

Written evidence from Environment Agency and Ofwat (DPP0031)

Environment Agency and Ofwat joint written evidence: House of Lords Environment and Climate Change Committee's Drought Preparedness inquiry

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Executive Summary

1. Droughts are natural events, and measures taken before and during a drought can reduce its impact on people, businesses and the environment. However, climate change means that England faces the risk of more frequent and severe droughts. England has had the driest spring in 2025 since 1956, and at the same time, demand is increasing from population and economic growth. As the population grows and climate change persists, there is growing pressure on water supply. By 2050, England will face a 5 billion litre daily gap between the water available and needed as shown in the latest Environment Agency (EA) national framework for water resources.
2. The EA was established in 1996 to protect and improve the environment and is England's main environmental regulator. The EA has a statutory duty to secure the proper use of water resources and protect the environment under the Water Resources Act 1991. The EA has a central role in drought preparedness and management in England; monitoring water resources; regulating water abstraction; and coordinating drought planning and response nationally and locally to protect supplies and the environment. The EA plans for and manages drought using dedicated incident management drought teams and procedures. As a Category 1 responder, the EA has the expertise, infrastructure and local presence to effectively respond to drought incidents across the country.
3. Ofwat, as the economic regulator, does not have a lead operational response role in the event of a drought. Ofwat is responsible for ensuring sufficient investment into drought resilience infrastructure in the short, medium and long term. This includes both ongoing measures to reduce demand and increase supply, such as reducing leakage and increasing uptake of water meters, and longer-term major infrastructure projects. Ofwat also has a role in challenging water companies to deliver sufficient investment.
4. As water regulators, the EA and Ofwat work together to take a proactive response before drought occurs, working with water

companies to ensure successful management of drought plans, and make sure that the right infrastructure is in the pipeline to tackle long-term challenges. The EA and Ofwat also ensure that drought resilience is considered in the wider context of water sector challenges.

5. England's water Regulators are actively working together to mitigate the risks of drought. The National Drought Group (NDG) is a group of drought stakeholders which is activated during periods of prolonged dry weather, to create a single coherent cross-sector view and manage a coordinated delivery of drought management activities, communications and risks for England across all sectors. For example, the NDG has co-ordinated communications across different organisations, so messages are amplified and reach a larger number of people. The NDG is chaired by the EA. The EA and Ofwat work with the Department for Environment, Food and Rural Affairs, water companies, and other stakeholders to manage the risks associated with drought.
6. The regulators are also taking proactive action to rise to the challenge of more severe and regular drought. The Water Efficiency Fund, which will make up to £100 million available over 2025-30, will facilitate the delivery of transformative improvements to water efficiency across England and Wales. Regulators have set targets for the installation of 10.4 million smart meters and the Regulators' Alliance for Progressing Infrastructure Development (RAPID), a cross-regulatory alliance of Ofwat, the EA and Drinking Water Inspectorate (DWI) is overseeing a pipeline of 28 major projects which will increase England's resilience to stress in prolonged periods of dry weather.

The current situation

7. As of 24 November 2025, three Environment Agency operational areas in England remain in drought and parts of Sussex supplied by South East Water, two are in recovery, and six in Prolonged Dry Weather.
8. Rain received in November has helped improve the situation. As of 18 November, England had already received the average amount of rainfall expected for the whole of the month. As of 18 November, England's reservoir stocks were at 75.7% (compared to the long-term average of 79.7%).

9. While reservoir storage is rising at all reported reservoirs following November's rain, sustained rainfall is required through the winter to ensure we start spring 2026 in a normal water resources position. The three EA operational areas in drought are reviewing the possibility of moving to recovery status before the end of the year.

Outlook for spring 2026

10. Without sustained winter rainfall, England could face widespread drought in 2026. The EA's leadership through the NDG remains critical. The forecast impacts under three rainfall scenarios:
 - a. **100% rainfall:** Mostly normal by spring 2026, with localised issues.
 - b. **80% rainfall:** Widespread drought from Dorset to East Yorkshire, crop failures, wildlife risks
 - c. **60% rainfall:** Severe drought across England, water restrictions, major agricultural and leisure impacts.

What are the potential risks of increased drought in England to: the urban, industrial, and rural environment; people, species and habitats; and the economy?

