Sewers, storm overflows and managing rain better where it lands

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Dorset Wildlife Trust 12th February 2026

Wessex Water
YTL GROUP

Agenda

- A brief history of sewers
- River water quality trends
- Storm overflows - addressing them - good and bad approaches
- Managing rain better where it lands - addressing water scarcity and floods as well as carbon footprint

Sewerevolution…

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1775
Alexander Cummings

1778
Joseph Bramah

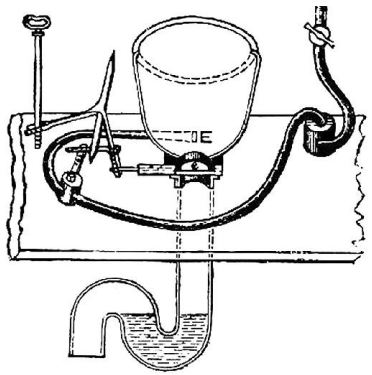
1815
Illegality removed

1840s
More fertilisers from overseas

1848-9
2nd Cholera epidemic

1855
Creation of the Metropolitan Board of Works

1858
The Great Stink



WC patent including the S-bend

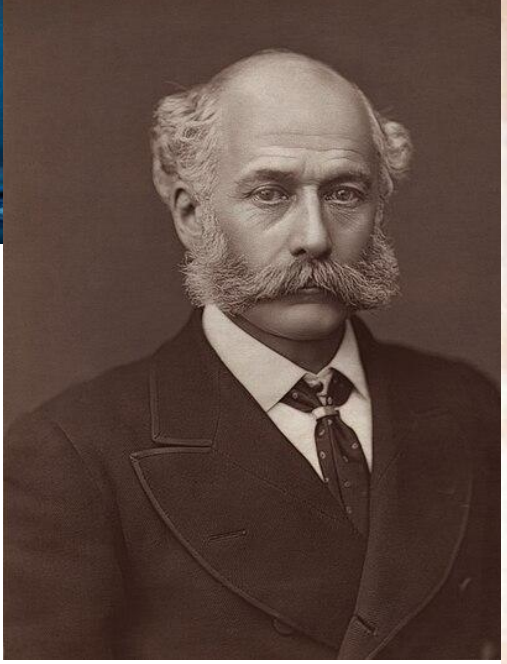
Early 1800s
c200,000 cesspits in London

Still illegal to put "night soil" in sewers

1831-2
1st Cholera epidemic

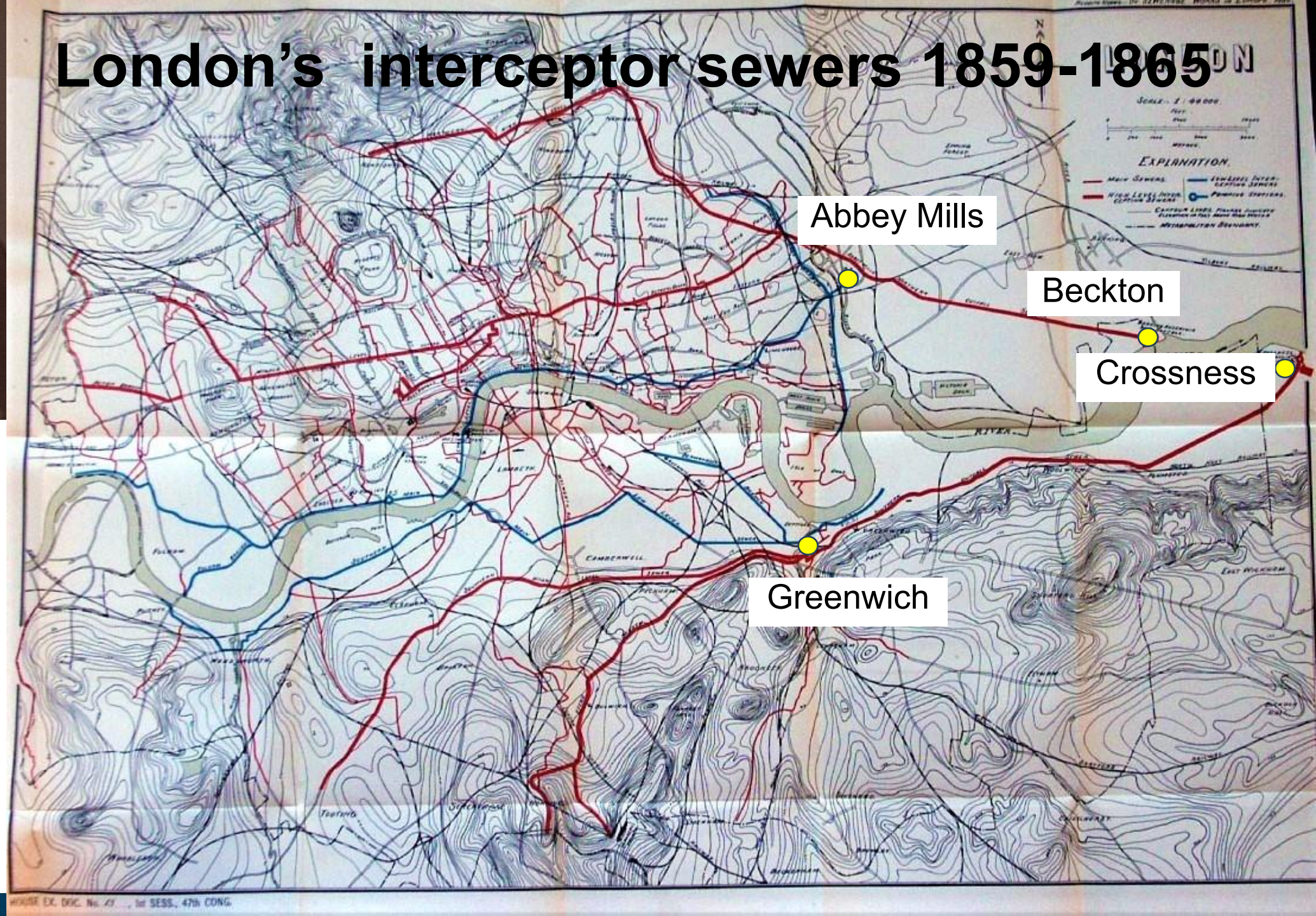
1848
Metropolitan Sewers Act

1853-4
3rd Cholera epidemic



Sir Joseph Bazalgette

London's interceptor sewers 1859-1865



‘Cathedrals’ to sewage

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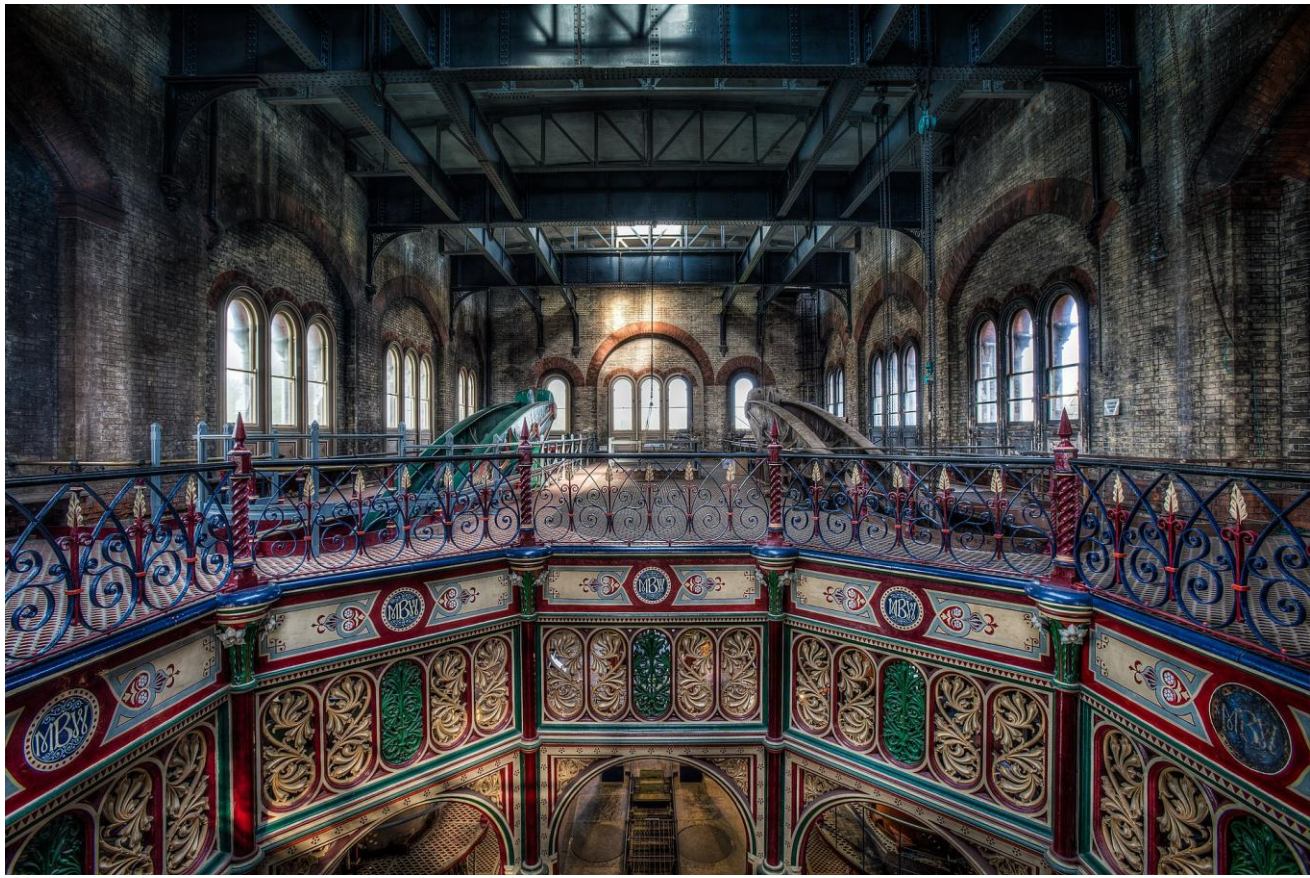
Abbey Mills pumping station

Crossness pumping station



So who was Thomas Crapper then?

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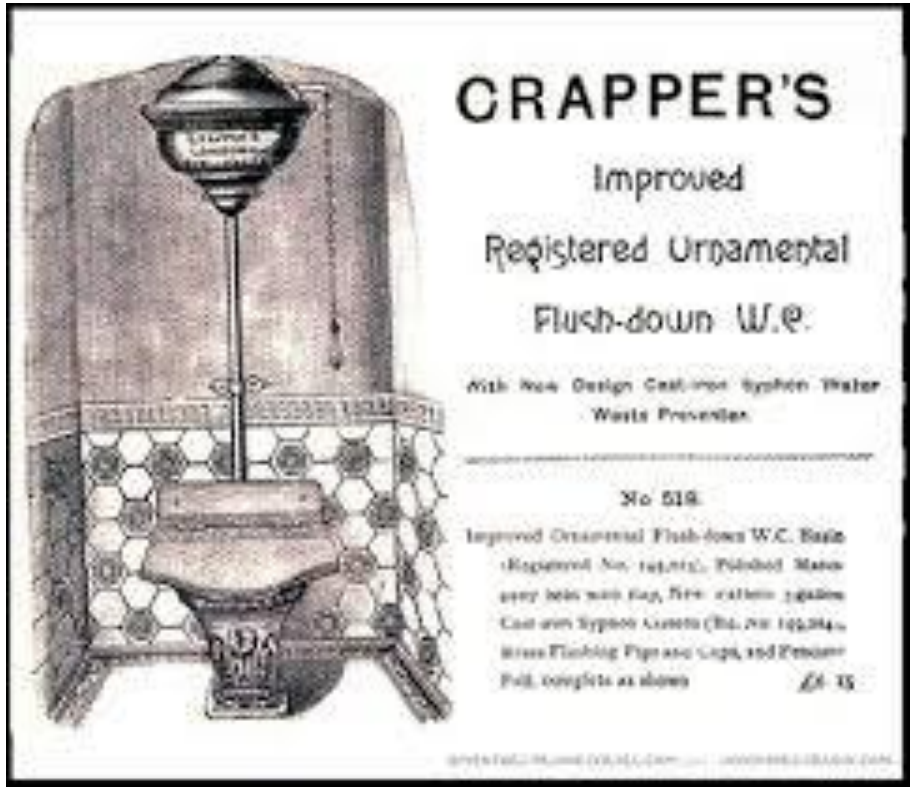
- In the late 19th century, London plumber Thomas Crapper mass-produced one of the first widely successful lines of flush toilets.



