



# The Oxford Rivers Project: Using Citizen Science to monitor bacteria of public health concern in rivers

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# River use in Oxford

- Oxford has a long history of recreational river use: rowing, punting, canoeing and kayaking and river swimming.
- Until 1970s – four council-maintained river swimming areas.
- River is more popular than ever: in Feb 2021, survey of *informal* river use had 1,200 respondents
- 75% swam weekly in summer months, 20% swam year-round



# How the campaign got started...

- July 2020: News broke of 200,000 raw sewage discharges across UK in 2019, 1,300 in Thames upstream of Oxford
- "End Sewage Pollution mid-Thames" group founded. Aim: to stop the thousands of raw sewage spills into the upper Thames
- August 2020: ~100 at floating protest, Port Meadow
- September 2020: 5,000+ signed petition for
  - Designated bathing water area in Oxford
  - Real-time alerts of raw sewage discharges
  - Upgrades to wastewater treatment works
- October 2020: Oxford City Council unanimously voted in favour
- December 2020: Meeting with CEO of Thames Water, Sarah Bentley





# The Oxford Rivers Project

- ...and the **local community**
- Launched April 2021
- 4 aims:
- Real-time alerts of sewage spills
- Water quality testing for bacteria – citizen scientists
- Bathing water status application
- Improvements to local sewage treatment works



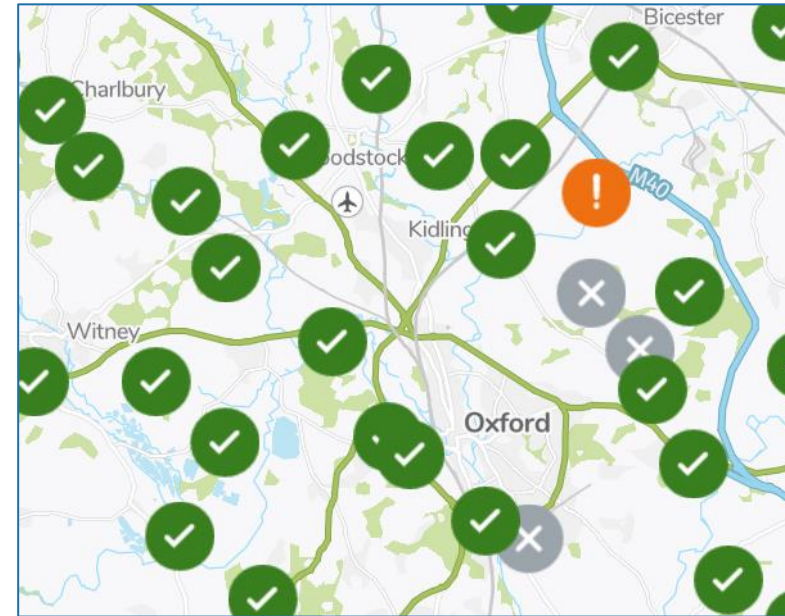
- Comparing **THEN**  
June 2021...

What has changed in 2  
years?

- ...with **NOW** June  
2023

# Sewage spill alerts

- **THEN**
- Alerts from 6 locations in and around Oxford.
- Near real-time, with a follow up 24 hours later to indicate continuous spilling
- April 2021 - on Twitter @oxthamessewage
- June 2021 - email sign up on Thames Water website
- Alert system failed on multiple occasions – undermined trust



- **NOW**
- Thames Water near real-time map of spill alerts from 458 locations across Thames basin
- New legal duty in Environment Bill for water companies to provide information on storm discharges within 1 hour.

# Designated bathing water status: **THEN 2021**

- May – September 2021: 64 river user counts over 46 days
- Highest usage: 437 river users (18th July 2021) over 600m stretch
- Consultation of residents, businesses, interest groups: 233 responses, 96% in favour of DBWS
- 1,260 in favour out of 1,267 responses to national consultation
- **Designation granted April 2022 – only the 2nd river site in the UK**



*(Reminder – France has over 400 river bathing sites, Italy 73, Germany 38)*





# Designated bathing water status - **NOW**

- Testing by the EA once per week  
15th May – 30th September
- Site designated "poor" after first  
season and "advice against  
bathing" sign
- Misunderstandings e.g. "most  
dangerous place to swim in the  
UK" headline
- Has until 2025 to reach  
"sufficient" status otherwise de-  
designated
- Still very popular!