11. Drought is listed on the [National Risk Register](#), with climate change driving the likelihood of more frequent and severe droughts. Rainfall, geology, meteorological pressure systems, the time of year, population demands and water supply infrastructure, all combine to determine the length and severity of a drought and geographical variations of impacts on people, the environment, agriculture, business and public water supply.
12. In urban areas the resilience of public water supply systems has improved in recent decades. However, risks remain within water companies where there are issues with poor asset management or local resilience challenges, such as resourcing and the geography of the area, and can be magnified if decision making and implementation of drought plans are delayed during a drought period. Businesses who rely on water for manufacturing and processing, and the energy sector which relies on water for cooling, may face supply risks during drought. Infrastructure such as road and rail networks could be affected by ground shrinkage in hot, dry ground.
13. In rural areas, drought reduces access to reliable water sources due to low river flows and declining groundwater levels, impacting private water supplies and farming. This affects irrigation, leading to crop losses, lower yields, and increased food prices. Livestock may suffer from reduced fodder and limited water availability, raising animal welfare concerns. Frequent droughts also

hinder reservoir replenishment and disrupt agricultural planning, with some crops becoming less viable under rising temperatures.

14. Natural habitats and species are vulnerable to repeated dry periods, which disrupt ecosystems, reduce habitat availability, and increase fish mortality due to low river flows. Economically, severe droughts could lead to water rationing, affecting households and businesses.
15. **Recommendation 1:** *Government, the EA and Ofwat should work together on a new water supply plan as recommended by the Independent Water Commission. General drought risks are well documented and understood for public water supply, but further action is required to ensure water companies are maintaining assets through the new regulatory planning being developed in response to the Independent Water Commission.*
16. **Recommendation 2:** *Government, the EA and Research Councils should conduct further research into the impacts of extreme dry weather and hot temperatures on infrastructure such as transport systems.*
17. **Recommendation 3:** *Government should prioritise policy development for the management of drought risks to other sectors beyond the water industry, particularly for the energy, farming sector and navigation. This could involve those sectors developing a type of drought plan.*

How will climate change affect drought risk (including severity, frequency and type) and impacts of drought?

18. Recent droughts in 2018, 2022 and 2025 have occurred in hotter, drier conditions. Higher temperatures add pressure to water resources from increased consumer demand, such as demand from growers as plant growing seasons lengthen.
19. 2022 saw the hottest temperature ever recorded in England at 40.3°C on 19 July at Coningsby, Lincolnshire. 2025 was the hottest summer on record for England as the UK's mean temperature from 1 June-31 August was 17.42°C - 1.69°C above the long-term average for 1991-2020 (1.69°C above the long-term average).
20. Climate change is expected to increase drought risk by altering patterns of temperature and rainfall in the UK, increasing the contrast between wetter winters and drier summers. This has the potential for a greater incidence of drought and flooding. There

may be geographical variations on the extent and impact of this contrast (see below).

21. The latest UK climate projections suggest larger seasonal contrasts. Spring and summer periods are expected to become drier, while autumn and winter may become wetter. These changes suggest that future droughts could become more rapid in onset, with important implications for soil moisture and river flows.
22. The latest research is indicating drought duration and intensity will increase for surface water systems, while groundwater droughts appear less sensitive. Areas such as northern England, where geology is impermeable and groundwater does not contribute significantly to river baseflow, may be at higher risk of intense summer droughts, such as in 2022 and 2025. In the future, groundwater areas that dominate the south east and east England may be at risk from a shortening of the recharge season through the winter due to weather extremes. This can be linked to temperatures – a hotter start to autumn, will leave soils drier so reducing the recharge season while the rain wets the soil.
23. Recent analyses highlight that the risk of extreme dry summers will rise with further warming. Hotter temperatures will increase the demand from vegetation, evaporation, plus increased demand from people and businesses (including farming).
24. Regional differences will persist, with the southeast more prone to long, severe droughts and the northwest experiencing shorter, less intense events. Long term trends on worsening droughts remain uncertain due to natural variability. This can seem at odds with the recent run of hot, dry summers, but it reflects the difference between individual events and long-term climate trends.
25. **Recommendation 4:** *Defra Chief Scientist Group should work with EA Chief Scientist Group to investigate options to influence research councils such as Natural Environment Research Council to show drought as a priority area. Further research is required to refine understanding of how climate change will continue to influence both drought processes and water use behaviours.*
26. **Recommendation 5:** *Government should commission the EA, Climate Change Committee, the water industry, and other regulators to work with Defra to conduct a joint assessment of whether current predictions/forecast of the changing climate is enough to prepare for an uncertain future.*