River water quality trends

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ACUTE river pollutants – national trend

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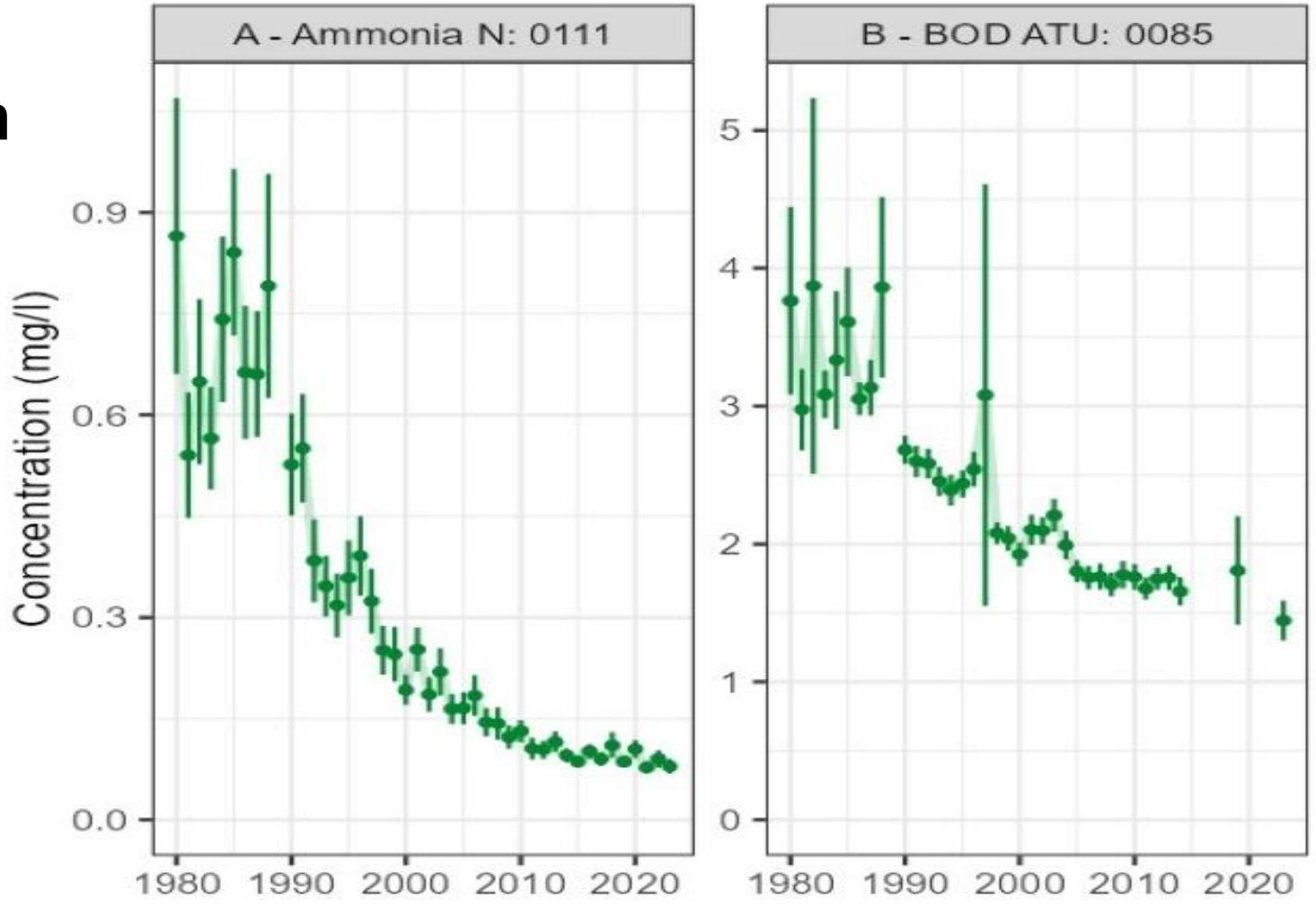
It's the **concentration** (mg/l) that matters



State of the water environment: long-term trends in river quality in England: 2024 - GOV.UK

CHRONIC river pollutants – national trend

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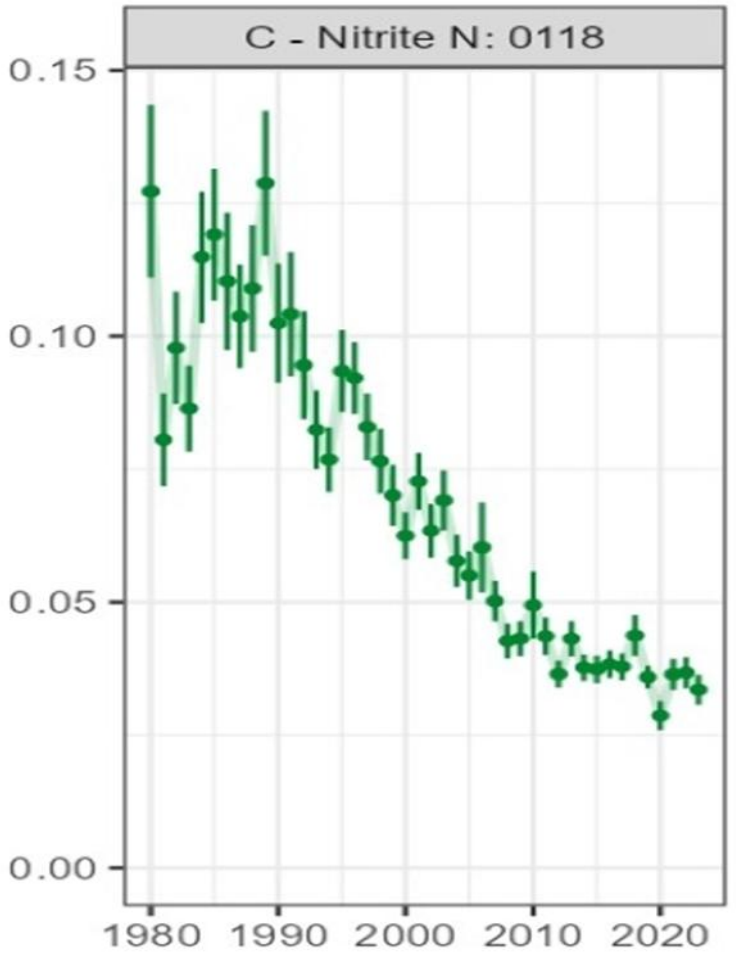
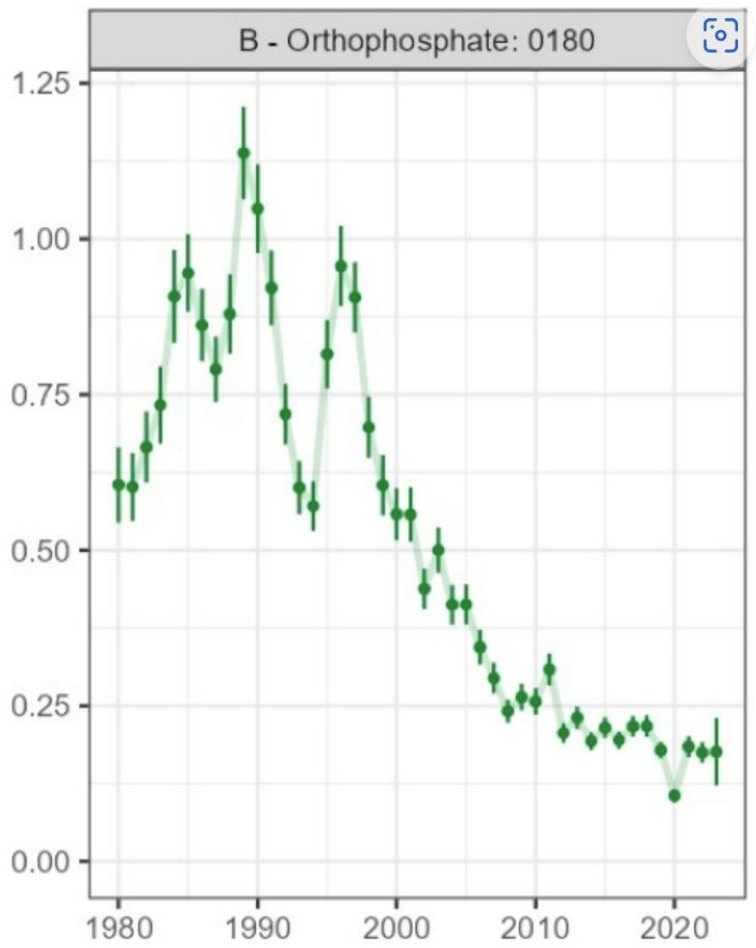
It's the **load** (kg) that matters

(Load = concentration x flow)





[State of the water environment: long-term trends in river quality in England: 2024 - GOV.UK]

Good reference material

- Evidence of biological recovery from gross pollution in English and Welsh rivers over three decades. Science of The Total Environment 2023: volume 878, page 163107. PHARAOH, E. AND OTHERS
- Potential drivers of changing ecological conditions in English and Welsh rivers since 1990. Science of The Total Environment 2024: volume 946, page 174369. PHARAOH, E. AND OTHERS.
- Significant improvement in freshwater invertebrate biodiversity in all types of English rivers over the past 30 years. Science of The Total Environment 2023: volume 905, page 167144. QU, Y. AND OTHERS.
- State of Nature Report October 2023
- Is pollution in England's rivers really getting worse? The Guardian Sept 2024