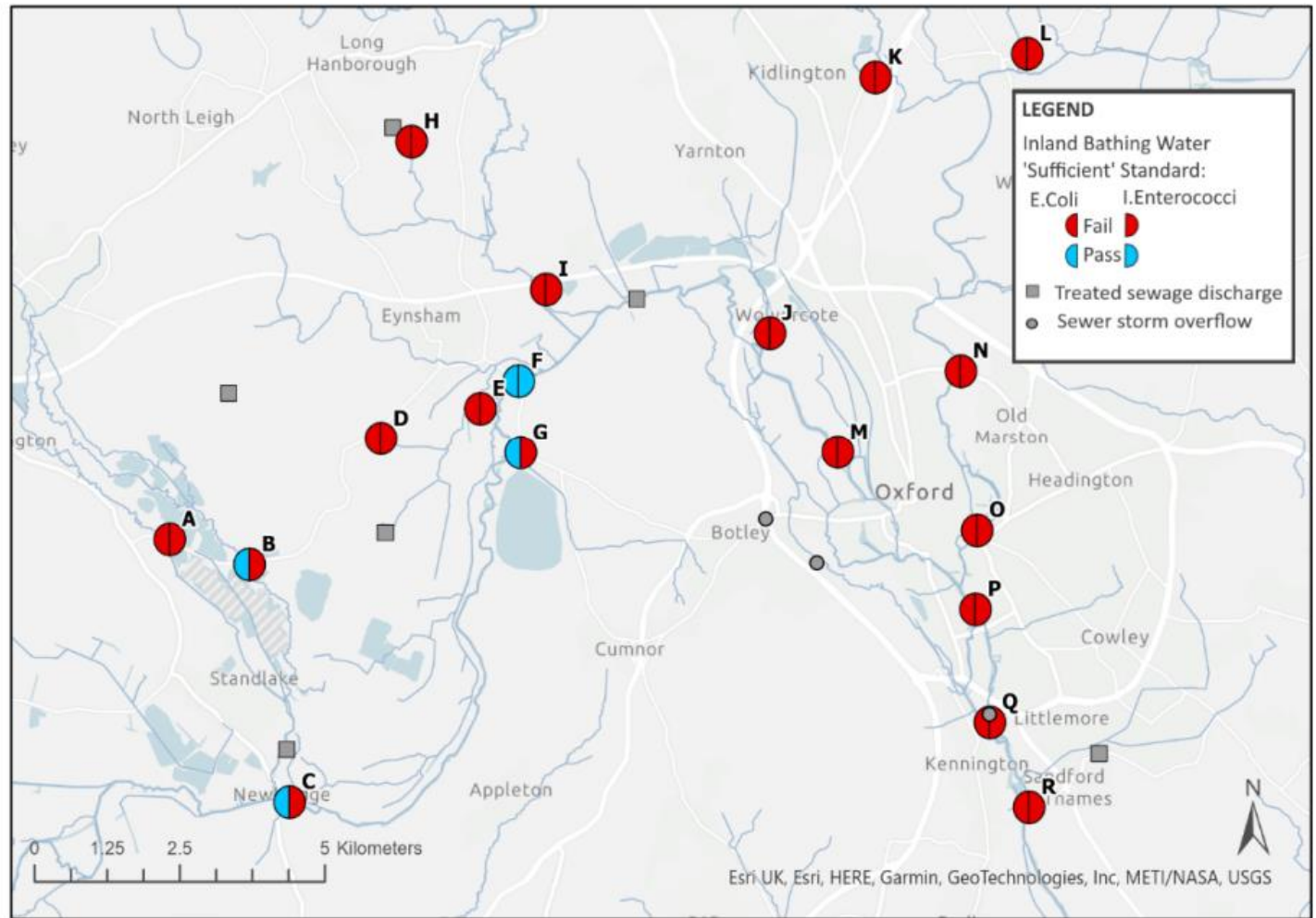
# Water quality testing

- 18 river locations in and around Oxford: 8 recreational, 10 upstream
- Testing for 2 different bacteria (E coli and intestinal enterococci) - faecal indicator organisms.
- Each location tested monthly January – December 2021
- ~20 volunteer citizen scientists collect water samples. Trained in 'aseptic protocols'
- Thames Water labs measure levels of bacteria species
- Data analysis by The Rivers Trust
- Open access water quality results posted weekly