27. **Recommendation 6:** *The Defra Chief Scientist Group and EA Chief Scientist Group should commission research into the influence of temperature on water demand. This should be prioritised to ensure preparedness keeps pace with the change in climate – this should cover demand in all sectors.*¹
28. As an example of a current research programme in this area, the EA Chief Scientists Group, with Defra Flood and Water Evidence, is running a research programme on drought and water scarcity under climate change. Current projects include investigating future river flow variability; reviewing governance and water-use behaviours; exploring AI applications in river flow modelling. Funded under Year 1 of SR24, the programme completes in March 2026.
29. The EA has bid for further funding to address gaps on water demand, coincident hazards in dry weather, drought intervention effectiveness, and future river ecology and quality; the outcome of those bids is pending. A joint submission was made between EA Chief Scientists Group and Defra Water Evidence in Spending Review 24, with allocations made via GoScience and ringfenced for research. We are awaiting confirmation of future year allocations.

¹ Evidence:

- Chan, W., Tanguy, M., Chevuturi, A. and Hannaford, J. (2025). Climate variability conceals emerging hydrological trends across Great Britain. *Journal of Hydrology*. Volume 60 A.
- Chan, W., Arnell, N., Darch, G., Facer-Childs, K., Shepherd, T., Tanguy, M., van der Wiel, K. 2023. Current and future risk of unprecedented hydrological droughts in Great Britain. *Journal of Hydrology*, 625 A
- [Hannaford, J., Turner, S., Chevuturi, A., Chan, W., Barker, L.J., Tanguy, M., Parry, S., Allen, S., in press. Have river flow droughts become more severe? A review of the evidence from the UK – a data-rich temperate environment. *Hydrology and Earth System Sciences*. <https://doi.org/10.5194/hess-2024-293>](https://doi.org/10.5194/hess-2024-293)
- Parry, S., Mackay, J. D., Chitson, T., Hannaford, J., Magee, E., Tanguy, M., Bell, V. A., Facer-Childs, K., Kay, A., Lane, R., Moore, R. J., Turner, S., and Wallbank, J.: Divergent future drought projections in UK river flows and groundwater levels, *Hydrol. Earth Syst. Sci.*, 28, 417–440, <https://doi.org/10.5194/hess-28-417-2024>, 2024.
- Tanguy, M., Haslinger, K., Svensson, C., Parry, S., Barkett, L., Hannaford, J., Prudhomme, C. 2021. Regional Differences in Spatiotemporal Drought Characteristics in Great Britain. *Front. Environ. Sci.*, 12 March 2021. Sec. Interdisciplinary Climate Studies. Volume 9 - 2021 | <https://doi.org/10.3389/fenvs.2021.639649>

How comprehensive and responsive is drought monitoring in England? Could early-warning systems be more effective?

30. The EA is lead responder for drought. During a severe drought, Defra assumes leadership, supported by the Cabinet Office.
31. The EA has a national monitoring programme which provides data to detect the onset, impacts and end of drought. The EA uses data from:
 - a. rain gauges (2,541 sites – 1,060 intensity gauges 1,481 storage gauges)
 - b. flow gauging stations (1,298 gauging stations)
 - c. groundwater level monitoring network (5,137 sites)
 - d. national ecological drought surveillance network
 - e. surface or ground water quality monitoring networks
 - f. water companies (e.g. reservoir storage data)
32. The EA collects additional hydrometric and ecological data when appropriate.
33. Droughts often develop slowly, and early signs are tracked through water situation reports. For instance, the 2025 drought was monitored from December 2024.
34. Each of the EA's 14 operational areas has a drought plan outlining local indicators, triggers, and response actions. For drought monitoring, the plans contain:
 - a. a summary of the monitoring and indicators used to understand the latest position
 - b. the triggers used to determine when to take actions and move drought stage
 - c. the actions the EA can take at each drought stage to recognise, monitor and, if possible, reduce the impact of the drought.
35. Water companies have statutory drought plans that are activated when they hit specified triggers.
36. The current national drought monitoring is conducted by the EA, with its experts reviewing the information from the monitoring sites listed above, rather than a dedicated system. Specific drought reporting is not made public until there is a confirmed move to a drought status of prolonged dry weather.
37. Other sectors such as the energy sector do not have statutory provisions to require mandatory drought plans. The NDG can warn