WFD: Ecological and Chemical status

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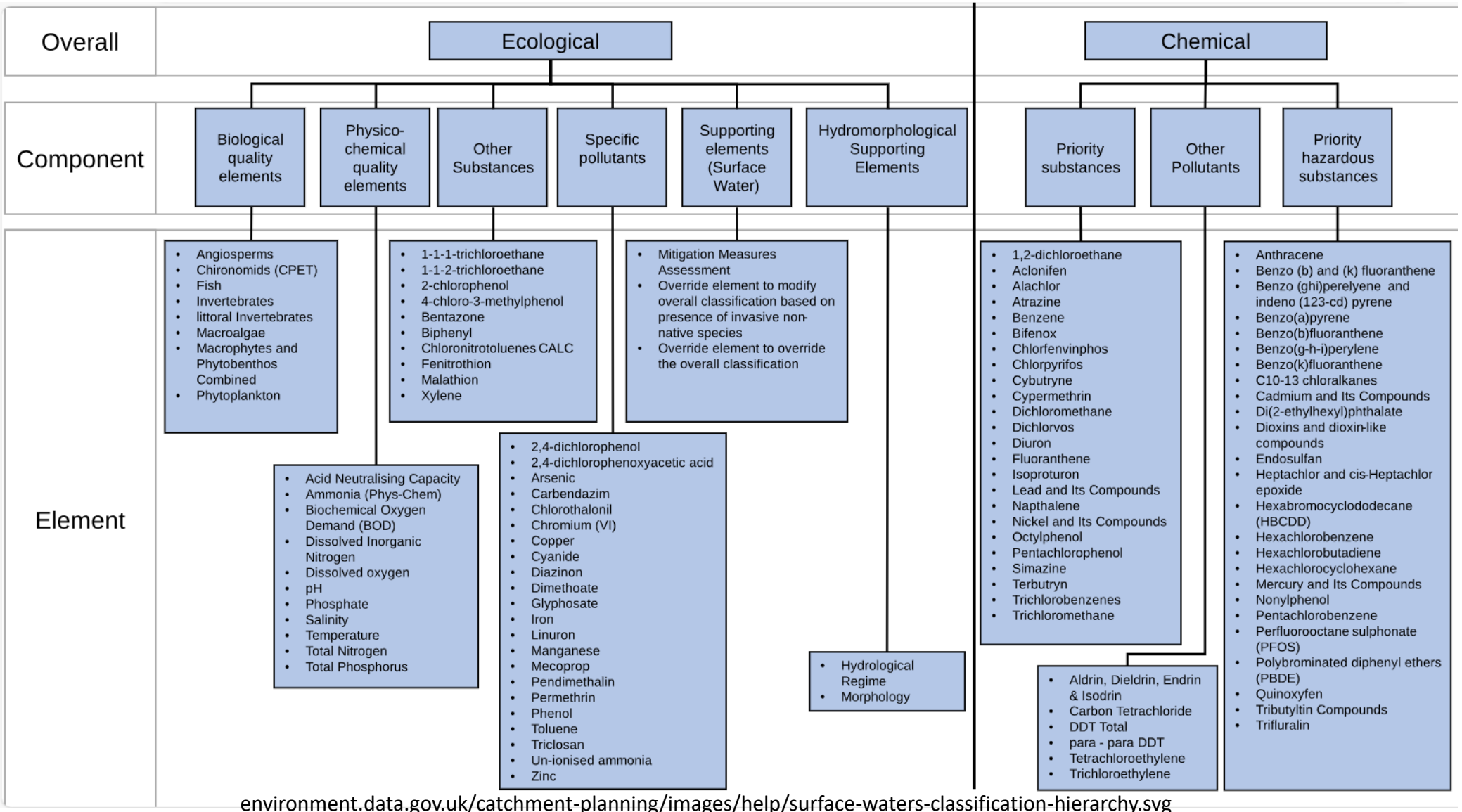

environment.data.gov.uk/catchment-planning/images/help/surface-waters-classification-hierarchy.svg

Biggest Reasons for Not Achieving "Good" (or **RNAG**s)

Ecological

- 29% nutrients (nitrogen/phosphorus)
- 18% macrophytes and phytobenthos
- 13% fish

Chemical

- 44% PBDEs
- 38% Mercury
- 11% PFOS

"1 out all out" principle

Ecological impact of storm overflows

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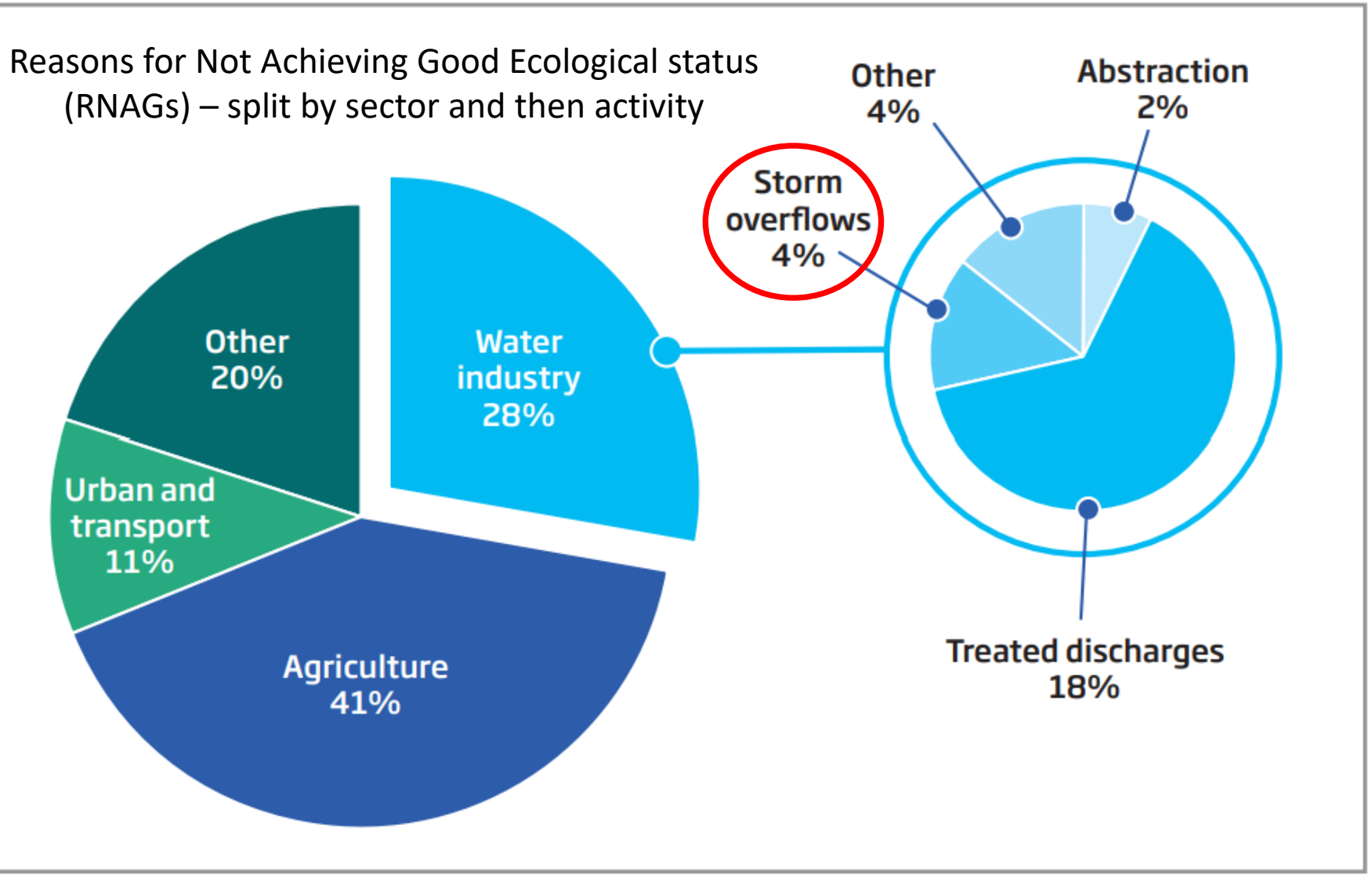

In Wessex Water, storm overflows currently account for 9 of the 1074 RNAGs (0.9%)

No overflows in Dorset causing RNAGs

Data from .gov.uk

Environment Agency: Catchment Data Explorer

Storm overflows

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'Joe Lycett vs Poo' as comic's new Channel 4 documentary investigates water companies

a societal rainwater management problem?

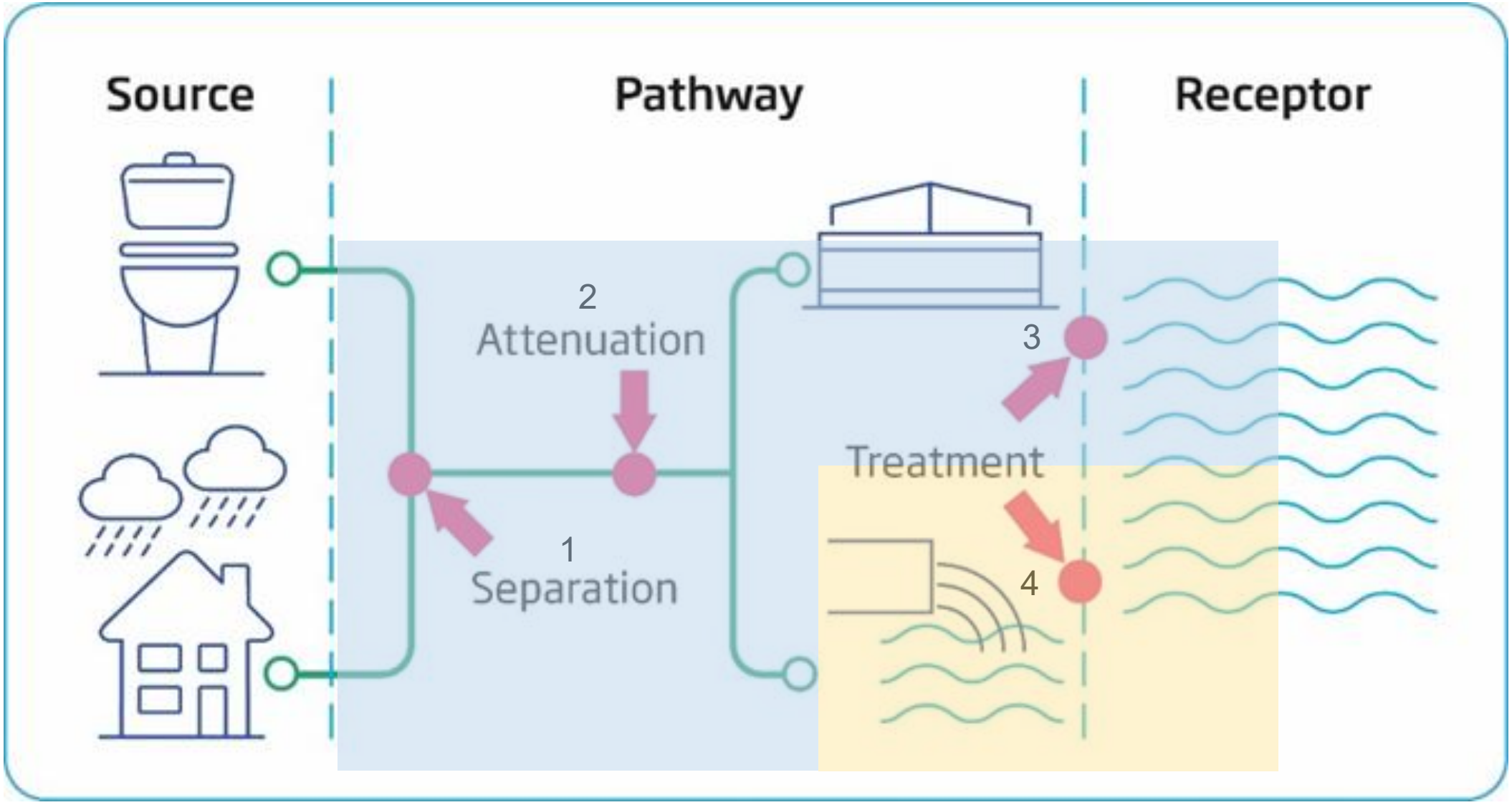
?

a water company poo problem?

Water companies in England face outrage over record sewage discharges

How much raw sewage is released into rivers and the sea, and what are the rules?

4 ways to address them



But some ways are better than others..

