



Drought Management in the UK

Policy Position Statement

Purpose

This Policy Position Statement discusses the causes of drought in the UK, how we can learn from and plan for drought, and sets out the position of the Chartered Institution of Water and Environmental Management (CIWEM) on this issue.

We request that this policy position statement is especially considered by Natural Resources Wales (NRW), the Environment Agency (EA) with Natural England, DEFRA and the devolved nations governments when they review and update individual water company drought plan guidelines, drought management strategy and climate related risks declarations.

CIWEM is the leading independent Chartered professional body for water and environmental professionals, promoting excellence within the sector.

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Note: CIWEM Policy Position Statements (PPS) represent the Institution's views on issues at a point in time. It is accepted that situations change as research provides new evidence. It should be understood, therefore, that CIWEM PPSs are under constant review and that previously held views may alter and lead to revised PPSs. PPSs are produced as a consensus report and do not represent the view of individual members of CIWEM.

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CIWEM's Position

We call for the following improvements to drought planning, communications, and research:

1. Planning and strategy

a. Rapid response to drought permit requests

Regulatory improvements to allow **more agility in responding to drought** by reducing the lead period in England and Wales required for drought permit / order applications (Scottish legislation already allows emergency powers to be used for short term licences to be applied for within a two-week lead time). The duration and severities of a drought should influence the extent and impact of the range of drought management measures available to manage it.

b. Equity and transparency between water purposes

It is recognised that there are prioritisation decisions that need to be made as droughts become increasingly severe. This requires assessing conflicting needs – for instance between public water supply, the environment, and water for livestock, agriculture, and emergency services.

c. The continuation of comprehensive drought planning

All those with an interest in the water environment – water companies, government bodies, regulators, other abstractors and businesses that rely on water – should maintain drought contingency plans. These should be updated as circumstances dictate, even during a drought if planned actions turn out not to be the most effective solution, or as a new option comes to light.

d. Temporary Use Bans as necessary tools

Temporary bans on the use of water, mainly for garden watering purposes, should be seen as an important drought management tool, and not as a systemic failure. Water companies should not be penalised financially for appropriate use of these restrictions. However, water companies should take into account the significant cost of such restrictions on some users.

e. Demand management as mitigation

Effective and innovative demand management options must be identified to postpone the need for more stringent drought measures (like drought permits and orders) and reduce the effect on the environment as far as possible.

2. Communication

a. Awareness for responsible consumption

There needs to be more education and awareness of the necessity to use water with care, even outside of drought periods, including an understanding of climate change and potential for increasingly dry and hot conditions.

b. Clarity across time and stakeholders

Clear communications from the onset, during and after drought about the situation and how people and businesses can save water. Integrated and accessible communication between all those involved in and affected by droughts, to minimise conflict and encourage effective management.

3. Research

a. Existing programmes

The maintenance of long-term monitoring programmes and datasets of the water environment (groundwater levels, river flows, pollutant concentrations, ecological impacts etc etc) as an essential ongoing activity that needs to underpin drought management activities.

b. Further Research

Support for scientific research on seasonal forecasting, drought monitoring and developing long term projections of the impacts of climate change on water resources, in conjunction with mechanisms to ensure uptake of the science into drought management and public information systems. Further research specifically into the following:

- long-term drought forecasting methods
- integrated analysis of hydrological, hydrogeological and ecological responses during and after drought
- impact of climate variability and change on drivers (precipitation, evapotranspiration) of future droughts and the impacts across different drought definitions/sectors. Future droughts and on baseline conditions outside of drought periods
- the economics of drought management, and
- the economic measures that might be employed during drought.

Context

UK droughts

Many people think that the UK is wet. It is, in some parts and at some times; however, the amount of rainfall per capita is low in some areas of the country. Our temperate climate brings frequent rain, but the weather is very variable, with very dry spells being possible at any time of year and climate change has made summer heatwaves which drive up demand for water more likely.

For much of the country, low rainfall in winter rather than in summer is the key driver of potential drought. Winter rainfall is critical for recharging aquifers, which maintain river baseflows in the following summer, and for recharging reservoirs. A series of dry months causes environmental stress, with low river flows and groundwater levels.

