SURFERS AGAINST SEWAGE

2021 WATER QUALITY REPORT

NOVEMBER 2021

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FOREWORD

Our rivers are centre-stage of the sewage scandal making headlines and stirring widespread public outrage, with shocking levels of raw effluent being discharged into the blue arteries of the country on a daily basis.

As a water-lover, I have often been caught in the disgusting everyday impact of this environmental neglect, surfing at the mouth of rivers where suddenly the rancid stench of sewage surrounds me, forcing a hasty exit. Or swimming through crystal clear waters only to traverse a slick of human excrement, recently discharged from a sewer overflow.

The fact is the decision by water companies and the government to view rivers as places that can absorb pollution has turned these precious watercourses into all but an open sewer, bearing the brunt of more than 3 million hours of sewage discharge in 2020 alone. Profit before people and the planet on a huge scale.

This sorry state of affairs is a result of weakened legislation and a defunded regulator, which has allowed the monolithic water industry to operate with near impunity – self-regulating and reporting pollution when it feels like it. An ineffective system and an inexcusable situation, somewhat akin to tasking bank robbers with their own arrest.

SHOCKINGLY, BUT SOMEWHAT UNSURPRISINGLY, ONLY 14% OF OUR RIVERS MEET GOOD ECOLOGICAL STATUS AND OUR BATHING WATERS NOW LANGUISH AT THE BOTTOM OF THE EUROPEAN BATHING WATER TABLE. THIS IS SIMPLY UNACCEPTABLE.

More and more people are using our seas and rivers for the mental and physical wellbeing effects they bring. The global health pandemic appears to have strengthened the bond between people and blue spaces, with record numbers of people wild swimming, cold water dipping and taking the water year-round. This should be celebrated as a deeply positive change. However, the state of the nation's water means that those bathing in these natural treasures are also exposing themselves to a myriad of health threats, from minor infections to colonisation by antibiotic resistant bacteria. The water industry has a lot to answer for.

SINCE PRIVATISATION IN 1989, INDUSTRY HAS FAILED TO PLAN AND INVEST SUFFICIENTLY IN PROTECTING THE BLUE ENVIRONMENT AND THOSE THAT USE IT.

Water companies have focused on maximising profits, at the expense of people and the environment. This has to stop. The health of our rivers and beaches is not for sale. It's time to force the water companies to act.

In 1858, the Great Stink of London forced politicians to pass new legislation to secure the huge investment to build the incredible Victorian sewage network that stands and still (partially) functions to this day.

Tough European legislation in the 1990s, the Water Framework Directive and the Urban Waste Water Treatment Directive, forced water companies to invest in new infrastructure after privatisation. Would they have done so if it was all voluntary? Based on the current rate of investment we can safely assume not.

And now, three decades on, we find ourselves in the midst of weakened legislation and regulation with an industry that for too long has put profits before the planet.

BUT ACTIVISM IS BEGINNING TO FORCE CHANGE.

The campaign for tougher water quality legislation in the Environment Act saw record numbers of Ocean Activists, environmental campaigners, swimmers, surfers, NGOs and local groups taking to beaches, riverbanks and high-streets in the call to End Sewage Pollution. An uprising like never before, driven by the Great Sewage Scandal of 2021.

The Government has claimed that the resulting legislation will be effective. We will be watching to make sure it is and that water companies are forced to work towards an end to sewage pollution, meeting targets for substantial reductions year on year.

In this Ocean Decade, in this UN Decade of Ecosystem Restoration, we must see large-scale action to protect and restore our rivers and coastline. Just like the Victorians before them, this government must deliver a positive legacy for our blue spaces.

IT'S TIME FOR A BRIGHTER, BLUER FUTURE FOR ALL ON PLANET OCEAN.

See you in a river or the ocean soon.

Hugo Tagholm,
Chief Executive, Surfers Against Sewage

EXECUTIVE SUMMARY

We are in the midst of a new wave of sewage pollution. In 2020 alone, sewage was pumped into rivers and seas nationwide over 400,000 times, totalling over 3.1 million hours of sewage polluting our precious waterways – the rivers and coastlines so many of us enjoy to bathe and play in.

These ecosystems are unique and fragile and home to wildlife that should be protected.

Surfers Against Sewage has been campaigning to End Sewage Pollution and improve water quality for more than 30 years, driving progress on many fronts - from helping deliver billions in investment, to campaigning for full and transparent information on raw sewage discharges. Our campaigning efforts have now helped sewage pollution re-emerge as a key political issue in the UK this year, fuelled by the insufficient action and investment by water companies, and the systematic weakening of legislation and regulation of the water industry monopolies.

The COVID-19 crisis has shown us just how important blue space is for both our physical and mental health. Our rivers, beaches and lakes have restored us at a time of crisis, given us sanctuary and provided us with places to play at a time we have been shut off from the rest of the world. Record numbers of people flocking to rivers and coastline have likely been exposed to sewage and water pollution for the first time and those that are aware of this hidden danger have been motivated to speak out. Data from our Safer Seas & Rivers Service and water quality evidence gathered by citizen scientists has helped shine a light on the sheer scale of the current sewage pollution scandal putting a red alert on our rivers and coastline.

There are hundreds of thousands of sewage discharges polluting rivers and coastlines, all of which could impact the overall health of aquatic ecosystems. This report focuses specifically on some of the beaches and blue spaces that people are known to use the most – the beaches where red and yellow flags fly, where people holiday, where families have fun, where surfers ride waves and where people swim. Places most people would never expect to come face to face with sewage pollution.

Over the past 12 months (1st October 2020 – 30th September 2021), 5,517 sewage discharge notifications were issued by water companies warning us of sewage pollution impacting designated Bathing Waters in England and Wales. Of these, 3,328 discharge notifications were issued during the Bathing Season (15th May - 30th September) with the remaining 2,187 issued outside the Bathing Season by the five water companies who share year-round sewage pollution data. Based on widely accepted advice to not swim in sewage polluted water for 48 hours following a discharge, 16% of swimmable days during the bathing season have therefore been lost due to sewage pollution events during this period.

Disappointingly, there have been few, if any, improvements by the water sector over recent years, however Southern Water stand head and shoulders above as the biggest offender, consistently delivering the worst performance and most pollution. Over the course of the 2021 Bathing Season alone, Southern Water were responsible for a staggering 1,949 sewage discharge notifications, averaging an eye-watering 38 notifications per Bathing Water. It is perhaps therefore unsurprising that almost 30% of the 286 health reports submitted to Surfers Against Sewage over the last year came from beaches in the Southern Water region.

This report also reveals the fundamental flaws of the water quality testing regime. Our findings indicate that sewage pollution still plagues Bathing Waters classified as having the "highest cleanest seas" as much as, and sometimes more than, beaches rated as "satisfactory" or "poor", both during the summer and winter months. These revelations have highlighted the need to completely rethink the way we monitor water quality and move to a system that provides information on the state of the water in real time and year-round.

However, what this report most clearly reveals is that is our rivers that are in the poorest health. Only 14% of rivers meet "Good Ecological Status" with none passing chemical standards, suggesting serious issues of sewage, and other pollution.

With only one designated river Bathing Water in the whole of the UK, rivers lack regular testing for pathogens, real-time water quality data, and water quality signage, potentially putting the hundreds of thousands of recreational water users at considerable risk. Our recent citizen science water quality monitoring programme reveals that six out of eight river mouth locations monitored were routinely of such poor quality that they posed a constant and serious risk to human health. These are rivers that flow directly onto, or very close to, designated coastal Bathing Waters, raising questions about the impact and effect this has on popular beach locations, and concerns about the health of those who might use, or stray into, the river water, such as families, children or young people.

The government must step in to set and enforce new legislation, and strongly regulate those who persistently pollute our rivers, waterways and coastlines. The era of industry self-reporting and under-funded, under-resourced regulators must come to an end. The water industry must increase investment to improve, restore and protect water quality, and regulators must be resourced to act strongly against an industry that has deprioritised the protection of the environment for far too long.

This year, we have seen a groundswell of action from Ocean Activists, national environmental campaign organisations, grassroot community groups and the wider public, demanding change. This has already resulted in significant progress, with new legislation for the provision of sewage pollution data, requirements for water companies to monitor water quality both up and downstream of outfalls, legal obligations for sewage pollution plans to be presented in Parliament, and requirements to reduce the harm from sewage overflows. But these measures do little to actually stop sewage pollution, which must be the focus of attention. For that, we need legal targets that forces the water industry to act. In this Decade of Ecosystem Restoration, we have to go further and see the introduction of legally binding sewage pollution reduction targets and legal obligations for action to decommission the most damaging sewage outfalls nationwide.

Our ambition is to end sewage discharges into UK Bathing Waters by 2030. The campaign has momentum, decision makers are listening, together, we can make a difference.

Add your voice and help us **#EndSewagePollution**

KEY FINDINGS

In 2020 sewage was pumped into rivers and seas nationwide over 400,000 times, totaling over **3.1 MILLION HOURS OF POLLUTION**.

5,517 SEWAGE POLLUTION DISCHARGE NOTIFICATIONS were issued by water companies warning for Bathing Waters in England and Wales (1st October 2020 to 30th September 2021)

3,328 sewage pollution discharge notifications were issued **DURING THE BATHING SEASON** (15th May - 30th September)

2,187 sewage pollution discharge notifications were issued **OUTSIDE THE BATHING SEASON** by the five water companies who share year-round sewage pollution data.

Based on widely accepted advice to not swim in sewage polluted water for 48 hours following a discharge, **16% OF 'SWIMMABLE DAYS' WERE THEREFORE 'LOST'** during the 2021 Bathing Season.

Sewage pollution **STILL PLAGUES BEACHES CLASSIFIED AS 'EXCELLENT'** for water quality.

SOUTHERN WATER WERE RESPONSIBLE FOR A STAGGERING 1,949 SEWAGE DISCHARGE NOTIFICATIONS, averaging an eye-watering 38 notifications per Bathing Water.

30% OF THE 286 HEALTH REPORTS submitted to Surfers Against Sewage over the last year came from beaches in the Southern Water region.

Citizen science water quality monitoring reveals that 75% of rivermouth locations monitored, flowing directly onto or close to bathing waters, were routinely of such poor quality that they posed a **CONSTANT AND SERIOUS RISK TO HUMAN HEALTH**. This highlights the inadequacy of water treatment and questions the validity of the testing regime to keep us safe.

CONTENTS

INTRO-DUCTION

The UK's rivers, waterways and coastline are plagued by an extensive network of Sewer Overflows, which are owned and controlled by water companies. They are part of a 'combined infrastructure network' which mixes both sewage effluent with surface water runoff into drains.

They are designed for emergency use only, taking the pressure off sewage treatment facilities in exceptional circumstances and during periods of "unusually heavy rainfall".[1] Surfers Against Sewage accesses data when Sewer Overflows discharge pollution at some of the country's best-loved beaches, which we provide through the Safer Seas & Rivers Service (SSRS), our real-time water quality alerts App.

We also track other types of pollution that impact water quality through the App. Pollution Risk Forecasts are issued by regulators[2] providing an indication of when there might be an increased risk of pollution, including from sewage, agricultural run-off and urban run-off. Forecasts are based on water quality sampling information, and consider factors including the tide, wind, rainfall and ultraviolet light. This forecasting provides daily predictions during the Bathing Season running from 15th May – 30th September to help water users better understand, and so avoid, potentially polluted waters.

This year, for the first time, the SSRS covers both coastal and inland waters. The service alerts water users when Sewer Overflows discharge untreated sewage into waterways and when forecasting models indicate a reduction in water quality due to pollution events. This information allows people to make informed decisions about how, where and when to use the sea and rivers at more than 400 locations around the country.

1 European Commission (2020) Urban Waste Water Treatment, 2020, https://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

IN 2020/21, WE TRACKED AND ALERTED SSRS SUBSCRIBERS OF MORE THAN 5,500 SEWER OVERFLOW DISCHARGES ACROSS 308 LOCATIONS IN ENGLAND AND WALES.

We also tracked and notified users of nearly 1,500 PRF warnings during the 2021 Bathing Season across 184 coastal locations in England and Wales. Disappointingly, the Scottish Environmental Protection Agency (SEPA) were unable to provide PRF notifications this year due to a cyber-attack on their systems and Scottish Water don't yet provide us with Sewer Overflow discharge notifications.

This report presents the data collected through the SSRS between 1st October 2020 and 30th September 2021 alongside evidence from our new water quality citizen science programme. Firstly, we look at sewage pollution, presenting Sewer Overflow discharge notifications issued by water companies affecting Bathing Waters and other popular recreational sites for water users.

Secondly, using this year's PRF notifications issued through the SSRS and the results from our first year of citizen science water quality testing work, we examine the state of the UK's water quality, specifically where rivers meet the sea.

Finally, we take a look at the evidence provided to us through Health Reports submitted through the SSRS and our website to better understand the possible impact of sewage pollution and poor water quality on human health.

Figure 1 shows the distribution of locations that received Sewer Overflow discharge notifications only, locations that only received PRF notifications, and locations that received Sewer Overflow and PRF notifications.

e regulators are the Environment Agency in England, Scottish
ironmental Protection Agency in Scotland, and Natural Resources
s in Wales

FIGURE 1

LOCATIONS COVERED BY THE SAFER SEAS & RIVERS SERVICE

SEWAGE POLLUTION

The majority of the UK's sewerage network is a combined system where surface water is mixed with sewage effluent before entering treatment plants. Sewer Overflows are a specific feature of sewerage infrastructure, there to prevent water from backing up into homes in the event of exceptionally heavy rainfall.

There are approximately 21,500 legally permitted Sewer Overflows and pumping stations in England and Wales.[3] The Urban Waste Water Treatment Directive states that Sewer Overflows should only be used in "exceptional circumstances" such as extreme weather conditions or exceptional rainfall.[4] However, we are increasingly seeing discharge notifications issued during what many would consider to be normal rainfall events. In 2020 alone, water companies released sewage into rivers, lakes, streams and coastlines more than 400,000 times, for over 3.1 million hours. That's nearly 8,500 hours of raw sewage being pumped into our waterways every single day.

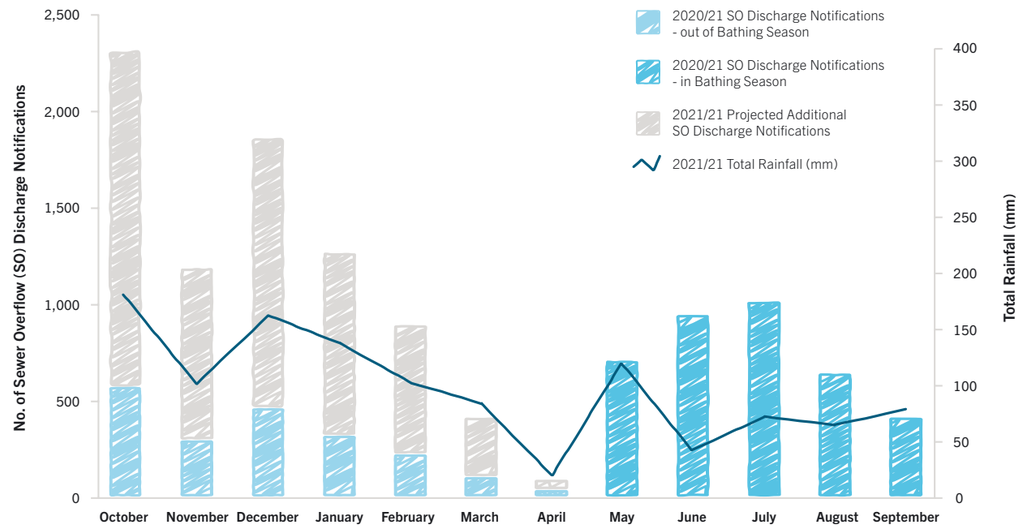
We also reported a total of 1,011 Sewer Overflow discharge notifications for Bathing Waters in England and 124 for Wales during the official 2020 summer "Bathing Season", releasing a toxic mixture of sewage, chemicals, pharmaceuticals, microplastics and other waste directly onto the beaches we surf, swim, paddle and play in.

The Safer Seas & Rivers Service (SSRS) includes 308 locations for which Sewer Overflow discharges are provided by eight major water companies in England and Wales. This information has been used to inform our analysis of Sewer Overflow discharges of the 2021 Bathing Season running from 15th May-30th September. We have also assessed 'Out of Season' Sewer Overflow discharge performance. It should be noted that Sewer Overflows have verifying trigger mechanisms according to water company methodology and permitting conditions (see **Table 1**). These trigger points determine when a discharge notification is issued. This variation between methodology will likely impact the result presented. It should also be noted that not all water companies currently provide discharge notifications outside the Bathing Season.

