

Water resources for the future

Water is vital for life

All living things need water to survive. People rely on water not only for drinking and for personal hygiene but also for many other purposes:

- around our homes, for cooking, washing and cleaning;
- in our gardens, to water plants;
- on farms, to water crops and clean equipment, and for animals to drink;
- in offices, schools, universities and hospitals, for cooking and cleaning;
- in commerce and industry, to help with manufacturing.

All the water we use is taken from streams, rivers or water-bearing rocks below the ground (aquifers). Water in the environment – in streams, rivers and wetlands – serves many other purposes that we must take into account. It allows plants to grow and keeps fish, insects and mammals healthy. It also gives people pleasure in many ways. We like the appearance of rivers and streams in the landscape, and many of us enjoy fishing, boating, canoeing or just walking by rivers. Our use of water needs to safeguard these benefits.

A water resources strategy for North West Region

The Government has given the Environment Agency the task of planning our use of water. As part of this process, we have developed a new water resources strategy for our North West Region. At the same time we are publishing seven other strategies for the rest of England and Wales, as well as a national strategy providing an overview. This leaflet summarises the strategy for the Agency's North West Region.

The region, shown in Figure 1, includes the Lake District and all catchments draining westwards from the Pennines between the Scottish border and Cheshire. Major catchments include the Rivers Eden, Lune, Wyre, Ribble,

Mersey, Dane and Weaver. The landscape ranges from the uplands of the Lakes and Pennines to the lowlands of Cheshire and the Lancashire coast. The total land area of North West Region is 14,500 km².

The region is often perceived to be wet, but its valuable natural environment and high population density both

Figure 1 North West Region



Figure 3

North West Region demand in 2010 and 2025

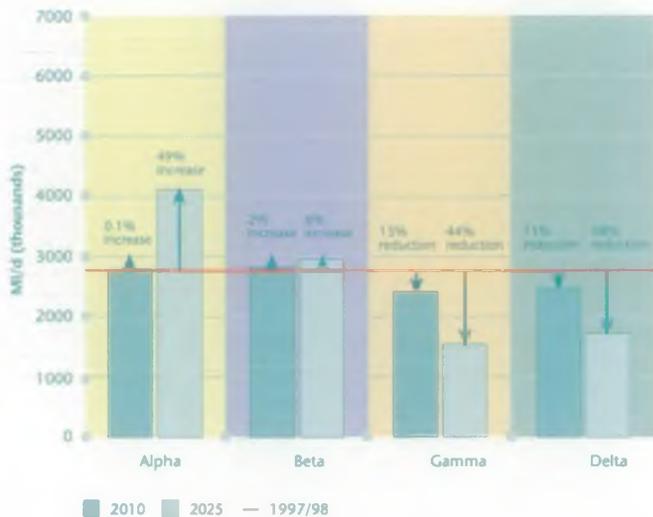


Figure 3 illustrates our demand forecasts for North West Region to 2025. The forecasts show that total demand for water could rise or fall over the next 25 years. For example, household demand could increase by as much as 33 per cent, or decrease by 30 per cent relative to current levels. The pattern of potential growth or decline in industrial demand for water also shows a wide range across the different scenarios.

It is unlikely that the future will follow any one of the scenarios we have used. However, by showing what could occur under each, we have identified boundary limits to guide our resource planning.

Climate change

Climate change is of great significance to water resources. Changes to rainfall patterns and amounts could affect how much water is available for people and for the environment. Climate change could also influence the demand for water. For example, if it becomes hotter, we may wish to water our gardens more.

Present analysis suggests that over the next 25 years, summers could become drier and winters wetter, with more rain in total. Temperatures are likely to increase. Since many questions remain about the effects of climate change, it makes sense to use our existing water resources carefully, and to look for flexible solutions to future demands that can cope with different climatic conditions. This is an area that we will keep under review.

Our strategy for North West Region

Our strategy is designed to improve the environment, while allowing enough water for human uses. We have considered its contribution to sustainable development,

including social progress that addresses the needs of all, protection of the environment, making wise use of natural resources, and maintaining high and stable levels of economic growth and employment. Our strategy is flexible and phased, so that we can avoid unnecessary investment while retaining the security of our water supply and improving the water environment.

Our strategy shows that:

- water is a vital and integral part of the environment, landscape and heritage of North West England. Sustainable management of this resource is central to our strategy;
- to maintain a reliable public water supply, we foresee a need to increase availability by up to 40 MI/d over the next 25 years. This can be achieved by improvement of existing schemes, further integration and the development of some new resources, primarily to meet local needs in Cumbria;
- increased water efficiency and water use minimisation should be an important aspect of resource management over the next 25 years. We therefore include a number of recommendations to encourage the efficient use of water in the home, in commercial premises, by industry and by agriculture;
- in recent years significant progress has been made in reducing leakage. It is vital that this continues;
- working together will be the key to delivering the sustainable development of water resources. We will continue to explore and develop opportunities for co-operation with a wide range of organisations in the region.