Droughts are not confined to the drier parts of England. In 1995 a dry winter in the Pennines gave rise to very low reservoir levels in parts of Yorkshire. Road tankers were used to bring water from Northumbria to Yorkshire. In Scotland, the most recent drought was in 2003 when the dry summer was followed by an exceptionally dry autumn resulting in several reservoirs reaching very low levels. The worst affected area was Tayside where two consecutive drought orders were granted during 2004 to allow reservoir levels to recover.

Public water supply is designed to cope with dry weather across a range of scenarios, but prolonged droughts that include low winter rainfall failing to recharge aquifers (of two years or more in duration) or significant increases in customer demand require careful management.

Drought in 2006 led to 16 million people in southern England experiencing hosepipe bans with three water companies being granted powers to restrict non-essential use of water. Environmental impacts included fish deaths, reduced breeding of wading birds, and outbreaks of poisonous blue-green algae in rivers and lakes.

Below average rainfall for central and eastern parts of England between late 2010 and early 2012 and a dry 2011-12 winter resulted in record low soil moisture, river flows and groundwater levels. Widespread temporary use bans were put in place together with restrictions on other water users (such as spray irrigation, nurseries, public gardens, etc.) but were removed after a particularly wet early summer. The drought was characterised by a pronounced east-west split with the west of England being largely unaffected.

In 2018 and 2022 drought plans were enacted in parts of the UK, not driven by dry winters, but by prolonged dry springs, followed by a relatively short but intense drought exacerbated by severe summer heatwaves that led to low river levels, very dry ground conditions and significantly increased customer demand for water. The emergence of demand-led drought events has been one of the ways we have started to experience the climate emergency.

The summer drought of 2022 would have been virtually impossible without the added impact of climate change (UK Met Office, 2022ⁱ). Climate change made the heatwave four degrees hotter and at least ten times more likely (Christidis, McCarty, & Stott, 2020)(Tandon, 2022)(UKWIR, 2023).

Lessons learned from the 2022 drought

During the dry and hot Summer of 2022, six water companies implemented Temporary Use Bans (TUBs) for their customers, with four subsequently applying for supply-side drought permits. Most permits were not used or the applications were withdrawn because of heavy rainfall in the autumn. In 2023, water companies were required to include lessons learnt from the 2022 drought within their water resources management plans, while UKWIR commissioned a study into TUBs' impactsⁱⁱ.

Key lessons revealed several important findings. Water companies need better understanding of treatment and supply assets during hot and dry conditions. While stochastic modelling has progressed understanding of raw water availability during drought, more knowledge is needed about water quality, pumping head capabilities and treatment plants' ability to meet peak heatwave demands.

The drought permit application process proved too slow to appropriately respond to short but intense drought and demand-driven events. Scottish legislation already allows emergency powers for short-term licences within a two-week lead time - a model that could benefit the English system. Several companies encountered unexpected delays, from EA regions having different requirements to lengthy lead times for booking paid advertising in public spaces.

TUBs introduced in August 2022 came too late for many areas of England and would have saved more water if implemented earlier in the hot, dry summer. Future improvements should focus on better training for water company employees to aid community communications, particularly given social media's importance and the speed at which drought triggers escalated. Communications with retailers to influence non-household water use and with New Apartments and Variations to the housing market also need enhancement¹.

Smart meter data, along with standardised methods for collecting and reporting communications campaign data, would improve both in-drought communications and real-time event management. This would enhance analysis of future drought events and help measure specific actions' impact at both household and non-household levels.

One key issue identified by CCW was customer confusion about who was affected by the drought and water use restrictions, especially amongst companies in the South of England where some areas weren't affected but customers thought they were. Clear, consistent messages about demand reduction at peak times would be crucial moving forward.

Although the summary above is focused on public water supplies only, CIWEM produce a Webinar on the 2022 drought experience in Wales which can be watched on YouTube [here](#). It presents information about the Welsh drought experience in 2022 from agriculture, environment, people, and other sectors in Wales.

¹ NAVs sit partly outside the wholesale water resource regulatory regime but it is important that they also work with their customers to reduce water demand before and during droughts even if they are not currently funded or incentivised to do that.

Planning for drought

Whilst drought cannot be entirely prevented, we can minimise its effects on the environment, people and economy. Drought planning in England and Wales involves multiple organisations including Government, regulators, water industry, and sectors responsible for navigation, power generation and agriculture.

Water companies' long-term resources management plans aim to maintain essential public supply through droughts up to 1 in 200-year severity, with plans to increase resilience to 1 in 500-year severity by 2040.