TABLE 1 SEWER OVERFLOW DISCHARGE NOTIFICATION TRIGGER METHODS

WATER COMPANY	SO ALERT TRIGGER	YEAR ROUND DATA?
Anglian Water	Use modelling to determine which bathing water will be affected by reduced water quality	✗
Northumbrian Water	An alert is sent 30 minutes after a sewage overflow discharges and another 30 minutes after the discharge is reported as stopped	✓
South West Water	When the discharge meets an 'agreed (with the EA) significance criteria'	✗
Southern Water	An alert is sent after a discharge has been verified as genuine	✗
United Utilities	Within ten minutes of a cumulative discharge occurring in a 12 hour window	✓
Welsh Water	>15 mins	✓
Wessex Water	Between 2 - 60 mins after a discharge depending on location	✓
Yorkshire Water	Uses specific values based on modelling at each individual asset	✓

FIGURE 2 SEWER OVERFLOW DISCHARGES VS RAINFALL



SEASONAL ANALYSIS

Figure 2 shows the number of discharge notifications issued each month between 1st October 2020 and 30th September 2021 alongside total monthly rainfall.

A total of 5,517 Sewer Overflow discharge notifications were issued over the 12-month period. 3,328 of these notifications were issued during the Bathing Season. We are often told that Sewer Overflow discharges happen due to rainfall. However, when we look at the number of discharges in comparison to rainfall in the summer months, there does not appear to be a correlation. If this were the case, we would expect the number of discharges to be lower in June and July than in May.

A total of 2,187 Sewer Overflow discharge notifications were issued outside of the Bathing Season. However, three water companies did not provide out-of-season information meaning 165 locations out of the 308 locations in the SSRS did not receive discharge information all year round. We would therefore expect discharge notifications to be higher outside of the Bathing Season than our reported figures.

During the Bathing Season, the three water companies that did not provide Sewer Overflow discharge notifications account for 76% of the discharge notifications issued. We can therefore assume and project that these water companies would also be responsible for an additional 76% out of season notifications, which would add a further 5,978 Sewer Overflow notifications over the course of the year. This would equal a total of 11,495 discharge notifications over the year.

Recent research and surveys into public participation in water sports since the global health crisis has shown that 56% of recreational visits to the coast occur outside the summer months[5] , highlighting the growing importance of providing Sewer Overflow discharge notifications and water quality information all year round. This also highlights the limitations and inadequacies of the Bathing Season, which fails to monitor water quality and protect the public in the current world of water users, which is very much year-round. Wetsuit technology and new water sports mean people are as likely to use blue spaces in January as in June.

3 Environment Agency (2021) Consented Discharges to Controlled Waters with Conditions, accessed 12 October 2021, https://data.gov.uk/dataset/55b8eaa8-60df-48a8-929a-060891b7a109/consented-discharges-to-controlled-waters-with-conditions

4 Extreme rainfall is the most intense 1% of rainfall or the highest rainfall fallen in 24 hours over the course of the year. European Commission (2020) Urban Waste Water Treatment, 2020, https://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

5 Elliott, L.R., White, M.P., Grellier, J., Rees, S.E., Waters, R.D., and Fleming, L.E. (2018) Recreational visits to marine and coastal environments in England: Where, what, who, why, and when?, Marine Policy, Vol.97, pp.305–314

PHOTO CREDIT: CARLY LAMBERT @SALTYLAMBPHOTOGRAPHY

CAMPAIGN WIN

This year, ALL water companies have committed to provide Sewer Overflow discharge notifications all year round. This has also been written into the Environment Act, placing a legal duty on water companies to provide transparent, year-round data.

This will not only allow surfers, swimmers, kayakers and paddle boarders to stay safe when using waterways but also allow us to track and monitor water companies' performance in order to hold them to account for their pollution and call for remedial action.

DOWNLOAD THE SAFER SEAS & RIVERS SERVICE TODAY FOR REAL TIME SEWER DISCHARGE NOTIFICATIONS

LOCATION ANALYSIS

The number of Sewer Overflow discharge notifications for each location covered by the Safer Seas & River Service (SSRS) are shown in **Figure 3** with the locations that have received the most Sewer Overflow discharge notifications highlighted.

16% OF SWIMMING DAYS WERE LOST DURING THE BATHING SEASON AS A RESULT OF SEWAGE POLLUTION

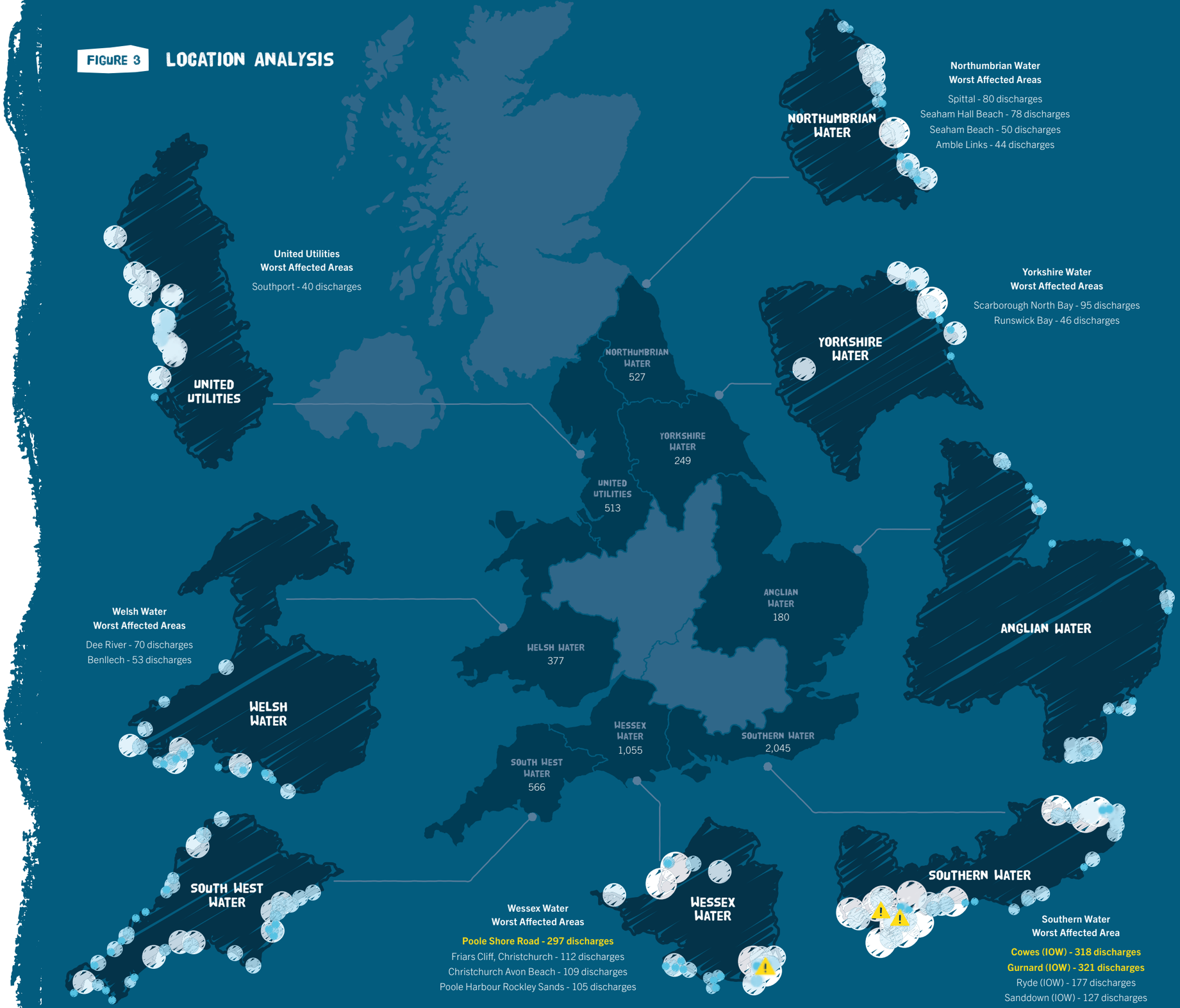
Notifications issued through the SSRS are kept live for 48 hours after the discharge has stopped to allow sufficient time for pollution to disperse. This has resulted in 6,656 swimming days being lost during the Bathing Season, 4,374 lost outside the Bathing Season and so a total of 11,034 swimming days lost over the year as a result of sewage pollution.

This amounts to 10% of total swimming days lost over 12 months from October 2020 - September 2021, with 16% of swimming days lost during the official Bathing Season alone. These totals do not consider the duration of the discharge occurring so these are conservative figures.

NOTIFICATION NUMBERS...

For some locations, we receive multiple notifications per day due to the way Sewer Overflows discharge. For example, the Sewer Overflow may include a pumping system that operates for a short time and stops and starts throughout the day. This means that for some locations, high numbers of discharge notifications are reported but the duration of these discharges are relatively short.

FIGURE 3 LOCATION ANALYSIS



WATER COMPANY PERFORMANCE

In July 2021, the Environment Agency (EA) released its annual report assessing the environmental performance of nine of the main water and sewerage companies in England for 2020.[6]

This report showed some movement in the right direction compared to 2018 and 2019 results, with five of the nine water companies (United Utilities, Severn Trent, Wessex Water, Yorkshire Water and Northumbrian Water) achieving the highest performance rating of four stars based on the Environment Agency's assessment criteria. Southern Water and South West Water, however, failed to make any progress on their environmental performance achieving an unacceptable 2-star rating, South West Water having still not improved beyond this poor rating for 5 years. Overall the report concludes that progress is still painfully slow and the sector as a whole has not met the performance expectations set for 2015-2020.

There is still a tendency, particularly amongst some in the sector, to make excuses for continued poor performance rather than acting to end polluting practices. This is putting water users and the environment at serious risk, and is simply not acceptable.

Whist the EA's environmental performance report seeks to assess serious pollution instances, Sewage Overflow discharge performance is not yet included within the analysis. The information provided by the SSRS, therefore, allows us to investigate water company performance in relation to sewage discharge from Sewage Overflow infrastructure, providing an additional and valuable perspective on water company performance. As highlighted, not all water companies provide year-round information, therefore, our analysis focuses on the Bathing Season that runs from 15th May – 30th September 2021.

Table 3 shows the number of locations Sewer Overflow discharge notifications are provided for by each of the eight major water and sewerage companies that voluntarily provide notifications through the SSRS.

TABLE 2 EPA PERFORMANCE STAR RATINGS (OUT OF 4) FOR THE 9 WATER AND SEWERAGE COMPANIES 2016-2020

WATER COMPANY	2016	2017	2018	2019	2020	TOTAL
Anglian Water	3	3	3	2	★★★☆ (3)	14/20
Northumbrian Water	2	2	4	2	★★★★ (4)	14/20
Severn Trent Water	3	4	3	4	★★★★ (4)	18/20
South West Water	2	2	2	2	★★☆☆ (2)	10/20
Southern Water	3	3	2	1	★★☆☆ (2)	11/20
Thames Water	2	3	3	3	★★★☆ (3)	14/20
United Utilities	4	4	3	3	★★★★ (4)	18/20
Wessex Water	4	4	3	4	★★★★ (4)	19/20
Yorkshire Water	3	3	2	3	★★★★ (4)	15/20

6 Environment Agency (2021) Water and sewerage companies in England: environmental performance report for 2020, accessed 13 July 2021, https://www.gov.uk/government/publications/water-and-sewerage-companies-in-england-environmental-performance-for-2020/water-and-sewerage-companies-in-england-environmental-performance-report-for-2020

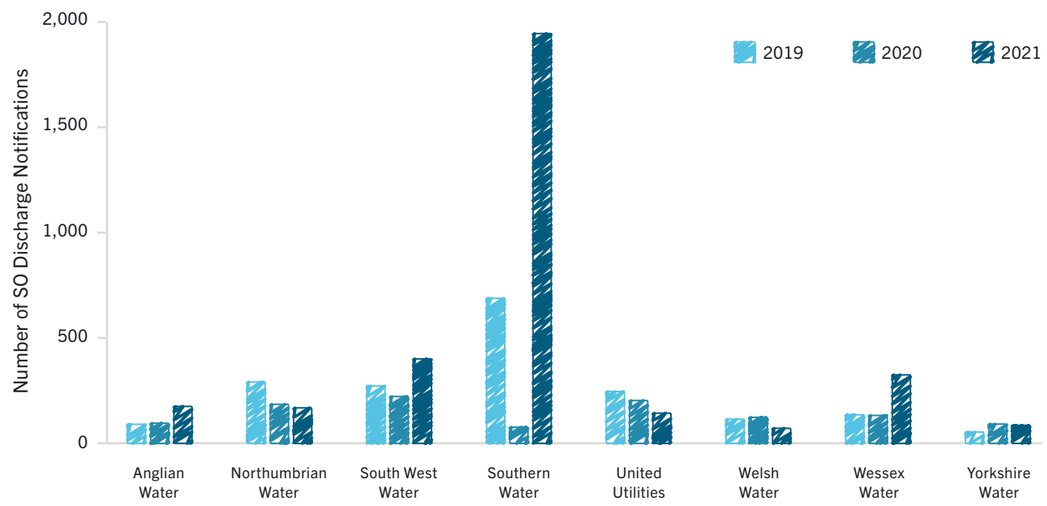
TABLE 3 NO OF LOCATIONS WATER COMPANIES PROVIDE SEWAGE OVERFLOW DISCHARGE NOTIFICATIONS FOR FROM 2018 TO 2021

WATER COMPANY	2018/19	2019/20	2020/21
Anglian Water	46	↓ 45	↑ 49
Northumbrian Water	31	– 31	↓ 30
South West Water	62	– 62	↑ 65
Southern Water	29	– 29	↑ 51
United Utilities	23	↓ 22	↑ 23
Welsh Water	30	– 30	↑ 36
Wessex Water	32	– 32	↑ 40
Yorkshire Water	12	↓ 11	↑ 14

Figure 4 shows the total number of Sewage Overflow discharge notifications issued by each water company during Bathing Seasons since 2019. Northumbrian Water, United Utilities, Welsh Water and Yorkshire Water have all seen a slight overall reduction in the total number of Sewer Overflow discharge notifications issued over the three year period, although this could be a result of overall lower rainfall during the Bathing Season months each year.

South West Water, Anglian Water and Wessex Water have seen a gradual increase in Sewer Overflow discharge notifications issued, however this could, in part, be a result of the increased number of locations for which they provide notifications.

FIGURE 4 TOTAL NUMBER OF SEWAGE OVERFLOW DISCHARGES 2019-2021



SOUTHERN WATER, HOWEVER, STANDS OUT.

In 2020, the total number of Sewage Overflow discharge notifications issued by Southern Water dropped considerably compared to 2019. In our 2020 Water Quality Report, we revealed that Southern Water had failed to issue Sewer Overflow discharge notifications during 2020 due to 'technical failures' resulting in thousands of water users along the South coast being put at risk.[7] The technical issues have now been rectified, showing that the total number of Sewer Overflow discharge notifications issued in 2021 has skyrocketed with a total of **1,949 notifications issued** compared to 78 in 2020 and 690 in 2019.

Whist the number of locations Southern Water provides notifications for has increased by 76% since 2019, the number of discharge notifications has risen disproportionately, increasing by 182% between 2019 and 2021.

Assessing the total number of Sewer Overflow discharge notifications issued does not allow relative comparisons to be drawn between water companies as there is a bias against water companies that provide notifications for a greater number of locations. We have therefore analysed the average number of Sewer Overflow discharge notifications per location for each water company to provide a fairer picture of water company performance (see **Figure 5**).

THE MAJORITY OF WATER COMPANIES ISSUE ON AVERAGE BETWEEN 2 AND 8 SEWER OVERFLOW DISCHARGE NOTIFICATIONS PER LOCATION.

Some have seen a slight decrease in average notifications and some a slight increase since 2020. Southern Water, however, issued an eyewatering average of 38 discharges per location, dramatically higher than any other water company and almost 5 times more than the average.

Following the same methodology the Environment Agency uses to assess environmental performance, **Figure 6** shows the number of Sewer Overflow discharge notifications issued by each water company per 10,000km of sewerage network between 2019-2021.

There have been disappointing and notable increases over time from Anglian Water (8 in 2019, 9 in 2020, 23 in 2021) and Wessex Water (63 in 2019, 62 in 2020, 96 in 2021). South West Water also produced a sharp increase from 143 in 2020 to 234 in 2021.

BUT YET AGAIN, THIS METRIC HIGHLIGHTS SOUTHERN WATER'S ABYSMAL PERFORMANCE WITH 498 SEWAGE OVERFLOW DISCHARGE NOTIFICATIONS ISSUED PER 10,000KM OF SEWERAGE NETWORK IN 2021 COMPARED TO 175 IN 2019.

