# General overview

● **From the Water Project - Facts about Water: Statistics of the Water Crisis**
Why Water? ...By the numbers (Last Update: 9/17/2024)
https://thewaterproject.org/water-scarcity/water_stats
● **From UNICEF** - **Water scarcity** - Addressing the growing lack of available water to meet children's needs.
https://www.unicef.org/wash/water-scarcity
● **The World Counts • Impact through Awareness** - https://www.theworldcounts.com/
*Insights • Facts • Figures • Live Statistics*
The World Counts provides you with live statistics about the world's population, social and environmental challenges. It's spooky but useful
https://www.theworldcounts.com/challenges/planet-earth/freshwater/deaths-from-dirty-water
● **More statistics about deaths linked to unsafe water (sorry, not fun)**
https://ourworldindata.org/grapher/death-rates-unsafe-water
https://www.statista.com/statistics/1488520/unsafe-water-death-rate-global-timeline/
● **So, to make up for this, here are a few fun facts about rivers**
https://www.funfactsabout.com/fun-facts-about-rivers/

International | Too much, too little. Too late?

## Document 1 - The poisonous global politics of water

Polarisation makes it harder to adapt to climate change

Photograph: Panos Pictures/ GMB Akash

***The Economist***, Aug 26th 2024|DENILIQUIN, MATHARE AND PUNITAQUI

THE WATER thieves come at night. They arrive in trucks, suck water out of irrigation canals and drive off. This infuriates Alejandro Meneses, who owns a big vegetable farm in Coquimbo, a parched province of Chile. In theory his landholding comes with the right to pour 40 litres of river-water a second on his fields. But thanks to drought, exacerbated by theft, he can get just a tenth of that, which he must negotiate with his neighbours. If the price of food goes up because farmers like him cannot grow enough, "there will be a big social problem," he says.

The world's water troubles can be summed up in six words: "Too little, too much, too dirty", says Charlie Iceland of the World Resources Institute (WRI), a think-tank. Climate change will only aggravate the problem. Already, roughly half of humanity lives under what the WRI calls "highly water-stressed conditions" for at least one month a year.

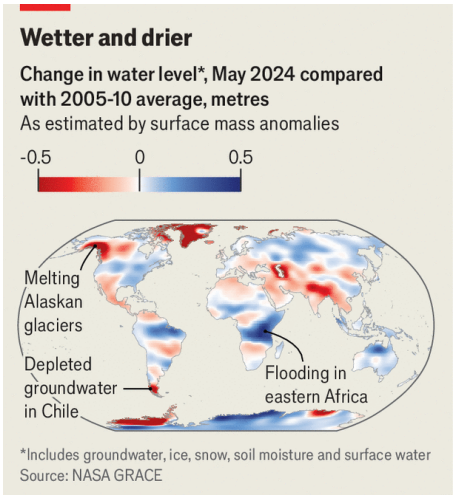



Chart: The Economist

Adapting will require not only new technology but also a new politics. Villages, regions and countries will need to collaborate to share scarce water and build flood defences. The needs of farmers, who use 70% of the world's freshwater, must be balanced with those of the urbanites they feed, as well as industry. In short, a politics of trust, give-and-take and long-term planning is needed. Yet the spread of "them-and-us" demagoguery makes this harder. A global study by Jens Marquardt and Markus Lederer of the University of Darmstadt notes that populists stir up anger, sow

distrust of science and dismiss climate policies as the agenda of liberal elites.

Around 97% of the water on Earth sits in the salty ocean; land-, lake- and river-bound life depends on the remaining 3%. Although the amount of water on Earth is immutable, the daedal workings that move it around are not. The water cycle is made up of a dizzying number of processes, many of them non-linear, which operate across manifold timescales and areas. All are, ultimately, driven by the energy of the sun, which makes seawater evaporate, plants transpire and, by disproportionately heating the tropics, powers ocean currents and weather systems.

Global warming alters the ways water behaves. It intensifies the water cycle, increasing the severity of both very wet events and very dry ones. Warmer air can hold more moisture, which also evaporates more readily out of warmer oceans. More moisture in the atmosphere means more water falls back as rain or snow. This increases the likelihood of heavier deluges in wet regions—and of less potential precipitation in drier spots. "Thirsty" air there is more likely to suck moisture out of the soil, prolonging and worsening droughts.

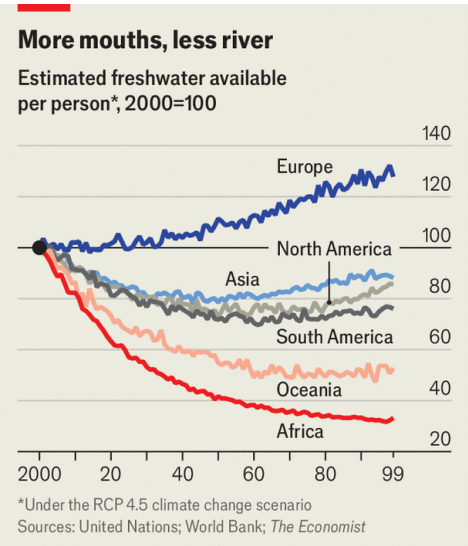



Chart: The Economist

The UN reckons that flooding affected around 1.6bn people between 2002 and 2021, killing nearly 100,000 and causing economic losses of over $830bn. Droughts in the same period affected 1.4bn, killed over 20,000 and cost $170bn. The World Bank estimates that by 2099, the global supply of freshwater per head will fall by 29% from what it was in 2000; and by a massive 67% in Africa, while rising by 28% in Europe (see chart).

In Chile, "too little" is becoming a crisis for which politics is nowhere close to finding a solution. It is the most water-stressed country in South America. "Santiago [the sprawling capital] is all right now, but in ten years' time it might not be," warns Jessica López, the minister for public works.

For centuries, Chileans who wanted water simply took it from streams and rivers, or sank wells to pump groundwater. But as parts of the country dry up, water rules written in wetter times are increasingly out of date. Intense distrust between left and right—in a country that has seen massive protests in recent years—makes them hard to revise.

Conservative governments granted many landowners "water rights", allowing them to pump a generous amount each day, free of charge and for ever. Today, the total volume of granted water rights far exceeds what can sustainably be extracted. So farmers like Mr Meneses have had to sit down with their local water association and agree on how much everyone can pump. Yet some people cheat, sinking illicit boreholes. Tension between big farmers, small farmers and villagers is high. "We're surrounded by farms with illegal wells, and that's why we have no water," says Erica Díaz, a hard-up villager who relies on water trucks and recycles her washing-up water onto her vegetable patch.

Conservative Chilean landowners think of "water rights" as a natural part of property rights. But water is not like land. A house need not encroach upon a neighbour; but a well depletes groundwater for everyone. Granting a fixed volume of water rights in perpetuity is nuts.

Meanwhile, politicians and activists on the Chilean left push the notion that water is a human right. A draft constitution, backed by the current government but rejected by voters in 2022, referred to "water" 71 times, affirming everyone's right to it, especially if they were poor or indigenous. Yet the draft gave little clue as to how that water might be delivered.

The trickiness of water politics is on display at a meeting of small farmers in Punitaqui, a town in northern Chile. Everyone agrees water is too scarce. Some farmers complain big companies have taken an unfair share. Others complain of widespread criminality—including a water inspector getting death threats. An expert shows how to use ultrasound to detect leaks, which are common. Yet many farmers in the room admit they don't even know where their local pipes are buried.

In one sense Chile has plenty of water: to the west is the Pacific Ocean. But getting a permit to build a desalination plant can take more than a decade. The problems are political more than technical. Just for permission to use a bit of shoreline for a plant, a firm must apply to the ministry of defence—taking three or four years. The archaeological-monuments council needs to be assured nothing of cultural interest is being

damaged. That can take another three or four years. And then transporting water is a bureaucratic morass.

Chile needs to think about water logically, says Ulrike Broschek of Fundación Chile, a think-tank. Desalination is useful, but unless powered by renewable energy it is bad for the climate. By one estimate, global emissions from desalination could match all of those from Britain by 2025.

In Chile, bigger, cheaper gains are there to be made. Farms, which account for four-fifths of water use, could use more drip irrigation and hydroponics. If farmers paid directly for water, they would use it more efficiently. Cities, instead of having impermeable pavement everywhere, could use "rain gardens" to capture rain and replenish the groundwater below. And the rules need to be simpler: 56 public bodies regulate water, with no overall co-ordinator, points out Ms Broschek.

Ms López, at least, offers an encouragingly pragmatic view. A pending bill will speed up permits for desalination, she promises, and more water infrastructure will be built. More broadly, she argues that water "needs to have an appropriate price".

**Elsewhere,** sensible water pricing is as rare as it is necessary. Even in places where it has been shown to work, it can be politically fraught. Take Australia, another dry country where farmers use more water than everyone else combined. Federal and state governments thrashed out an agreement in 2012 to conserve water in the Murray-Darling Basin, Australia's biggest system of interconnecting rivers. It relied on an existing scheme allowing farmers to buy or sell water entitlements. The goal was to save 3,200 gigalitres (gl) by 2024, either by "buying back" entitlements from farmers or by investing in projects that could save equivalent amounts, such as more-efficient irrigation systems.

Australia has conserved about 2,130gl of water, equivalent to over 20% of what was previously consumed. Meanwhile, farm output has risen. It helps greatly that the country is rich. The government has pumped A$13bn ($8.8bn) into water-saving. Systems for measuring water use are sophisticated. When Malcolm Holm, a dairy farmer, needs to irrigate his pastures, he orders water online. Sensors measure out the volumes. Locks are raised, and it trickles into his fields. The system sustains his 1,200 cattle.

Yet nearly everyone is unhappy. Environmentalists say the targets should be more ambitious. Farmers say they are too strict. No one is forced to sell their water to the government, but because many do, the system reduces the total amount available to trade for irrigation. This is one reason why water prices have risen in the past decade. That is the point: higher prices spur conservation. But they also threaten rural livelihoods. Protests have erupted in rural New South Wales. "Pre-schools are struggling to get children in. Footy clubs haven't got enough players," says Linda Fawns, a councillor in Deniliquin, a small town. A local agricultural mechanic, Jamie Tasker, claims the government is "scaremongering" about the environment and squeezing irrigation to shore up city votes.

Almost nine out of ten Australians live in cities, and politicians, certainly, do not want their taps to run dry. But priorities change as parties alternate in power. The (conservative) Liberal Party, which is more pro-farmer and reluctant to do much about climate change, stopped doing water buybacks. The Labor Party, in federal power since 2022, resumed them.