of impending drought, as it has done since 2017, but a broader review of sectoral planning is needed to strengthen national resilience.

38. The UK Droughts & Water Scarcity research programme (a 5-year £12 million+ interdisciplinary initiative) explored forecasting improvements through the IMPETUS: Improving predictions of drought to inform user decisions project. The research identified limitations, and further development of early-warning systems is now essential, especially given advances in climate science and technology.
39. The current system for monitoring the development of a drought works, but there is scope to improve its transparency to the public and bring information together from different organisations (such as Met Office, UKCEH, British Geology Survey etc.). Current technology and funding are barriers to this.
40. **Recommendation 7:** *Government should provide funding for the EA to develop a more comprehensive early warning system for drought, including capturing inputs from organisations and citizen science. The outputs should be published regularly on GOV.UK to inform the public and businesses of risks.*
41. **Recommendation 8:** *The Natural Environment Research Council and other organisations should start a new comprehensive research programme to aid future drought response. Key areas of research are social behaviours, drought impact capture, economic cost of drought (see question 5), forecasting for water supply and demands for future water resources planning, and utilising AI technology.*

How effective are drought response protocols in England, both before a drought has been declared and once a drought is underway? Are there opportunities for improvement?

42. The EA responds under 4 stages of drought management:
 - a. prolonged dry weather
 - b. drought
 - c. severe drought
 - d. recovery
43. The EA plans and manages drought using stages to illustrate the worsening or improving situation. All water companies have statutory drought plans that are in place, that mirror the stages (although termed in levels of response between 1 to 4).

44. While current drought plans address prolonged dry weather, drought and recovery, severe drought plans remain less clearly defined. The potential impacts on public water supply during such events could be significant, affecting people, businesses, and the economy. The EA is developing guidance for water companies on emergency drought plans. Water companies will still rely on the government to inform them of the prioritisation for water users, such as continuation of water supplies to hospitals.
45. Some organisations in other sectors, such as the Canal & River Trust (CRT) for navigation, have non-statutory drought plans that set out their triggers and actions in these conditions, and how they will ensure clear, effective and targeting messaging. These could be strengthened by inclusion in statutory frameworks. Similarly, the energy sector would benefit from a formal requirement to plan for drought conditions.²
46. **Recommendation 9:** *Government should ensure that all water companies have an emergency/severe drought plan. A priority of water for water companies to follow in a severe drought is also required.*
47. **Recommendation 10:** *The EA would recommend other sectors such as navigation and energy should have to produce statutory drought plans. Defra would need to develop and assess how to bring these sectors into a statutory process.*

What are the potential economic costs of drought management actions that may be needed in the future?

48. This is an area which is poorly understood. The economy, growth and prosperity rely on having enough water. Research from the EU (there is no England or UK wide research) shows the rising threat of water scarcity puts almost 15% of the euro zone's economic output at risk, according to new research conducted by the European Central Bank with Oxford University.
49. A 2016 Water UK report suggested households were willing to pay £40–£160 to avoid emergency severe-drought measures like rota cuts. The National Infrastructure Commission (2018) estimated that relying on emergency drought responses could cost £40 billion, whereas proactive investment in water infrastructure capacity over 30 years would only be £21 billion.
50. Both reports are now outdated, and the lack of recent analysis limits understanding of drought-related costs across sectors beyond

• ² Evidence: [Drought: how it is managed in England](#)

public water supply - such as agriculture, energy, industry, navigation, recreation, and the environment. Improved economic assessments are essential to support investment in long-term drought resilience. ³

51. **Recommendation 11:** *Government should commission immediate work on the latest economic costs of a severe drought and this should inform work related to answers in question 4 about emergency/severe drought plan developments.*

52. **Recommendation 12:** *Government should commission the EA to undertake research to understand whether we are investing to protect our future from a water crisis and whether current plans are sufficient.*

In what ways are residents, businesses and industry involved in drought management planning and drought actions? Could engagement by water companies with their customers be improved?