FIGURE 5 AVERAGE NUMBER OF SEWAGE OVERFLOW DISCHARGE NOTIFICATIONS PER LOCATION 2019-2021

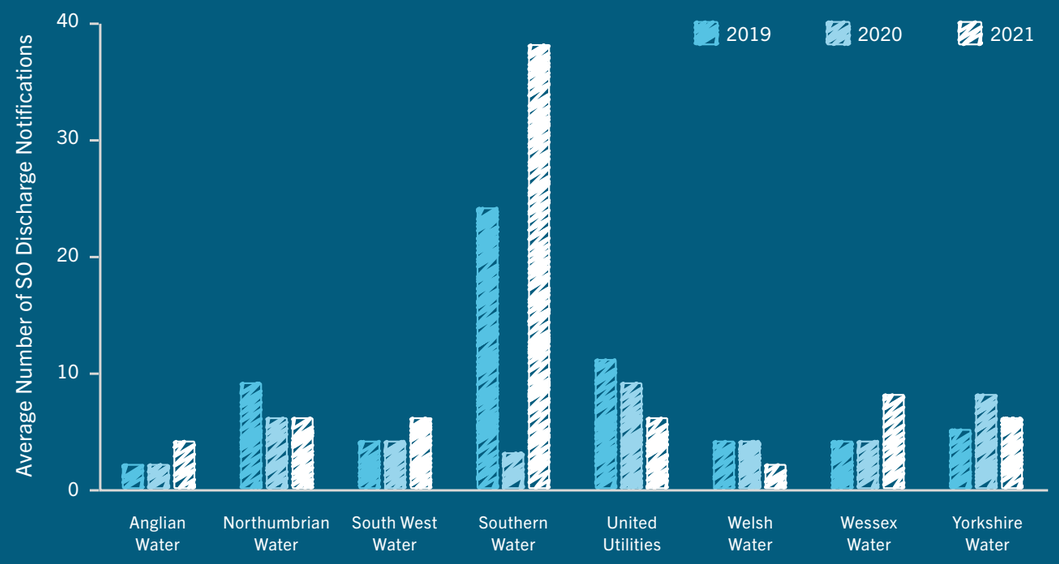
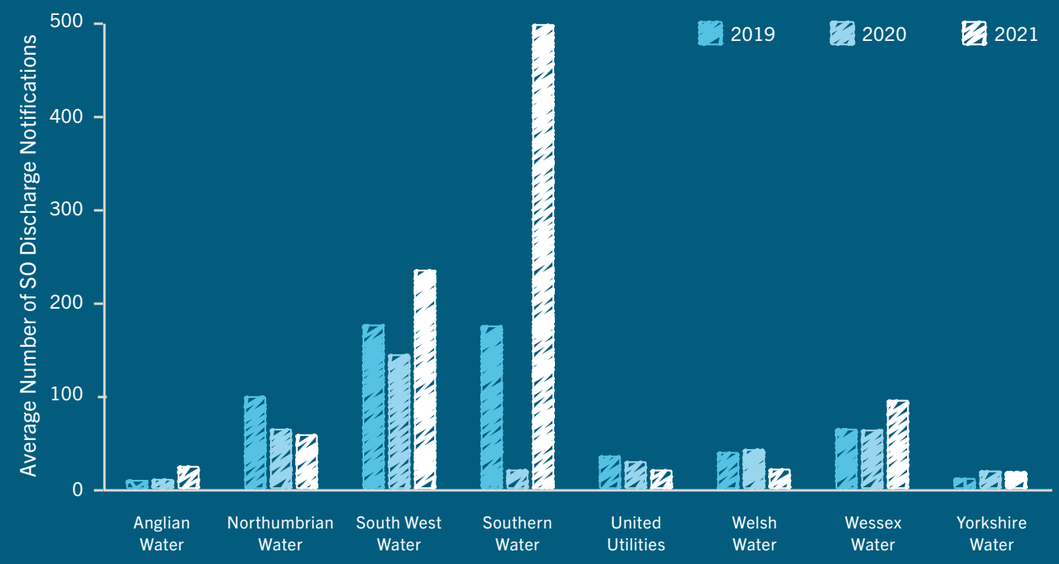


FIGURE 6 SEWAGE OVERFLOW DISCHARGE NOTIFICATIONS PER 10,000KM OF SEWERAGE NETWORK



7 Slack, A., Tagholm, H., and Field, A. (2020) 2020 Water Quality Report, 2020, https://www.sas.org.uk/wp-content/uploads/SAS-Water-Quality-Report-Digital-v1.pdf

SOUTHERN WATER, CLEAN UP YOUR ACT. NOW.

Southern Water appear to have a deep-rooted and ingrained cultural disregard for the environment and the safety of those who live in Southern England a.k.a. their customers.

In July this year, the company was slammed with a record fine of £90 million for knowingly and deliberately dumping 21 billion litres of raw sewage into some of the most protected, precious and delicate waterways during the period 2010-2015. This followed on from a £126 million penalty from Ofwat in 2019 paid back to customers for the same offences. It was demonstrated that they completely ignored the 163 previous offences and cautions received prior to the Environment Agency investigation that resulted in these fines and penalties. Recent research shows that Southern Water were responsible for almost 30% of the 174 reported breaches to permits due to 'dry spills' (i.e. discharges occurring when no rainfall had occurred for the previous 2 days) between 2010-2020.[8] But these fines and breaches are not the end of this story.

THE ENVIRONMENT AGENCY ARE STILL INVESTIGATING INSTANCES OCCURRING AFTER 2015 AND HAVE RECENTLY OPENED AN INVESTIGATION INTO THE COMPANY FOR DUMPING RAW SEWAGE INTO THE COASTLINE AROUND THANET THIS SUMMER, WHICH SAW THE CLOSURE OF 11 BEACHES.

Last year, we revealed that Southern Water had completely failed to issue any sewage discharge notifications for the majority of Bathing Waters along the south coast. This year, we've been shocked at just how frequently sewage is being pumped out into beaches on England's southern coastline.

ITS PERFORMANCE IS SIMPLY SHOCKING AND WE DEMAND THAT THEY FINALLY PUT THE PLANET BEFORE THEIR PROFITS AND DIVERT SHAREHOLDER DIVIDENDS TO PROTECTING OUR RIVERS AND COASTLINE FROM SEWAGE POLLUTION.

8 Hammond, P. (2021) Review of Unpermitted Spills from Sewage Treatment Works, 2021

FIGURE 7 WATER COMPANY CEO REMUNERATION 2020-21

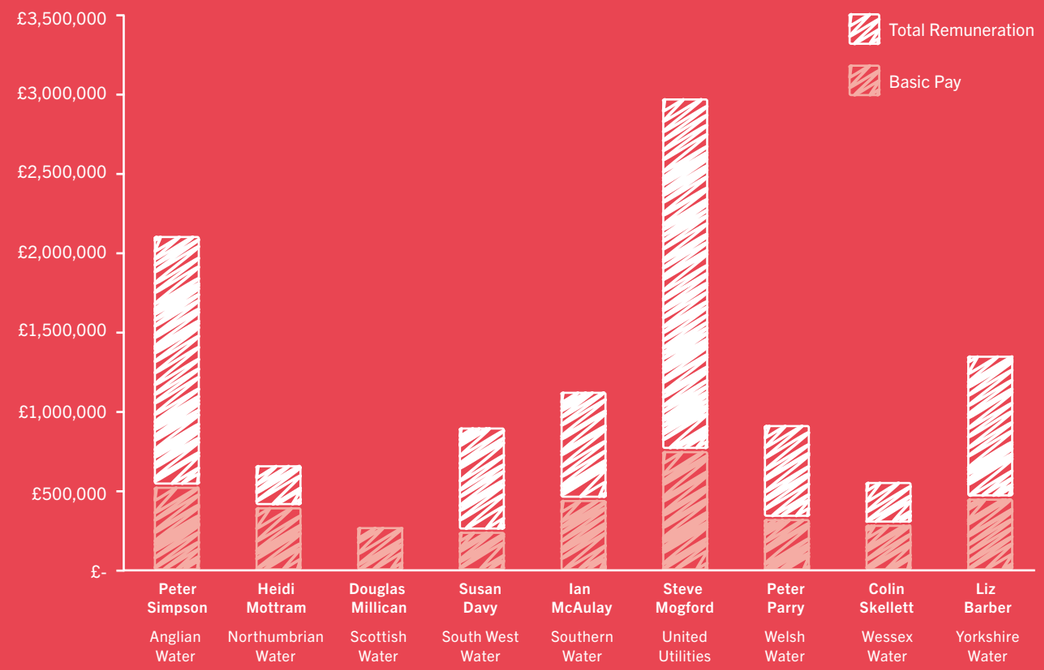
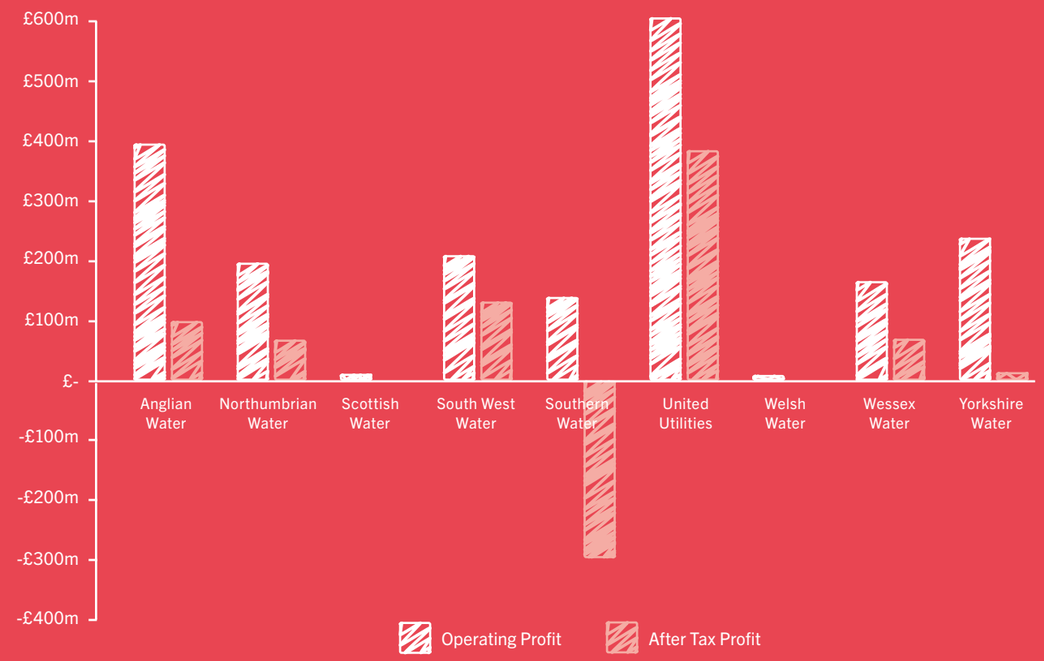


FIGURE 8 WATER COMPANY PROFITS 2020-21



CONCLUSIONS

Sewage is still being discharged into rivers and the sea at an alarming rate. We are yet to see the absolute reductions in Overflow discharges that these precious blue spaces so desperately need and in some cases the evidence indicates that sewage pollution is getting worse, with South West Water and Southern Water delivering notably poor performance for the third consecutive year.

The findings shared in this report present a partial picture. We are only able to assess information voluntarily provided by some water companies, and for coastal Bathing Waters. We can only look at the number of Sewer Overflow discharge notifications issued for a particular location. We have limited information to allow us to assess the duration of pollution discharges, or the volume of sewage that's actually being pumped into waters we surf, swim and play in. We therefore need much clearer, more widespread and transparent information on where sewage discharges occur when they are happening and the volumes discharged. We need this both for our Bathing Waters and popular locations inland, on rivers and coastally, especially for those locations that we already know people are using for recreation.

WE NEED URGENT AND TARGETED INVESTMENT IN THE INCREASINGLY AILING AND OVERBURDENED SEWERAGE SYSTEM NATIONWIDE.

In some cases, this may require separating surface water runoff from sewage effluent or building new engineering solutions to drastically reduce the frequency and impact of Sewer Overflows. However, this may not always however be possible and so it is incumbent on water companies to identify other ways to eliminate sewage discharges, including nature-based solutions and rewilding of riverine or aquatic environments.

What this report consistently highlights is a water industry failing to take sufficient action to end sewage pollution. Instead, enormous annual dividends are paid to shareholders and the CEOs are the beneficiaries some of the UK's biggest remuneration packages.

Analysis by the University of Greenwich has shown that accelerating water company debt levels are primarily the result of disproportionate dividend pay-outs, which exceeded the companies' cash balances in all but one year since 1989.

IN TOTAL, THE INDUSTRY AMASSED DEBTS OF A STAGGERING £48BN OVER THE LAST 30 YEARS WHIST PAYING OUT £57BN IN SHAREHOLDER DIVIDENDS.[9]

Econometric analysis suggests that the 40% increase in real household bills since privatisation has mainly been driven by continuously growing interest payments on debt, contrary to the regulator attributing them to growing costs and investments.[10]

With the huge increase in public pressure over the last 18 months, long-fought for progress is beginning to be made. The Green Recovery Fund will see water companies invest an additional £793 million between now and 2025 on top of what they have already committed. In addition, £1.9bn of investment in statutory environmental schemes will be brought forward from 2025-2030 investments.[11] The focus of many proposals has been tackling sewage discharges, improving water quality and investing in nature-based solutions, all positive steps. The devil, however, is always in the detail but we expect and demand an absolute reduction in Sewer Overflow discharges in the coming years as a key metric of success.

It is clear that without strong and enforced legislation that places a legal duty on water companies to end sewage pollution there is scant incentive for them to act. We have seen a gradual erosion in legislation over recent years, with legal obligations to report on pollution scrapped in favour of self-reporting and a relaxation of rules under which Sewer Overflow discharges are permitted. Research undertaken by Windrush Against Sewage Pollution suggest that 95% of illegal sewage discharges could be going unreported.[12] Furthermore, the Environment Act sets out requirements for water companies to put forward Drainage & Waste Water Management Plans and targets in place, but without overarching legal requirements to stop sewage discharges, these plans will simply give the water industry a green light to dictate what they do and how they do it.

ENVIRONMENT AGENCY & OFWAT LAUNCH MAJOR INVESTIGATION INTO SEWAGE POLLUTION

In November 2021, following significant public concern and pressure on the growing issue of sewage pollution, the Environment Agency and Ofwat announced a large-scale investigation into potentially illegal sewage discharges at over 2,000 sewage treatment works across England.

New monitoring requirements have brought to light suspected breaches in sewage discharge permits, forcing some water companies to take the unprecedented step of announcing that they could indeed be responsible for unlawful sewage discharges into both rivers and seas.

This long overdue investigation will be widespread and cover every water company in England. We expect to see the investigation culminate in the full force of the law being thrown at water companies that have been systematically flouting their legal responsibilities and obligations to treat sewage properly and protect the environment. It's time for regulators to force water companies to come clean and face punishment for any illegal and immoral practices. But of course the proof will be when sewage emissions are drastically reduced or eliminated, and our rivers and coastline meet the standards that the water industry and those that regulate them should have helped deliver many years ago.

9 Laville, S. (2020) England's privatised water firms paid £57bn in dividends since 1991, The Guardian

10 (2018) Privatised water: a system in need of repair?, accessed 24 October 2021, https://www.gre.ac.uk/news/articles/public-relations/2018/privatised-water-failure

11 OFWAT (2021) Green economic recovery: Overview of draft decisions, May 2021, https://www.ofwat.gov.uk/wp-content/uploads/2021/05/Green-economic-recovery-overview-of-draft-decisions.pdf

12 Hammond, P. (2021) Review of Unpermitted Spills from Sewage Treatment Works, 2021

WATER QUALITY

WATER QUALITY OF DESIGNATED BATHING WATERS

Each year, the water quality of designated Bathing Waters is assessed by the relevant regulator throughout the Bathing Season (15th May – 30th September in England and Wales, 15th July – 15th September in Scotland).