And then there is water theft. Last year a farmer was fined a mere A$150,000 for stealing over A$1.1m-worth of groundwater. "Theft is a business model, because fines don't fit the crime," grumbles Robert McBride, an outback sheep farmer.

In 2026 the Murray-Darling plan comes up for review. As droughts grow worse, the government ought to buy back more water, thus raising water prices and driving the least water-efficient farms out of business. They won't go quietly.

**From conflict to compromise**

**If the politics of water is touchy in well-off, stable places like Australia and Chile, it is explosive in poorer countries**. In many of them, climate change seems to be making the weather more erratic, for example by magnifying the variability inherent in the El Niño-Southern Oscillation, a global driver of monsoons and their rains.

In April and May floods in **Kenya** were the worst in memory, with bridges, schools and railways destroyed. Perhaps 300 people died. Following years of drought, the government was caught off-guard, says Kennedy Odede of SHOFCO, an NGO serving Kenya's slums. "When it started raining, people were happy. Nobody was expecting there to be too much."

The government should have been better informed. Persistent drought paves the way for flooding, because the soil hardens and the water has nowhere to go but sideways. Kenya's populist president, William Ruto, ignored warnings last year of impending floods.

Benninah Nazau, a vegetable-hawker in Mathare, a Nairobi slum, recalls rain pounding on her tin roof at 5pm on April 23rd. When she peered out, she saw tables and chairs swept along by the nearby river. By 1am the

water was surging through her home. She grabbed her five children and took them to higher ground, unable to salvage any possessions. "It was life or death." Neighbours were carried off in the deluge.

Political dysfunction makes cities less resilient. Rules barring the construction of homes dangerously close to watercourses are ignored (Ms Nazau's home was only six metres away). Landowners bribe officials in order to flout planning codes. Builders pave over wetlands.

Whereas scarcity has an obvious solution—higher prices—the problem of too much water does not. Flood defences must be built and people discouraged from living in the riskiest places. But where, and how? Kenya's government is sponsoring tree-planting along Nairobi's river banks, to help hold back future floods. A moratorium has been placed on new building permits in the city. Officials are evicting people from homes built 30 metres or less from the riverbanks and destroying the buildings. In the worst-affected part of Mathare, all that remains is rubble and a stench of sewage. Compensation for each household was 10,000 shillings ($77.60).

Many residents are resisting by refusing to leave their shacks. Others want more compensation. Many distrust the government, widely seen as corrupt. Some Kenyans even think politicians deliberately caused the flooding, to pave the way for the slum clearances that followed. Belief in such far-fetched conspiracy theories makes co-operation between state and citizens less likely.

**Squabbles over water can turn violent**. **The Water, Peace and Security partnership**, a global body, crunches data to predict water-related conflicts. Its latest update, in June, noted that herders and farmers across the Sahel are fighting over scarce water. Drought-related skirmishes are expected in South Africa, Madagascar and Mozambique, and floods in Iran and Afghanistan have displaced populations into areas where they may not be welcome.

**Tensions between states are common, too**. As rivers grow more erratic, negotiations between downstream countries and upstream ones may grow more fraught. Dry countries (such as China and the Gulf states) are buying up farmland in Africa and the Americas to secure future supplies of food. In effect, they are importing vast quantities of water in the form of wheat and soyabeans. This could become a political flashpoint.

Water wars between states are fortunately rare. But **Egypt** is furious about an Ethiopian dam that could disrupt its access to the Nile river, from which it gets nine-tenths of its water. Talks over how to share the water keep failing. Egyptian officials hint they might go to war. They may be bluffing, but no one can be sure.

**To avoid water wars, countries need to use water more efficiently** (Egypt wastes it copiously) and **negotiate more amicably.** Much work needs to be done in both areas. The world spends roughly 0.5% of GDP on water, the World Bank estimates, but 28% of allocated public funds go unspent. Meanwhile, a typical water utility has "efficiency losses" (leaks and theft) of around 16%. As for amicable haggling, **three-fifths of the world's 310 international river basins lack frameworks to govern disputes.**

**Chile's jetties to nowhere** Photograph: Le Pictorium

Another thing that makes water policy hard is that many people—such as those whose homes are too costly to defend from floods, or whose crops wither—will eventually have to move. Chilean vineyards are already shifting south. Outback towns will shrink. Inundated Africans and Asians will keep migrating to cities or abroad.

Rich countries may be able to help compensate those whose homes and fields are rendered worthless, but the process will be disruptive everywhere. Nonetheless, it should be manageable. The WRI estimates that solving the world's water crises would cost 1% of GDP per year until 2030, and that every $1 invested in sensible ways to do so would yield $6.80 in benefits. However, getting the politics right will require calm, collaborative leadership, disproving the epigram attributed, perhaps erroneously, to Mark Twain: "Whisky's for drinking; water's for fighting."■

## Document 2 - Climate warning as world's rivers dry up at fastest rate for 30 years

Helena Horton Environment reporter, ***The Guardian,*** Mon 7 Oct 2024

Rivers dried up at the highest rate in three decades in 2023, putting global water supply at risk, data has shown. Over the past five years, there have been lower-than-average river levels across the globe and reservoirs have also been low, according to the World Meteorological Organization's (WMO) State of Global Water Resources report.

In 2023, more than 50% of global river catchment areas showed abnormal conditions, with most being in deficit. This was similar in 2022 and 2021. Areas facing severe drought and low river discharge conditions included large territories of North, Central and South America; for instance, the Amazon and Mississippi rivers had record low water levels. On the other side of the globe, in Asia and Oceania, the large Ganges, Brahmaputra and Mekong river basins experienced lower-than-normal conditions almost over the entire basin territories.

Climate breakdown appears to be changing where water goes, and helping to cause extreme floods and droughts. 2023 was the hottest year on record, with rivers running low and countries facing droughts, but it also brought devastating floods across the globe.

The extremes were also influenced, according to the WMO, by the transition from La Niña to El Niño in mid-2023. These are naturally occurring weather patterns; El Niño refers to the above-average sea-surface temperatures that periodically develop across the east-central equatorial Pacific, while La Niña refers to the periodic cooling in those areas. However, scientists say climate breakdown is exacerbating the impacts of these weather phenomena and making them more difficult to predict.

Areas that faced flooding included the east coast of Africa, the North Island of New Zealand, and the Philippines. In the UK, Ireland, Finland and Sweden, there was above-normal discharge, which is the volume of water flowing through a river at a given point in time.

"Water is the canary in the coalmine of climate change," said the WMO secretary general, Celeste Saulo. "We receive distress signals in the form of increasingly extreme rainfall, floods and droughts which wreak a heavy toll on lives, ecosystems and economies. Melting ice and glaciers threaten long-term water security for many millions of people. And yet we are not taking the necessary urgent action.

"As a result of rising temperatures, the hydrological cycle has accelerated. It has also become more erratic and unpredictable, and we are facing growing problems of either too much or too little water. A warmer atmosphere holds more moisture which is conducive to heavy rainfall. More rapid evaporation and drying of soils worsen drought conditions," she added.

These extreme water conditions put supply at risk. Currently, 3.6 billion people face inadequate access to water for at least one month a year, and this is expected to increase to more than 5 billion by 2050, according to UN Water.

Glaciers also fared badly last year, losing more than 600 gigatonnes of water, the highest figure in 50 years of observations, according to the WMO's preliminary data for September 2022 to August 2023. Mountains in western North America and the European Alps faced extreme melting. Switzerland's Alps lost about 10% of their remaining volume over the past two years.

"Far too little is known about the true state of the world's freshwater resources. We cannot manage what we do not measure. This report seeks to contribute to improved monitoring, data-sharing, cross-border collaboration and assessments," said Saulo. "This is urgently needed."

# Water Conflicts

**• The Wold's Water – Information on the World's Freshwater Resources**

**Map and Chronology of water conflicts by the Pacific Institute**

In an ongoing effort to understand the connections between water resources, water systems, and international security and conflict, the Pacific Institute initiated a project in the late 1980s to track and categorize events related to water and conflict, which has been continuously updated since. The database, most recently updated in August 2024,

presents the information as a chronology and map. Use the links below to explore the chronological list of events or the interactive events map.
https://www.worldwater.org/water-conflict/

• **VIDEO Water Wars: 15 Cities FIGHTING Over WATER Resources, GeoInsider, August 2024**
https://youtu.be/QNuS2JyQuD0?

**•VIDEO Global Water Wars – National Geographic**
https://youtu.be/A0yu7nP50rM

**• Two water conflicts in the US**
https://www.southernenvironment.org/topic/tri-state-water-wars-alabama-georgia-florida/
https://www.cnn.com/2024/06/17/climate/water-conflict-us-mexico-heat-drought/index.html

## Document 3 – AUDIO - Water wars in the western U.S. could spread to the Midwest, Great Plains

**NPR,** October 16, 2024
https://www.npr.org/2024/10/16/nx-s1-5135588/water-wars-in-the-western-u-s-could-spread-to-the-midwest-great-plains

## Document 4 -The water wars of the future are here today

*Seven thirsty states, including California, are fighting over the dwindling waters of the Colorado River. USC experts look at how we got here — and why this was inevitable.*

**USC Today,** February 28, 2023, **Nina Raffio**
***(USC = University of Southern California a private research university in Los Angeles, California. Founded in 1880 by Robert M. Widney, it is the oldest private research university in California and has an enrollment of more than 49,000 students.)***

Once hailed as the "American Nile," the Colorado River spans 1,450 miles and supplies nearly 40 million people across seven states plus northern Mexico with drinking water, irrigation for farmland and hydroelectric power. But after decades of drought and overuse, major reservoirs along the river are drying up.

As the Colorado River levels drop to historic lows, tensions are rising between the seven states that depend on its flow — Arizona, California, Colorado, New Mexico, Nevada, Utah and Wyoming. Their original agreement for distributing the river water lacked foresight and failed to account for dire circumstances like long-term drought.

The American Southwest now faces a crisis it knew was coming.

The fate of the Colorado now depends on the states' ability — and willingness — to agree on a plan to slash water consumption and equitably distribute what's left.

"When they made their original estimates of the river's annual yield, states were aware that there probably wasn't going to be that amount of water available in the years to come," says Robin Craig, professor of law at the USC Gould School of Law. "Figures that were never true over historical time are increasingly not true now as we deal with the effects of climate change."

