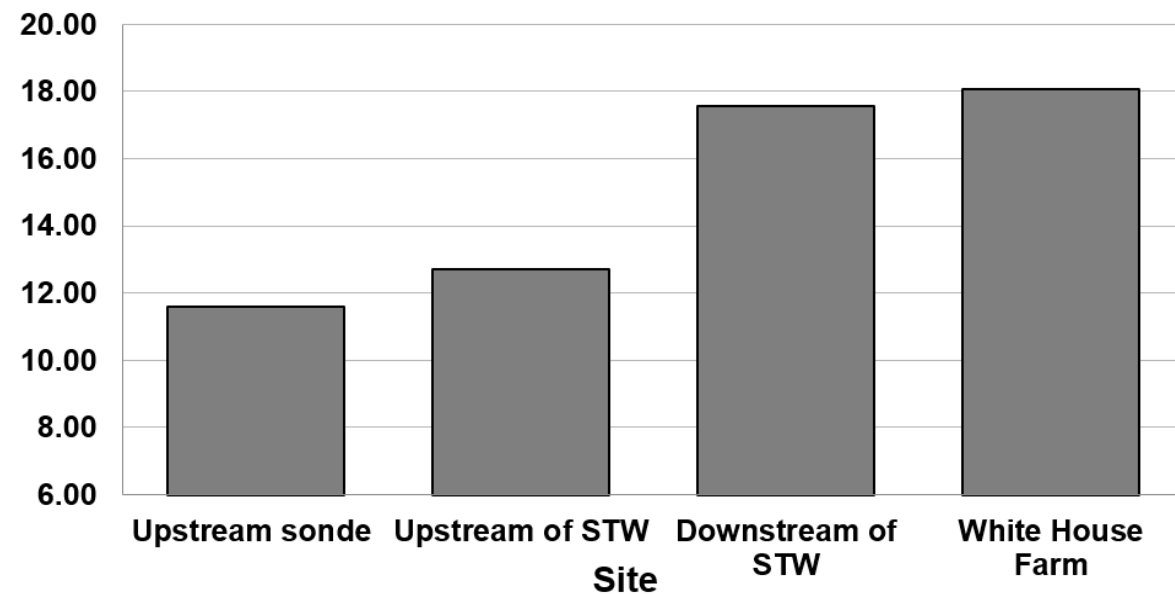
mg/litre Average FWW nitrate April- September 2026



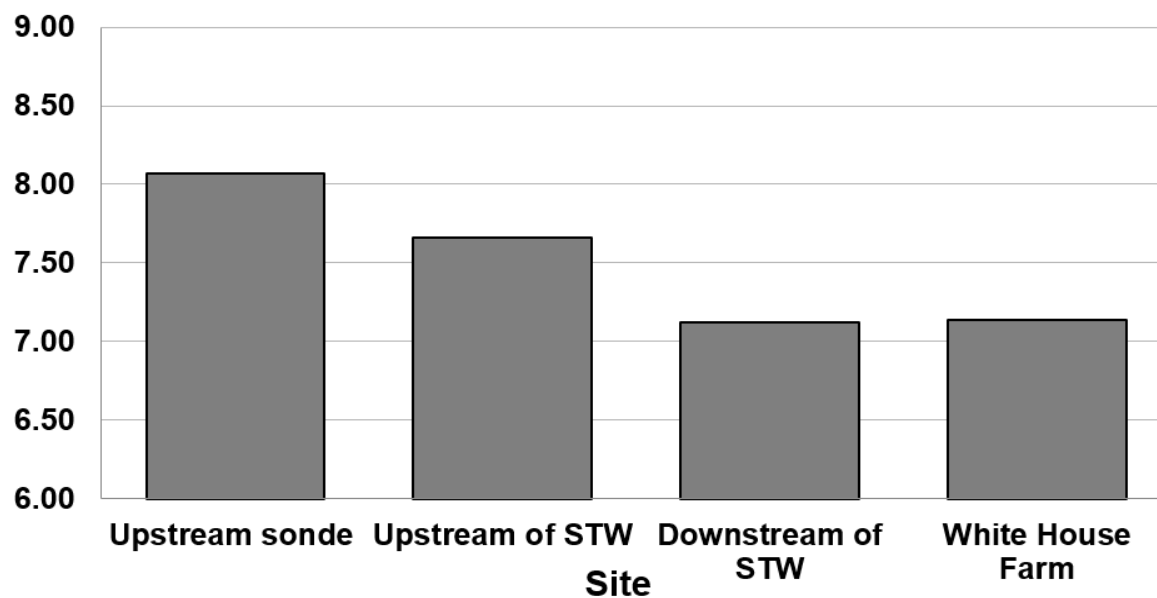
Average dissolved oxygen April - September 2026