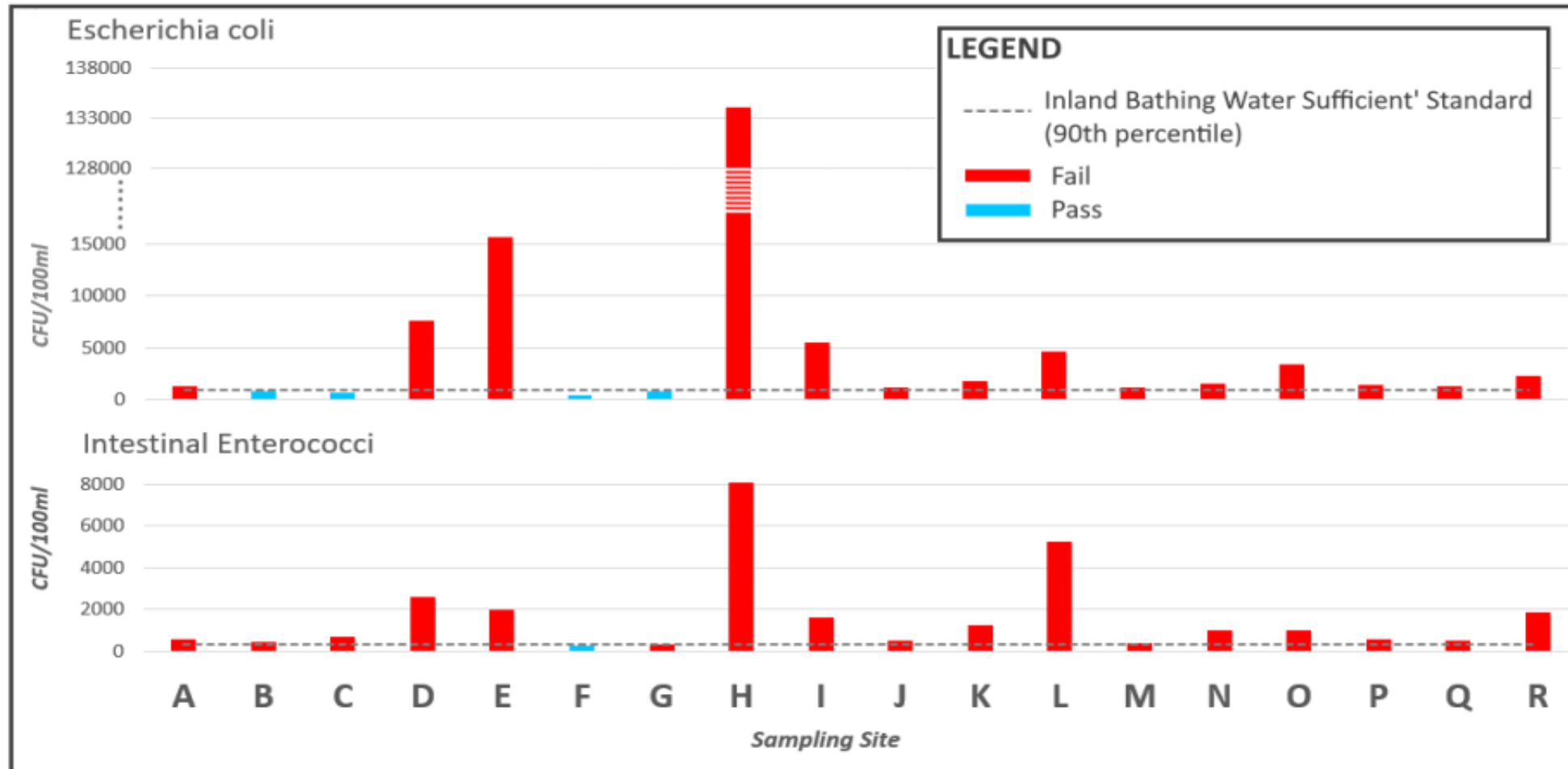
# Water quality testing - THEN

- Only 1 site of the 8 recreational sites would pass bathing water status standards
- The other 7 sites had between 1.5 - 3 times the safe level
- Full report & data: <https://endsewagepollutionthames.wordpress.com/water-quality-testing/>



# Water quality testing THEN (2)

- Big variability in how much levels exceeded the 'safe' threshold
- Varied from 1-100 times the safe level of FIO



# Water quality testing **NOW**

- Ongoing investigations by both Thames Water and the Environment Agency.
- EA investigation using multiple methods e.g. sondes, flow monitoring, "waterblitz" days etc. as well as regular bacterial sampling.
- Report expected January 2024
- Environment Agency have carried out Microbial Source Tracking on 53 samples – mainly human source.
- Thames Water modelled source apportionment of bacteria at bathing site from different sewage treatment works
- Solutions proposed for WINEP... April 2025 – March 2030 delivery timeframe... too late?



# Sewage treatment work improvements

- Upper Thames, Windrush, Evenlode, Thame, Cherwell: 55 monitored storm overflows
- **THEN** 2021, Upper Thames: 2,315 spills, 31,575 hours
- **NOW** 2022, Upper Thames: 1,141 spills, 12,459 hours (dry year)
- 2023, ???
- Thames Water commitment to halve sewage overflows by 2030 (on 2020 baseline)
- Commitments for many STWs (<https://www.thameswater.co.uk/about-us/performance/river-health>)
- However, timeline delayed e.g. commitment to upgrade Oxford back in 2020



Environment  
Agency



# Thank you!

- A massive thank you to all the partners involved, but especially the local community of incredible volunteers
- For more information: <https://endsewagepollutionthames.wordpress.com/>