**Water wars: 'Law of the River' sparks a centurylong standoff**

The low water level on the Colorado River is noticeable behind Hoover Dam. (Photo/iStock)

The Colorado River has been a point of contention for over 100 years. In 1922, the seven basin states endorsed the original Colorado River Compact. The agreement split the region into the Upper Basin, comprising Colorado, New Mexico, Utah and Wyoming, and the Lower Basin, which includes Arizona, California and Nevada.

The pact was the region's first formal attempt at appropriating Colorado River water and has served as a cornerstone of the West's "Law of the River" — the collection of legal documents governing the river's water apportionments — for over a century.

Although the agreement defines how much water each state and Mexico should receive, the distribution was based on false assumptions about the river's annual flow.

Until recently, the states have largely ignored the realities of the river, the truth of its annual rain and snowfall, and the vast, harsh desert climate of the West. The agreement assumed that an average of 16.4 million acre-feet flowed from the Colorado River downstream each year. The average flow, though, is significantly less, said Craig, an expert in environmental and water law.

"The original compact was negotiated at the height of a record wet period," said Craig, who holds the Robert C. Packard Trustee Chair in Law at USC Gould. "Depending on whose data you look at, average flow in the Colorado River hovers around 13.8 million acre-feet per year, and it could drop down to 12 or even 10 million. I've seen projections as low as 8 million acre-feet annually."

Distorted from the start, the initial estimates set an unrealistic precedent that worsened with the impacts of climate change.

"At the time, it was more important for states to get a political deal on the table," Craig said. "They figured they would sort out their differences later."

Under the 1922 pact, each basin receives an annual allotment of 7.5 million acre-feet of water from the Colorado River. In northern Colorado where the river begins, the Upper Basin is still required to deliver the Lower Basin's portion in full, even in a drought like California is experiencing. In addition, a 1944 treaty requires the United States to give Mexico 1.5 million acre-feet each year.

**Native American tribes still denied water rights**

For many American Indian tribes in the West, the river is a mirage perpetuated through legalized oppression. They cannot reach it, and the water does not reach them.

The Navajo Nation in Arizona, among others, has historically and repeatedly been denied access to the Colorado River, despite having a legitimate legal claim to its resources.

The 1922 pact makes only one reference to tribal water rights in a single sentence that reads: "Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes."

Several tribes have yet to receive their full share of the Colorado River. The U.S. Supreme Court will hear the Navajo Nation argue for its allotment as part of a case filed against the state of Arizona.

"Tribes were, if not being actively discriminated against, at least legally ignored," Craig said. "We're still dealing with the historical injustice that several tribes — many of whom were dislocated and put on the worst lands in the West to begin with — are entitled to water rights that have never been quantified and certainly never delivered."

**In water wars, California is 'first-in-time, first-in-right'**

The Colorado River winds its way from the Rocky Mountains, through the American Southwest to the Gulf of California.


The Colorado River Basin includes parts of seven states. (Graphic/Bureau of Reclamation)

To the chagrin of six basin states, California is first in line for the water, receiving an annual allotment of 4.4 million acre-feet from the Colorado River — the most of any state.

The Golden State is first in line because its use of the Colorado River for irrigation began during the Gold Rush of the 1840s.

"The highest priority goes to whoever first accessed the water and put it to beneficial use — or in other words, who made the original investment," said Shon Hiatt, an associate professor of business administration at the USC Marshall School of Business. "Anybody else that comes up would be considered a minority water rights holder, so they only get their share if there's enough left from the people ahead of them."

Earlier this year, the seven basin states issued two rival proposals: One from California stresses its first-place status under the Law of the River. Another from the other six basin states argues that the river's water deficits make the original agreement impractical.

At the time that this story was published, negotiations were at an impasse.

"California as a senior water rights holder is still demanding its share of 4.4 million acre-feet, which doesn't allow for variation in the river's actual water supplies," says Hiatt. "States can compromise by maintaining their annual allotments as a percentage, though I don't foresee California letting up in negotiations. The only way to force the state to compromise would be through congressional action."

**The 'American Nile' is one of several battlegrounds in the global water wars**

Halfway around the world lies a river in crisis. The true Nile River — the longest on the planet and the lifeblood of more than 300 million inhabitants in East Africa — is the site of a similar, long-running conflict over water rights.

"The story of the Nile is our story, too. It's somehow a window into the future to see ourselves under the rising in both climate fluctuations and water uses," said Essam Heggy, a scientist and founding member of the USC Viterbi School of Engineering's Arid Climates and Water Research Center and an affiliate of the NASA Jet Propulsion Laboratory.

"Like the American Southwest, the Nile River Basin is under great pressure due to decades of increased water consumption, droughts and upstream damming. Combined, the three drivers are significantly altering the river flow. The environmental impacts are often minimized to build more hydropower dams or extend lucrative farming activities that are exogenic to the river system," says Heggy.

"The last few decades of disbelief in water and climate sciences were enough to bring Egypt, the most downstream country of the Nile Basin and fully relying on its water, from one of the fast-growing African economies to one of the most economically vulnerable nations on the planet."

Heggy emphasizes that although the Nile is thousands of miles away from California, its story is essential to the U.S. given these shared challenges.

Unlike the case of the Colorado River, where academic institutions are exploring the risks associated with these challenges to support proper long-term mitigation measures, interest and lobbying groups supporting the increase in hydro dams on the Nile are minimizing risks of water shortages and environmental impacts, ignoring lessons learned from other mega-dams where these damages were irreversible.

# Can rivers be moral persons?

● **The Rights of Nature: A Global Movement - Feature Documentary by Isaac Goeckeritz, March 2020**
https://www.youtube.com/watch?v=kuFNmH7lVTA&ab_channel=IssacGoeckeritz%7CFilmmaker
Western views and the legal system tend to view nature as property, and as a resource from which wealth is extracted, a commodity whose only value is to provide for human needs. But for millennia indigenous communities have viewed themselves as part of nature. As pressures on ecosystems mount and as conventional laws seem increasingly inadequate to address environmental degradation, communities, cities, regions and countries around the world are turning to a new legal strategy known as The Rights of Nature. This film takes viewers on a journey that explores the more recent origins of this legal concept, and its application and implementation in Ecuador, New Zealand, and the United States

**Document 5 - Granting legal 'personhood' to nature is a growing movement – can it stem biodiversity loss?**

***The Conversation***, April 2024
**Viktoria Kahui**, Senior Lecturer in Environmental Economics, University of Otago

Biodiversity is declining at rates unprecedented in human history. This suggests the ways we currently use to manage our natural environment are failing.

One emerging concept focuses on giving legal rights to nature.

Many Indigenous peoples have long emphasised the intrinsic value of nature. In 1972, the late University of

Southern California law professor Christopher Stone proposed what then seemed like a whimsical idea: to vest legal rights in natural objects to allow a shift from an anthropocentric to an intrinsic worldview.

Ecuador was the first country to enshrine rights of nature in its 2008 constitution. Since then, a growing number of countries have followed in awarding rights of nature.

This includes Aotearoa New Zealand, where legal personhood was granted to the Whanganui River, the former national park Te Urewera and soon the Taranaki maunga.

At its core, the rights-of-nature movement allows persons to take legal action on behalf of natural ecosystems, as opposed to on behalf of people affected by environmental degradation.

Ecosystems can become separate entities with their own agency, in the same way other non-human entities such as charitable trusts and organisations can exist as separate entities in law.

But can the movement help stem the loss of biodiversity? There is no easy answer. Our new research shows that many rights-of-nature examples have emerged because current systems were not enough to protect nature from continued economic pressure from development.

We find one of the key features of well designed rights-of-nature frameworks lies in defining who is ultimately liable, and what for.

**Global case studies**

The design of rights-of-nature frameworks varies widely in geography, legal status, guardianship and who holds liability. We investigated 14 global rights-of-nature examples and categorised them by types of guardianship. For example, in 2008, Ecuador enshrined rights of nature in its constitution because of decades of pressure from large mining companies.

This represents a type of public guardianship where *every* citizen has the right to take legal action on behalf of nature.

In New Zealand on the other hand, the former national park Te Urewera was granted legal personhood with Tūhoe trustees as appointed guardians.

A legal person is defined as an entity which has the capacity to enter into contracts, incur debts, sue and be sued in its own right, and to be accountable for illegal activities. We define rights-of-nature cases with appointed guardians as "environmental legal personhoods".

We then compared these cases to explore why they emerged and how they are designed. Who advocated on behalf of the environment? What was the exploiting activity putting pressure on the ecosystem? What is the liability status of the guardians?

We found that, overwhelmingly, Indigenous people and local communities acted as advocates. **For example, the Whanganui River in New Zealand was granted legal personhood in 2017 as a result of hundreds of years of resistance by Indigenous Māori to aggressive colonisation.**

Since 1848, the Crown has introduced a steamer service, cleared forest from river banks, extracted sand and gravel, and diverted water into a power scheme. This led to ongoing conflict with Whanganui iwi who raised concerns about the river's health and the desire to preserve the resource for future generations.

**Response to sustained economic pressure**

On the other side of the world, the Mar Menor lagoon in Spain was declared a legal person in 2022 due to strong local community advocacy against pollution from agriculture, mining and sewage.

The evidence from our research points to a fundamental divide between local communities and external economic interests. The rights-of-nature movement has come as a response to sustained pressure from economic (urban, agricultural and industrial) activity. The features of design, however, vary significantly.

For example, the Victorian state government in Australia established the Victorian Environmental Water Holder, an independent statutory body under the state's Water Act 1989, as a legal person. It manages water entitlements to improve the health of rivers and wetlands. The entity acts indirectly on behalf of the ecosystems, which is not precisely the same as creating legal rights for rivers themselves.

The Whanganui River, on the other hand, was itself declared a legal person. Its appointed guardians have the legal status of a charitable entity. This group includes representatives of Whanganui iwi and the government, supported by members of councils, locals, and recreational and commercial users.

**Liability matters**

The recent overturning of two rights-of-nature decisions in particular puts the spot light on the importance of liability.

**In the US, farming operations challenged the Lake Erie Bill of Rights in 2020, which granted Lake Erie the right to "exist, flourish and naturally evolve". Farmers argued the bill was too vague and would expose them to liability from fertiliser runoff.**

In India, the Ganges and Yamuna rivers were granted living-person status, where injury to rivers was to be treated equally to injury to human beings. The decision was challenged on the grounds of uncertainty about who the custodians are and who would be liable to pay damage to the families of those who drowned in the rivers.