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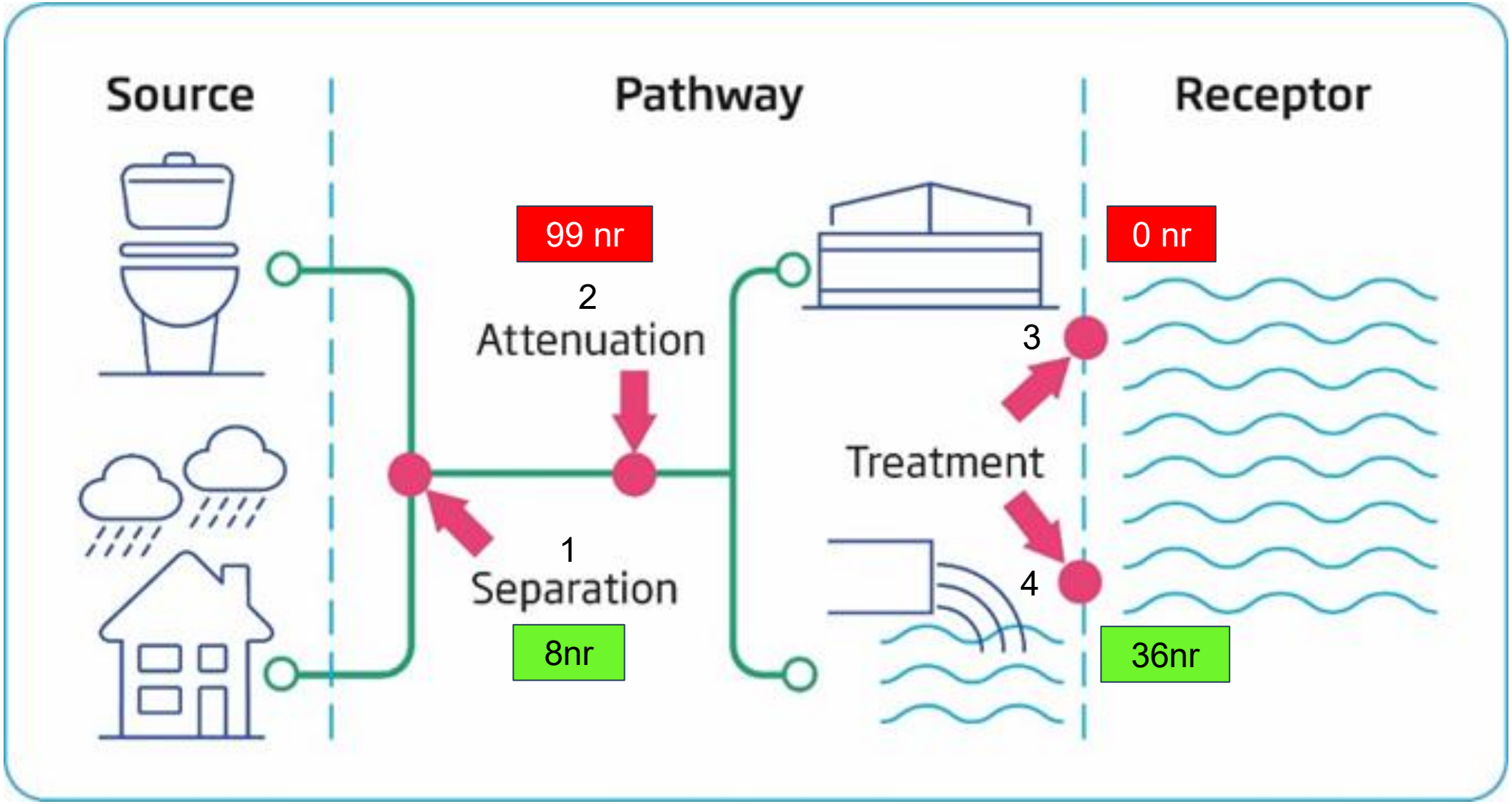
Outcome	Solution	Relative Benefits Assessment					
		Water efficiency	Biodiversity	Customer bills	Embodied Carbon	Operational Carbon	
Reduction in discharges	1a. Separation (@ property level)	✓	✓	✓	✓	✓	V GOOD
	1b. Separation (@ community level)	x	✓	x	✓	✓	GOOD
	2. Attenuation	x	x	x	x	x	BAD
	3. Treatment capacity increases at WRCs	x	x	x	x	x	BAD
Reduction in harm	4a. Treatment at overflow: nature-based solutions	x	✓	x	✓	✓	GOOD
	4b. Treatment at overflow: grey solutions (e.g. UV)	x	x	x	x	x	BAD

2025-2030 solution mix



Investment in storm overflows 2025-30

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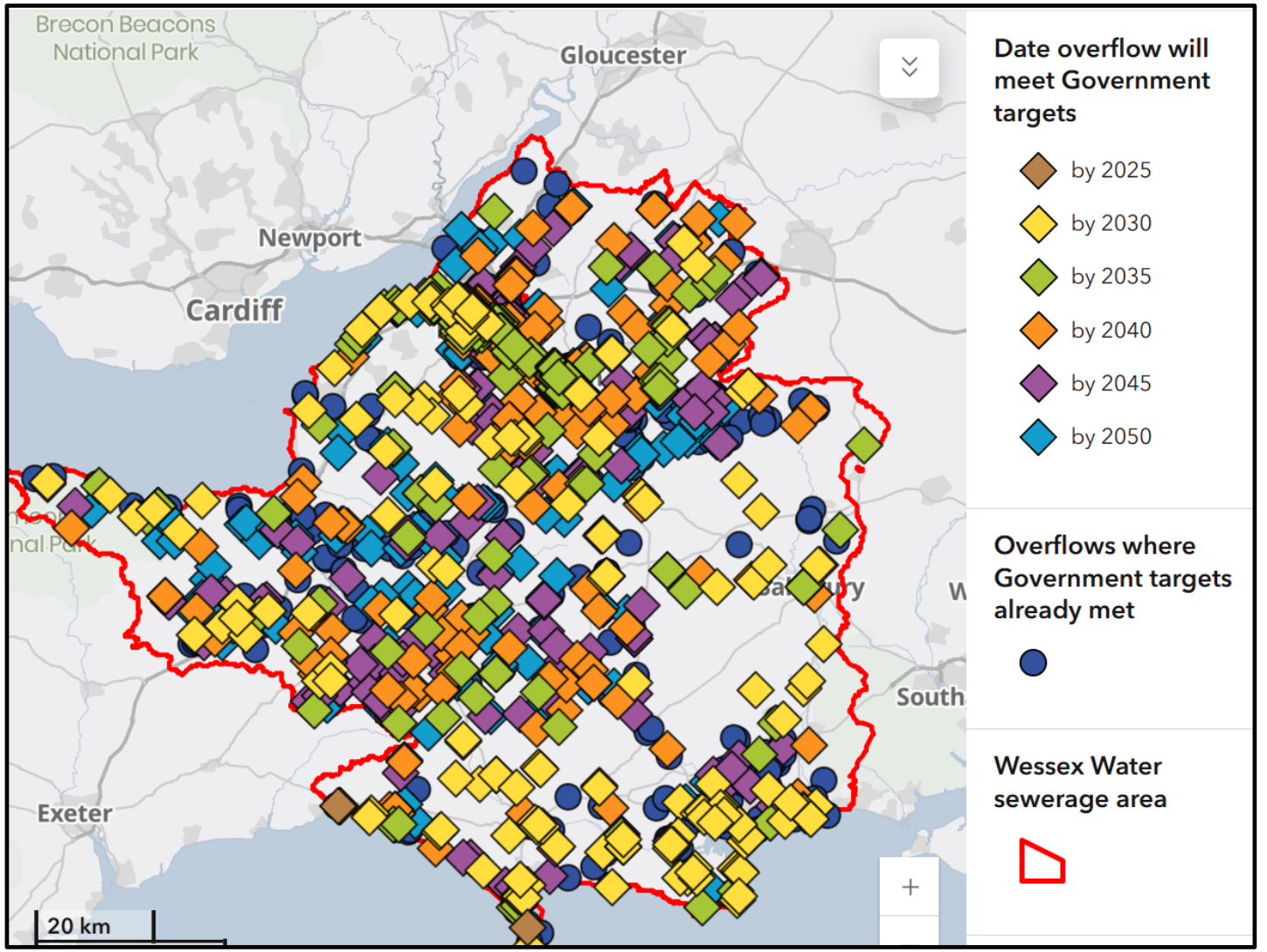
- Storm overflow improvements on our Storm Overflow Improvement Dashboard
- £500m to address 143 overflows between 2025-2030



Investment in storm overflows 2025-30

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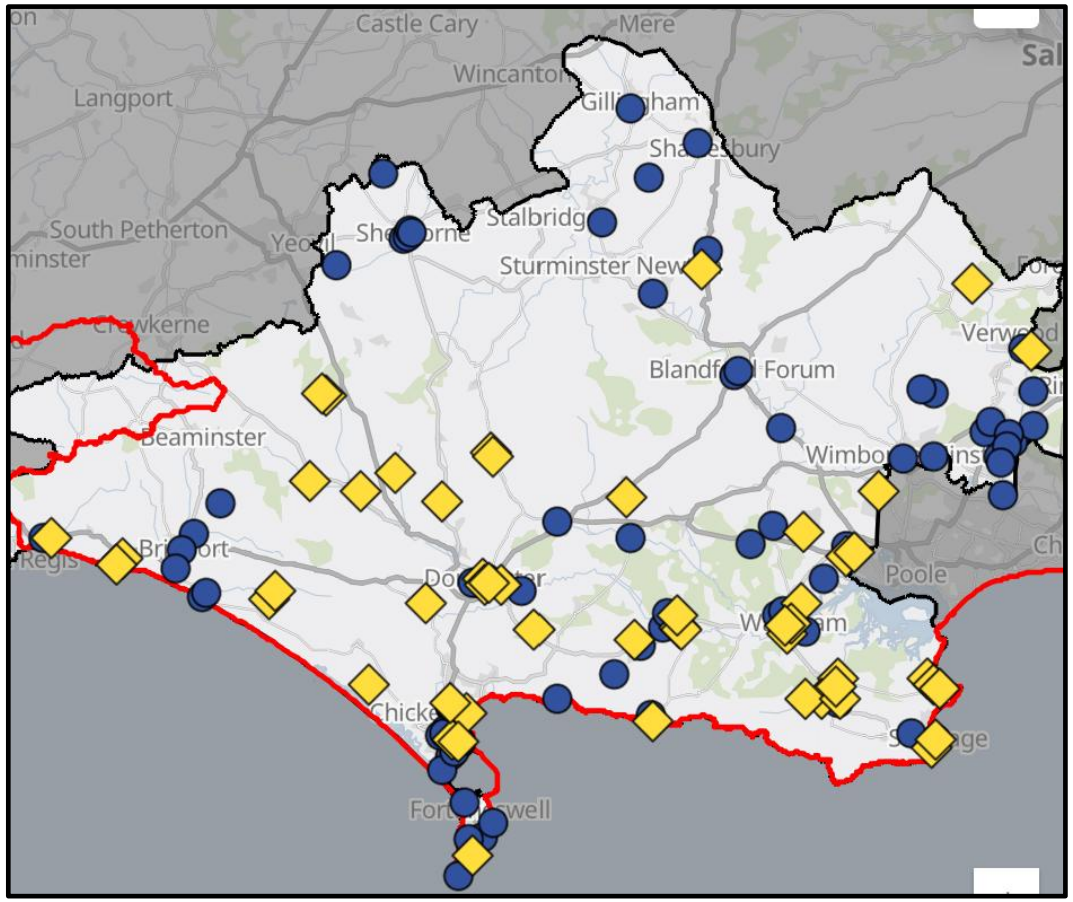
- 52 in Dorset
- [Storm Overflow Improvement Dashboard]



◆ by 2030 ● meets target

Including 6 nature-based solutions

Where high groundwater levels fill drains and sewers for weeks/months on end

Hanging Langford Reedbed, Wylye Valley

Shrewton STW reedbed

Ubley STW floating wetland

@Martinstown; Piddletrenthide; Sydling St Nicholas; Toller Porcorum; Milborne St Andrew