Water quality samples are taken on a weekly basis and tested for bacteria that indicates whether there is faecal matter in the water, namely e. coli and intestinal enterococci. These samples are used to determine the water quality classification for each Bathing Water for the following Bathing Season. Each Bathing Water is classified as either:[13]

EXCELLENT
The highest cleanest seas

GOOD
Generally good water quality

SUFFICIENT
The water meets minimum standards

POOR
The water has not met minimum standards

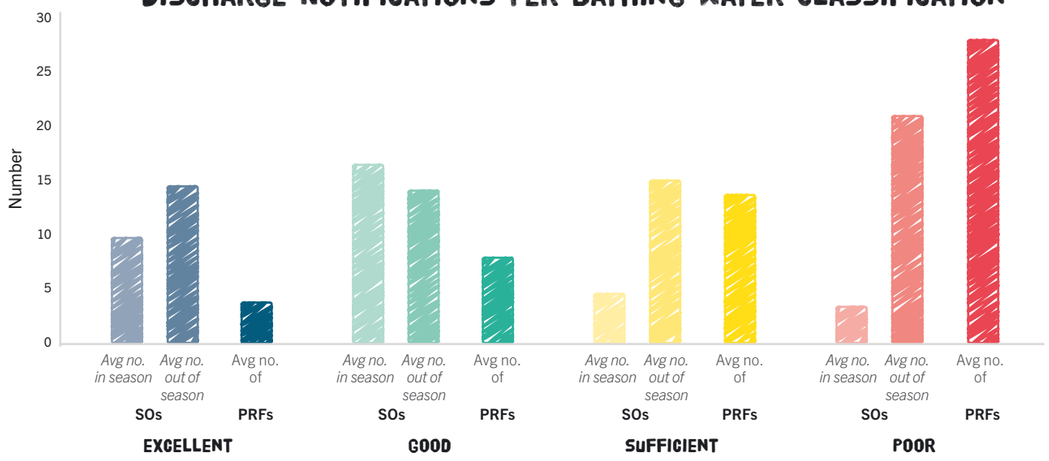
Locations rated as 'poor' remain open but bathing is unadvised and work is planned to improve water quality. If a Bathing Water receives a 'poor' classification for four years running, it is de-designated. In 2020, due to the COVID-19 pandemic, regulators were unable to undertake the legally required number of water quality samples and were therefore not able to update classifications for the 2021 Bathing Season. Classifications from 2019 have therefore been used to classify Bathing Waters in 2021.

POLLUTION RISK FORECAST ANALYSIS

Annual classifications only provide information based on a snapshot in time.

However, water quality changes over time and can vary over the course of a month, week and even day. Whilst annual classifications can give an indication of water quality at a Bathing Water generally, they are not able to tell us the state of the water quality at any given moment.

FIGURE 9 AVERAGE NUMBER OF PRF WARNINGS AND SEWER OVERFLOW (SO) DISCHARGE NOTIFICATIONS PER BATHING WATER CLASSIFICATION



Regulators therefore combine water quality testing results with a range of metrics including rainfall, tide and wind to model water quality in near real-time and issue Pollution Risk Forecasts (PRFs) if an increased risk is forecast. PRF warnings are issued through the SSRS by the EA in England and Natural Resources Wales (NRW) in Wales for 184 locations. Unfortunately, due to a major cyber-attack, the Scottish Environment Protection Agency (SEPA) was unable to provide PRF warning for the 2021 Bathing Season.

Figure 10 shows the number of PRF warnings issued per location with the worst performing locations highlighted.

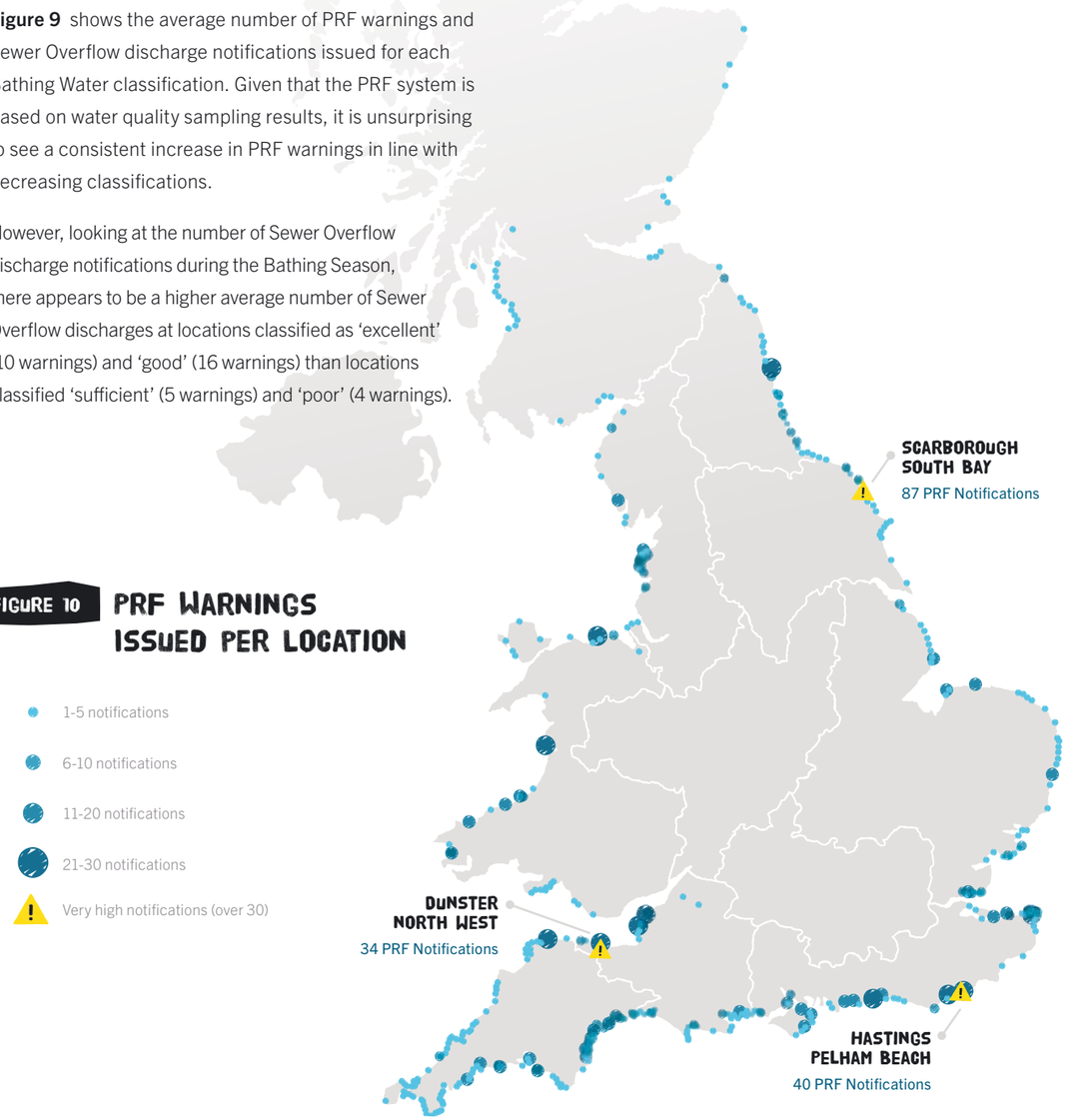
Figure 9 shows the average number of PRF warnings and Sewer Overflow discharge notifications issued for each Bathing Water classification. Given that the PRF system is based on water quality sampling results, it is unsurprising to see a consistent increase in PRF warnings in line with decreasing classifications.

However, looking at the number of Sewer Overflow discharge notifications during the Bathing Season, there appears to be a higher average number of Sewer Overflow discharges at locations classified as 'excellent' (10 warnings) and 'good' (16 warnings) than locations classified 'sufficient' (5 warnings) and 'poor' (4 warnings).

This is opposite to the trend we would expect to see, suggesting that Bathing Water classified as 'excellent' and 'good' may in fact be experiencing significant sewage pollution.

Bathing Water classification are based on water quality testing undertaken during the Bathing Season only. As shown in **Figure 9**, there are significantly higher numbers of Sewer Overflows discharge notifications issued out of season for each classification other than 'good'. We would therefore question if the same classifications would be achieved if water quality testing were undertaken all year round.

FIGURE 10 PRF WARNINGS ISSUED PER LOCATION



13 Bathing water quality glossary, accessed 4 November 2021, https://environment.data.gov.uk/bwq/profiles/help-glossary.html

RIVER WATER QUALITY

Only 14% of rivers meet good ecological status and none pass chemical tests, suggesting that pollution from sewage discharges, chemicals, and agricultural run-off are having a devastating impact on river water quality.[14] We are on track to fall far short of the UK's commitment under the Water Framework Directive for 100% of rivers to achieve 'good ecological status' by 2027.

Every fortnight, over 4.3 million people visit mainland UK inland waterways.[15] With thousands of individuals escaping the confinement of their homes during lockdown, many picked up new hobbies such as open water swimming and paddle boarding, particularly on rivers, lakes and estuaries. Yet, in England, only 3% of Bathing Waters in the UK are inland and we only have one Bathing Water located on a river. This compares to 39% in France, 22% in Portugal and 12% in Italy.

Following considerable local campaigning, the River Wharfe at Ilkley achieved designation in December 2020. Attracting over 2,000 visitors on sunny days, but plagued by sewage pollution, the primary purpose for seeking designation was to place a legal obligation on industry to improve water quality. The Bathing Water Directive is, after all, what initially helped drive coastal water quality improvements in the 1990s. Water quality samples taken by the Environment Agency during the 2021 Bathing Season in the River Wharfe have seen shocking levels of intestinal enterococci, almost ten times higher than Environment Agency safe limits for coastal Bathing Waters, putting it on course to be classified as "poor".[16]

It is estimated that 90% of licenced Sewer Overflows in England and Wales discharge directly into rivers. Without official designations, we have no way of knowing what the quality of these waterways is like, subjecting water users to potentially significant health risks. And of course, rivers and the ocean are all part of the same water cycle, with rivers flowing out into the sea, often on to the very beaches where we surf. If rivers are in such poor health, this surely also has significant impact on the state of the water at the coast.

14 Environment Agency (2021) State of the water environment, 2021, https://www.gov.uk/government/publications/state-of-the-water-environment-indicator-b3-supporting-evidence/state-of-the-water-environment-indicator-b3-supporting-evidence

15 Canal and River Trust Waterways and Wellbeing, Building the Evidence Base, First Outcomes Report, https://canalrivertrust.org.uk/refresh/media/thumbnail/33802-canal-and-river-trust-outcomes-report-waterways-and-wellbeing-full-report.pdf

16 Polluted bathing site in England, data reveals, accessed 28 September 021, https://inews.co.uk/news/swimming-sewage-most-polluted-outdoor-bathing-site-england-ilkley-river-wharfe-yorkshire-1160722

CITIZEN SCIENCE WATER QUALITY TESTING

This year, for the first time, we undertook our own water quality testing. We investigated water quality at designated Bathing Waters and in rivers at locations where they flowed into the sea, to better understand how river water quality might be impacting coastal beaches.

METHODOLOGY

Throughout the 2021 bathing season, trained citizen scientists carried out regular water quality sampling at eight locations across the UK where rivers flow into the sea in close proximity to designated Bathing Waters. Samples were taken using an aseptic testing protocol developed by TH-Environmental with AquaGenX testing kit used to analyse the samples using the Most Probable Number (MPN) method. The AquaGenX MPN Kit simultaneously detects and quantifies Escherichia coli (EC) and Total Coliforms (TC) bacteria in a 100 mL sample.

The testing approach used was not a methodology used for official Bathing Water Regulations[17] and does not compare to a fully accredited laboratory-based analysis method. It does, however, have a proven track record worldwide, a strong validation process behind its development and proven science for its specific detection of E.coli, which is widely used by lab based accredited methods. It provides a strong comparison to water quality testing undertaken by environmental regulators, without the need for full lab testing. It also provided a robust, replicable and accessible approach that can be undertaken by citizen scientists in the field, giving results immediately.

Samples at beach locations were taken at the same location at which regulators are known to take official samples.

All results obtained were statistically analysed and converted to a “percentile value” as defined in Bathing Water regulations. The “percentile value” then compared against water quality standards to indicate the Bathing Water classification.

TABLE 4 BATHING WATER CLASSIFICATION PERCENTILE VALUES

CLASSIFICATION	E.COLI		ENTEROCOCCI	
	LEVELS	PERCENTILE	LEVELS	PERCENTILE
EXCELLENT	500	95	200	95
GOOD	1000	95	400	95
SATISFACTORY	900	90	330	90
POOR	>900	90	>330	90

17 UK Govenment The Bathing Water Regulations 2013, accessed 24 October 2021, https://www.legislation.gov.uk/uksi/2013/1675/regulation/19

FIGURE 11

BATHING WATER TEST RESULTS

(1) LLANRHYSTUD BEACH AND (2) AFON WYRE RIVER, MID WALES

Official Classification: Excellent

Beach Results: Poor

E.coli Levels at 90 Percentile: 40,044.46
E.coli Levels at 95 Percentile: 177,231.26

River Results: Poor

E.coli Levels at 90 Percentile: 1,172.31
E.coli Levels at 95 Percentile: 3,584.94

(3) PENBRYN BEACH AND (4) HOFFNANT RIVER, SOUTHWEST ENGLAND

Official Classification: Good

Beach Results: Excellent

E.coli Levels at 90 Percentile: 6.34
E.coli Levels at 95 Percentile: 7.44

River Results: Poor

E.coli Levels at 90 Percentile: 1,771.05
E.coli Levels at 95 Percentile: 5,959.41

(5) PORTOBELLO BEACH (CENTRAL) AND (6) FIGGATE BURN, EAST SCOTLAND

Official Classification: Sufficient

Beach Results: Excellent

E.coli Levels at 90 Percentile: 49.15
E.coli Levels at 95 Percentile: 82.01

River Results: Poor

E.coli Levels at 90 Percentile: 24,227.76
E.coli Levels at 95 Percentile: 34,359.48

(7) PORTSTEWART BEACH AND (8) RIVER BANN, NORTHERN IRELAND

Official Classification: Excellent

Beach Results: Excellent

E.coli Levels at 90 Percentile: 2.87
E.coli Levels at 95 Percentile: 2.87

River Results: Excellent

E.coli Levels at 90 Percentile: 10.67
E.coli Levels at 95 Percentile: 13.99

(9) SEATON SLUICE BEACH AND (10) SEATON BURN, NORTHUMBRIA

Official Classification: Excellent

Beach Results: Excellent

E.coli Levels at 90 Percentile: 24.10
E.coli Levels at 95 Percentile: 36.07

River Results: Poor

E.coli Levels at 90 Percentile: 2,319.95
E.coli Levels at 95 Percentile: 7,467.13

(11) SOUTHWICK BEACH AND (12) RIVER ADUR, SOUTHERN ENGLAND

Official Classification: Excellent

Beach Results: Excellent

E.coli Levels at 90 Percentile: 14.32
E.coli Levels at 95 Percentile: 18.65

River Results: Poor

E.coli Levels at 90 Percentile: 5,612.74
E.coli Levels at 95 Percentile: 19,762.43

(13) ST. ANNES BEACH AND (14) RIVER RIBBLE, NORTHWEST ENGLAND

Official Classification: Good

Beach Results: Poor

E.coli Levels at 90 Percentile: 2,683.45
E.coli Levels at 95 Percentile: 7,609.16

River Results: Poor

E.coli Levels at 90 Percentile: 9,935.11
E.coli Levels at 95 Percentile: 34,282.26

(15) WHITMORE BAY BEACH AND (16) CADOXTON RIVER, BARRY ISLAND, SOUTH WALES

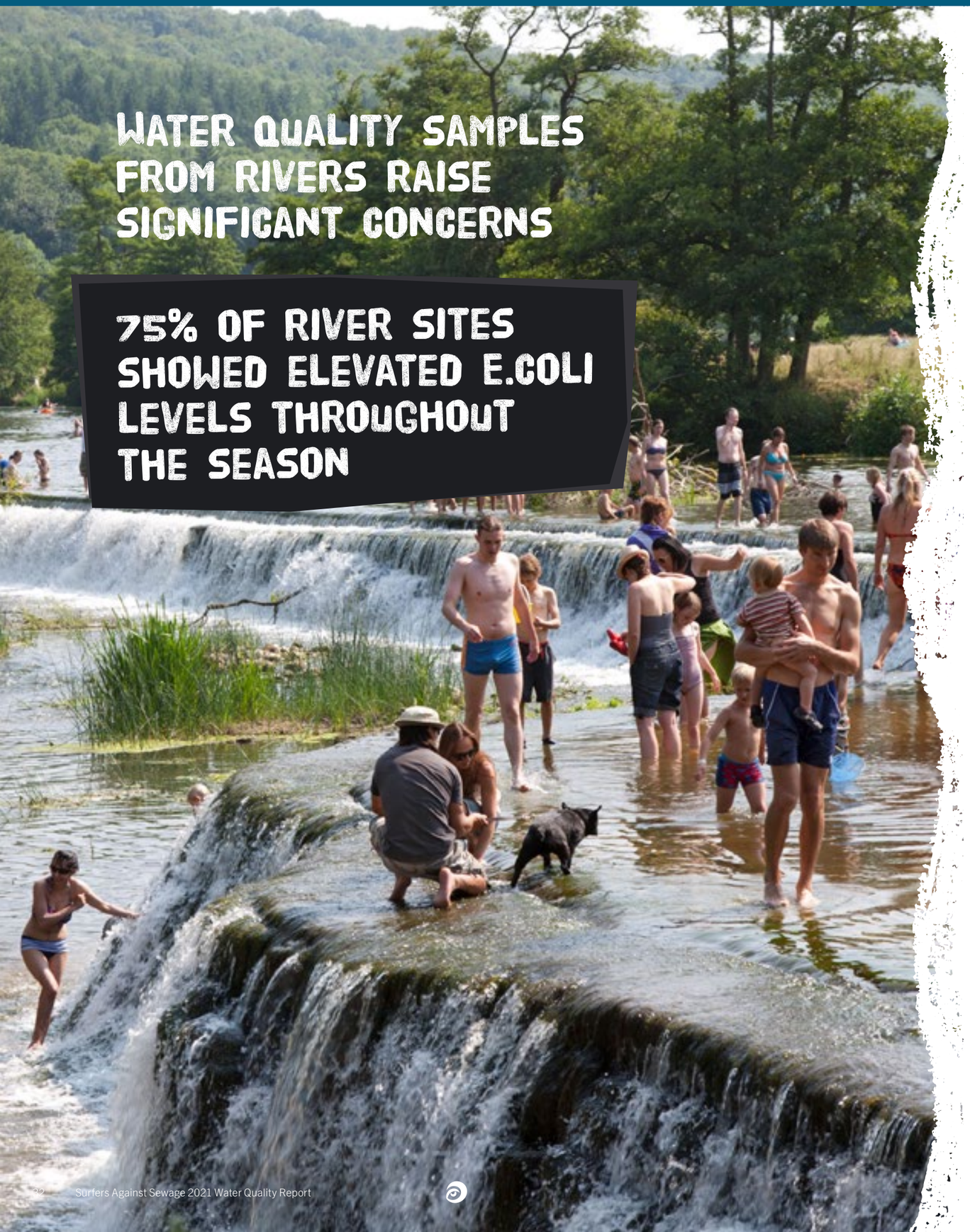
Official Classification: Good

Beach Results: Excellent

E.coli Levels at 90 Percentile: 155.11
E.coli Levels at 95 Percentile: 338.39

River Results: Excellent

E.coli Levels at 90 Percentile: 83.92
E.coli Levels at 95 Percentile: 172.24



WATER QUALITY SAMPLES FROM RIVERS RAISE SIGNIFICANT CONCERNS

75% OF RIVER SITES SHOWED ELEVATED E.COLI LEVELS THROUGHOUT THE SEASON

SUMMARY

Both beach and river locations at Barry Island and Portstewart returned excellent water quality results throughout the season. However, with only four samples taken at Portstewart, the dataset was too small to draw any robust conclusions.