53. Residents, businesses and industry are encouraged to help shape how water companies and the EA plan for droughts.

54. Water companies are required to consult the public during the development of drought and water resource management plans as part of the statutory process. Engagement typically includes public consultations, targeted outreach events, and online resources.

55. The EA conducts public consultations to gather views when developing guidelines for drought planning processes. It also provides accessible resources through blogs and dedicated web pages on GOV.UK to support public engagement and awareness.

56. Water companies are improving their approach by encouraging voluntary water-saving actions through clear, locally targeted messaging (rather than telling customers to stop doing something). They have used how-to examples and targeted specific audiences for hyper-localised campaigns, such as explaining water saving at a Bolton Wanderers football match. Their drought plans include detailed communication plans to guide customer engagement throughout the drought cycle.

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- ³ [Water resources long term planning | Water UK](#)
 - 'Preparing for a drier future' published by the **National Infrastructure Commission (NIC)** in April 2018.

57. Future improvements could include more coordinated messaging across agencies. The NDG is working toward this for spring 2026.
58. Ofwat's upcoming Water Efficiency Campaign (Spring 2026) is an opportunity to drive long-term behavioural change. This should offer water companies a platform to amplify messages and help customers change how they use water in the long term. There is up to £75 million available over five years to deliver this large-scale, innovative, and evidence-led campaign.
59. Ofwat is also launching the Water Efficiency Lab (WEL) on 25 November. WEL is a problem-led innovation competition to fund solutions to key challenges in water efficiency. The first round of WEL will focus on the challenge of providing water customers with actionable insights to help them understand and reduce their water use.
60. ***Recommendation 13:*** *The National Drought Group should continue to improve the coordination of communications during a drought, with close support from Defra.*

Are roles and responsibilities in relation to drought management clear enough?

61. Roles and responsibilities are clear:
- a. EA is lead authority on managing droughts, chairs the NDG and will follow its own drought plans. The EA has a lead role in developing guidance for water companies on long term water resources planning and drought plans as well as advising government on these plans. The EA produces the water resources national framework every 5 years to ensure all sectors are improving their resilience to drought.
 - b. Water companies have responsibility over public water supply. Water companies produced statutory water resources management plans that if delivered will increase drought resilience. Current drought resilience is set to withstand a 1:200-year drought and this will rise to 1:500 by 2040. Water companies produce drought plans which are operational plans to follow when in a drought.
 - c. Defra act as lead government body, with support from Cabinet Office.⁴
 - d. Ofwat has a responsibility for reviewing company drought plans together with the EA to ensure they align with duties to

• ⁴ [Drought: how it is managed in England](#) details roles, responsibilities and management of Drought

customers and the environment and ensuring sufficient investment into infrastructure.

62. Regulators are also working together to make sure that we are investing in the large-scale water infrastructure projects required to prepare for future droughts. RAPID was set up by the three water regulators (Ofwat, the EA and DWI) in 2019 to accelerate solutions for a resilient water system in England and Wales. RAPID currently oversees a pipeline of 28 major projects, that have been identified in the latest round of water resources management plans. One example is the Hampshire Water Transfer and Water Recycling Project which will, once operational, be capable of providing up to 90 million litres of water a day to the Hampshire supply area.

63. ***Recommendation 14:*** *While roles and responsibilities are well defined during a drought; there is improvement to be made in the response to a severe drought. This scenario should be tested nationally to identify gaps and understand what progress has been made since the last national exercise in 2017. Government should lead this work on defining roles and responsibilities to a severe drought with the close support of the EA.*

What lessons can be learnt from other countries about managing rapid or severe droughts? What innovative solutions or technological approaches to water management are being deployed in other countries to improve drought resilience and preparedness?