We will publish an annual bulletin reporting on progress against this strategy, and review it fully in a few years' time.

How to find out more

You can find more information in the full water resources strategy for North West Region, available from our Warrington address. Details of our strategies for other regions of England and for Wales can be obtained from regional Environment Agency offices. You can obtain our water resources strategy for the whole of England and Wales from Water Resources, Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, BS32 4UD. Further information on all of our water resources activities can be found on the Agency's website at www.environment-agency.gov.uk.



relatively small quantity of water, and the activity is concentrated in a few catchments, it takes place in the summer months, when river flows are at their lowest.

Around 85 per cent of water used in North West Region comes from reservoirs and river sources. Major upland reservoirs play a key role, by storing large volumes of winter rainfall for use in dry periods when river flows are low. Direct abstraction from rivers can be used at times of high flow. The remaining 15 percent of usage comes from groundwater. Sandstone aquifers underlie about a third of the region. Across most of the region, the various source types are linked into an integrated system that provides a reliable public water supply, although parts of Cumbria still rely on more isolated sources.

In some places we think that too much water is taken already. Here, the environment may already be damaged or is in danger, so we must reduce our abstractions if we want to restore the environment. There are also areas where we think that there is no damage now, but that no more water should be taken. In the rest of North West Region, water may be available. Almost anyone who wants to abstract water needs a licence from the Environment Agency. Before we give a licence, we must be sure that it will not cause damage, and detailed studies are often necessary.

The maps in Figure 2 illustrate the availability of water for North West Region. They show that there is little scope to license additional summer abstraction from many of our rivers. However, water is available for abstraction from rivers during the winter over most of the region. An exception is the Fylde area in Lancashire, where winter flows are needed in order to recharge the underlying aquifer.

Figure 2c shows several aquifers with an unacceptable balance between recharge and licensed abstraction. Historically, this problem has been particularly severe around Manchester, along Merseyside and in parts of Cheshire and the Fylde, and in some places has led to increasing salinity in the groundwater. More recently, abstraction in these areas has reduced, so that many water levels have risen again. As a result, problems have occurred in places such as central Liverpool, where rising groundwater levels are affecting foundations and tunnels. Current management policies aim to prevent further saline intrusion and achieve a sustainable balance between recharge and groundwater abstraction.

The Eden valley has additional groundwater available for abstraction. However, the sensitive nature of this catchment means that there is scope here only for limited, small-scale abstractions remote from watercourses.



Enjoying different activities on Derwentwater

Future demand for water

The amount of water we need is known as demand. The demand for water will change over the next 25 years, under the differing influences of a variety of factors.

In the home, we each choose how much water we use. We need water for washing, bathing and cooking, to water our gardens, and to wash our cars. Today, on average we each use about 150 litres every day – enough to fill about 15 buckets. Future household water use depends on the choices that we make as individuals and collectively as a society. For example, showering usually uses less water than a bath, but using a power shower for five minutes can use more water than taking a bath. Depending on attitudes, individual household water use could increase or decrease over the next 25 years. In some places, more homes are planned. While individually any new homes built could be more water-efficient, they will add to the total demand for water.