Reassuringly, a further four beach locations at Penbryn, Southwick, Portobello and Seaton Sluice returned overall excellent water quality results throughout the season.

However, beach locations at Barry Island, Portobello and Seaton Sluice all returned at least one result during the bathing season that showed E.coli levels posing a risk to human health.

When focusing on water quality samples from rivers, however, there are significant and widespread concerns.

SIX OUT OF THE EIGHT RIVER SITES SHOWED ELEVATED E.COLI LEVELS AND RETURNED AN OVERALL POOR WATER QUALITY RESULT THROUGHOUT THE SEASON.

Of particular concern is Figgate Burn, which flows onto Portobello Beach. The E.coli levels recorded throughout the season were continuously at a level that poses an extreme risk to public health. For 11 out of the 12 samples the E.coli results recorded were 10x the acceptable levels to meet “sufficient” classification and when analysed in line with Bathing Water Regulations (2013) they returned results of 27x “sufficient” status 90% of the time and 35x “sufficient” status 95% of the time. These high levels categorically indicate a continuous input of faecal based point source pollution, or sewage pollution, into Figgate Burn.

For the remaining five river locations, results consistently show contamination levels that pose an extreme risk to public health, and at 10x the acceptable levels to meet “sufficient” Bathing Water classification, including

- 4 out of 18 samples at Seaton Burn flowing into Seaton Sluice Beach
- 5 out of 13 samples at River Ribble flowing into St Anne’s Beach
- 1 out of 8 samples at Afon Wyre flowing into Llanrhystud Beach
- 3 out of 14 samples at Hoffnant River flowing into Penbryn Beach
- 4 out of 14 samples at River Adur flowing into Southwick Beach

The results from our river water quality sampling are sampling shocking and raise serious cause for concern. The Bathing Water Directive requires that waste water treatment works up to 10 miles from a designated bathing area to have UV treatment on final effluent and associated sewer overflows.

OUR RESULTS BRING IN TO QUESTION WHETHER ASSOCIATED TREATMENT WORKS ARE MEETING THESE REQUIREMENTS.

But how does this correlate to the Bathing Water quality at the beaches these rivers connect to? At St Anne’s beach, two out of thirteen samples taken found E.coli levels recorded that would pose an extreme risk to public health. These correlated with elevated levels also recorded in the river. This clearly shows the impact river health has on beach locations.

Our results also highlight fundamental flaws in the testing regime. Regulators use modeling to identify the likely plume of dispersal around a point source and or river flowing into a bathing water. Water quality testing is taken at the same location at each bathing water and can be located on the edge of or outside this plume of dispersal, therefore ignoring the quality of water where pollution might be highest. Of course, people don’t simple just enjoy beaches in one spot and move around. Given the findings of our citizen science work highlighting the risk water quality of rivers pose to human health, we might expect those using beaches to be at a higher risk of getting sick

Interestingly, for five of the eight locations, our results returned a different overall classification to that of the regulator, two returning worse classifications and three returning better overall classifications.

Taking in to account the limitations of the method, an accepted error factor of 50% could be applied to the results, which would still not change the overall calculated Bathing Water classifications of any of the eight locations.

CONCLUSIONS

Bathing Waters in the UK have struggled to achieve the highest standards for over thirty years, compared to our European neighbours. We regularly rank close to the bottom of the league table of European countries for cleanliness with the number of 'excellent' rated Bathing Waters consistently missing the 83% high of 2011.

In 2019, whist 98% of Bathing Waters met minimum standards, only 66% were classed as 'excellent'. In 2020, 71% of Bathing Waters were not classified at all due to COVID-19 restrictions. This saw us tumble to the bottom of the table of 31 European counties for the cleanliness of Bathing Waters.

The UK consistently performs poorly in the Bathing Water classification system, yet we also believe the current regime is seriously flawed, which raises even greater concerns about the state of our waters. Water quality testing is limited by the number of days sampling takes place – just 153 days of the official Bathing Season. This only provides a single weekly snapshot of water quality at a designated location, with classifications collated from the four previous years to provide public information. This clearly doesn't provide a real picture of Bathing Water on any given day but rather a prediction, based on historic and selective data. Furthermore, water quality performance can be legally manipulated through the optional provision within the Bathing Water Directive to discount up to 15% of samples if they are affected by a "short term pollution event". Shockingly, this includes sewage contamination, one of the major causes of poor water quality! The regulator has the power to eliminate this loophole that conveniently casts a blind eye to sewage pollution at Bathing Waters nationwide.

The Safer Seas & Rivers Service clearly shows that sewage is still plaguing Bathing Waters that are classified as 'excellent' and 'good'. Perhaps surprisingly, during the summer months, this is a more regular occurrence at the better rated beaches than at those rated 'sufficient' and 'poor. Worse still, in the winter, when no testing is carried out, more sewage is being pumped out with little variation between classifications. The testing and classification regime provides a framework of historic water quality data and a foundation to call for improvements. However, it currently provides no specific real-time water quality information, so on those days that we choose to use the water we are gambling with our health. It is clear that this system needs a major overhaul, moving towards a programme that monitors water quality all year round and provides real-time data. We must move away from the archaic concept of a 'Bathing Season', which is a hangover from a time when people only used the sea to paddle in the summertime. We need to modernise expectations for a society that increasingly relies on clean green and blue environments all year round.

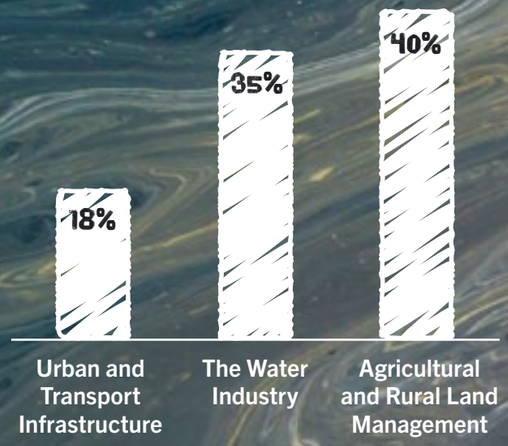
We are regularly told that rivers are in the best state they have been since the industrial revolution.[18,19] Our finding suggests otherwise and provides yet more evidence of the shocking state of rivers. **All but two rivers we monitored pose an extreme risk to human health and these rivers flow directly onto or in very close proximity to some of our most popular beaches.** The results of our citizen science work clearly show the continuous input of faecal based pollution into rivers and that this can impact the quality of water at Bathing Waters. Rivers are at the forefront of a new boom in wild swimming, canoeing and stand-up paddle-boarding. However, even Sir James Bevan, the chief executive of the Environment Agency has been quoted stating ***"[I'd] be cautious about swimming in a river unless I was satisfied that it did have the necessary level of assurance. Our rivers have not been, and are currently not managed for people to swim in"***.[20] We need urgent action to clean up our rivers for people and wildlife. We need popular recreation spots on rivers to be recognised and designated as Bathing Waters. This would add a strong legal driver to improve river water quality and give those who enjoy using rivers for recreation the same access to information and protection as those who visit the coast. It would help drive a new wave of action to clean and restore blue spaces nationwide, funded from water company profits rather than by the bill payer. Water companies must stop treating our rivers as open sewers and finally put people and the planet before their profits.

WHAT CAUSES POOR WATER QUALITY?

Of course, sewage is not the only contributor to poor water quality.

Water quality is also impacted by the agricultural industry and urban environments, including pollution from roads. River Action recently revealed the extent to which industrial chicken farming is causing the destruction of the River Wye[21]. In evidence provided to the Environmental Audit Committee, it was also revealed that there are in the region of 1 million highway drains that discharge water contaminated with hydrocarbons, metals and plastic directly into water courses.[22]

FIGURE 12 HUMAN IMPACTS ON WATER QUALITY



18 Environment Agency (2020) Emma Howard Boyd on the State of the Environment Report - Creating a better place, accessed 25 October 2021, https://environmentagency.blog.gov.uk/2020/09/08/emma-howard-boyd-on-the-state-of-the-environment/

19 UK Govenment (2019) Letter to The Times from Emma Howard Boyd, Chair of Environment Agency (3 August 2019), accessed 25 October 2021, https://www.gov.uk/government/news/letter-to-the-times-from-emma-howard-boyd-chair-of-environment-agency

20 McGlone, C. (2021) EA chief would be 'cautious' about swimming in England's dirty rivers, Ends Report

21 River Action (2021) The poultry farms turning the Wye into a "wildlife death trap", accessed 25 October 2021, https://riveractionuk.com/Campaigns/the-poultry-farms-turning-the-wye-into-a-wildlife-death-trap/

22 Environmental Audit Comittee Water quality in rivers - Session 3 - Committees - UK Parliament, accessed 25 October 2021, https://committees.parliament.uk/event/4556/formal-meeting-oral-evidence-session/

WATER QUALITY AND HUMAN HEALTH

Using blue spaces on our coastline and rivers for recreation brings many well-known human health benefits.[23] However, poor water quality puts us at risk of illness when we immerse in these spaces, due to exposure to harmful bacteria and viruses that can be present in sewage and other runoff.

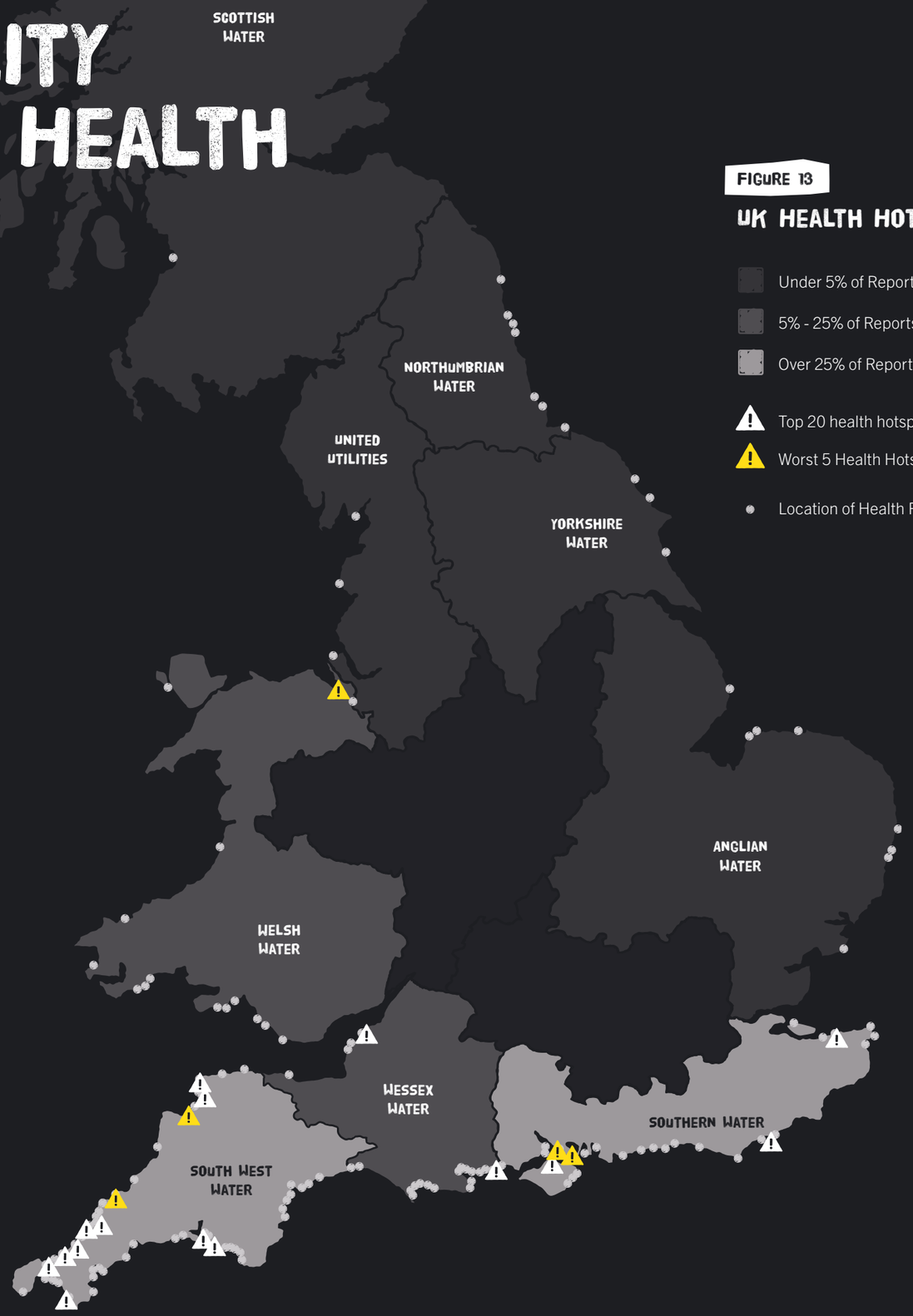
Recent research has shown that we are just as likely to get sick from entering the water now as we were back in the 1990s.[24] However, the public health risks we face when we surf, swim and play in the water are poorly documented.

For the second year, we have collated health reports through the Safer Seas & Rivers Service (SSRS) to gather evidence on the impact poor water quality and sewage pollution could be having on people's health. They offer a glimpse into the threats faced by water users across the UK and allow us to identify areas where there might be elevated risk of illness from poor water quality or sewage spills.

It should be noted that we have limited levels of data from those who are directly engaged with our work through the Safer Seas & Rivers Service, and other water quality campaigns. As a result, it is likely that our analysis is a vast underestimate of water quality related illness actually experienced by the wider public. We also only track health reports for those locations covered by the SSRS; these are predominately coastal. Outbreaks may go unreported for locations not covered by the App, particularly inland locations on rivers and lakes. We are also unable to account for factors such as location popularity which could impact on the number of health report submitted for a location.

FIGURE 13

UK HEALTH HOTSPOTS



HEALTH HOTSPOTS

Between 1st October 2020 and 30th September 2021, 286 water users reported being ill after entering the water. That's an increase of 124 reports compared to the same time period in 2019/20.

Every report submitted represents a period of time at which all water users at that location might have been exposed to harmful microorganisms and subsequent illness and disease.

Figure 13 shows all locations for which health reports have been submitted.

The worst health hotspot this year, with 21 incidences of sickness, was at **Hillhead**, a "good" classified Bathing Water within the Southern Water area. The majority of these health reports occurred outside the Bathing Season. Hillhead is home to two river or stream intersections, as well as the Southampton Water estuary.[25] As we found though our water quality testing programme, rivers are generally in poor health and can pose a serious risk to human health. It's therefore unsurprising that we have seen a large number of health reports from Hillhead.

The majority of reports submitted fell within the boundaries of South West Water (38%) and Southern Water (29%).