**Both these were legally overturned, meaning these natural entities no longer have rights of nature. This suggests attention to legally defining who is liability for what may be an important building block for the movement to protect biodiversity in the future.**

**Our recommendation is that future rights-of-nature frameworks need to have well-defined legal rights and include appointed guardians, established as separate legal entities with limited liability, as well as the support of representatives from interest groups.**

# Cleaning Rivers


**Document 6 - The Guardian view on reclaiming the Seine: hope for 21st century rivers**

Editorial, ***The Guardian,*** Fri 2 August 2024

It was an American modernist poet who captured best the ancient, elemental status of rivers. In one of his best-loved poems, Wallace Stevens celebrated their "third commonness with light and air / A curriculum, a vigor, a local abstraction". Life-supporting and place-defining, the great rivers of the world have nurtured and sustained our cities, but more latterly been blighted by the toxic legacy of industrialisation.

The successful staging of Olympic events in a cleaned-up River Seine therefore deserves to be seen as a social and environmental milestone, as well as a sporting one. The remarkable spectacle of triathlon competitors diving from the Pont Alexandre III, as the Eiffel Tower loomed large on a blue-skied summer morning, will take some beating as a signature image of Paris 2024.

Given that intense summer rainstorms almost derailed the event, generating contaminated overflow from the city's water pipes, that scene will have been greeted with immense relief by the city's socialist mayor, Anne Hidalgo. It was Ms Hidalgo who put the reclamation of the Seine at the heart of Paris's Olympic bid in 2016 – a $1.5bn project that only just came in on time. Her green ambition has been justly rewarded by the emergence of the Seine as a example of what a 21st-century urban river can become.

More investment may be needed to cope with the challenge of Paris's Napoleonic-era sewage system. But three urban beaches are due to open next year, including under the Eiffel Tower and next to the Hotel de Ville. Almost 30 more, equipped with parasols and river pools, are being planned for the suburbs and to the east of the capital. As global heating delivers hotter summer temperatures, the availability of cool bathing areas in the heart of the city will be an invaluable public good. Wildlife is returning to the cleaner water, including catfish and crustaceans, shrimps, sponges and perch.

Beyond leisure and recreation, there are also plans to develop the Seine as a major carbon-free transport route for businesses. The European Green Deal envisages a doubling of barge traffic across the continent by 2050, moving goods off the roads and on to rivers, which currently account for less than 2% of freight transport. From Paris to Le Havre, where the Seine meets the English Channel, France's main port operator, Haropa, is investing more than €1bn to make it fit for that purpose.

The last century appeared to turn its back on the flowing arteries that pumped life through its cities. Rivers were shunted into economic irrelevance by the rise of road and rail, and used as a dumping ground for the toxic detritus of modernity.

But Paris offers further evidence that a necessary comeback is under way. Restoration of Munich's Isar began a quarter of a century ago, transforming it into a recreational hub and spectacularly renewing habitats for fauna and flora. Switzerland has restored more than 300km of degraded rivers, and cities such as Basel, Zurich and Geneva have made their waterways accessible and safe.

The notorious state of Britain's sewage-infested rivers has become a modern scandal. The recent completion of the Thames Tideway project – a £5bn super sewer designed to divert raw sewage away from the river – is at least a start, but there is a very long way to go. London should take inspiration from the City of Light, where the "vigor" observed by Stevens has been restored to one of the most famous stretches of water in the world.

## Document 7 - **Splashing in the Seine, diving in the Danube: the drive to make cities swimmable**

*Campaigners and architects around the world are turning previously polluted rivers and harbours into the perfect places for a refreshing dip. So will we soon be swimming to work?*

**Oliver Wainwright**, ***The Guardian***, Mon 19 Aug 2024

**O**n a summer morning in the Swiss city of Basel, groups of commuters bob merrily down the Rhine. They're not on boats but in their trunks, clutching fish-shaped waterproof bags that double as floats as they drift to work alongside cargo ships and gravel barges.

At lunchtime in Copenhagen, the harbour walls are packed with bronzed bodies tanning on tiered decks, and launching themselves into the water from daring wooden platforms. Office workers stop for a quick dip between meetings, while ferries cruise by. After work in Vienna, the grassy banks of the Danube throng with swimmers lounging in the dappled shade, fresh from changing in multistorey locker room towers, as a metro train rumbles across a nearby bridge.

After a century of ignoring the very arteries that allowed them to grow in the first place, cities are learning to love their rivers again. Around the world, as global heating causes summer temperatures to soar, people are flocking to urban waterways and reclaiming these once polluted, poisoned gutters as indispensable places to cool off and unwind.

Last month, the urban swimming movement made its biggest splash yet, when 110 athletes dived into the River Seine for the Olympic triathlon. The televised spectacle of swimmers front-crawling their way through Paris, flanked by beaux-arts bridges, offered a glimpse of what all our urban waterways could look like. Might these dangerous arteries of cargo and sewage be reborn as the great free public spaces that they could be? Could taking a plunge in the Thames, Hudson or Tiber one day be as common as going for a stroll in the park?


'A generational baton-change' … triathletes dive into the Seine during the Paris Olympics. Photograph: Jeff Pachoud/AFP/Getty Images

"What's happening in Paris represents a generational baton change," says Matt Sykes, an Australian landscape architect and the convener of the Swimmable Cities Alliance, a global network of urban swimming campaigners pushing to make the scenes in the Seine an everyday reality for us all. "With climate change, cities are being forced to adapt. Swimming access will become an inevitable part of the urban design vocabulary. The next generation are ready – kids will be watching the Olympic triathlon on TV and asking: 'Why can't we swim in our river?'"

*While Basel's bathers enjoy steps down to the Rhine, London treats the Thames as a filthy foe*

In Sykes's eyes, floating pontoons and riverside showers should be as common a part of the cityscape as bike lanes and benches – and he and his fellow advocates are pushing to make it a reality. To coincide with this summer's Olympics, the alliance published a charter, signed by a host of municipalities, government agencies, community groups and cultural institutions from 31 cities around the world, in a bid to create safe, healthy and swimmable waterways, accessible to all. The hope is to have 300 new cities starting their journey towards "swimmability" by 2030.

The alliance is already making headway. In the Dutch city of Rotterdam, a masterplan for the Rijnhaven dock includes a new permanent beach and a tidal park. In Sydney, the Urban Plunge programme has plans that include floating pools, and riverside ladders and lockers. By next summer, if all goes according to plan, New Yorkers will be swimming beneath skyscrapers in the safe surrounds of a floating, filtered pool in the East River.

"This is going to be the cleanest water anyone ever swims in," says Kara Meyer, the managing director of Plus Pool, a project which began in 2010 as a Kickstarter campaign by four young designers. Fourteen years on, New York State and New York City have announced changes to regulations that finally make the project possible, and committed $16m (£12.4m) to see a prototype pool realised by 2025.

Campaigning to change bylaws … the Fluss Bad swim in the Spree canal, Berlin. Photograph: © Axel Schmidt

"The original idea was: 'What if you just dropped a big strainer in the river?'" says Meyer. "Now, we're essentially building a floating wastewater treatment facility." Engineered by Arup, the pool will pass the river water through a series of filtration membranes and blast it with UV disinfectant, in order to meet stringent water quality standards.

It will be a far cry from the floating bathhouses that used to be docked on the city's riverbanks in the 19th century. These rectangular wooden slatted structures, which allowed the river to flow freely through, were gradually decommissioned in the 1930s as water quality declined. The Clean Water Act, passed in 1972 with the ambitious goal of making all US rivers and lakes swimmable by 1983, set the wheels in motion, but that target is still a way off.

"The pandemic was a real catalyst," says Meyer. "There's been a realisation that we need far more public space, and much better access to our natural environment." She says a recent rise in drowning deaths, after decades of decline, underlines the importance of access to water and basic swimming skills – a need exacerbated by a shortage of lifeguards, after decades of pool closures. "It's taken getting to this point of crisis for people to pay attention and understand the value of projects like these."

Along with Switzerland – where *Rheinschwimmen* has been a tradition since the 1980s, after wastewater treatment reforms – Denmark is leading the way. Thirty years ago, Copenhagen's harbour was a polluted mess of sewage and industrial waste. Now Danes are spoilt for choice of architect-designed bathing structures, and water quality is constantly monitored on a dedicated app. The Islands Brygge harbour baths, designed in 2002 by then-little-known architects Bjarke Ingels and Julien De Smedt, launched a generation of increasingly expressive timber platforms for diving, lounging and people-watching. They will soon be joined by Water Culture House, a temple to urban swimming by Kengo Kuma at the heart of a new waterfront development.

Positive addition … a CGI concept illustration for the Plus Pool in New York's East River, the prototype of which will be realised by 2025. Photograph: Courtesy of Friends of + POOL

Elsewhere in Europe, the Fluss Bad campaign in Berlin organises an annual swim in the Spree canal, seeing swimmers splashing past the cultural palaces of museum island. The group is pushing for local bylaws to be changed to permit swimming, and has launched a water quality monitoring website to show the canal is clean enough to swim in 90% of the time. In Brussels, a city without a single outdoor swimming pool, the Pool Is Cool campaign operates a temporary pool each summer, as a prelude to future plans for swimming in the canal. In the bathing capital of Budapest, the Valyo group wants to see the city's history of floating wooden pools return to the Danube. Swim fever is rampaging across the continent. So why is the UK lagging so far behind?

"There is an inherent fear in this country of getting anyone near water," says architect Chris Romer-Lee of Studio Octopi, who has been battling to realise his floating Thames Baths project for over a decade. "Which is ridiculous, given we're an island."