To address groundwater inundation

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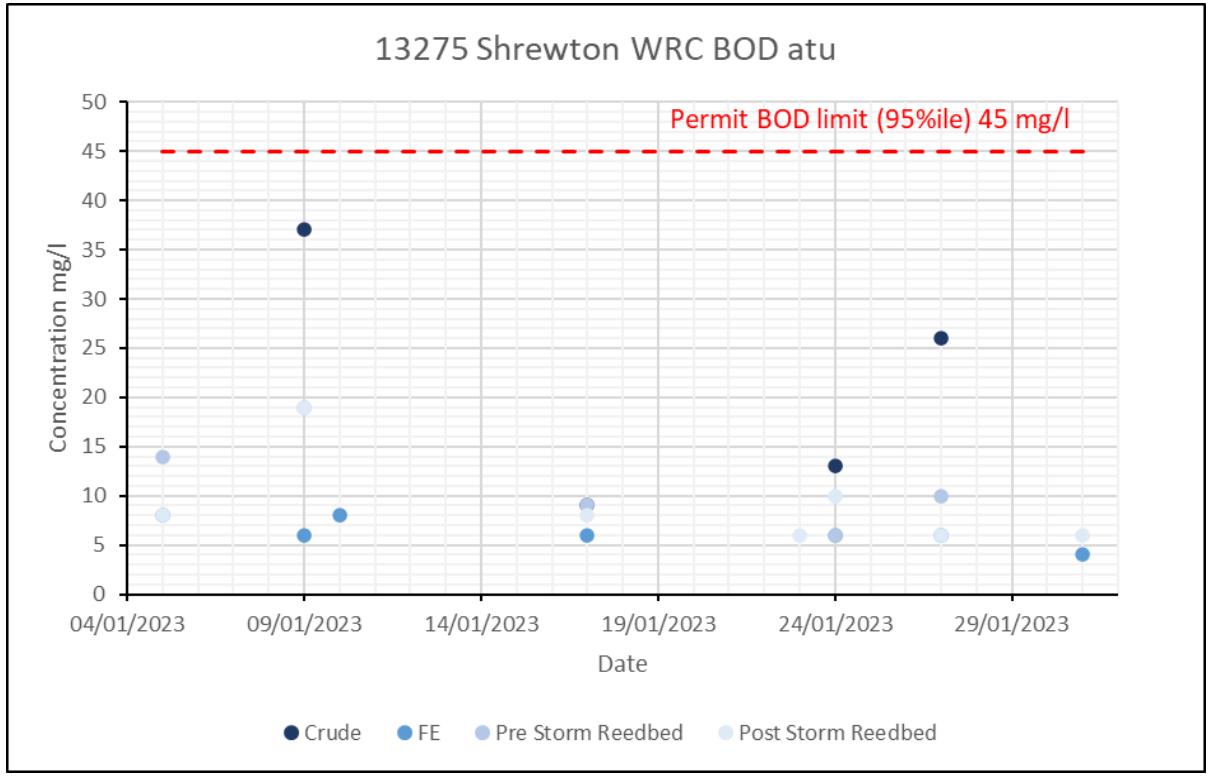
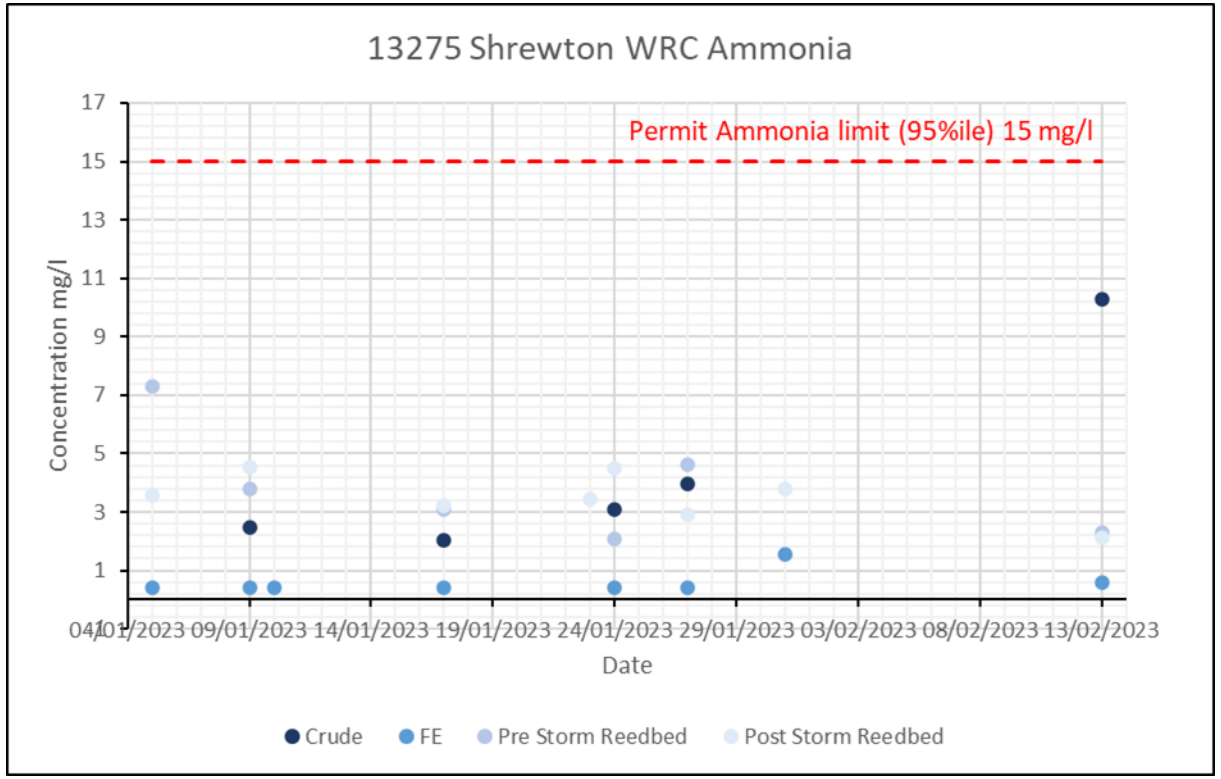
Winter operation, long periods of discharge, massive dilution





e.g. Bulbury Lane, Lytchett Matravers

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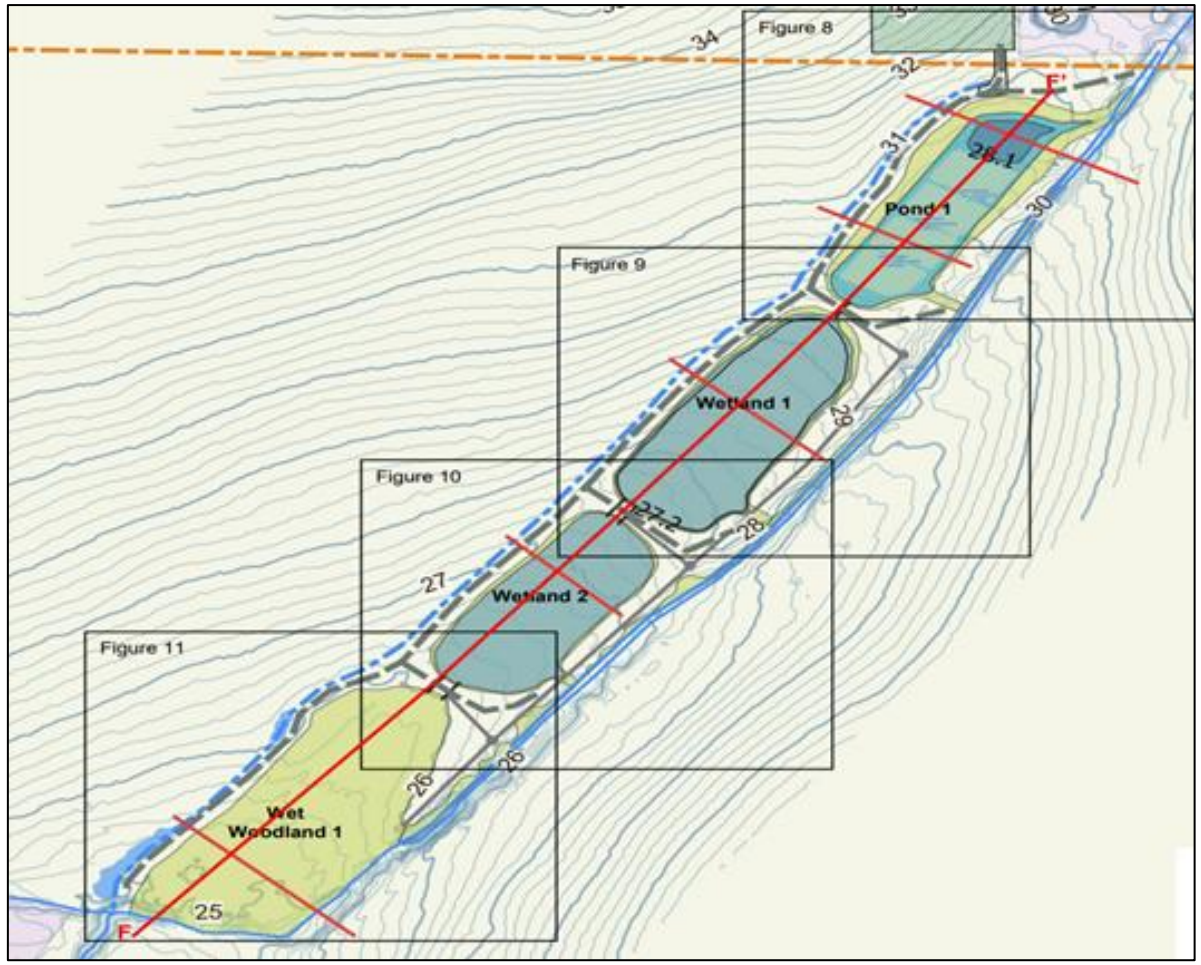

e.g. Bulbury Lane, Lytchett Matravers

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But investment is dominated by poor environmental solutions!!!

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- Storing contaminated rain
- Pumping it
- Pumping it again
- Treating it