64. International approaches typically focus on demand reduction, supply enhancement, and conservation measures.

65. The 'Day Zero' concept used in South Africa during Cape Town's drought in 2018, has been replicated across the world. In 2025 the EA commissioned a 'Review of International Extreme Drought Measures' in regions including California, Barcelona, Cape Town, Victoria (Australia), Israel and the Netherlands. Key lessons included proactive emergency drought planning and management; public engagement and investment in water supply (and more). ⁵

• ⁵ Environment Agency - Review of International Extreme Drought Measures, 2025 (internal document)

66. Innovative solutions used abroad include water recycling (effluent reuse) and desalination to increase supplies, as seen during an EA visit to Australia and Singapore. Australia showed lessons from the varying success of different innovations.
67. While England's planning and operating water system is highly regarded for delivering high quality drinking water, there remains significant value in learning from global experiences to strengthen drought resilience.
68. Regulators are also encouraging innovation in England and Wales. Ofwat is delivering a £600 million, 10-year Innovation Fund to grow the water sector's capacity to innovate, enabling it to better meet the evolving needs of customers, communities and the environment. The Fund is delivered in partnership with Challenge Works (formerly Nesta Challenges) and supported by Arup and Isle Utilities.
69. **Recommendation 15:** *Government should commission the Environment Agency to conduct a comprehensive review of drought management across the UK and worldwide with knowledge exchanges between countries. The UK should be shown as a leader in the area.*
70. **Recommendation 16:** *Government to consider whether the UK increases its use of rainfall independent sources of water such as desalination and water recycling. The EA has already signalled this in its latest Water Resources National Framework.*

Are emerging sources of future water demand, such as new housing, data centres, industry and energy processes, adequately accounted for in water resource planning and drought plans? What impact might these sources of future demand have on drought risk?

71. Emerging sources of water demands are increasing pressure on water resources. These demands are not always fully reflected in current water resource and drought plans. Gaps arise from limited data in Local Authority growth plans and commercial secrecy (especially in the energy sector), forcing water resources and drought planning to use assumptions.
72. As climate change alters rainfall patterns and raises temperatures, water demand - especially for cooling, irrigation and environment needs- will rise. Population growth, with England projected to gain 8 million people by 2055, will further intensify demand.

73. The EA's National Framework for Water Resources warns that without action there could be a shortfall of up to 5 billion litres of water a day for public water supplied by 2055, with an additional 1 billion litres needed for other sectors. Addressing this requires cross-sector planning, accelerating resource options and improved demand management.
74. The latest water resources management plans, if delivered by water companies will aim to build resilience through demand management (smart meters, leakage reduction, water efficiency labelling) and new supply options (10 reservoirs, desalination, recycling). The latter are known as Strategic Resource Options. By 2040, all water companies will be achieving a drought resilience of 1:500.
75. Water companies are assessing future water demand from all sectors through Water Resource Management Plans. Water companies have £8 billion to deliver Water Resource Management Plans to maintain or enhance drought resilience in the context of other pressures. This includes £1.7 billion on water meters, £2.9 billion on short/medium term supply schemes, and £2.4 billion on longer term major supply projects, via RAPID (see above). Ofwat is tracking delivery of this investment, including jointly with the EA via the annual review of Water Resource Management Plans. Uncertainty remains around future needs for areas such as data centres.
76. **Recommendation 17:** *Government to introduce mandatory reporting of current and projected water use by all sectors to improve forecasting and water security planning.*
77. **Recommendation 18:** *Government to improve Local Authority housing and non-household growth data, timed to inform Water Supply and Environment plans.*
78. **Recommendation 19:** *Government to introduce a new requirement making water availability a primary consideration when deciding where to site water intensive industries. Local authority plans could identify growth areas where water is available or can be developed. Mandatory water-use reporting and better data of non-household water demands would enable future plans to support sustainable growth.*

How should the Government consider drought management alongside its other priorities such as nature restoration, food

security, flood management and expansion of artificial intelligence?

79. Drought can have lasting impacts on the economy, people and the environment with estimated costs of severe events reaching £40 billion in 2018—and likely higher now. The 2025 drought and risk of continuation into 2026 make drought and water planning critical.
80. Effective planning for drought is an essential component of nature restoration, food security and flood management both now and in the future.
81. ***Recommendation 20:*** Immediate government action is required to: (1) ensure all water companies have emergency/severe drought plans; (2) establish a clear priority framework for water allocation during severe drought.

24/11/2025