Might our rivalry with the French be the catalyst we need to force our statutory agencies to work together? Following Paris's €1.4bn (£1.2bn) clean-up operation of

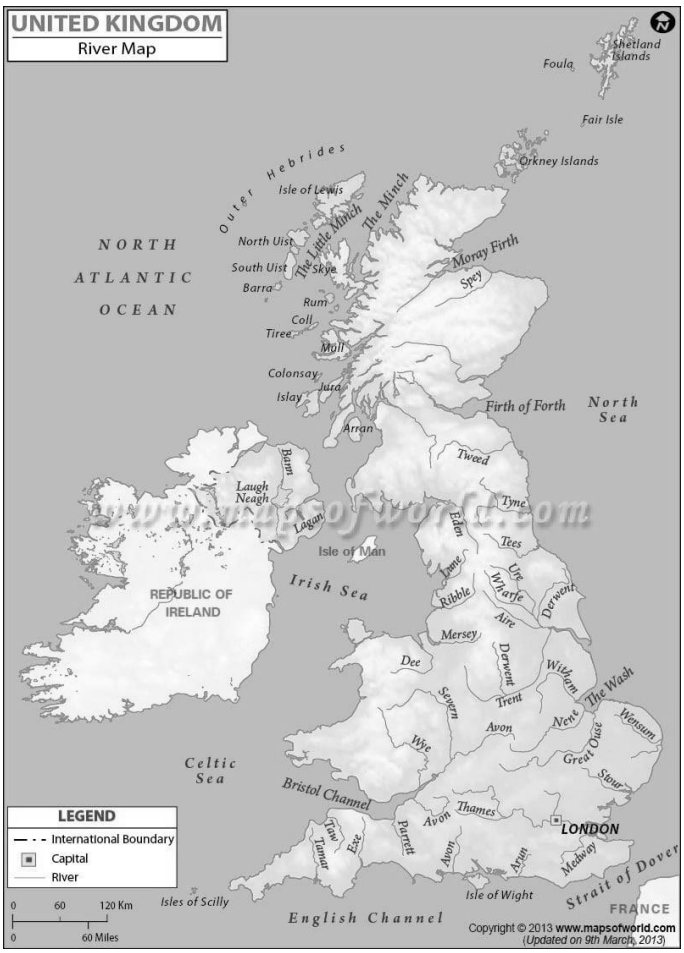
the Seine, and scenes of mayor Anne Hidalgo boldly plunging into the river, London's mayor, Sadiq Khan, hastily pledged to make the UK capital's rivers "swimmable by 2034". He faces an uphill battle. Recent City Hall analysis found a five-fold annual increase in sewage entering London's rivers, with spills lasting nearly 7,000 hours between April and December 2023.

Pollution isn't the only barrier. The Port of London authority, in charge of Thames traffic, shows no sign of lifting its ban on swimming east of Putney. They cite "fast-flowing tides, undertows, underwater hazards and the heavy presence of commercial vessel traffic" – even if the £5bn super sewer eventually makes Thames water clean enough to swim in. While Basel's bathers enjoy broad banks of stone steps leading down to the Rhine, London continues to treat its majestic river as a filthy foe. A brand new series of riverside public spaces, currently being completed as part of the Tideway sewer project, sadly greet the Thames with the same suspicion as our Victorian forebears, with defensive walls and high railings.

Paris shows another way is possible. The Olympic triathlon wasn't a stunt but the culmination of a 30-year shift in public policy. Next summer will see four new swimming pools floating in the Seine, built for €10m, allowing Parisians to plunge directly into river water, with changing rooms, showers and lockers all provided for free. Boat traffic and currents are just as much of a hazard there, but through careful negotiation and political will, they've made it work.

"We lost the tradition of river swimming in the last century," says Julien Laurent, who has the enviable job title of head of swimming in the Seine River. "But it's not so new, or so radical. It happened for centuries, before boat traffic took over. We're just bringing it back."

# Rivers in the UK




HERE is a quiz to try and guess where English rivers are (very hard!)
https://www.sporcle.com/games/jcarricklawson/location-of-uk-rivers
You can see them all HERE

Document 8 - AUDIO – **Étudié en cours**

**Dangerously high levels of E. coli bacteria overshadow rowing event on the Thames**

NPR, March 29, 2024

https://www.npr.org/2024/03/29/1241576447/dangerously-high-levels-of-e-coli-bacteria-overshadow-rowing-event-on-the-thames

## Document 9 - Conservative 'failures' have led to more sewage pollution, say water experts

*Increased flooding blamed on years of government delays over 'sponge cities' rules*

Sandra Laville ***The Guardian*** Wed 10 Jan 2024

***Cf Synthèse DS 3***



## Document 10 - Amid a Water Crisis, England Asks: Who Should Be in Charge?

*Four decades after privatization, calls to nationalize the water industry have swept across England and Wales amid sewage spills and rising household bills.*

By Eshe NelsonPhotographs by Sam Bush, Reporting from London and Henley-on-Thames, England

***The New York Times***, October 14 2024

***Cf Synthèse DS 3***

## Document 11 - Explainer - How could England's water system be fixed?

After decades of underinvestment, the debt-ridden, polluting industry is in crisis. Experts share their views on how to reverse the tide

***The Guardian***, *Wed 10 Jan 2024*

A debt-ridden, leaking, polluting industry, owned largely by foreign investment firms, private equity and pension funds who have presided over decades of underinvestment most shockingly illustrated by the scale of raw sewage dumping into rivers: that is the privatised English water industry in 2024.

It is a global anomaly. Over the last three decades it has evolved into a notoriously complex system of shadow ownership that has loaded debt on to the balance sheet, while providing rich dividends for investors.

Today, water as an industry is in varying levels of crisis. In the south-east, Thames Water, the biggest company, is riddled with debts of £18bn and struggling to extract the millions it needs from shareholders while its value plummets. At South East Water, the cost of servicing its debt has risen in six months by £7.4m to £54.8m as inflation and higher interest rates bite.

Water companies across England are under criminal investigation into suspicions thousands of treatment works have been illegally dumping sewage into rivers for many years.

Total dividends paid since 1989 have reached £83.7bn at today's prices. Meanwhile, customers are being asked, via bill increases of up to 40%, to pay for required new investment of £96bn.

Is there a solution for the water industry that will protect the environment, build in better accountability, provide clean drinking water and build resilience to climate change? We asked experts for their views.

**Ownership**

Dr Ewan McGaughey, a professor of law at King's College London, argues England should join Scotland, Wales, Paris and most of the world, and restore public ownership using the legal framework of special administration that already exists.

This can be triggered if companies are unlikely to be able to pay their debts without public subsidies or have seriously breached their duties, for example by failing to improve their pipes to stop leaks or failing to drain and clean sewers to stop pollution.

Once in special administration, the companies can be transferred to a new publicly owned entity. Responding to the criticism that paying off shareholders and debts would cost too much, he argues the current law allows for debts to be reduced or even removed if they infringe on the water company's ability to properly carry out its legal duties.

Richard Murphy, of the Corporate Accountability Network and Sheffield University, argues the water companies are in effect environmentally insolvent because they do not have the financial means to raise the £260bn needed to stop their sewage dumping, according to a House of Lords assessment. Therefore no compensation is due to shareholders, or to those who lent money to the companies.

But Murphy said in order to be pragmatic, a small offer to shareholders and a reasonable offer to secured creditors would be required to take the companies back into public control using the special administration rules.

The cost of nationalisation would run into billions – all of which could be paid for by the issue of government bonds.

To raise capital for the future of the publicly owned industry, the public could be offered the chance to buy a bond paying 4% or more in the long term to last for at least 70 years. For the first 15 years the return would be guaranteed by the government, encouraging the public to buy the bonds at scale and fund much of the required investment the industry needs over time.

Dieter Helm, a professor of economic policy at Oxford University, says the privatised industry has "run into the sands" and what is required is systemic change focusing on sustainability, water conservation and a catchment system of regulation to tackle pollution at its source.

Helm does not support re-nationalisation, but he does dismiss the often-repeated view that to take water back into public control would cost too much.

"The one objection to nationalisation which has little merit is that it would cost the government a lot. This is nonsense," says Helm. Re-nationalisation, he argues, would involve swapping the regulatory asset-based debt (RAB) for government bonds. "The government would gain the assets and the RABs and swap utility debt for Treasury debt," he says.

## Regulation

McGaughey says the rules that say the regulator, Ofwat, must secure reasonable returns for investors on their capital must be scrapped. Instead, a new social regulator should be set up with duties to ensure bill payers have clean water and sanitary services, communities have clean waterways and beaches, and all future surpluses are invested in upgrading infrastructure.

Cat Hobbs, of campaign group We Own It, says the current regulatory system is consistently biased towards investors and the regulator is caught in an impossible bind to meet contradictory and contested interests of investors, end users and the state. The current law says companies need 25 years' notice for the removal of their licence.

"If you were starting from scratch, there's no way you would start with the privatised system we have in England, geared towards shareholders with our rivers and seas coming as an afterthought. It's simply not a sensible way to deliver what we need," she said.

What is required are publicly owned water companies with a duty to work with communities to clean up and protect our rivers and seas, she said. Governance structures and regulatory mechanisms must hold them accountable as in countries like Scotland and France.

## Sustainability

Population increases, climate change-induced droughts and increases in water demand from data centres mean the pressure on the water system will only rise over the coming decades.

A large facility might use anywhere between 4m and 19m litres of water a day for cooling.

Without further action there is a one in four chance over the next 30 years that large numbers of households will have their water supply cut off for an extended period because of a severe drought, according to the National Infrastructure Commission.

There is a need for more water, but also to reduce water use – currently the average person in England and Wales used 146 litres of water a day. The government wants to cut this to 110 litres a day by 2030.

In that context, using drinking water to flush toilets and wash our faces is seen as costly and unsustainable. Helm argues for separation of the system of drinking and wastewater, something dismissed by the government as too expensive – an argument Helm rejects. He argues instead that separation can be done gradually and grey water can be recycled at the household level with localised urban networks built into the system.

"At the moment, everyone has access to drinking-water-quality supplies for everything, including

watering the garden, cleaning the car and to cool [computing] data hubs," says Helm.

"Imagine if drinking water was for drinking and related uses only, and its use was metered with volume-related charges.

"Imagine a world where drinking water was separated from grey water … [and] new houses [had] a water efficiency requirement to store water … [There would be] strong incentives [for] all houses to store water and recycle for gardening and other non-drinking water use because the metered price was high and reflected scarcity over different periods.

"It could eventually be real-time pricing … in this imaginary world there would not be a scarcity of water supplies."

## Document 12 - Thatcher started the water scandal

*The roots of Britain's water crisis, like so many now facing the country, lay in Thatcherite deregulation*

Jonathan Portes, ***The New European***, October 30 2024

The high-water mark of ideological Thatcherism in the UK came between Nigel Lawson's triumphalist 1988 budget, which – not long after the Conservatives' third successive election victory – slashed the top rate of tax, and the introduction of the poll tax in 1990. Both have since been reversed, either suddenly or gradually – the poll tax didn't survive Thatcher's fall, while those on top incomes now mostly face average or marginal tax rates close to 1987 levels.