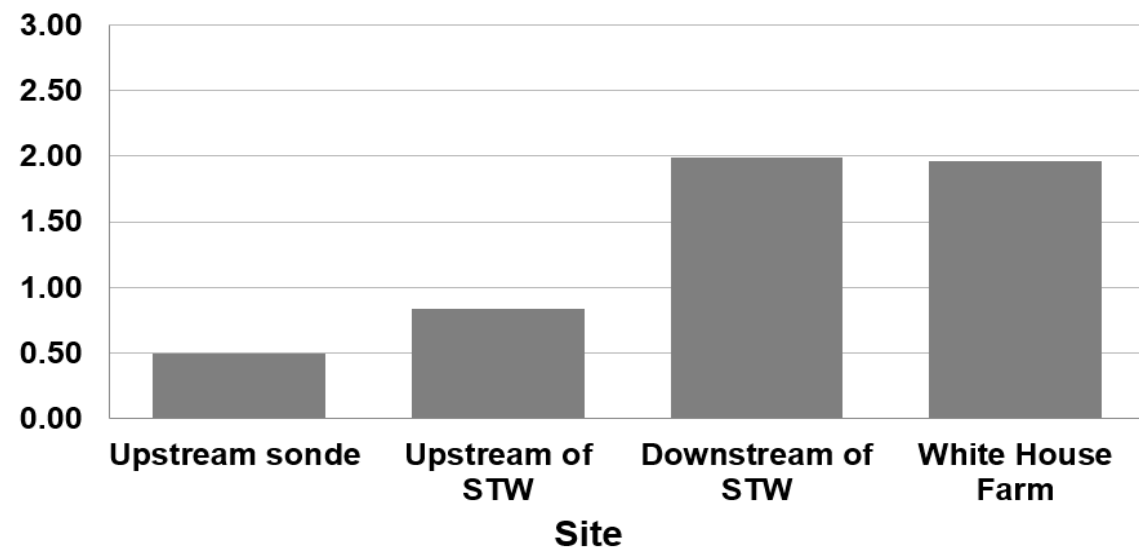
Average temperature (°C)