THIS PATTERN IS THE SAME AS THE PREVIOUS YEAR, BUT IT SHOULD BE NOTED THAT THERE HAS BEEN A LARGE JUMP IN THE REPORTS OF SICKNESS WITHIN THE SOUTHERN WATER BOUNDARY THIS YEAR, AS SHOWN IN FIGURE 14.

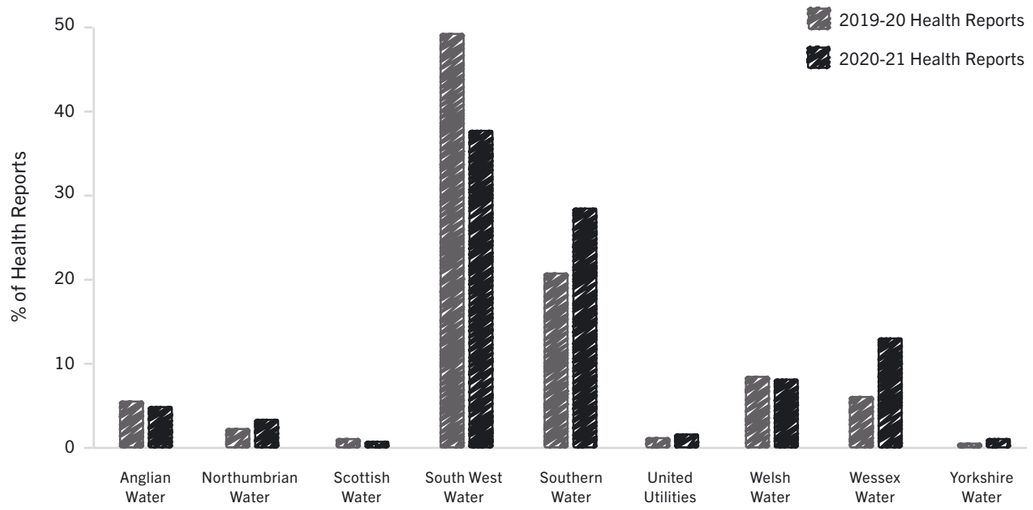
23 White, M.P., Elliott, L.R., Gascon, M., Roberts, B., and Fleming, L.E. (2020) Blue space, health and well-being: A narrative overview and synthesis of potential benefits, Environmental Research, Vol.191, p.110169,Crouse, D.L., Balram, A., Hystad, P., et al. Associations between Living Near Water and Risk of Mortality among Urban Canadians, Environmental Health Perspectives, Vol.126, No.7, p.077008

24 Leonard, A.F.C., Garside, R., Ukoumunne, O.C., and Gaze, W.H. (2020) A cross-sectional study on the prevalence of illness in coastal bathers compared to non-bathers in England and Wales: Findings from the Beach User Health Survey, Water Research, Vol.176, p.115700

25 Bathing water profile, accessed 19 October 2021, https://environment.data.gov.uk/bwq/profiles/profile.html?site=ukj3304-16850

FIGURE 14

PERCENTAGE OF HEALTH REPORTS SUBMITTED BY WATER COMPANY BOUNDARY



TOP 20 LOCATIONS

Compared to last year, seven locations have remained in the top twenty for number of health reports submitted: the Dee River, Hillhead, Plymouth Hoe East, Perranporth, Polzeath, St Leonard's and Westward Ho!

Of these locations, 6 reported increased levels of sickness from the previous year. The number of sickness reports for the top twenty locations has increased with an average of six reports per Bathing Water, up from three reports in 2019/20.

A TOTAL OF 16 OF THE TOP TWENTY LOCATIONS FOR HEALTH REPORT SUBMISSIONS FALL WITHIN THE BOUNDARIES OF SOUTH WEST WATER AND SOUTHERN WATER.

TABLE 5

LOCATIONS WITH MOST HEALTH REPORTS SUBMITTED

RANK	LOCATION	WATER COMPANY
1	Hillhead	Southern Water
2	Westward Ho!	South West Water
3	Polzeath	South West Water
4	St Leonards	Southern Water
5	Dee River	Welsh Water
6	Croyde Bay	South West Water
7	Perranporth	South West Water
8	Porth	South West Water
9	Plymouth Hoe East	South West Water
10	Tankerton	Southern Water
11	Gwithian Towans	South West Water
12	Cowes	Southern Water
13	Hastings Pelham Beach	Southern Water
14	Mawgan Porth	South West Water
15	Porthtowan	South West Water
16	Woolacombe Village	South West Water
17	Christchurch Avon Beach	Wessex Water
18	Clevedon Beach	Wessex Water
19	Plymouth Hoe West	South West Water
20	Poldhu Cove	South West Water

HEALTH REPORTS & WATER QUALITY

Reviewing the 168 health reports submitted during the 2021 Bathing Season (15 May to the end of day on the 30 September), when all water companies and regulators provide notifications, we have found that 30% of all reported sickness occurred within 48 hours of a Sewer Overflow discharge or PRF notification on the SSRS.

A total of 18% of all reports submitted correlate with a Sewer Overflow discharge notification (see **Figure 15**).

PERHAPS, MOST CONCERNING OF ALL IS THAT MOST ILLNESS THAT WAS REPORTED WAS LINKED TO BATHING WATERS CLASSIFIED AS 'EXCELLENT'.

As shown in **Figure 16**, sicknesses have been reported across all Bathing Water quality classifications during the Bathing Season, and are not limited to those ranked as "sufficient" or "poor". Interestingly, on average, sicknesses reported didn't decline as Bathing Water classifications improved. In fact, the majority of sickness reports fell within "excellent" rated Bathing Waters.

FIGURE 15

HEALTH REPORTS AND SSRS NOTIFICATIONS

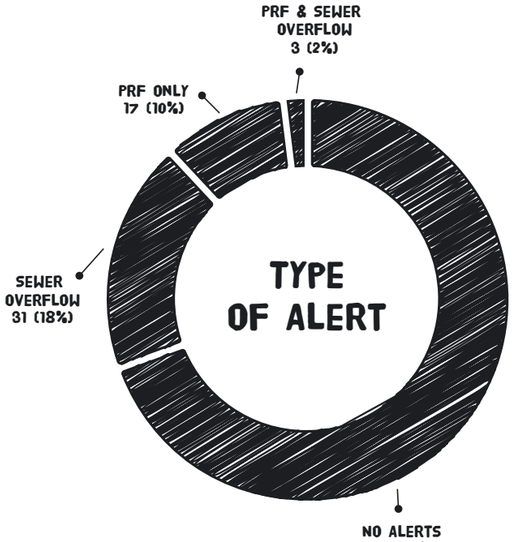
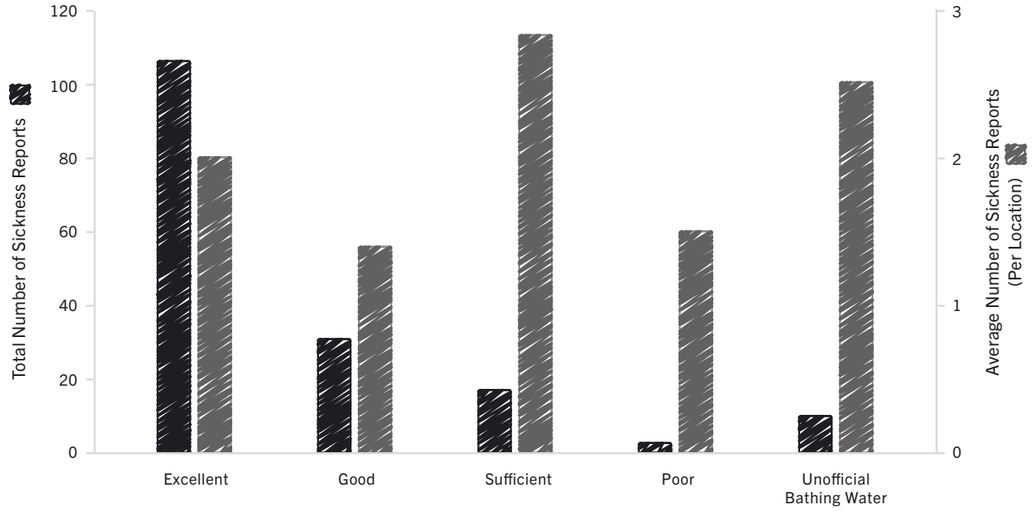


FIGURE 16

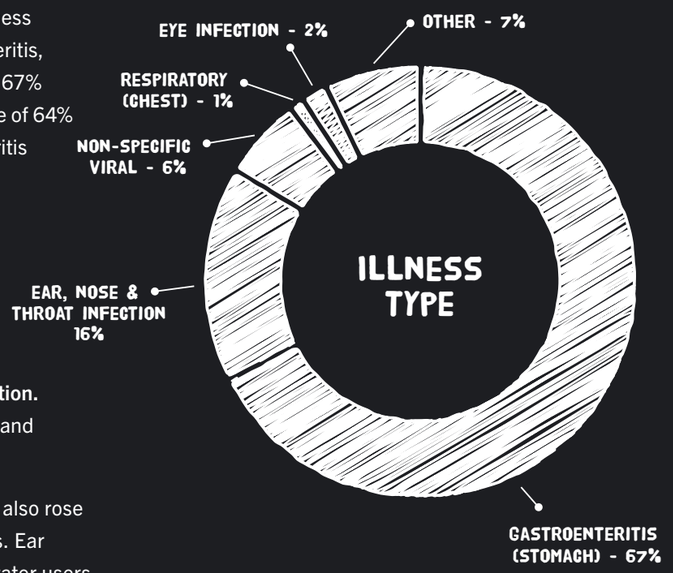
BATHING WATER CLASSIFICATIONS AND THE NUMBER OF SICKNESS REPORTS SUBMITTED



TYPES OF ILLNESS REPORTED

Figure 17 shows the types of illnesses reported this year.

FIGURE 17 TYPES OF ILLNESS REPORTED



Similarly to last year, the most common illness experienced by water users was gastroenteritis, with 177 reports submitted accounting for 67% of all illnesses reported. This is an increase of 64% compared to 2019/20 reports. Gastroenteritis makes water users experience a variety of symptoms, from severe diarrhoea and nausea to projectile vomiting and fevers.

This is not a minor health issue - on NHS Inform Scotland[26], it states to **get medical advice if you've returned from travelling to an area with poor sanitation.** Maybe we should start including UK rivers and waters in this too?

Reports of ear, nose and throat infections also rose this year, accounting for 39 health reports. Ear infections have had profound effects on water users in the past few years, with one individual reporting that it was no longer comfortable to swim with their head underwater as a result.

The most severe ear infection reported this year resulted in such severe swelling that a facial nerve became damaged **causing right sided facial paralysis**. The effects of which were still being endured seven months later with reduced facial movement.

THE MOST SEVERE CASE REPORTED TO US THIS YEAR INVOLVED A PERSON THAT REQUIRED THREE DOSES OF ANTIBIOTICS TO TREAT A KIDNEY INFECTION, SUSPECTED TO HAVE BEEN CONTRACTED WHILST USING THE WATER.

26 Gastroenteritis | NHS inform, accessed 4 November 2021, https://www.nhsinform.scot/illnesses-and-conditions/stomach-liver-and-gastrointestinal-tract/gastroenteritis

27 (2018) Lucky dip: the thrill of wild swimming, accessed 20 October 2021, https://www.positive.news/lifestyle/lucky-dip-the-thrill-of-wild-swimming/,(2021) 'My problems wash away': bathers reveal the healing power of swimming, accessed 20 October 2021, https://www.positive.news/lifestyle/wellbeing/bathers-reveal-the-healing-powers-of-cold-water-swimming/

28 Environment Agency State of the environment: health, people and the environment, accessed 7 October 2020, https://www.gov.uk/government/publications/state-of-the-environment/state-of-the-environment-health-people-and-the-environment

29 Surfers Against Sewage (2020) Long Time No Sea: Beach Loving Brits Count Down the Days Until They're Reunited with the Coast • Surfers Against Sewage

30 Surfers Against Sewage (2021) Thriving Ocean, Thriving People: The connection between ocean restoration and the blue wellbeing economey, 2021

31 'Tens of people' fall ill after swimming in Warleigh Weir - Somerset Live, accessed 20 October 2021, https://www.somersetlive.co.uk/news/local-news/tens-people-fall-ill-after-5731712

CONCLUSIONS

The COVID-19 pandemic has shown us just how important our natural world is for both our physical and mental wellbeing. We have seen huge increases in the numbers of people taking up water-based sports such as paddle boarding and kayaking, particularly on rivers and lakes by those who are unable to easily access the coast.[27,28,29]

In a representative survey of 10,000 members of the British public, we found participation in water sports doubled between 2019 and 2020[30] with the sharp increase in popularity of stand-up paddle boarding resulting in it being dubbed 'the sport of 2020'.

THE FUNDAMENTAL HUMAN RIGHT TO BE ABLE TO ACCESS WATER WITHOUT THE RISK OF GETTING ILL SHOULD PERHAPS BE APPLIED TO THE USE OF WATER FOR OUR MENTAL HEALTH AND WELLBEING.

Health reports submitted this year highlight that we are still getting sick after enjoying the water, and in some cases, the impacts can be very serious. With one in three reported instances of illness correlating with warnings of the potential for reduced water quality, the links between water quality and sickness are clear.

IN ADDITION, IT IS SHOCKING TO SEE THAT OVER 60% OF HEALTH REPORTS SUBMITTED ARE FROM BATHING WATERS CLASSIFIED AS "EXCELLENT" – A CLASSIFICATION THE IS DEFINED AS 'THE HIGHEST, CLEANEST SEAS'.

There also seems to be no correlation between Bathing Water classifications and the number of health reports submitted – we would expect to see considerably fewer health reports on average for Bathing Waters with better classifications.

The water quality testing regime and classification process is meant to protect human health and so we would expect that when swimming at locations classified as "excellent" or "good" the risk of getting sick would be extremely minimal.

But the limitations of the testing regime, based on restricted spot sampling during the Bathing Season alone, appears to give limited assurance as it is currently interpreted and implemented.

THE SHOCKING STATE OF RIVERS IS CLEARLY HAVING A DETRIMENTAL IMPACT ON THE HEALTH OF THE INCREASING NUMBER OF PEOPLE USING INLAND WATERWAYS.

The River Dee has consistently been within the top ten health hotspots over the past two years, with five reports being submitted during this year's Bathing Season alone and three instances of illness occurring within 48 hours of a sewage discharge. This, along with the "tens of people" who fell ill after bathing at Warleigh Weir this autumn[31], puts the harmful consequences of sewage discharges at the doorstep of all water companies. With many popular inland locations lacking official Bathing Water status, no routine water quality testing is carried out, however flawed it currently is, leaving river swimmers, kayakers and paddle boarders in the dark on the quality of water they are entering.

It is a huge concern that this growing community of water users in communities nationwide are being denied common-sense public health information and the sort of water quality data and safeguards offered to coastal communities.

TALKING POLITICS

In January 2021, the UK left the European Union and is therefore no longer bound by European environmental legislation. As the UK develops its own environmental policy, we must take the opportunity to fight for legislation that reduces pollution into rivers and seas, that allows nature to rebound, and enables people to safely enjoy beautiful natural and wild environments for our physical and mental wellbeing.

Catastrophically, however, when the new Environment Bill (now the Environment Act) was first published in 2020, the document which sets out how the environment will be protected for decades to come, it contained almost nothing that would do anything to tackle sewage pollution or improve water quality.

This was simply not good enough. So, over the last 18 months, thousands of people have used the Safer Seas & Rivers Service to highlight the sewage pollution crisis to their local MPs. Since May 2020, almost 8,000 emails were sent to 103 MPs across the country notifying them when there was a Sewer Overflow discharge or PRF warning at a location in their constituency (see **Table 5**). And in 2020, almost 50,000 people signed the #EndSewagePollution petition, in a campaign that was backed by a cross sector group of over 20 organisations. This was handed directly to George Eustice, Secretary of State for the Environment Food & Rural Affairs in November 2020.

SO ARE OUR ELECTED LEADERS LISTENING TO OUR GROWING CONCERNS AND CALLS TO #ENDSEWAGEPOLLUTION?

WHO MAKES UP THE #ENDSEWAGEPOLLUTION COALITION?

The #EndSewagePollution Coalition is cross sector group of organisation working hard to bring about an end to sewage pollution. It is made up of:

Angling Trust
Backwash Surf Magazine
Blue Marine Foundation
British Canoeing
Cave Magazine
London Waterkeeper
Oceanogrpahic Magazine
Outdoor Swimmer
Outdoor Swimming Society
Rayal Lifesaving Society
RSPB
Salmon & Trout Conservation
Surfers Against Sewage
Surf Girl
Surfing England
The Rivers Trust
Waterkeeper Alliance
Wavelength
Wildlife & Countryside Link
Windrush Against Sewage Pollution

THE GOOD

The mounting public and political pressure has driven the issue of sewage pollution and water quality right up the political, media and public agenda.