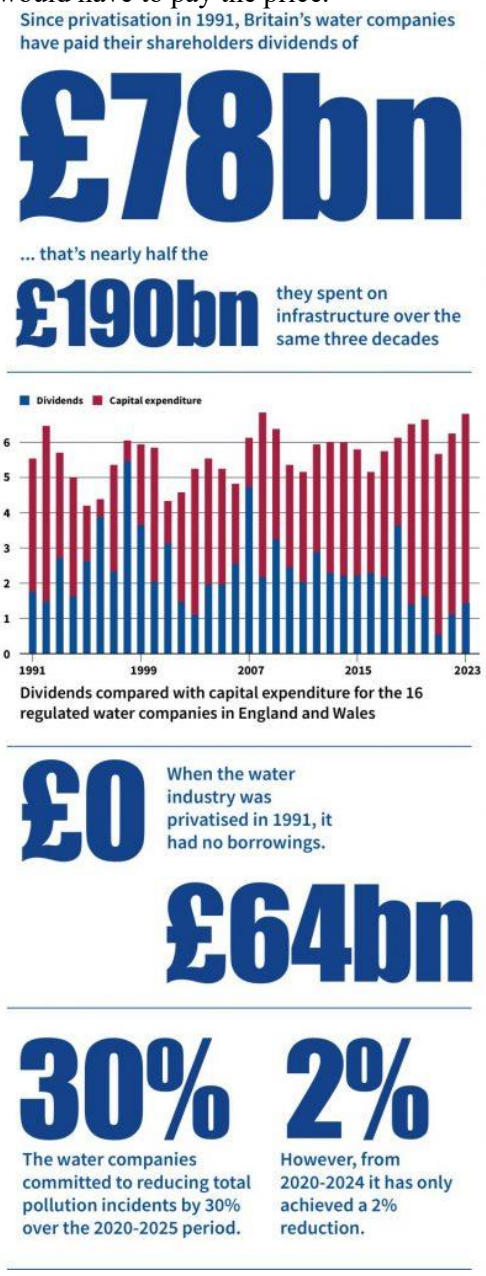
It's odd then that one of Thatcher and Lawson's most unpopular and unsuccessful policies – the privatisation of the water industry in England, which took place in 1989 – remains in place. How did we get it so wrong, and how did the regulatory framework put in place manage to achieve a remarkable trifecta – water companies teetering on the edge of bankruptcy, consumers outraged about bills, and environmental degradation and leaks?

Unfortunately, economics and economists must share some of the blame here. Like British Telecom and British Gas – but unlike other major privatisations of the Thatcher era, such as British Airways – nobody thought that you could just privatise a "natural monopoly" like the water industry without regulating the prices they could charge. Without that, they'd exploit their monopoly position.

And private ownership of natural monopolies wasn't new. Power companies in the US usually had their profits fixed or capped by regulators.

When this worked well, it ensured that their returns were constrained to a reasonably low level, while at the same time making it relatively easy for them to raise capital from risk-averse investors, since the returns were in effect guaranteed by the state. However, there was one big disadvantage – with profits mostly fixed, regardless of how efficient the company was, there wasn't much incentive to increase productivity or reduce costs.

The UK's big innovation was "price cap regulation". Instead of controlling profits, the regulators would fix prices in advance. As long as the private companies continued to deliver an acceptable service, any money they saved by higher productivity would feed into higher profits. Equally, if they messed up, shareholders would have to pay the price.



From an Economics 101 point of view, this seemed far preferable to a nationalised regime where the Treasury had to decide what level of spending and investment was required to deliver an acceptable level of service. It was also thought to be better than a US-style system, with little incentive for private companies to increase efficiency.

But it didn't solve the problem that someone still had to decide what "acceptable service" looked like. And that was the regulators.

Ofwat was established to scrutinise the companies' investment plans and work out what they "needed" to spend, and whether they were spending it. Meanwhile, the Environment Agency was supposed to ensure the companies met their environmental obligations.

They failed. Miserably. The Treasury was right that incentives mattered, and that the system they had introduced would give the new private companies much stronger ones. But it failed to perceive that while reducing costs would indeed increase profits, persuading, misleading and bullying the regulators would be even more lucrative.

So the water companies did just that, hiring a small army of expensive consultants and lawyers. Ofwat could never hope to match this onslaught, particularly since its more experienced and able employees could easily double or triple their salaries simply by switching sides and taking jobs in the sector that they regulated. So in the first decade of privatisation, as investment increased, bills went up, and so did profits.

Eventually that approach ran out of road, running up against a combination of a backlash against rising bills and the fact that even Ofwat could no longer ignore the level of excess profits. The regulator responded by restricting more severely how much they could spend and invest.

But, again, never underestimate the power of incentives. The companies turned to financial engineering to extract yet more money from the businesses; something Ofwat was even less well equipped to understand, let alone resist. In an era of low interest rates, the attraction of high returns, seemingly guaranteed by the companies' ability to stay three steps ahead of Ofwat, was irresistible.

That too couldn't last for ever. The combination of public outrage over the companies' failure to meet even the most basic minimum standards with the recent rise in interest rates mean that the current regulatory model is both economically and politically bankrupt. The eye-catching, but ultimately superficial, reforms recently announced won't change the underlying incentives much. Unfortunately – still constrained, 35 years on, by Treasury dogma – the government doesn't seem to have realised it. We have not reached the end of this saga yet.

***Jonathan Portes is professor of economics and public policy at the School of Politics & Economics of King's College London, and a senior fellow at UK in a Changing Europe***

DOCUMENT 13 - **What happens when you set a river free? | BBC News – Oct 20, 2024**

https://www.youtube.com/watch?v=Qp7K6pEWEuk&ab_channel=BBCNews

# Rivers in the U.S.


● **A remarkable series of reports *The New York Times* Interactive - UNCHARTED WATERS** – November, 2023

https://www.nytimes.com/series/uncharted-waters

**(You can ask me if you need such or such article but shush 🤫. Here are a few as gifts)**

**>> A Tangle of Rules to Protect America's Water Is Falling Short HERE**

The Times asked all 50 states how they manage groundwater. The answers show why the country's aquifers are in trouble.

**>> Who Gets the Water in California? Whoever Gets There First. HERE**

As the world warms, the state is re-examining claims to its water that have gone unchallenged for generations.

**>> As Groundwater Dwindles, Powerful Players Block Change HERE**

Here are some of the people fighting efforts to conserve a vital resource that's disappearing across the United States.

DOCUMENT 14 -**How do you fight a drought when it's flooding?**

*Standard-Speaker* (Local paper in Pennsylvania), Jan 22, 2023

California is built upon the great gamble of irrigation. Left alone, much of the land in the Western United States would be inhospitable to teeming cities. But we're Americans; we couldn't let the desert stand in our way. More than a century ago, the U.S. Bureau of Land Reclamation began taming the water in the West. It's been a remarkably successful project. In California, where I live, irrigation has turned largely barren regions into some the country's most fertile farmland and most prosperous metropolises. We've built "the most ambitious desert civilization the world has seen," Marc Reisner put it in "Cadillac Desert," his 1986 history of Western irrigation.

I've been thinking a lot about "Cadillac Desert" in the past few weeks as the rains fell and fell and kept falling over California — much of which, despite the pouring heavens, seems likely to remain in the grip of a severe drought. Reisner anticipated this moment. He worried that the West's success with irrigation could be a mirage — that it took water for granted and didn't appreciate the precariousness of our capacity to control it. "Everything depends on the manipulation of water — on capturing it behind dams, storing it, and rerouting it in concrete rivers over distances of hundreds of

miles," he wrote. "Were it not for a century and a half of messianic effort toward that end, the West as we know it would not exist."

But what happens to that century of irrigation when the weather changes, as it is now? Experts say that climate change is exacerbating "weather whiplash" in California — that we'll increasingly suffer years of prolonged, extreme aridity followed by great biblical gushers of precipitation. Can a society adjust to a climate of opposing calamities — a climate of both megadroughts and atmospheric rivers, of far too little and far too much?

Just psychologically, this is a difficult balance to maintain: It's hard to worry about drought when it's flooding. It's hard to worry about flooding when there's a drought. Adjusting infrastructure and water usage to the seesawing weather is going to require some big and possibly painful changes to many of the state's key constituencies. Farmers will have to give up some agricultural land and grow different crops. Homeowners and developers might have to leave some flood-prone areas uninhabited. We're going to have to alter our cities to capture more water and alter our lifestyles to use less of it.

California's water system "was designed and built and is operated for different climatic conditions — for the climate of the 20th century, not the 21st century," said Peter Gleick, a co-founder and senior fellow at the Pacific Institute. Gleick said there's some reason for optimism that we'll be able to tackle this problem; at least California's government understands and is determined to address the changing weather. Still, Gleick said, "given what we now know about the unavoidable changes of climate change, our policymakers are not doing enough."

California's precipitation patterns are naturally variable; we have always had very dry years and very wet years, and quick shifts from droughts to floods are not unheard-of. But climate change is supercharging this phenomenon. A recent state climate report found that year-to-year weather variability has increased sharply since the 1980s. (…)

It's not just that wet years bring more water; it's also how the water is falling. Because temperatures are warmer, a lot more of California's precipitation has in recent years been falling as rain instead of snow. This is a problem for a few reasons. Snow acts as a kind of "frozen reservoir" that stores water from one season to another — the snow falls in the winter, then trickles into California's water supply as it melts. But when precipitation falls more heavily as rain — and when the storms come in quick succession, as they have recently — water isn't as easily stored and instead becomes destructive.

And so we're left with this surreal phenomenon of a flood-drenched drought. As the storms pounded California last week, water-management officials were telling people not to go wild with water: "We're kind of dealing with this extreme flood during an extreme drought, and so we're, of course, encouraging Californians to continue to conserve water and make conservation a way of life," one official told The Los Angeles Times. (713 mots)

## DOCUMENT 15 - **America's reservoirs are drying up**

The Economist, Los Angeles, November 18, 2022

ACROSS THE American West, the landscape bears scars from the megadrought that has dehydrated the region for more than two decades. Tourists can hike through canyons in Arizona that used to be under water. Fields in California, once filled with thirsty crops such as alfalfa, lie fallow. Ghost towns flooded long ago to create reservoirs are re-emerging.

The current drought is the driest 22-year period the south-west has seen in 1,200 years, according to a paper in *Nature Climate Change*. On August 16th, when the federal government announced another round of water cuts for Nevada and Arizona, 86% of the West was at least "abnormally dry", and half of the region was experiencing severe to exceptional drought (see map). Parts of the region have long been arid and unforgiving, but human-caused climate change has increased the severity of the dry periods.

The drying of the region is wreaking havoc on more than just agriculture and ecosystems. The West's energy infrastructure is also under threat. The dams at many big reservoirs generate hydropower, which for decades provided reliable, renewable energy. About 32% of America's renewable energy came from hydropower in 2021, 44% of which was generated in California, Oregon and Washington. Scientists praise hydro for its flexibility: when demand for electricity surges, hydropower can be ramped up easily.