Managing rain better where it lands

The best long term solution

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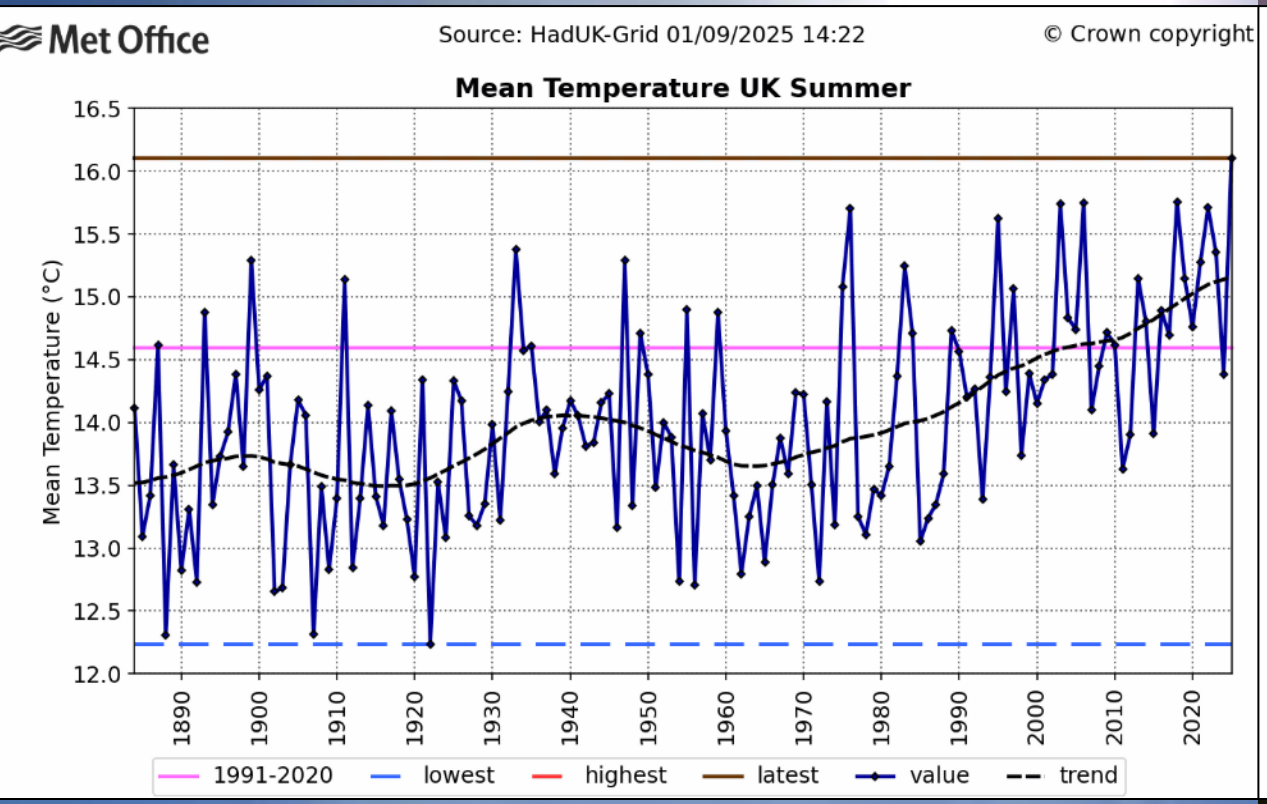
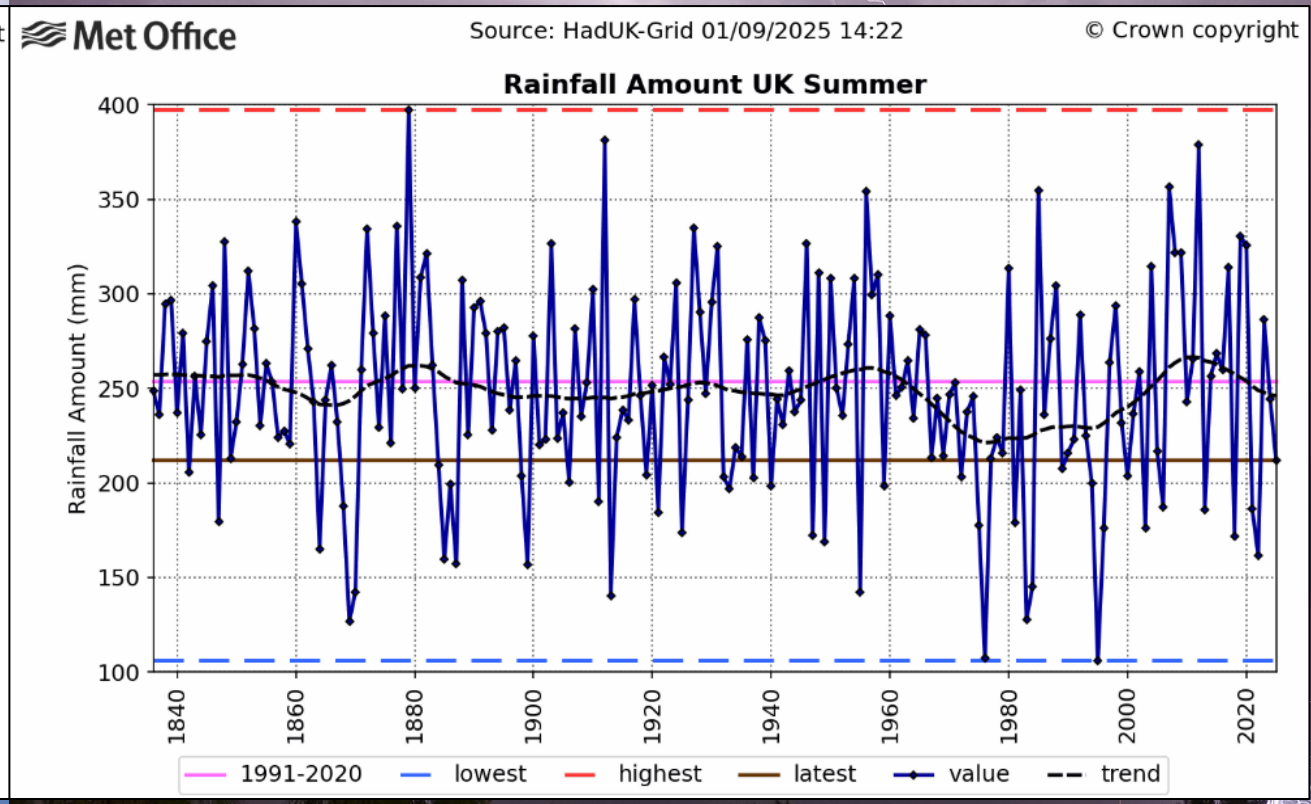
Changing summers

Warmer

Wilder

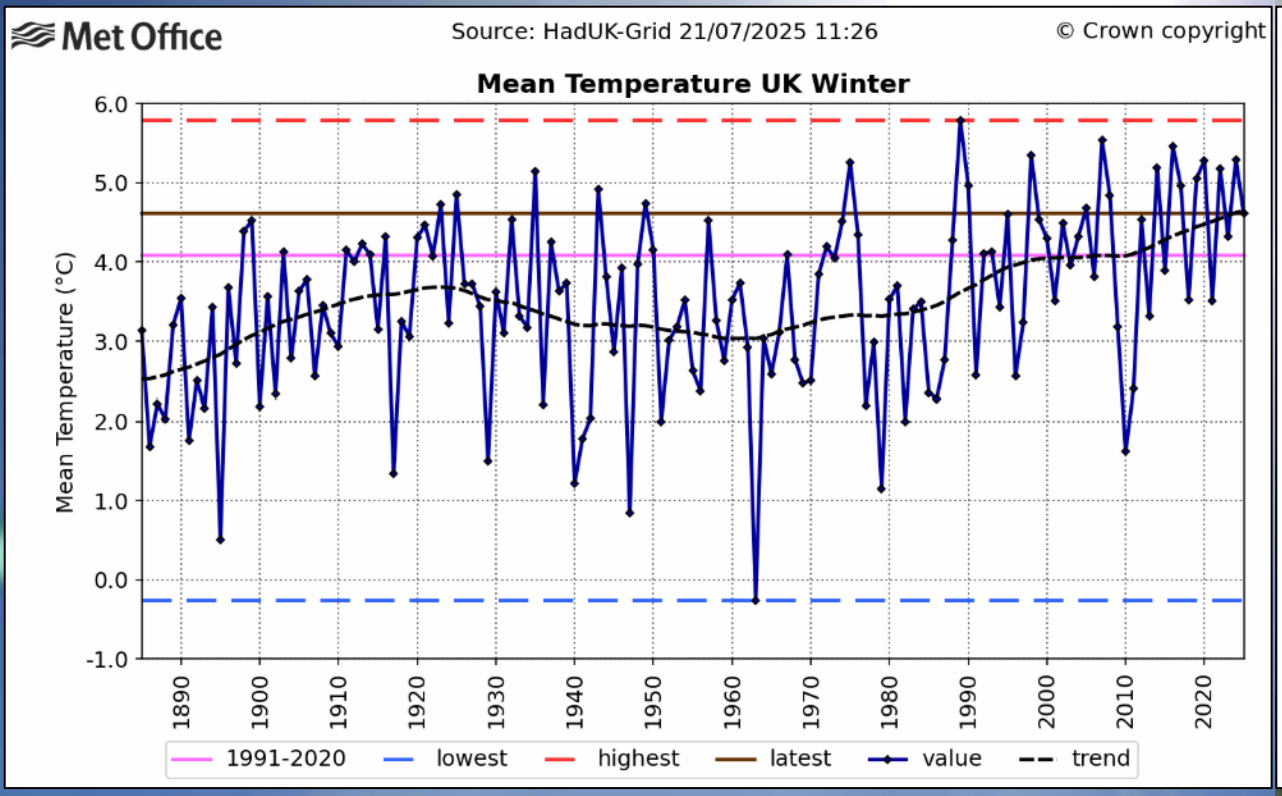




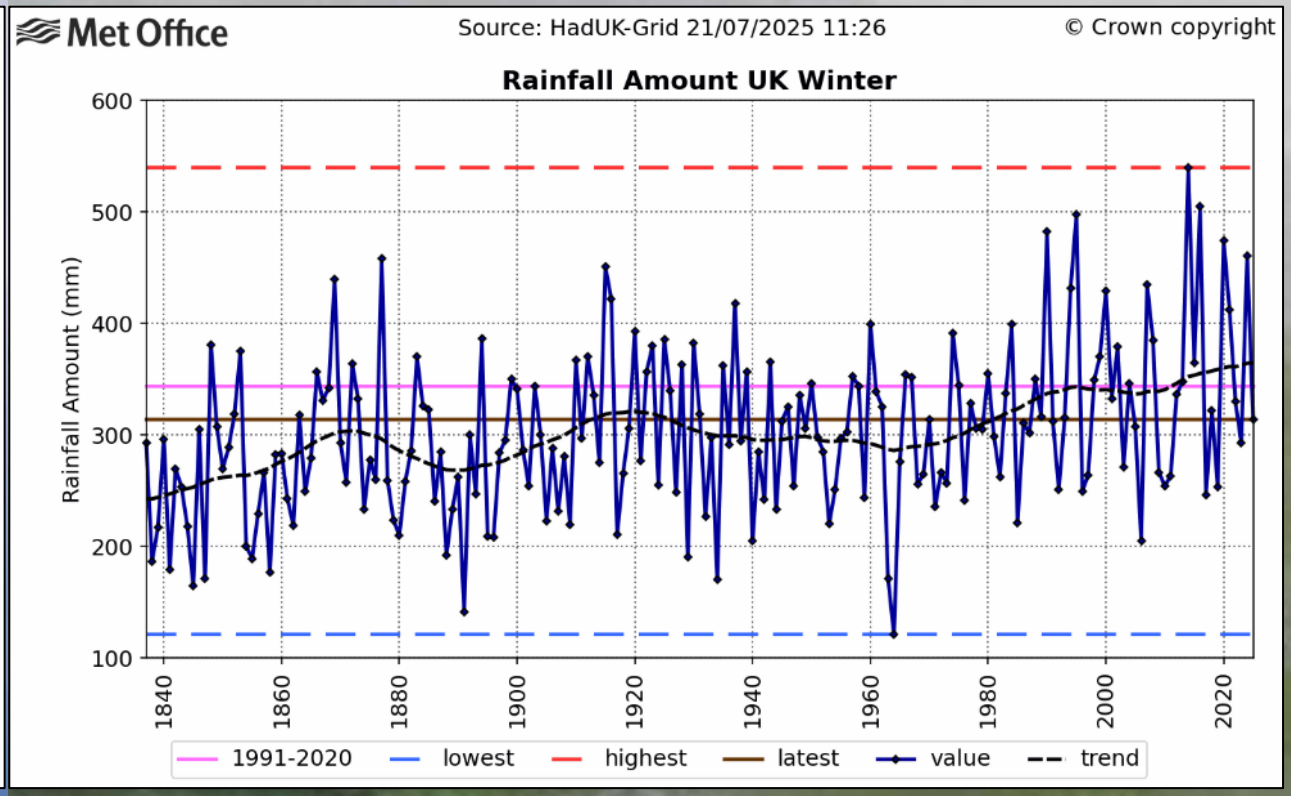
UK temperature, rainfall and sunshine time series - Met Office

