Water resources

We have responsibility for managing water resources in England and Wales. This means making sure there is enough water available for everyone without damaging the environment.

We achieve this by regulating the removal of water from water bodies, environmental monitoring and working closely with the water industry and major water users to plan for future needs.

Our water resources are coming under increasing pressure.

By 2031, there are likely to be ten million more people living in England and Wales, all requiring water for drinking, business, industry, leisure, and sanitation. Currently, population growth and development are the greatest pressures on our water supply.

Climate and risks

Climate change	Examples of key impacts
Increased summer temperatures	Increased water demand from households, businesses and agriculture. Increased risks to freshwater habitats and species as water temperatures rise with air temperatures.
Decreased annual and summer rainfall	Reduced rainfall with larger seasonal variations in river flow and groundwater levels will affect available resources and the abstraction (water withdrawal) regime.
Increased winter rainfall	Implications for the design and management of existing and newly planned reservoirs, with winter rainfall being condensed into fewer, higher intensity events.
Sea level rise	Water supply infrastructure near to the coast could be at risk from increased flooding.
More frequent extreme events (such as flooding, drought, heatwaves)	Yields from existing reservoirs, groundwater sources and rivers may decrease. Potential pollution of available water resources during flash flooding events, with greater surface water runoff/overland flows. Some critical infrastructure (such as water treatment plants) may be more vulnerable to flooding due to more intense rainfall.

Climate change will make dealing with these other pressures even more of a challenge. Climate change will seriously affect the water supply-demand balance, including resource availability, security of supply and the water required to keep our rivers, lakes and ecosystems healthy.

'River Flows to 2050'

We commissioned research to demonstrate the potential impact of climate change on river flows across England and Wales by the 2050s. The project concentrated on low flows, but it also looked at the potential change in seasonal river flow patterns.

The results suggest that river flow will halve in the summer months with some areas seeing a possible decrease of up to 80 per cent. Flows in the winter months could rise by up to 15 per cent. The study suggests that although we will have wetter winters, they could be shorter and that our drier summers could be longer. When combined with increased temperatures – and hence increased evaporation, this could reduce total annual river flow by up to 15 per cent.

We have also considered how climate change may affect groundwater. By 2025, it is likely that overall recharge to aquifers will decrease, river flows fed by groundwater will decrease and that there will be a general lowering of groundwater levels, with a more marked reduction further away from rivers.

Adaptation actions

Our highest priority in adapting to climate change is to reduce demand for water in order to manage our reliance on this vulnerable and uncertain natural resource.

Flexible approach: The uncertainties we face in long-term water resources planning mean that step by step and flexible solutions are often preferable to fixed solutions which may not prove to be a suitable response to the uncertainty of climate change (particularly in public water supply planning). For example, we favour water efficiency measures over new reservoirs.

Review of water company water resources management plans: We provide guidance to water companies on how they should consider and allow for climate change. We then work, together with Ofwat (the economic regulator for the water industry), to check that the plans allow for climate change in their supply-demand balance. These need to be flexible solutions which will be able to adapt to an uncertain climate.

Water Resources Strategy: Our *Water Resources Strategy* considers the long-term future direction of water resources management in the face of a number of pressures, including climate change. As well as adaptation actions, we have also looked at the carbon cost of different water supply and demand management measures.

Government Public Service Delivery Agreement: This Agreement uses Catchment Abstraction Management Strategies to assess the proportion of areas with sustainable abstraction of water. Currently only 66 per cent of catchments are considered sustainable and climate change will add additional pressures to water stressed areas. This indicator provides a measure of Government progress in adapting to climate change. The indicator captures efforts to reduce demand and use water efficiently, as well as long-term planning to ensure resilience of water supply.

Communicating climate change: It is essential that we take action to reduce our water use. Water efficiency and reducing demand relies on changing behaviours. We will work with our stakeholders and the public to communicate the challenges climate change presents to future water resources. Our staff will be fully trained on climate change adaptation issues.

Flexibility and a requirement for water efficiency within water resources licensing: For example, time-limiting abstraction licences means that we can take climate change into account in future catchment management. By improving water efficiency, we will be able to cope better with reduced water availability, and different environment needs as a result of climate change.

Hydrometric Monitoring Review: We need good quality long-term records, as these are best suited to monitoring the impact of climate change. Reviews of surface and groundwater networks will explicitly consider the value of sites that will be particularly sensitive to climate change.

Climate change in our policies and processes: As we develop new policies and processes we will ensure they consider climate change, ensuring future resilience.

Vale of Evesham study

The Vale of Evesham is an area of the UK with a high concentration of irrigated agriculture. This project examined how hotter and drier summers could increase irrigation water demand. It also explored whether the agricultural community is concerned and what adaptation options are available to it. The water needed for irrigation will increase by 50 per cent by 2050 and by 84 per cent by the 2080s.

This will mean more frequent restrictions on water abstraction. We are communicating information on how to adapt to climate change, and targeting those involved in farming and land management.

Science projects

We are working on two new projects to investigate the impact of climate change on water resources. The first will use the UK Climate Projections 2009 (UKCP09) to develop projections of future river flows and groundwater levels that can be used to assess the impact of climate change on many different aspects of water resources.

The second project will evaluate the way that climate change is considered in long-term water resources plans, with the aim of incorporating the new UKCP09 projections effectively into the next round of plans for Price Review 2014 (PR14).

We have major responsibilities for helping to limit greenhouse gas emissions and adapt to climate change in England and Wales. We also administer schemes that cover a large proportion of the UK's greenhouse gas emissions, and play a leading role in reducing the risks from climate change, such as increased flooding, drought, and sea level rise.

For our latest report and case studies covering the work we and our partners are doing to adapt to climate change, please visit our adaptation web pages www.environment-agency.gov.uk/adapt

For more information contact the Climate Change Team on 08708 506 506 or enquiries@environment-agency.gov.uk