Drought Plans are operational, short-term plans showing water companies' intended actions during drought progression, balancing water supply with environmental impact. We support TUBs as reasonable measures, considering that unlimited water supply shouldn't be expected. Water companies should face no criticism or financial penalties for implementing necessary restrictions, which include limits on hosepipes and sprinklers for car washing, garden watering, pool filling and outdoor cleaning.

The responsibilities during droughts are shared between a number of stakeholders. In England, the EA has the higher level of responsibility. The framework for responding to droughts in England can be found on the government website² and is currently being updated to improve clarity and reflect changes over the last few years.

In Scotland, SEPA published their National Water Scarcity Plan in July 2020, whilst Northern Ireland Water included drought planning in Section 5 of their Water Resources and Supply Resilience Plan (March 2020).

Public awareness of drought impacts and mitigation measures remains broadly low, meaning knowledge on effective behaviour responses is insufficient. Though water suppliers hesitate to alarm customers, understanding potential supply restrictions is crucial. We advocate increased efforts from suppliers, regulators and Government to raise drought risk awareness, emphasising that supply security means ensuring essential uses rather than unrestricted usage.

Taking additional water from the environment during drought, while valuable for management, may further stress already struggling ecosystems. We endorse clear identification and mitigation of environmental impacts, with comprehensive monitoring before, during and after droughts, accounting for climate change effects on baseline conditions.

Cross-sector collaboration in catchment drought planning is important to ensure fairness between water uses (public supply, environment, livestock, agriculture, emergency services). Regional water resources planning groups' multi-sector discussions could provide one avenue for this collaboration.

² <https://www.gov.uk/government/publications/drought-management-for-england>

Future droughts

Future droughts are inevitable and likely to become more challenging as climate change, environmental obligations and population growth increase pressure on water supplies during dry, hot periods. Climate change is expected to bring hotter, drier summers and wetter wintersⁱⁱⁱ, though not necessarily together or every year. This pattern suggests more frequent summer droughts, particularly affecting upland reservoirs in the north and west, which can reach very low levels in hot, dry summers.

The impact on long droughts is less certain. Evidence shows changes in groundwater drought characteristics due to climate change-related increases in evapotranspiration. Whilst wet winters between dry summers might reduce long-lasting droughts in favour of short, intense ones, some winters will still be drier. Multi-season drought sequences remain possible and could be more intense than previously experienced. Though three-season and longer droughts are rare in the UK (with the driest period on record in the 1880s-1890s), Australia has recently experienced a seven-year drought.

We recommend that scientific studies of the likelihood and impact of climate change on the frequency and duration of future droughts, and of the response of social and environmental communities be continued, and that the results be widely disseminated. Water companies should build the findings of such work into their long-term water resources plans and adequate funding to deliver these plans should be provided by Ofwat but should also make sure that their drought plans can cope with a wide range of future conditions. Similarly, other parts of the water sector with a responsibility or need to plan for droughts should take account of such studies and research.

We advocate regulatory improvements to enable quicker drought responses by reducing permit application lead times in England and Wales, following Scotland's model of two-week emergency powers.

Drought management currently operates assuming continued dry weather, as reliable long-range forecasts aren't available. This often leads to precautionary measures that prove unnecessary in hindsight. Whilst improved long-term forecasts would aid decision-making, planning must still consider worst-case scenarios. We call for further research into long-term drought forecasts and future climate change impacts, noting that despite improving climate science, precipitation change predictions retain significant uncertainty.

References & further reading

Further reading

[CIWEM Webinar - The 2022 drought experience in Wales](#)

CCW published two reports following the 2022 drought:

- [Bridging the gap: Awareness and Understanding of Water Issues - CCW](#)
- [Citizens Forum Extension Wave 1 - Drought Message Testing – CCW](#)

Bibliography

ⁱ <https://www.metoffice.gov.uk/about-us/press-office/news/weather-and-climate/2022/july-heat-review>

ⁱⁱ <https://ukwir.org/review-of-2022-drought-demand-management-measures-summary-report>

ⁱⁱⁱ Bloomfield, J. P., Marchant, B. P., and McKenzie, A. A.: Changes in groundwater drought associated with anthropogenic warming, *Hydrol. Earth Syst. Sci.*, 23, 1393–1408, <https://doi.org/10.5194/hess-23-1393-2019>, 2019.

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