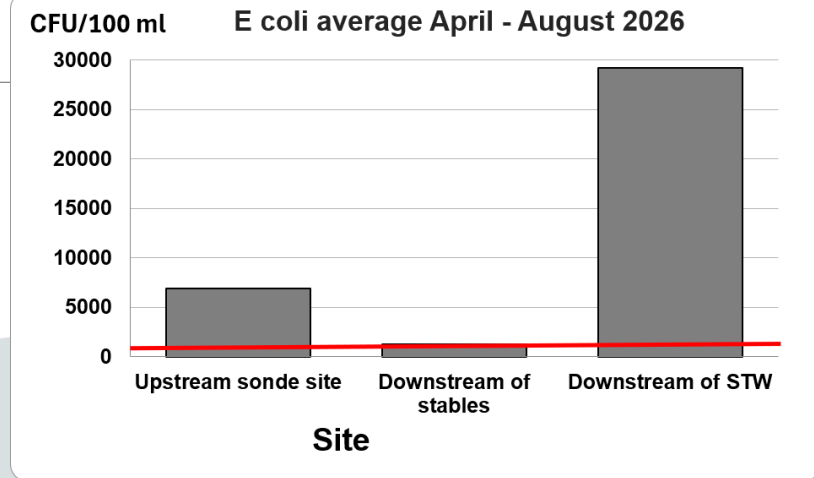
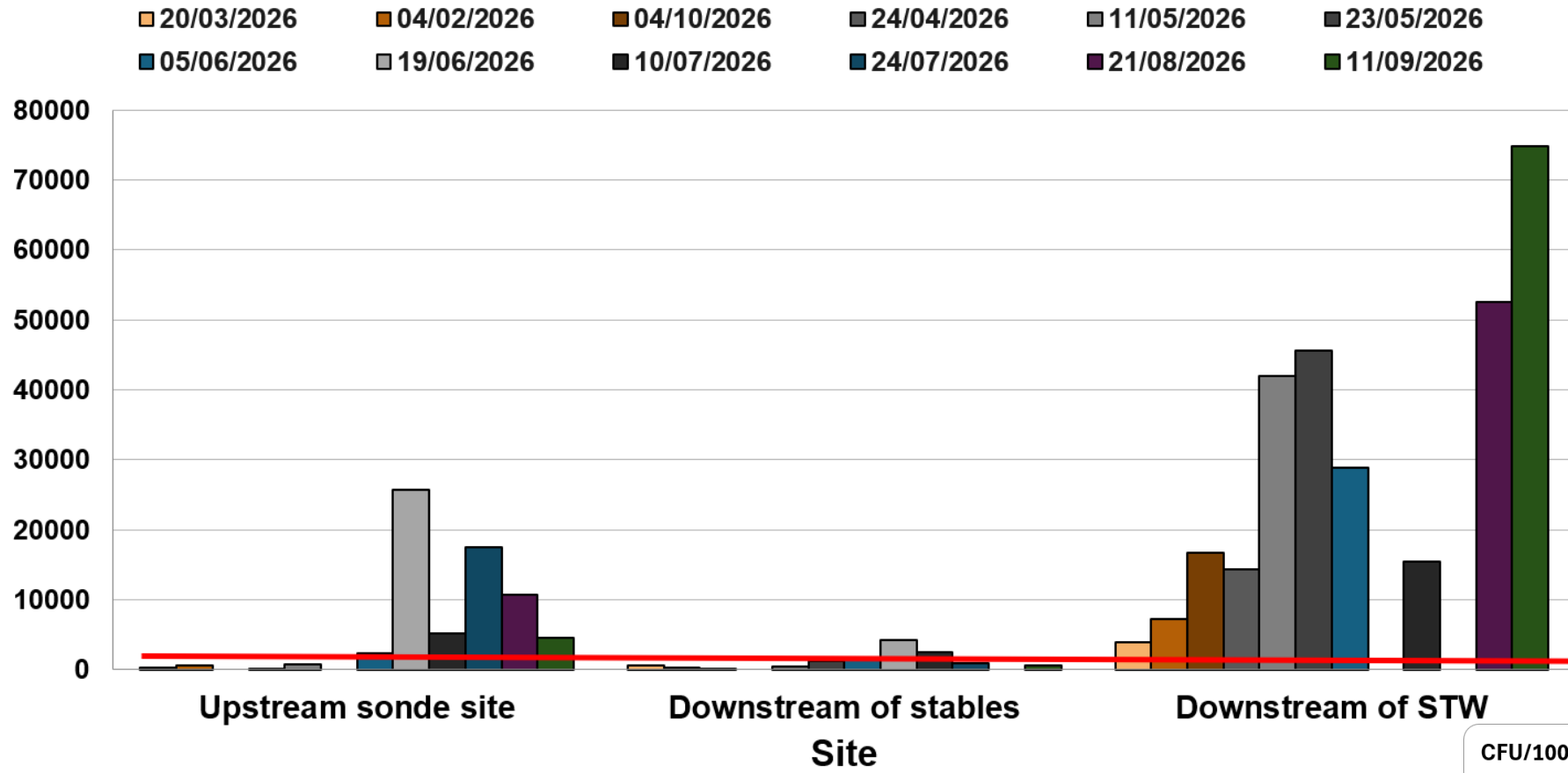
Average pH



Average Ammonium (mg/L)