But as the water levels in the West's reservoirs decline, so too does the use of hydropower. A recent analysis by researchers at WWF, an NGO, found that hydropower projects in the American West were among the most vulnerable in the world to increased water scarcity.

Some places are already feeling the effects. In 2021 California shut down a power station at Lake Oroville, one of the state's largest reservoirs, when water levels fell below what is needed for electricity generation. The plant can usually

provide enough power for 80,000 homes. Lake Powell, on the border of Utah and Arizona, is inching towards a similar fate. Its colossal concrete dam, which straddles the Colorado river, can generate enough electricity to support 5m homes across seven states. A study from Oak Ridge National Laboratory warns that government-owned reservoirs in Idaho, Oregon and Washington could see hydropower generation decrease during summer months. In future, the researchers suggest, higher temperatures in the region will cause "severe" water loss from evaporation.

The loss of hydropower is no small matter. The power grid is already strained, and demand for energy will only increase as devices from stoves to cars go electric. Officials hope they will eventually be able to replace lost hydropower solely with other renewables and energy storage. But the short-term solution is dirtier. California's hydropower generation has fallen by 62% since 2019. The state is burning more natural gas to help make up for it.

The term "dead pool" will join "megadrought" on the lips of Americans in the summer of 2023, as some reservoirs approach the level where they can no longer send water downstream, let alone generate electric power. A lack of water has long shaped the West. But the future looks increasingly dry.

**About California, See also:**

- https://www.newsweek.com/2015/05/01/can-science-save-california-drought-324087.html
- https://www.newsweek.com/california-drought-reservoirs-water-level-storage-1774298
- "On Fallow Ground, The Race to Save Californian farms"
https://vimeo.com/125626453

Lake Oroville, California - Newsweek

## American way of life and water overconsumption

DOCUMENT 16 **-This heatwave is a reminder that grass lawns are terrible for the environment**

Akin Olla,***The Observer***, Sun 31 Jul 2022

As a heatwave drags across the United States, local and state governments are scrambling to find solutions to the threats brought by record high temperatures. Washington DC and Philadelphia have declared heat emergencies, activating public cooling centers and other safety measures across their cities, while Phoenix and Los Angeles continue to push programs to plant new trees in working-class neighborhoods with little canopy coverage. Many of these short-term solutions rely on water, a dangerous reality given that nearly 50% of the country is experiencing some form of drought, with the amount of Americans affected by drought increasing 26.8% since last month. This looming threat has pushed one state, Nevada, to seek a more long-term solution: the banning of non-functional lawns.

Lawn grass takes up 2% of all land in the United States. If it were a crop, it would be by far the single largest irrigated crop in the country. Nevada has, due to necessity, taken an obvious but large step in alleviating some of the more immediate symptoms of the climate crisis and bought themselves more time for other measures. It is time for the federal government to push all states to do the same and create incentives to ensure that it happens quickly and in a manner that doesn't force working-class Americans to foot the bill.

The US is experiencing the beginning of a water shortage. A 2021 study found that the drought in the western US is the worst the region has seen in 1,200 years, and that much of it is the result of the current climate crisis. While lawns are not the largest contributor to climate change, they take up space from plants that could be offsetting carbon or slowing down wildfires, while still doing a heft of damage on their own.

According to the EPA, outdoor water usage for lawns and gardens accounts for 60% of household usage in arid areas of the country. And unlike indoor water usage, much of that water is lost to evaporation and runoff. All in all, American lawns use 3tn gallons of water each year – enough drinking water for billions of people annually – on top of 59m pounds of pesticides and 1.2bn gallons of gasoline for lawn mowers. These are all relative drops in the bucket given the full scale of the climate crisis, but given the absolute pointlessness of lawns, it's a few too many drops too much.

The history of lawns in the US is deeply rooted in racism and the aristocratic ambitions of America's ruling and middle classes. In the 18th century, something akin to modern lawns gained popularity among the wealthy elite of France and England, and was imported by founding fathers like Thomas Jefferson and George Washington. Lawns' difficulty to maintain made them the exclusive domain of the wealthiest Americans until they became widespread in the 1950s after federal aid and a friendly lending market made it easier for Americans to purchase homes and move to the nation's growing suburbs.

A confluence of federal housing policies, discriminatory lending practices, and newly created homeowners associations allowed white families to almost exclusively reap the full benefits of this growth. White people fled the cities and claimed their own private white fenced fiefs. Lawns became a symbol of the American Dream – a dream deferred, for some. The American lawn represents the worst of the United States, wasteful and vain.

This mess of negative features is why Nevada moved to ban non-functional turf lawns in southern Nevada. (…) Lake Mead, which supplies 90% of the drinking water for southern Nevada, has gotten so empty that the agency responsible had to construct a new pumping station to extract what remains. With this new legislation, southern Nevada is predicted to reduce the amount of water it extracts from Lake Mead and another reservoir by 10% this year.

The rest of the country should follow suit. While it will not by itself avert the global disaster we are already in the midst of, it is the kind of commonsense reform that can generate support on both sides of the dimly lit aisle – as evidenced by the bipartisan nature of the Nevada bill. The federal government should step in and provide incentives to states to encourage citizens to abandon lawns willingly, with firmer dates for mandatory removal for locations that fit criteria similar to those set out by Nevada's committee.

This may sound like the bare minimum, and that's because it is. And it is about time we at least did that. 751 words

## The Colorado River in Crisis

**●VIDEO - Colorado River in Crisis: A Los Angeles Times documentary, November 2023**
**https://www.youtube.com/watch?v=k8DovzEMxpY&ab_channel=LosAngelesTimes**
journalists. Consulting producers included Maggie Beidelman, Robert Meeks and Erik Himmelsbach-Weinstein. (46 minutes)
**Read the L.A. Times series Colorado River in Crisis**:
https://www.latimes.com/environment/story/colorado-river-in-crisis

**●PODCAST. Colorado, le fleuve qui refuse de mourir, *La Croix*, Alexis Buisson, Juillet 2022**

## Quality / Pollution of drinking water

**● Majority-Latino city endures years of toxic water in health 'crisis'**
After repeated violations, the state of New Mexico has stepped in — but problems are a reminder that safe water is not available to all Americans
***Washington Post*** April 18, 2024 **This is part of the Toxic Taps series of reports**

https://wapo.st/4geV7hp

● **Kids drink contaminated water at schools, but testing for lead isn't required**

Despite aging pipes and vulnerable children, schools face no national requirement to test for lead

August 8, 2024

https://wapo.st/3ZSky2F

**Document 17 - Drinking water of millions of Americans contaminated with 'forever chemicals'**

*Water of about 26 million is contaminated as new data offers the most robust look into exactly which communities are polluted*

*Kyle Bagenstose, The Guardian,* Thu 17 Aug 2023

Drinking water consumed by millions of Americans from hundreds of communities spread across the United States is contaminated with dangerous levels of toxic chemicals, according to testing data released on Thursday by the Environmental Protection Agency (EPA).

The data shows that drinking water systems serving small towns to large cities – from tiny Collegeville, Pennsylvania, to Fresno, California – contain measurable levels of so-called "forever chemicals", a family of durable compounds long used in a variety of commercial products but that are now known to be harmful.

The water of as many as 26 million Americans is contaminated, according to an analysis of the new EPA data performed by the Environmental Working Group (EWG), a Washington DC-based non-profit.

Studies have linked the chemicals to cancers, immunodeficiencies, reproductive harms and developmental effects in children.

Scientists and environmental advocates have increasingly warned about the harms of chemicals like perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in recent decades, leading to an agreement between the the EPA and chemical manufacturers such as DuPont and 3M to phase out PFOA by 2015.

However, lasting pollution of the environment and human bodies with forever chemicals continues. Studies show nearly all Americans have some level of PFOA, PFOS, and similar chemicals, scientifically known as per- and polyfluoroalkyl substances (PFAS), circulating in their bodies. Additional analyses calculate that hundreds of millions of Americans are probably exposed through drinking water contamination.

But, the EPA's testing program, part of a 27-year-old effort to sample the nation's drinking water for unregulated chemicals, offers the most robust look into exactly which communities are polluted. The data released on Thursday is the first round of a program that will test most US water systems serving more than 3,300 Americans for 29 different forever chemicals, along with the metal lithium, over the next three years.

This first batch, which analyzed data from about 2,000 systems across the country, already spells trouble.

According to the data, 220 water systems found some level of PFOA, PFOS, or both chemicals in their drinking water. That means about one in 10 drinking water systems contain the two most notoriously dangerous forever chemicals.

When including all 29 forever chemicals, the data confirms that the drinking water of approximately 26 million Americans is contaminated, according to the EWG non-profit. The data is also "consistent" with a 2020 study from the group that calculated more than 200 million Americans could have some form of PFAS in their drinking water.

"This data confirms that PFAS is a pervasive problem, and it's going to be a massive challenge for all of these water systems to deliver safe and clean water," said John Reeder, vice-president for federal affairs at EWG.

The EPA says the testing program is part of a holistic effort to address forever chemicals. In March, the agency proposed new regulations to limit PFOA, PFOS and several other sister chemicals in drinking water. That followed updates to the agency's scientific findings in recent years dramatically lowering the amount of the chemicals considered safe in drinking water.

In a press release, agency officials said the new monitoring data will further help inform what actions to take to protect drinking water.

"PFAS are an urgent public health issue facing people and communities across the nation. The latest science is clear: exposure to certain PFAS, also known as forever chemicals, over long periods of time is linked to significant health risks," Radhika Fox, EPA assistant administrator for water, said in the release. "EPA is conducting the most comprehensive monitoring effort for PFAS ever, at every large and midsize public water system in America, and at hundreds of small water systems."

But the road ahead remains perilous, says Tracy Carluccio, deputy director of the Delaware Riverkeeper Network, a Pennsylvania-based environmental non-profit that has pressed state regulators and the EPA for nearly two decades to take decisive action on PFAS.

Carluccio says that until regulations are finalized and contaminated drinking water is treated, Americans remain at risk. With the new release of data, hundreds of towns and millions of people will probably be learning for the first time that their water is contaminated with PFAS. But with the EPA admitting its testing program is just 7% complete, that means probably tens of millions more still remain in the dark.

"This is explosive and is going to be a shocker for a lot of people who thought, 'Well I don't live near a military base, I don't live near a factory,'" Carluccio said, naming two common sources of forever chemical pollution. "In fact, PFAS are being found in really weird places because of how thoroughly they've been transported into the environment."