Changing winters

Warmer



Wetter



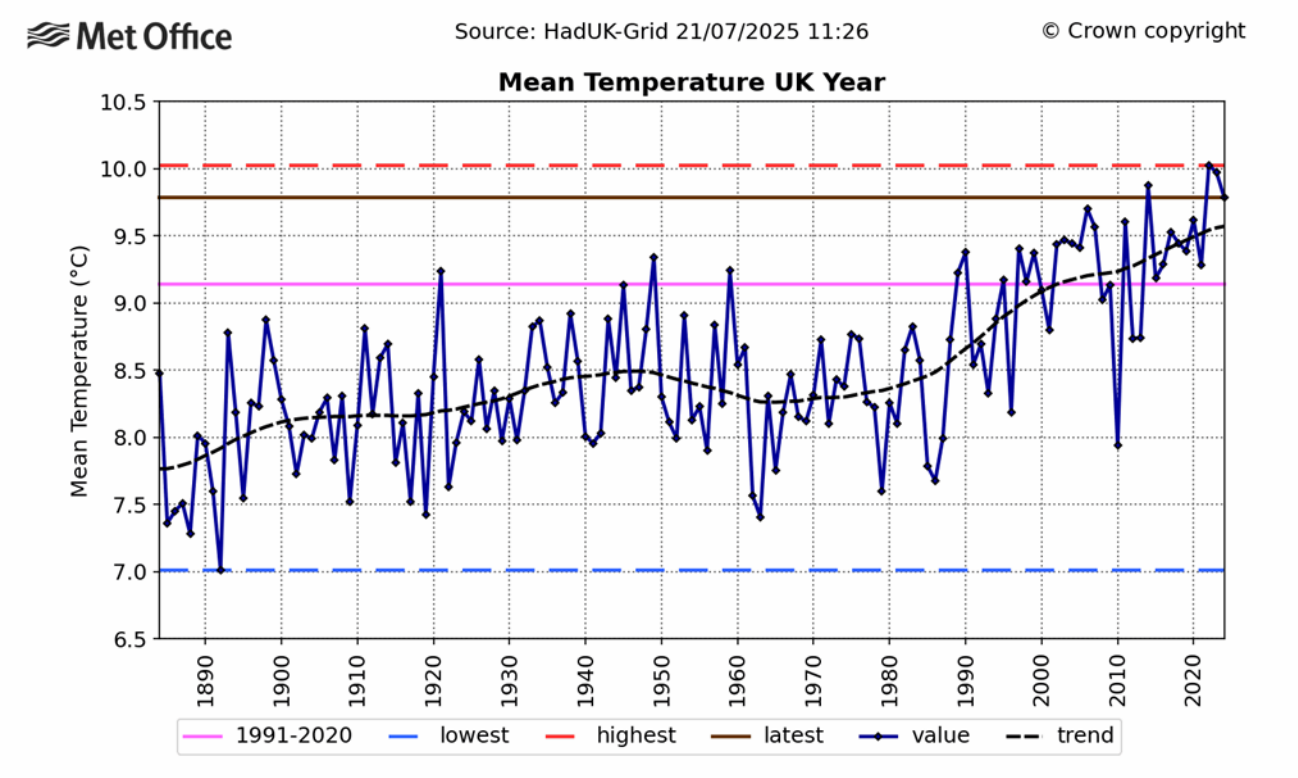
UK temperature, rainfall and sunshine time series - Met Office

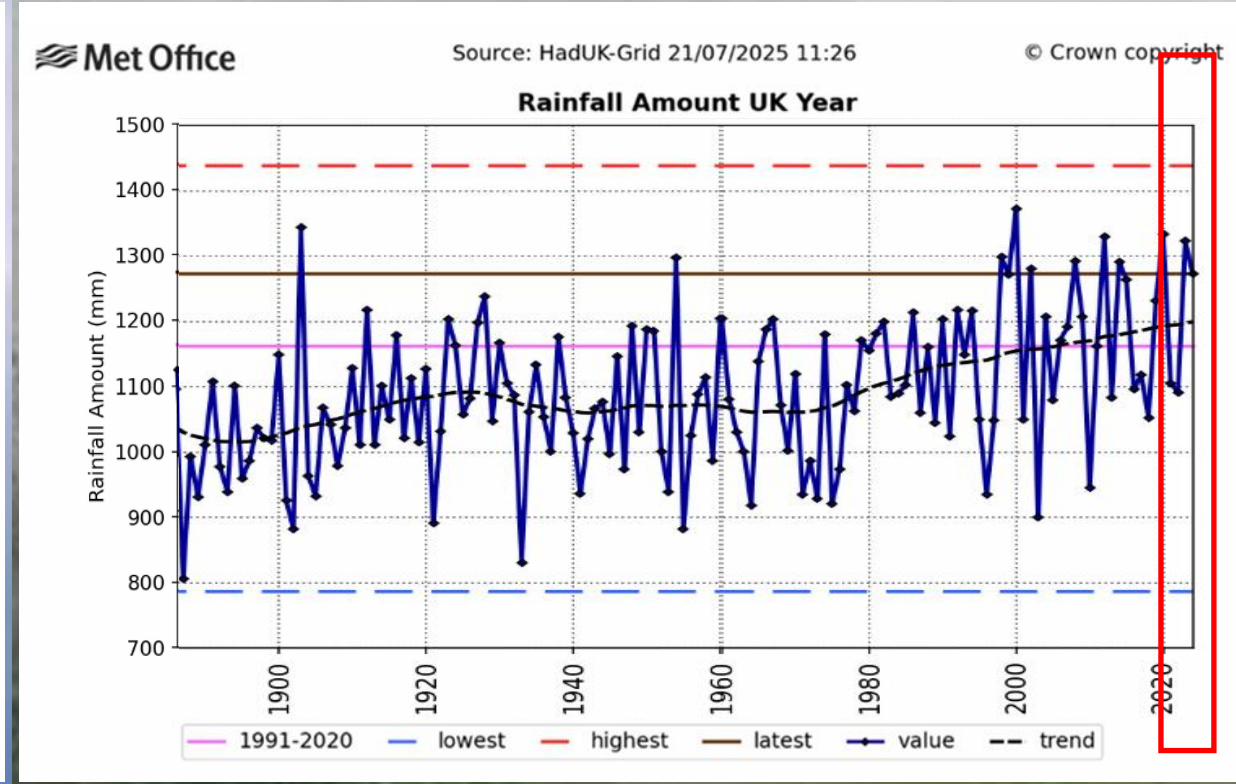
Changing years

Warmer

Wilder

Wetter





UK temperature, rainfall and sunshine time series - Met Office

Key other externality

c370,000

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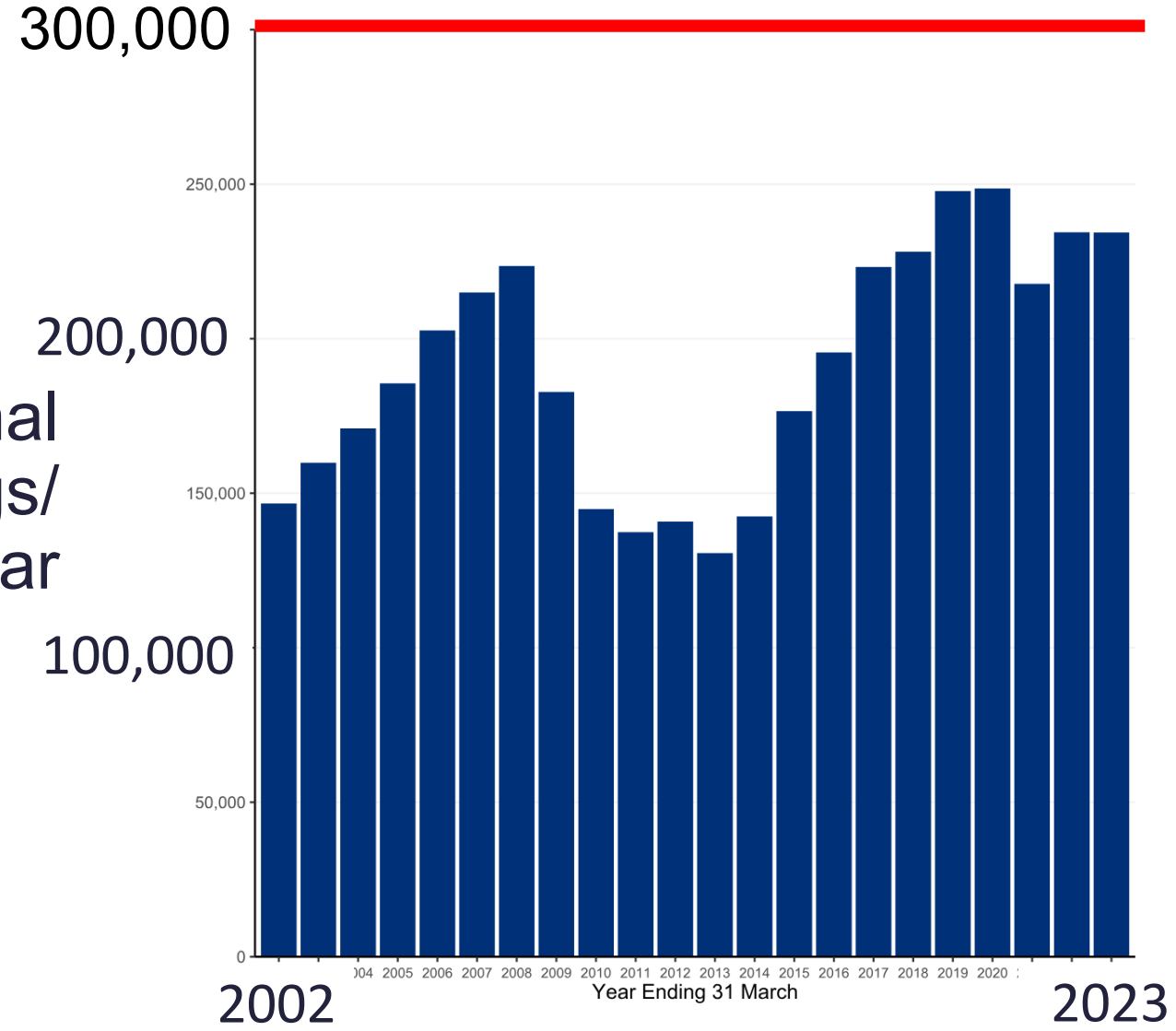
…we do love building impermeability….



Problem here…solution there

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Problem is here

We usually fix problems here…

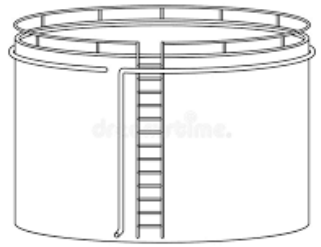
Drinking water

MOVE and TREAT STORE

Sewage & rainwater

MOVE STORE and TREAT

…and here



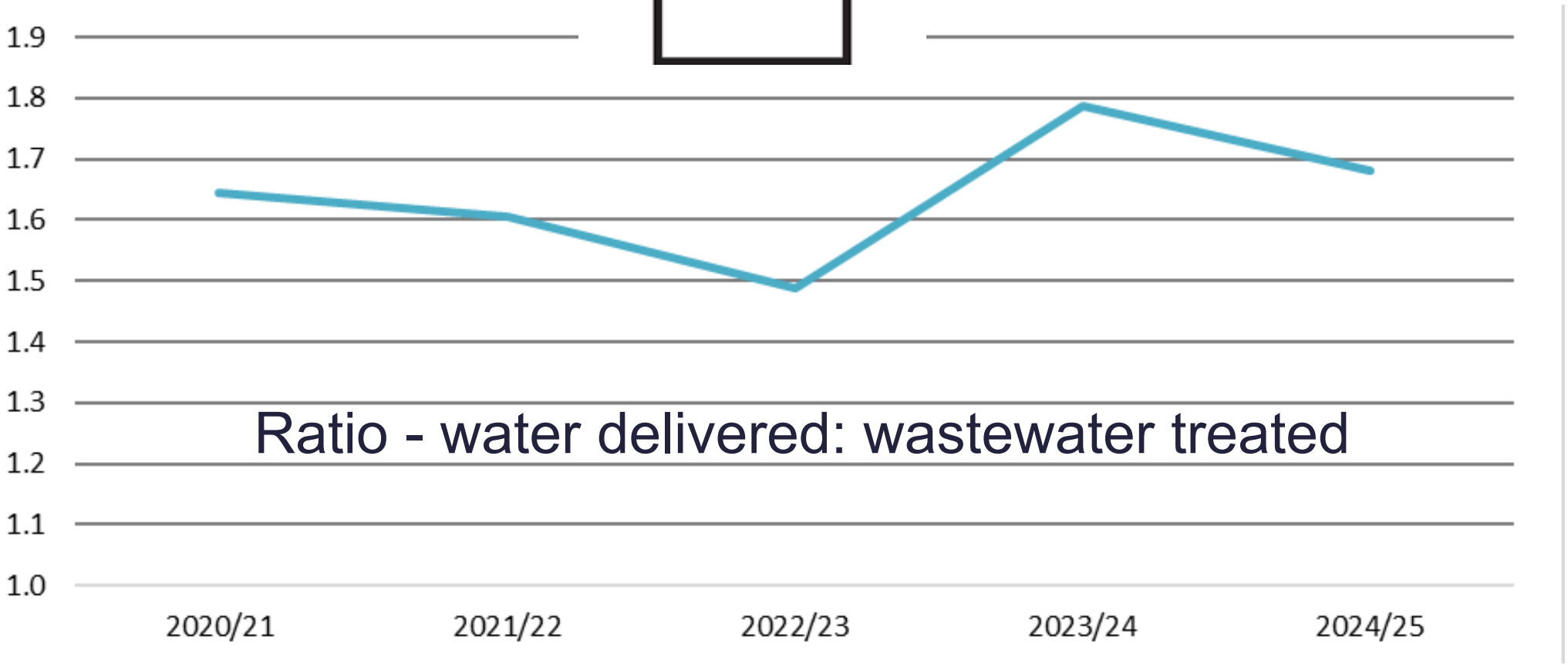
Drinking water vs wastewater volumes

2024/5 Drinking water delivered:

4,620 Gl/year

2024-25 Wastewater treated:

7,770 Gl/year



Unnecessary pumping and treating

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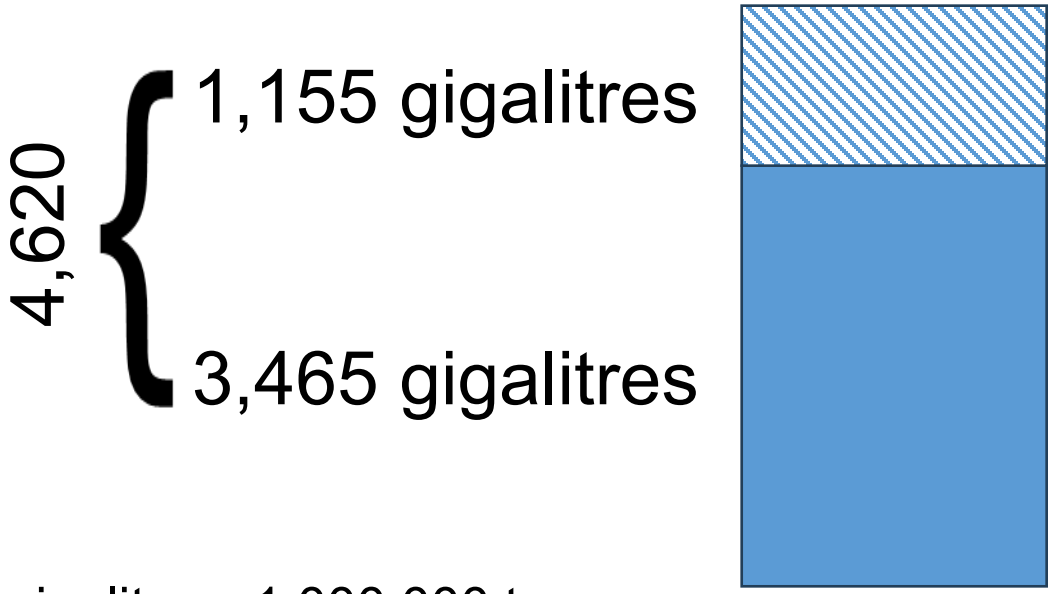
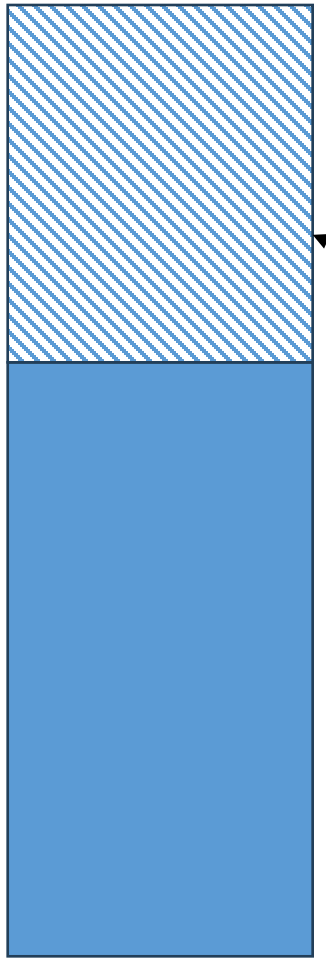
Water delivered* (2024/25)

Pointlessly treating and pumping drinking water to flush toilets c25%



1 gigalitre = 1,000,000 tonnes

Wastewater treated* (2024/25 and 2020/21-2024/25)



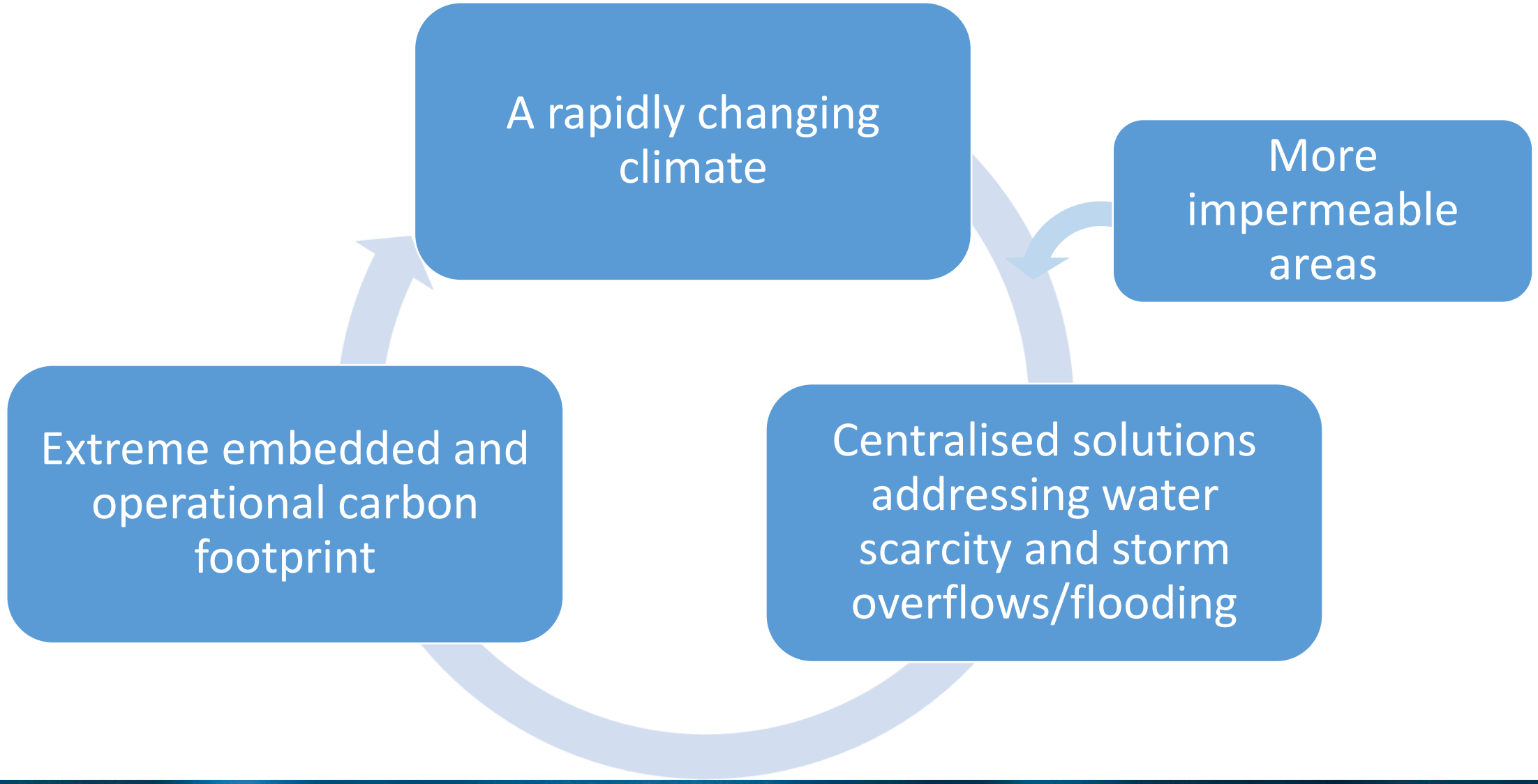
2,310 - 3,696 gigalitres
(1.5 -1.8 x water delivered)

Pointlessly pumping and treating rain added to combined sewers

4,620 gigalitres

* Tables 6B and 7C of Annual Performance reports

Stuck in a vicious circle



Q: How do we break this circle?

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A: We manage rain better where it lands

Simple principles based on nature

1. Rain is a resource that should be captured locally and reused where possible
2. Rain should be returned back to the environment as close as possible to where it landed

“Simple principles”

Managing rain better where it lands provides greatest opportunities for reuse

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Opportunities for non-potable re-use

	Agriculture (Irrigation)	Agriculture (Glasshouse)	Brewing	CCUS (Carbon Capture, Usage and Storage)	Data centre (Cooling)	Domestic (Toilet flushing)	Domestic (Outdoor use)	Energy (Cooling)	Food processing	Hydrogen production	Recreation (Irrigation)
Rainwater (from roofs)	💧 ↻	💧 ↻	💧 ↻	💧 ↻	💧 ↻	↻	↻	💧 ↻	💧 ↻	💧 ↻	↻
Urban drainage systems	💧 ↻	💧 ↻	💧 ↻	💧 ↻	💧 ↻	↻	↻	💧 ↻	↻	💧 ↻	↻
Highway runoff	💧 ↻	💧 ↻	💧 ↻	💧 ↻	💧 ↻	↻	↻	💧 ↻	↻	💧 ↻	💧
Domestic grey water	💧			💧	💧			💧		💧	
Internal drainage board water	↻	↻	↻	↻	↻	↻	↻	↻	↻	↻	↻
Sea water											
Sewage effluent											
Industrials effluent											
Mine water											
Polluted groundwater				💧	💧			💧			

Key

Quality of water (no/min. treatment): Low suitability | Medium suitability | High suitability

Potential issue with water quantity: ↻ Reliability across the year | 💧 In total across the year

[Re-using water for non-potable purposes: a review of opportunities April 2025.pdf]

Managing rain better where it lands provides greatest additional benefits when tackling storm overflows

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Outcome	Solution	Relative Benefits Assessment				
		Water efficiency	Biodiversity	Customer bills	Embodied Carbon	Operational Carbon
Reduction in discharges	1a. Separate rain from roofs connected to combined sewers (property level)	✓	✓	✓	✓	✓
	1b. Separate rain from highways connected to combined sewers (community level)	x	✓	x	✓	✓
	2. Attenuation (then treatment)	x	x	x	x	x
	3. Treatment capacity increases at WRCs	x	x	x	x	x
Reduction in harm	4a. Treatment at overflow: nature-based solutions	x	✓	x	✓	✓
	4b. Treatment at overflow: grey solutions (e.g. UV)	x	x	x	x	x

Separation solutions in Dorset

Separation/hybrid solutions to remove rain

- Evershot
- Godmanstone
- Roman Rd, Weymouth
- Melcombe Avenue, Weymouth

The five pillars for change

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A national rainwater management strategy

Legislation | Regulation | Economic incentives | Education | Technical Guidance

based on Simple principles

How do we change course?

- Lobby your MP: ask him or her why we are building new homes that flush their toilets with drinking water and don't return the surplus back to the environment right next to where it landed?

- Make small changes: How to help manage rainwater runoff

My goodness me John, we've sorted water scarcity **and** storm overflows **and** reduced our carbon footprint!

Ah Janet, that's because you and me are good at **managing rain where it lands, Simples!**

Thank you for listening

Questions?

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