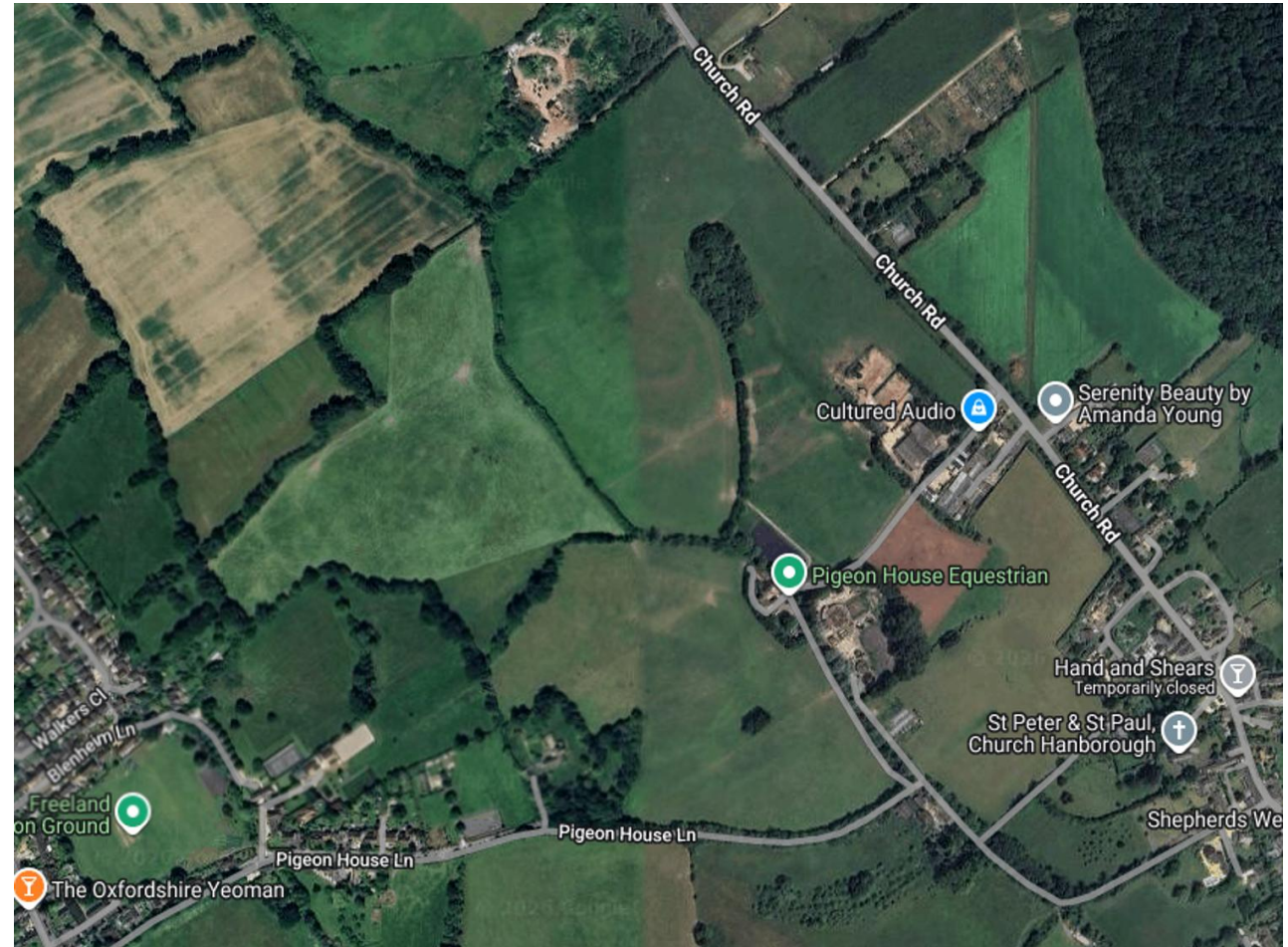


E Coli CFU/100 ml



Next steps for Hanborough

- Continue monitoring until end of November
- Analyse sonde data
- Local feedback and awareness
- Media releases
- Pressure on EA and TW to act
- Intersect with housing planning processes



Next steps for **you** – why not get involved?

- Our rivers and streams are not adequately monitored by the EA
- Citizen science relies on volunteer commitment
- Not only sampling but also data analysis and outreach are needed
- Kits, staff time, and transport all need funding
- Find me at the Earthwatch stand!



A man and a woman are working in a lush green field next to a body of water. The man is wearing a dark jacket and blue gloves, and the woman is wearing a dark jacket and blue gloves. They are both looking at a small white card or piece of paper. The background is filled with dense green foliage and trees. The water in the foreground is calm and reflects the surrounding greenery.

Thank you

earthwatch
EUROPE