Carluccio says she believes officials with contaminated water systems should immediately work to provide clean water, whether from another river or well, or bottled water.

Experts also question how swiftly EPA has worked to regulate PFAS. The agency previously tested water systems across the country for PFOA and PFOS as part of a similar program conducted between 2013 and 2015. That study used a less accurate technology that was incapable of detecting the smallest amounts of PFOA and PFOS in water, and thus found them in only about 4% of systems.

But a report by Eurofins Eaton Analytical laboratories, a California-based lab that performed some of the earlier testing for the EPA, found that by using more accurate technology available at the time, the chemicals were actually present in an estimated 28% of systems.

Andrew Eaton, former technical director of the laboratory and now owner of Eaton Environmental Water Quality Consulting in South Pasadena, California, says the newly released data thus represents a "missed opportunity".

"We could have had most of this information 10 years ago," Eaton said, adding a caveat that safe levels of PFOA and PFOS were also believed to be much higher at the time.

But Reeder, with EWG, says the lost time creates all the more impetus for EPA to work as swiftly as possible to finalize its drinking water regulations for PFOA, PFOS and other chemicals, as well as crack down on polluters.

"This calls for more urgency to keep the rules on time and get them out by the end of the year," Reeder said.

## Document 18 - **Trump allies begin attack on EPA and rules protecting US drinking water**

With Biden soon to leave the White House, Republicans start an assault on the Environmental Protection Agency

**Tom Perkins**, ***The Guardian,*** Mon 2 Dec 2024

Donald Trump's allies have fired the opening salvoes of his coming administration's attack on the Environmental Protection Agency (EPA), the federal agency that enforces and regulates laws on air, soil, and water quality among other crucial environmental and health issues.

In a letter from Republican House leadership to the EPA administrator Michael Regan, Republicans trained their sights on the agency's scientific integrity policies that are designed to insulate scientists and research from political interference.

Meanwhile, the incoming chair of the Senate environmental committee in a hearing last week promised to target portions of new PFAS regulations put in place over the last year, a top priority for Trump's chemical and water utility industry allies.

The Republican House committee on oversight and accountability chair, James Comer, charged in his letter that scientific integrity policies would be used by EPA scientists to "hamstring the incoming Trump administration's ability to implement their own executive agendas".

The Republicans promptly moving to shred the integrity policies – which critics say were weak to begin with – demonstrates how party officials are "bending over backwards" to assist Trump in attacking career servants, said Jeff Ruch, a former EPA official now with the Public Employees Environmental Responsibility non-profit.

"They want to clear out all potential obstacles," Ruch said.

The integrity policies were put in place during Barack Obama's administration in response to George W Bush

political appointees requiring EPA researchers to scrub terms like "climate change" from agency science and reports, and making other politically directed alterations.

The policies include the EPA's and other administration agencies' standards for objectivity and accuracy in scientific information, but Ruch said they were too vague under Obama. Among other problems, they didn't stipulate how investigations would be carried out, or punishments for managers and political appointees who violated the rules.

The policies essentially tasked federal agencies like the EPA "with policing themselves", Ruch said.

Trump did not attack the policies during his first administration, and his former EPA administrator Scott Pruitt, an industry ally, even used them as cover at times because they were so vague that he could claim to be following the rules, Ruch said.

The Biden administration pledged to strengthen the policies, but failed to produce many substantive changes, Ruch said. Still, Comer stated that the policies exist to stop Trump by "enabling career bureaucrats who favor one set of scientific viewpoints to undermine politically accountable agency leaders who seek to base agency actions on differing science".

Comer ordered the EPA's Regan to turn over reams of documents detailing the policies and their application.

Ruch said the attack points to two certainties: a stepped-up attack on agency scientists who contradict Trump in the second administration, and a crackdown on research produced by federal scientists.

"There will be blood," Ruch added.

Meanwhile, Senator Shelley Moore Capito, the incoming chair of the Senate committee on environment and public works, took aim at strong PFAS limits during a recent hearing. Her comments show how years of industry efforts to cast doubt on science used to establish PFAS regulations are being weaponized with the GOP fully in control.

The EPA earlier this year finalized strong new drinking water limits for some PFAS compounds after the agency found virtually no level of exposure is safe to humans. It also designated two of the most common and dangerous PFAS compounds as hazardous substances under the nation's Superfund laws, which could force industry to pay to clean up the messes.

Moore Capito repeated claims from many of those polluters, some of whom are among her largest campaign donors, alleging the rules were developed off of bad science, and are too expensive for many water utilities to implement. Documents show trade groups representing water utilities are already lobbying Moore Capito and the incoming Trump team to undo the rules.

While questioning a former EPA official who helped develop the rules, Moore Capito accused the EPA of "inconsistent inclusion and exclusion of epidemiology and animal studies, lack of predefined protocol, insufficient transparency". She said not all scientists agreed on the low drinking water limits, including those on the EPA's science advisory board.

However, many scientists who have been calling into question the EPA's process and limits receive industry funding.

Linda Birnbaum, a former EPA water division manager, said there were some industry-aligned individuals on the EPA board who raised questions about the drinking water limits, but the board's final report was strongly supportive of them.

The Biden administration has made tens of billions of dollars available for water utilities to implement the rules, and utilities continue winning funding through litigation against chemical makers. Meanwhile, the EPA has pledged not to hold small water systems, such as those run by schools, responsible for PFAS pollution.

Still, Capito Moore's lines of attack are being used as justification to make broader changes to the rules, Birnbaum said.

"There was no major controversy around the rules," she added. "She is spouting-industry sponsored lines."

# Water activists and water protectors

- **Water Protectors (from Wikipedia)**

Water protectors are activists, organizers, and cultural workers focused on the defense of the world's water and water systems. The water protector name, analysis and style of activism arose from Indigenous communities in North America during the Dakota Access Pipeline protests at the Standing Rock Reservation, which began with an encampment on LaDonna Brave Bull Allard's land in April, 2016.

Water protectors are similar to land defenders, but are distinguished from other environmental activists by this philosophy and approach that is rooted in an indigenous cultural perspective that sees water and the land as sacred. This relationship with water moves beyond simply having access to clean drinking water, and comes from the beliefs that water is necessary for life and that water is a relative and therefore it must be treated with respect. As such, the reasons for protection of water are older, more holistic, and integrated into a larger cultural and spiritual whole than in most modern forms of environmental activism, which may be more based in seeing water and other extractive resources as commodities
HERE is a famous children's story about the water protectors

- **Surfers against Sewage** https://www.sas.org.uk/
- **Save Windermere** https://www.savewindermere.com/
https://www.theguardian.com/environment/article/2024/jun/11/protect-windermere-from-sewage-campaigners-urge-uk-party-leaders
- **See here how English anglers and river swimmers are joining forces to protect the river Severn**
https://www.theguardian.com/environment/2024/nov/19/the-sores-on-the-fish-are-nasty-whats-behind-the-changes-in-the-severn-river
- **About the UN 2023 Water Conference**

**Mapping and Progress of the UN 2023 Water Conference Water Action Agenda – The Full Report**
https://sdgs.un.org/sites/default/files/2024-06/WAA%20Mapping%20and%20Progress%20Report%20May%202024.pdf

## Document 19 - **Thousands of blue-clad protesters join London march for clean water**

More than 130 organisations take part in protest demanding government action over country's sewage crisis
**The Guardian,** Sun 3 Nov 2024

Thousands of blue-clad protesters have told the government to "stop poisoning Britain's water" as they marched through London calling for action on the country's contaminated coastal waters and rivers.
A coalition of more than 130 nature, environmental and water-sport organisations called supporters out on to the streets of the capital on Sunday afternoon, aiming to create the country's biggest ever protest over water.
The broadcaster Chris Packham, the actor Jim Murray and Giles Bristow, the chief executive of the campaign group Surfers Against Sewage, led the march from the Albert Embankment in Vauxhall to Parliament Square, with banners reading: "Stop poisoning Britain's waterways" and "Cut the crap, save our rivers".
Behind them thousands of protesters clad in blue, many of them carrying the multicoloured flags of the climate activist movement Extinction Rebellion, followed dancing to samba bands and waving placards, most homemade.

Bristow said: "We've been campaigning for over 30 years – nearly 35 years, in fact – to end shit in our waters, because we are fed up of surfing, of swimming, of trying to enjoy our natural blue spaces but they're being polluted in front of our eyes.
"So we're joining in because it's a march for clean water and we're saying it's time to cut the crap. We've got to get on, sort out this shit show."
Charles Watson, the founder and director of the charity River Action, the lead organiser, said: "One of the key demands of this march is that this notion that it can be profitable to pollute has got to stop, that the laws have got to be enforced.
"And in order to enforce the laws, the bodies that are tasked to do that [have] got to be reformed, they've got to be taken to pieces and put back together again and most importantly they've got to be properly funded."
The protest comes amid a crisis in the country's water provision. Last year, raw sewage was discharged for more than 3.6m hours into rivers and seas by England's water companies, a 105% increase on the previous 12 months. At the same time, mass deaths of fish in England's rivers have increased almost tenfold since 2020.
The UN rapporteur for the right to clean water, Prof Pedro Arrojo-Agudo, last month singled out the privatised English water system for criticism, accusing the sector's regulators of being ineffective and unaccountable.

Meanwhile, the water industry has extracted vast profits from customers, while saddling their companies with billions in debt. Last year, the Guardian revealed that more than a quarter of water bills in London and parts of the south of England have been spent paying the interest on the debt the companies hold.

Watson said: “The underlying cause of the problem is the fact the regulatory system that is there to enforce the law and hold polluters to account, has literally systemically failed.

“Ofwat, the water regulator, was supposed to be there to protect the environment, to protect customers from the privatised industry paying themselves too much. But they failed, over 70bn [pounds] of dividends has been stripped out of the industry, money that was desperately needed to be invested in making the system future-proof.”

The protest attracted huge numbers of supporters, affiliated to a diverse range of organisations including the National Federation of Women’s Institutes and the GMB union.

Melissa Green, the chief executive of the WI, said: “Our members have been calling for action against water pollution unbelievably since 1927. That was the first time we raised the alarm with government about the quality of the water in our communities, and then we raised it again in the 60s, again in the 80s, and again in 2023.

“Our message for government is you’ve got the regulation, you’ve got the regulators, you need to hold people to account. We know that our water is being polluted wantonly, knowingly, for profit, and we can’t understand why the government are not taking more action.”