Thanks to this pressure, a total of 136 MPs supported the Chair of the Environmental Audit Committee, Phillip Dunne MP's, Sewage (Inland Waters) Bill. This Bill sought to place legal obligations on water companies to take steps to ensure sewage is not discharged into inland waters. Whist this Bill unfortunately ran out of time in the last parliamentary term to make it into law, it provided gold standard policies that have shaped the vital improvements needed in the Environment Act.

The amendments made to the to the Environment Bill during the summer of 2020 require government to publish a plan by September 2022 to reduce discharges from sewage overflows and report on progress of this plan annually.

WATER COMPANIES WILL ALSO BE REQUIRED TO PUBLISH DATA ON SEWAGE OVERFLOW OPERATIONS ANNUALLY, PROVIDE YEAR-ROUND REAL-TIME INFORMATION ON WHEN SEWAGE OVERFLOWS OPERATE AND MONITOR THE IMPACTS OF SEWAGE DISCHARGES UP AND DOWN STREAM OF DISCHARGE POINTS.

In addition, the Environmental Audit Committee have opened an inquiry into river water quality, bringing together critical evidence on the state of English rivers and questioning the biggest industries responsible for pollution. The evidence of the inquiry is already shining a political spotlight onto the worsening water quality in rivers and the scale of the sewage pollution crisis.

The formal findings from the inquiry will soon be presented to government and be used to hold them to account and inform future environmental policy.

THE BAD

This increase in transparency of data and monitoring of water quality is a big step in the right direction and will help surfers, swimmers, paddleboarders and water lovers stay safe when using the water.

But it won't actually address the fundamental issue of stopping sewage pollution and improving water quality.

Therefore, when the Environment Bill arrived in the House of Lords for scrutiny in October 2021, the Duke of Wellington put forward an amendment to the Bill that would place a legal duty on water companies to ensure untreated sewage is not discharged from sewage overflows.

WITH THE BACKING OF OVER 100,000 MEMBERS OF THE PUBLIC AND CROSS-PARTY SUPPORT, THIS AMENDMENT WAS PASSED BY THE HOUSE OF LORDS.

THE UGLY

However, as the Environment Bill returned to the House of Commons, the government won a narrow vote (268 to 204) to strip the legal duty on water companies legally obliging them to stop the discharge of sewage into our rivers and seas.

The Duke of Wellington's amendment was a reasonable and clear new driver to make water companies accountable and force them to take action so it was a great surprise that some MPs decided to vote it down. This vote seemed to protect water company shareholders and profits rather than the blue environment and the people that use it. This wholeheartedly contradicts the 'polluter pays' principle that will be enshrined in law in the very same Bill.

THE GOVERNMENT'S 2022 SEWAGE POLLUTION PLAN MUST BE FOCUSED ON BOTH LONG TERM AND INTERIM TARGETS TO DELIVER FAST-PACED ACTION TO END THE SCOURGE OF POLLUTION

IN RIVERS AND AT THE COASTLINE.

We were also surprised that MPs suggested the Duke of Wellington amendment would potentially cost the public up to £660 billion to End Sewage Pollution. The government has itself commissioned a report that shows that dealing with the worst of the sewage pollution of rivers and coastlines would cost in the region of £3.9 - £62 billion – well within affordability using some of the huge profits the industry makes every year. An important note of context to these sums is that water companies have extracted almost £60billion in dividends since privatisation in 1989.

THE RESULTS OF THE VOTE AND THE MISINFORMATION CAMPAIGN SUBSEQUENTLY CAUSED HUGE PUBLIC OUTCRY WITH STORIES OF THE SEWAGE SCANDAL HITTING HEADLINES ACROSS THE COUNTRY.

On return of the Bill to the Lords, The Duke of Wellington subsequently put forward a reworded amendment in another attempt to place a legal duty on water companies to act. This amendment passed overwhelmingly in the House of Lord. This, along with huge public anger, forced the Government to shift course, announcing it would enshrine into law a duty on water companies to 'progressively reduce the adverse impacts of sewage discharges.

What we have ended up with in the Environment Act is a legal obligation on water companies to act, but one riddled with loopholes that could allow water companies to continue to discharge sewage into the rivers and seas we cherish.

SO WHAT NOW?

Our campaign is far from over...

The government has a real opportunity to ensure the environment is at the heart of water company investment programmes through the guidance it gives the price regulator, OFWAT, in its 'strategic policy statement'.

We'll be working hard to make sure investment to end sewage pollution is a core part of this advice.

And of course, we'll be watching closely as the government develops its plan to tackle sewage pollution that it will publish in 2022. This MUST be focused on both long term and interim targets to deliver fast-paced action to end the scourge of pollution in rivers and at the coastline.

AFTER ALL, THIS IS THE DECADE OF ECOSYSTEM RESTORATION SO WHAT BETTER PLACE TO START THAN WITH OUR RIVERS AND SEAS.

PHOTO CREDIT: TWIN FI

#ENDSEWAGEPOLLUTION CAMPAIGN MILESTONES

14 OCT 2020

SEWAGE (INLAND WATERS) BILL

Published by Phillip Dunne MP.

10 NOV 2020

#ENDSEWAGE-POLLUTION

petition delivered with 44,691 signatures.

22 JAN 2021

STORM OVERFLOW TASKFORCE

announce goal to eliminate harm from storm overflow

- Water companies commit to make real-time data on sewage discharges available at bathing sites all year round.
- Water companies commit to publish how many times they have used Sewer Overflows to pump raw sewage into the environment each year.

31 MAR 2021

ENVIRONMENT AGENCY

Reveals water companies discharged raw sewage into rivers and coastal waters 400,000 times for a total of 3.1m hours via storm overflow pipes.

9 JUL 2021

SOUTHERN WATER FINED £90 MILLION

2 AUG 2021

GOVERNMENT ANNOUNCE DOUBLING OF FUNDING

To help farmers improve water quality and announce funding for 50 new environmental inspectors.

13 SEPT 2021

HOUSE OF LORDS

Passes amendment 60 which places a legal duty on water companies to take all reasonable steps not to pollute.

30 SEPT 2021

BATHING SEASON IN ENGLAND ENDS

But for the first time Water companies continue to provide sewage discharge notifications through the Safer Seas & Rivers Service.

21 OCT 2021

HOUSE OF COMMONS

Vote to remove amendment to the Environment Bill passed in the Lords. 20 backbench conservative rebel against the government.

22 - 26 OCT 2021

HUGE PUBLIC OUTCRY

of government decision to remove legal obligations to stop water companies polluting from the Environment Bill. Over 27,000 emails sent to MPs demanding action.

5 - 7 NOV 2021

GOVERNMENT PUBLISH AMENDMENT

To place a duty on water companies to progressively reduce harm from sewage discharges however the amendment is widely criticised by the environmental sector for lacking teeth.

8 NOV 2021

HOUSE OF COMMONS VOTE

In favour of the government's amendment along party lines.

9 NOV 2021

HOUSE OF LORDS

Support changes made by the Commons and the Bill receives royal assent and becomes the Environment Act 2021.

6 NOV 2020

2020 WATER QUALITY REPORT

Published by Surfers Against Sewage.

8 DEC 2020

ENVIRONMENT AUDIT COMMITTEE

Open its Inquiry on Water Quality in Rivers.

29 MAR 2021

GOVERNMENT COMMITS TO AMEND THE ENVIRONMENT BILL TO PLACE:

- A duty on government to publish a plan by September 2022 to reduce sewage discharges from storm overflows;
- A duty on government to report to Parliament on progress on implementing the plan; and
- A duty on water companies to publish data on storm overflow operation on an annual basis.

15 MAY 2021

BATHING SEASON IN ENGLAND BEGINS

27 AUG 2021

GOVERNMENT COMMITS TO AMEND THE ENVIRONMENT BILL FURTHER...

...to place a legal duty on water companies to:

- Provide real-time information (within one hour) on when storm overflows operate.
- Monitor the water quality impact of their sewage discharges and to make this data publicly available.
- The government also created a duty on themselves to publish a report considering the costs and benefits of eliminating overflows entirely and committed to review the use of Sustainable Drainage Systems.

26 OCT 2021

HOUSE OF LORDS

Emphatically pass new amendment to place a duty of water companies to take all reasonable steps to stop discharging sewage into inland and coastal waters.

GOVERNMENT ANNOUNCE U-TURN

And commit to placing a legal duty on water companies to progressively reduce harm from sewage discharges.

18 NOV 2021

MAJOR SEWAGE POLLUTION INVESTIGATION LAUNCHED

The Environment Agency and Ofwat announce widespread investigation of over 2,000 sewage treatment works covering all water companies for releasing unpermitted sewage.

LOOK AHEAD...

MAR 2022

PUBLICATION OF 2021 STORM OVERFLOW DATA

MAR/APR 2022

PUBLIC CONSULTATION

On Government's Storm Overflow plan takes place

SEPT 2022

GOVERNMENT PUBLISH STORM OVERFLOW PLAN

TABLE 6 MPs CONTACTED THROUGH THE SSRS AND THEIR SUPPORT TO END SEWAGE POLLUTION

NAME OF MP	CONSTITUENCY	TOTAL EMAILS SENT	E-MAILS SENT IN 2019/20	E-MAILS SENT IN 2020/21	SUPPORTED THE SEWAGE INLAND WATERS BILL	VOTED*
Alan Mak	Havant	98	94	4	Yes	No
Allan Dorans	Ayr, Carrick and Cumnock	6	6	0	No	Did not vote
Alun Cairns	Vale of Glamorgan	80	7	73	No	No
Anne Marie Morris	Newton Abbot	103	32	71	Co-sponsor	No
Anne-Marie Trevelyan	Berwick-upon-Tweed	64	16	48	No	Did not vote
Anthony Mangnall	Totnes	23	16	7	Yes	No
Ben Lake	Ceredigion	14	8	6	No	Yes
Bob Seely	Isle of Wight	220	128	92	Yes	No
Brandon Lewis	Great Yarmouth	24	20	4	No	Did not vote
Caroline Ansell	Eastbourne	43	9	34	No	Did not vote
Caroline Dinenage	Gosport	63	39	24	No	No
Cat Smith	Lancaster and Fleetwood	8	3	5	No	Yes
Cherilyn Mackrory	Truro and Falmouth	456	277	179	Yes	No
Chris Loder	West Dorset	121	24	97	No	No
Christian Matheson	City of Chester	91	34	57	Yes	Did not vote
Conor Burns	Bournemouth West	43	7	36	No	Did not vote
Craig Mackinlay	South Thanet	146	39	107	No	Yes
Dame Angela Eagle	Wallasey	74	0	74	No	Yes
Damien Moore	Southport	13	7	6	No	No
David Duguid	Banff and Buchan	1	1	0	No	No
David Morris	Morecambe and Lunesdale	43	10	33	Yes	Did not vote
Derek Thomas	St Ives	318	74	244	Co-sponsor	Yes
Douglas Ross	Moray	1	1	0	No	No
Dr James Davies	Vale of Clwyd	15	4	11	Yes	No
Dr Jamie Wallis	Bridgend	33	11	22	No	No
Dr Liam Fox	North Somerset	145	130	15	Yes	No
Dr Philippa Whitford	Central Ayrshire	2	2	0	No	Did not vote
Dr Thérèse Coffey	Suffolk Coastal	6	5	1	No	No
Duncan Baker	North Norfolk	27	23	4	Yes	No
George Eustice	Camborne and Redruth	358	175	183	No	No
Geraint Davies	Swansea West	94	39	55	No	Yes
Giles Watling	Clacton	45	5	40	No	No
Gordon Henderson	Sittingbourne and Sheppey	9	0	9	No	Yes
Graham Stuart	Beverly and Holderness	35	3	32	No	No
Grahame Morris	Easington	52	10	42	No	No
Huw Merriman	Bexhill and Battle	73	12	61	Yes	Yes
Ian Levy	Blyth Valley	16	8	8	No	Did not vote
Jacob Young	Redcar	77	6	71	No	No
James Duddridge	Rochford and Southend East	112	38	74	No	Did not vote
James Heappey	Wells	25	11	14	No	No
James Wild	North West Norfolk	8	6	2	Yes	No
Jill Mortimer	Hartlepool	16	0	16	No	No
John Lamont	Berwickshire, Roxburgh and Selkirk	1	1	0	No	No
John Penrose	Weston-Super-Mare	113	75	38	No	No
Julie Elliott	Sunderland Central	3	3	0	No	Yes
Karin Smyth	Bristol South	9	0	9	No	Did not vote
Kenny MacAskill	East Lothian	1	1	0	No	Yes
Kevin Foster	Torbay	110	35	75	No	Did not vote
Kevin Hollinrake	Thirsk and Malton	10	9	1	Yes	No
Kirsty Blackman	Aberdeen North	13	13	0	No	Did not vote
Liz Saville Roberts	Dwyfor Meirionnydd	2	1	1	No	Yes
Luke Pollard	Plymouth, Sutton and Devonport	58	11	47	No	Yes
Margaret Greenwood	Wirral West	19	13	6	No	Did not vote
Mark Menzies	Fylde	39	32	7	Yes	No
Martin Vickers	Cleethorpes	28	17	11	Yes	No
Mike Hill	#N/A	9	3	6	No	
Mr Geoffrey Cox	Torridge and West Devon	122	98	24	Yes	Did not vote
Mr Ian Liddell-Grainger	Bridgwater and West Somerset	66	39	27	No	Did not vote
Mr Jacob Rees-Mogg	North East Somerset	46	0	46	No	No
Mr Robert Goodwill	Scarborough and Whitby	109	36	73	No	No
Mr Simon Clarke	Middlesbrough South and East Cleveland	126	22	104	No	Did not vote
Mr Tobias Ellwood	Bournemouth East	171	44	127	No	Did not vote
Mrs Emma Lewell-Buck	South Shields	6	2	4	Yes	Did not vote
Mrs Sheryll Murray	South East Cornwall	90	41	49	No	No
Ms Angela Eagle	Wallasey	3	3	0	No	Yes
Neale Hanvey	Kirkcaldy and Cowdenbeath	2	2	0	No	Did not vote
Neil Parish	Tiverton and Honiton	21	4	17	Yes	No
Nick Gibb	Bognor Regis and Littlehampton	91	19	72	No	No
Patricia Gibson	North Ayrshire and Arran	2	2	0	No	Did not vote
Paul Maynard	Blackpool North and Cleveleys	17	9	8	No	No
Peter Aldous	Waveney	39	36	3	No	No
Peter Kyle	Hove	117	117	0	No	Yes
Richard Drax	South Dorset	106	22	84	Yes	Did not vote
Robbie Moore	Keighley	8	0	8	Yes	No
Robin Millar	Aberconwy	2	2	0	Yes	No
Rosie Duffield	Canterbury	252	5	247	Yes	Yes
Sally-Ann Hart	Hastings and Rye	168	36	132	Yes	No
Scott Benton	Blackpool South	20	5	15	No	No
Scott Mann	North Cornwall	133	73	60	Co-sponsor	No
Selaine Saxby	North Devon	151	63	88	Yes	No
Simon Fell	Barrow and Furness	8	3	5	Yes	No
Simon Hart	Carmarthen West & South Pembrokeshire	95	38	57	No	Did not vote
Simon Jupp	East Devon	301	109	192	No	No
Sir Alan Campbell	Tynemouth	104	36	68	No	Yes
Sir Bernard Jenkin	Harwich and North Essex	1	0	1	No	Yes
Sir Christopher Chope	Christchurch	281	38	243	No	Did not vote
Sir David Amess[32]	Southend West	122	36	86	No	N/A
Sir Gary Streeter	South West Devon	83	30	53	Yes	No
Sir Geoffrey Cox	Torridge and West Devon	112	0	112	Yes	No
Sir Greg Knight	East Yorkshire	8	3	5	No	No
Sir Peter Bottomley	Worthing West	151	88	63	No	Yes
Sir Robert Syms	Poole	122	47	75	No	No
Sir Roger Gale	North Thanet	124	4	120	Yes	Did not vote
Stephen Crabb	Preseli Pembrokeshire	107	43	64	Yes	No
Steve Double	St Austell and Newquay	449	225	224	Yes	No
Tim Loughton	East Worthing and Shoreham	61	24	37	Yes	Yes
Tommy Sheppard	Edinburgh East	28	28	0	No	Did not vote
Tonia Antoniazzi	Gower	94	16	78	No	Yes
Trudy Harrison	Copeland	7	3	4	No	Did not vote
Victoria Atkins	Louth and Horncastle	131	6	125	No	No
Virginia Crosbie	Ynys Môn	38	24	14	No	No
Wendy Chamberlain	North East Fife	2	2	0	No	Yes
Other	#N/A	63	36	27	N/A	N/A

* Voted in Favour of Legally Requiring Water Companies to End Sewage Pollution

32 Sir David Amess was tragically murdered whist undertaking his duties as an elected member of parliament in his constituency just the week before this vote took place. Our respects are with his family and friends.