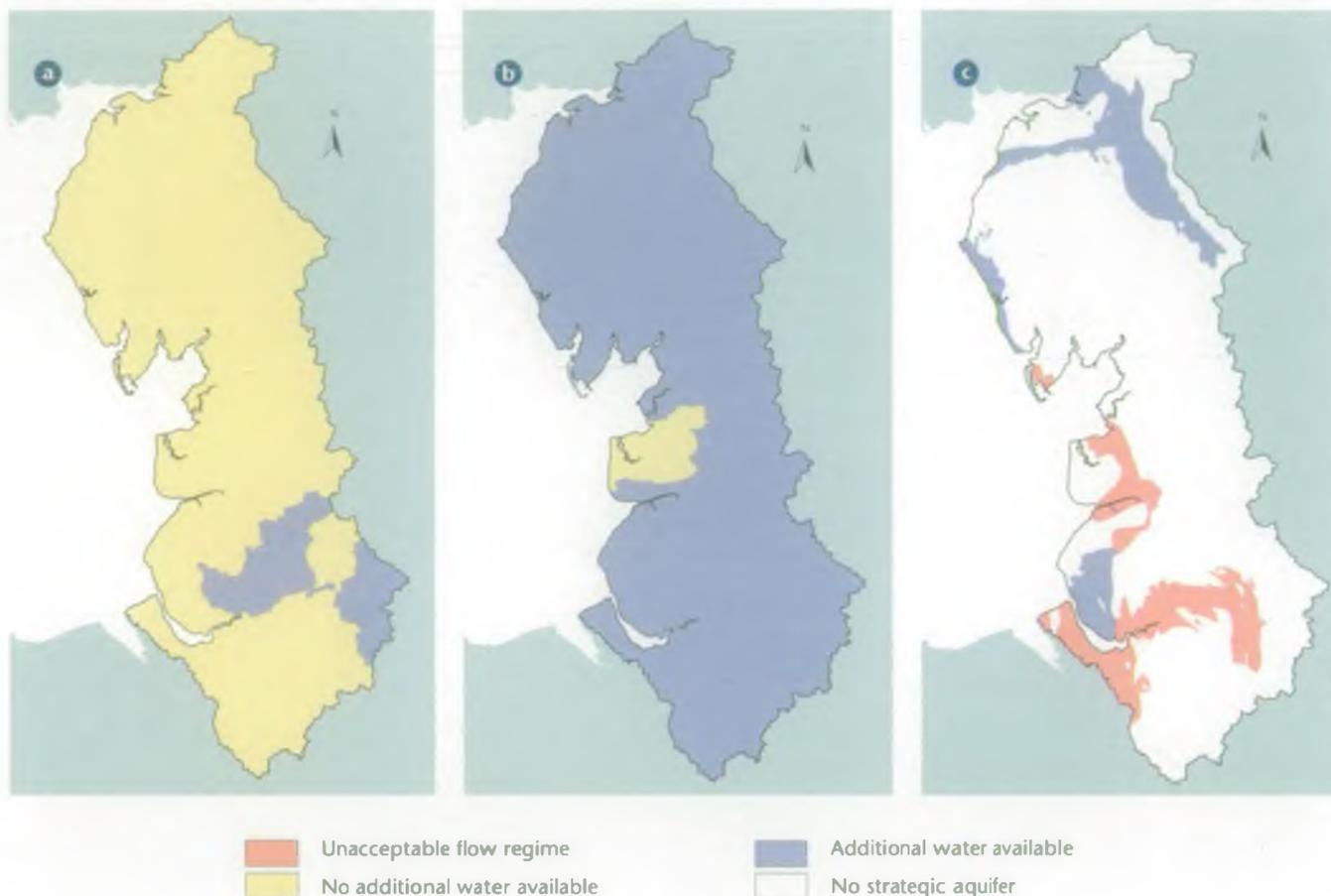
Similar arguments about the effect on demand of differing water use practices apply to industry, commerce and agriculture. Their needs for water are also affected by market considerations, such as the price commanded by different product or crop types.

To consider many of these different effects, we have taken a scenario approach to predict future demands. The Government's Foresight framework looks at the different ways that our political and social values could change over time; we have used it to consider a range of possible social and economic changes, and calculated the resulting future demands.

Current and likely future demands in North West Region are dominated by public water supply. The rate of growth predicted by government planners for the region could lead to 300,000 additional households by 2025.

Figure 2

Resource availability: a. Summer surface water b. Winter surface water c. Groundwater resource



depend on having a plentiful supply of water. Compared with other areas in England and Wales, many rivers in the North West are relatively short and steep. Flows rise rapidly after heavy rain, especially on impermeable rocks where little water soaks into the ground. In the more lowland southern part of the region, abstractions and discharges associated with water supply and industry affect our rivers significantly. The region has many areas of scenic beauty, including the Lake District National Park, and many of our wildlife habitats are recognised and protected by national laws and EC directives. Valuable wetland environments include the mosses and meres in Cheshire, the almost pristine catchment of the River Eden, and major estuaries that support migrating birds. Water is an essential element of such sites, and plays an important role in defining the character of the landscape.

Planning our use of water

North West Region receives just over 1,200 mm of rain in an average year, ranging between 3,600 mm in the wettest parts of the Lake District to around 800 mm in the lowlands where most people live. Some of this rainfall is taken up by trees, crops and other growing plants, and some evaporates. The remainder, known as effective rainfall, amounts to about 4,500 litres each day (about 450

buckets) for every person who lives in the region. Effective rainfall is unevenly spread through the year, with much of it occurring during the winter months. We can't use all this water because we want to leave enough in our rivers and streams to protect nature and allow us to enjoy our landscape. In a dry year, our use of water can lead to problems. Since every drop of water that humans take comes from our natural environment, we need to plan our use of water to make sure that we have enough for our needs while protecting plants and animals from damage.

Our strategy reflects these issues. It looks 25 years ahead, and considers the many changes that may occur over this time. Our vision is:

Enough water for all human uses with an improved water environment.

The availability of water

In 1997/98, abstraction of water for public supply purposes in the Agency's North West Region amounted to some 2,100 million litres per day (Ml/d) on average. Household use accounted for about half of this, and industry and commerce about a quarter. In addition, some 1,300 Ml/d was abstracted directly by industry. Farmers also abstract water directly for spray irrigation. Although this is a

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