THE IMPACTS OF CLIMATE CHANGE

Current climate projections suggest the UK is in for wetter and warmer winters, and increased rainfall in both autumn and summer as a result of human induced climate change.[33,34]

Recent figures released by the Met Office have shown summers between 2010-2019 were 13% wetter than the period 1961-1990.[35] Winter rainfall has shown similar patterns with UK winters on average 5% wetter between 2010-2019 than 1981-2010[36] and 12% wetter than the period 1961 to 1990.[37] Rainfall records are now regularly being broken with February 2020 being the wettest February in history and the highest daily rainfall occurring in October 2020 at 32mm recorded.[38] This rainfall is increasingly occurring in heavier and more intense busts with a rise of 17% in the total rainfall on extremely wet days.[39]

This could have considerable implications for the challenges we face with sewage pollution. The increase in intense and heavy rainfall events will likely lead to a growing need to trigger Sewer Overflows, if action is not taken.

Numerous studies have linked climate change predictions to a greater frequency of combined sewer overflows events with modelling predicting up to three times more Sewer Overflow events under climate scenarios for rainfall.[40]

Whist the intensity of hourly rainfall is projected to increase in the future, overall, summers are projected to become drier with more frequent droughts. This will result in lower water flow within rivers with less volume for dilution. This is combined with the impact of water abstraction by the water industry which will result in an 80% reduction in river water flow by 2050.[41] Flash flooding from increased intensity summer rainfall events will therefore likely lead to increased levels of nutrient contaminates from sewage, agricultural and urban pollution, due to decreased dilution levels, further worsening water quality in rivers, lakes, streams and estuaries.[42]

If we do nothing to address climate breakdown, if industry across all sectors fails to invest, and if the government continues to refuse to introduce and enforce tough legislation to reduce sewage pollution, we expect the changing climate to further compound the challenges we face with water quality, the state of our rivers and the health of those that use these environments.

33 Met Office (2021) UK Climate Projections (UKCP), accessed 20 October 2021, https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index

34 Strandsbjerg Tristan Pedersen, J., Duarte Santos, F., van Vuuren, D., Gupta, J., Encarnação Coelho, R., Aparício, B.A., and Swart, R. (2021) An assessment of the performance of scenarios against historical global emissions for IPCC reports, Global Environmental Change, Vol.66, p.102199

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36 Kendon, M., McCarthy, M., Jevrejeva, S., Matthews, A., and Legg, T. (2019) State of the UK climate 2018, International Journal of Climatology, Vol.39

37 How is climate change affecting river and surface water flooding in the UK?, accessed 6 October 2021, https://www.lse.ac.uk/granthaminstitute/explainers/how-is-climate-change-affecting-river-and-surface-water-flooding-in-the-uk/

38 Kendon, M., McCarthy, M., Jevrejeva, S., Matthews, A., and Legg, T. (2019) State of the UK climate 2018, International Journal of Climatology, Vol.39,Davies, P.A., McCarthy, M., Christidis, N., et al. The wet and stormy UK winter of 2019/2020, Weather, Vol.n/a

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41 DEFRA (2021) Taskforce sets goal to end pollution from storm overflows, accessed 28 January 2021, https://www.gov.uk/government/news/taskforce-sets-goal-to-end-pollution-from-storm-overflows

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NATURE BASED SOLUTIONS TO TACKLE SEWAGE POLLUTION

Historically, we have looked to hard engineering solutions in an attempt to tackle sewage pollution and address water quality issues, often investing millions of pounds in pouring concreate, laying new pipes and building treatment works.

These solutions remain an important part of tackling sewage pollution but often come with their own challenges, not least the high carbon intensity in manufacture and construction. It's now time to also look at alternative means to address the sewage pollution crisis and improve water quality. It's time to invest in nature-based solutions.

NATURE-BASED SOLUTIONS ARE LIVING SOLUTIONS INSPIRED BY, MAINTAINED BY AND USED BY NATURE.

They are designed to mitigate societal challenges whilst simultaneously providing benefits to the surrounding environment, society and economy.[43] Nature-based solutions are multi-functional, providing several different ecosystem services and functions.[44]

BY PROTECTING, CONSERVING AND MANAGING DIFFERENT ECOSYSTEMS, THEY CAN HELP TO ADDRESS THE TWIN CHALLENGES OF CLIMATE CHANGE AND BIODIVERSITY LOSS.

They protect, manage and restore habitats to address these multiple challenges effectively, whilst also improving human well-being and ecosystem biodiversity.[45]

NATURE-BASED SOLUTIONS CAN BE USED TO BOTH REDUCE PRESSURE ON SEWERAGE SYSTEMS AND REDUCE SEWAGE DISCHARGES INTO THE ENVIRONMENT AS WELL AS TREAT WASTEWATER.

Sustainable Urban Drainage systems, tree planting and habitat creation capture water and slow surface and groundwater flow, reducing the rate at which water enters sewerage networks. This drastically reduces the pressure on the network and subsequent need to trigger sewage discharges into the environment.

Many studies have supported the use of nature-based solutions, principally wetlands, to retain excess nutrients and improve water quality.[46] The construction of wetlands as an 'end of pipe' solution have been shown to limit the pollution from Sewage Overflows.[47] Operating costs of wetlands are low and the capital costs can be highly competitive to other more tradition treatments, plus they bring a wealth of additional benefits including increasing local biodiversity and space for nature. However, it is critical that the use of nature-based solutions to treat sewage discharges do not negate the need to tackle the problem at source and reduce the reliance on Sewage Overflows in the first place.

43 Gómez Martín, E., Giordano, R., Pagano, A., van der Keur, P., and Máñez Costa, M. (2020) Using a system thinking approach to assess the contribution of nature based solutions to sustainable development goals, Science of The Total Environment, Vol.738, p.139693

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CONCLUSION

The government and industry want us to believe that water quality in the UK is improving. The findings of this report clearly show that this is far from the case.

THE WATER INDUSTRY IS STILL PUMPING SEWAGE INTO RIVERS AND THE OCEAN AT AN ALARMING RATE AND SHOWING LITTLE SIGN OF STOPPING. THE TREATMENT OF OUR BLUE SPACES AS OPEN SEWERS HAS TO END.

Our team of citizen scientists have clearly highlighted the dire state of rivers which flows directly into Bathing Waters. Seventy-five percent of rivers we tested over the summer pose a serious risk to human health. Rivers are the blue arteries of the country and are connected to the ocean as one water system, from cloud to coastline. Can the sea really be as clean as we are led to believe if it is being fed by river water that is in such a poor state? We simply cannot continue to use rivers as a means to 'treat' polluted water. However dilute the water industry claims Sewer Overflow effluent is, this cannot be a justification for them to release millions of hours of untreated sewage every year.

IT'S OVERWHELMINGLY CLEAR THAT THE ENTIRE WATER INDUSTRY NEEDS TO CLEAN UP ITS ACT.

However, Southern Water has again been shown to have a complete contempt for some of our most precious waterways and best-loved beaches on the south coast. It is no wonder that we are seeing the most cases of sickness being reported from beaches in Southern Water's operational boundary.

The links between sewage pollution and human health are clear. Left to its own devices, the water industry will continue to put the profits of its shareholders over the health of people and the environment, paying out huge dividends whilst destroying the rivers and coastlines we love and rely upon. Government must stop weakening legislation that protects us and the environment, stop hindering investment that encourages water companies to 'sweat their assets', and stop wilfully ignoring some of the worst pollution instances. Instead, we need to properly resource, regulate and enforce against water pollution, putting legal requirements and targets in place that will result in improved water quality for all.

The public is waking up to the mistreatment of our blue spaces. We are coming together in communities across the country and are seeing beyond the smoke and mirrors.

WE WANT TO SEE OUR RIVERS, LAKES, STREAMS AND OCEAN RESTORED. WE DEMAND ACTION TO #ENDSEWAGEPOLLUTION.

PHOTO CREDIT: SALLY LOW

OUR AMBITION IS TO END SEWAGE DISCHARGE INTO UK BATHING WATERS BY 2030.

PHOTO CREDIT: SALLY LOW

WE ARE CALLING FOR...

AN ENHANCED WATER-QUALITY TESTING REGIME

We need an enhanced regime which gives a true picture of the UK's water quality, tests for emerging threats to humans, such as antibiotic resistant bacteria and viruses, and the effects pollution is having on the environment.

We need to increase the number of inland bathing and recreation sites designated as Bathing Waters.

We need accurate real-time water quality information available all-year round for all UK inland and coastal bathing areas as well as popular water usage areas.

WORLD-LEADING WATER QUALITY LEGISLATION

We need sewage legislation that sets ambitious and legally binding targets to end untreated sewage discharge in all bathing waters by 2030.

INVESTMENT FROM WATER COMPANIES AND OTHER SYSTEMIC POLLUTERS

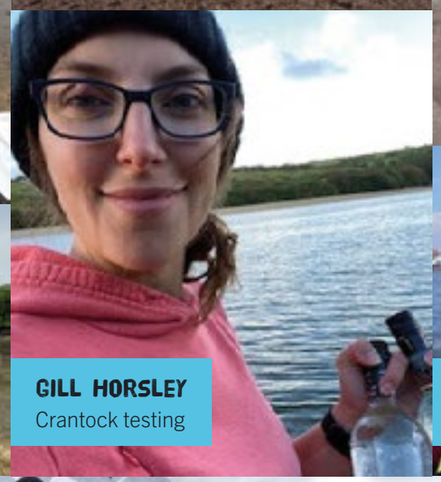
We need water companies to invest urgently in their sewage infrastructure and end the use of Sewer Overflows and emergency overflows.

We need the agricultural industry to amend practices to improve water quality, and for government to provide effective support to encourage this.

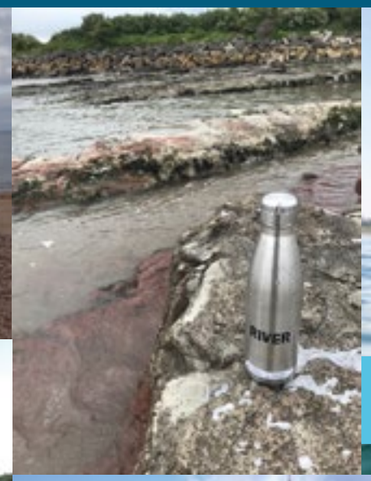
NATURE-BASED SOLUTIONS TO SEWAGE POLLUTION

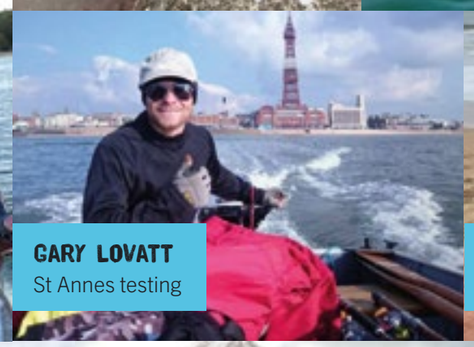
We need increased investment and associated targets for the restoration of natural habitats to reduce pressure on the water systems and help prevent sewer overflows.

MICHAEL GOODE
Barry Island testing

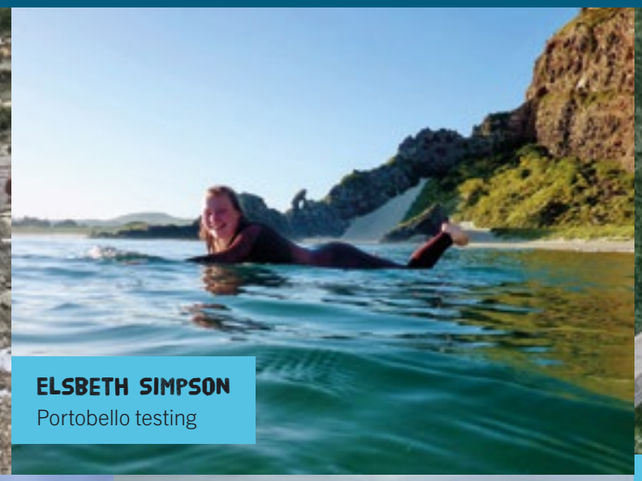


GILL HORSLEY
Crantock testing

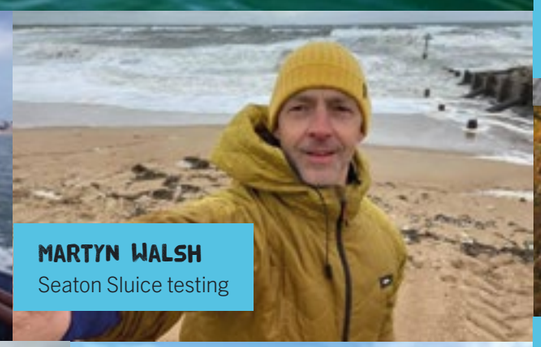




GARY LOVATT
St Annes testing



ELSBETH SIMPSON
Portobello testing

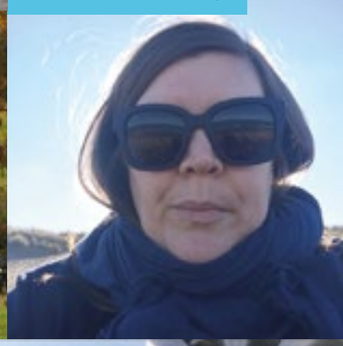


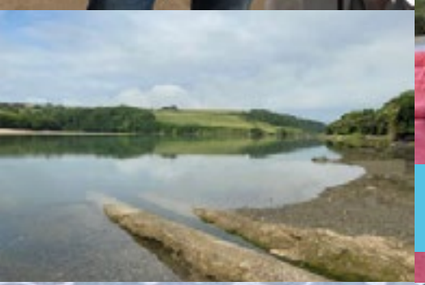
MARTYN WALSH
Seaton Sluice testing

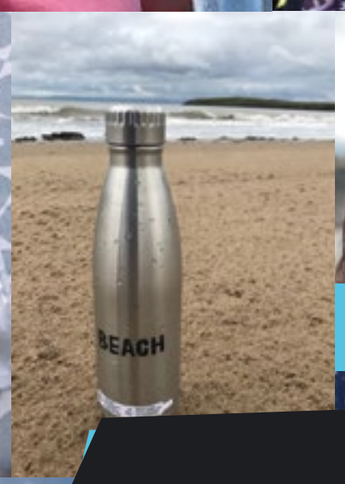
CHARLIE ALLANSON-ODDY
Portobello testing

AMY GOODWIN
Lianrhystud testing

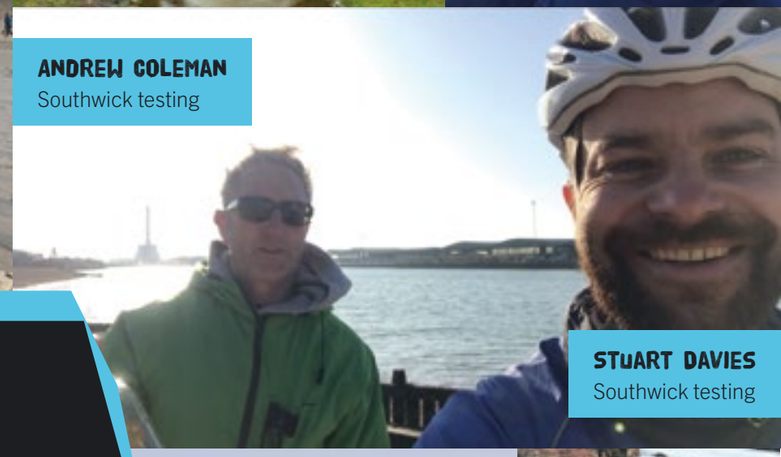
ALI ELLY
Seaton Sluice testing







GAIL TUDOR
Penbryn testing

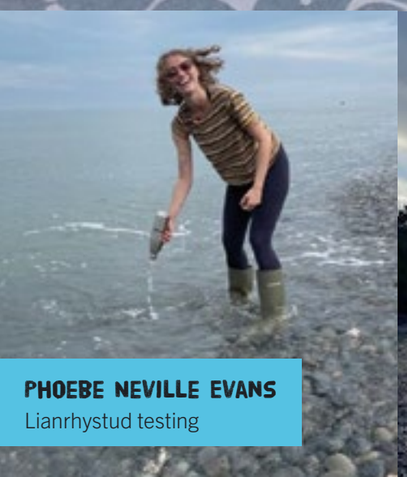


ANDREW COLEMAN
Southwick testing

STUART DAVIES
Southwick testing

THANK YOU

WITH HUGE THANKS TO ALL WHO TOOK PART IN OUR CITIZEN SCIENCE PROJECT IN 2021



PHOEBE NEVILLE EVANS
Lianrhystud testing

CARLA MAGEE
Portstewart testing

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