

Water Sources

Water sourced for public water supplies comes predominantly from surface waters such as rivers, lakes and man-made reservoirs. Private group water schemes and small private supplies are more reliant on ground and spring water. The latest report by the Environmental Protection Agency (Figure 2) states that 84% of our water is sourced from surface water whilst 16% is sourced from groundwater (wells & springs). In rural areas which are not served by public or group water schemes groundwater is usually the only water source available. In some rural areas over 80% of drinking water is privately sourced from groundwater.

Ensuring the Quality of Drinking Water

To protect human health and ensure the quality of our drinking water:

- Our drinking water sources (rivers, lakes or groundwater) must be protected from pollution
- Any regulations governing the quality of our drinking water must be met

To ensure that our water is fit for human consumption and does not pose a threat to human health it must meet the standards set in the European Communities (Drinking Water) Regulations 2007. Public water sources treat their water prior to use to ensure these standards are met. In many cases the water provided from private group water schemes and small private supplies receive only minimal or no treatment. It is important that untreated water sources are protected from any pollution which may render them unsafe for human consumption. By protecting our sources we also reduce the likelihood of pollution with chemical or microbiological contaminants, like cryptosporidium, which are difficult or expensive to remove during treatment.

Various pieces of European legislation united under the Water Framework Directive are aimed at safeguarding and improving the quality of our water sources and the wider aquatic environment. The Local Government (Water Pollution) Acts, 1977-1990, are the primary national legislation protecting our water sources from pollution. The Water Services Act 2007 sets out a comprehensive legislative code governing drinking water supplies. It is aimed at ensuring compliance with national drinking water standards and protecting our drinking water sources.

Drinking Water Regulations

The quality of our drinking water is governed by the European Communities (Drinking Water) Regulations 2007. These regulations enact the EU Drinking Water Directive and sets standards governing the quality of water intended for drinking, cooking, food preparation and other domestic purposes. The regulations specify how the quality of our drinking water should be monitored and what action should be taken if its standards are not met. The regulations do not cover water supplied to single domestic dwellings by private wells. Whether our drinking water undergoes treatment or not, it must meet the standards set out in the Regulations. The regulations set limits for the most common substances (so-called parameters) that can be found in drinking water. In all 48 parameters, along with their limit values, are listed in the regulations. Each parameter is grouped into 3 categories;

1. Microbiological
2. Chemical
3. Indicator parameters

Microbiological and chemical parameters are used to indicate the presence of substances which may be harmful to our health or which impair the quality of our water. Indicator parameters determine the presence of substances which may not be harmful to us but affect the taste, odour, colour and physical properties of our water. If the limits imposed for the microbiological and chemical parameters are found to be exceeded action must be taken to reduce their levels. However if the limits for indicator parameters are exceeded, corrective action may not be required unless it poses an immediate threat to human health. It is the responsibility of the Local Authorities to carry out drinking water monitoring on both public and private supplies. The frequency of water testing is dependent on the size of the population the supply is serving.

Drinking Water Quality In Ireland

In general the quality of drinking water in Ireland is good. The most recent report published by the Environmental Protection Agency indicates that the overall compliance rate with the standards set out in the Drinking Water Regulations was over 96%. However the quality of drinking water supplied by private group water schemes is lower than public water supplies. Problems also exist with the microbiological contamination of private and public water supplies.

The most important indicator of drinking water quality in Ireland are the microbiological parameters, and in particular *Escherichia Coli* bacteria (*E. Coli*). The presence of *E. Coli* indicates contamination by human and/or animal faecal waste. Water contaminated by faecal waste is a threat to public health. The compliance rate of public water supplies with the microbiological parameters in the latest Environmental Protection

Agency report was 99.8%. In contrast the compliance rate of private group water schemes was 77.5 %. Under the National Development Plan 2007-2013, a total of €850 million is being provided for rural water services. A large proportion of this money will be used to upgrade and install treatment equipment in private water schemes to ensure the microbiological safety of the water supplied by them.

Although monitoring has indicated that public water supplies are relatively free from contamination by harmful microscopic organisms, the presence of *Cryptosporidium* is currently one of the greatest threats to our drinking water. *Cryptosporidium* is a parasite which originates from animal and human faecal waste. *Cryptosporidium* causes problems for drinking water supplies for a number of reasons. Whereas other disease causing organisms die-off in the natural environment, *Cryptosporidium* is particularly resilient and can survive for much longer in the soil or in the surface waters. Due to the resilience of *cryptosporidium*, once waters have become

contaminated they may remain unfit for consumption or bathing for a long period. It is also very difficult to remove *Cryptosporidium* from drinking water using conventional treatment methods. In the past outbreaks of *Cryptosporidiosis* have occurred in Carlow, Clare, Roscommon and most notably in Galway City, which resulted in nearly 200 cases of infection and put thousands of others at risk of infection. To reduce the possibility of *Cryptosporidium* entering drinking water supplies, drinking water sources which are at increased risk of being contaminated are being more strenuously protected from pollution. Existing treatment facilities are also being upgraded to ensure they are able to remove *cryptosporidium*.

As a public health measure fluoride is added to our public water supplies. The fluoridation of public drinking waters has been carried out in Ireland since 1964. Adding fluoride to the water we drink strengthens our teeth and reduces the likelihood of tooth decay.

Further Information

For more information about Ireland's water resources or drinking water you can consult the following websites.

- www.environ.ie/en/
- www.wfdireland.ie/
- www.fsai.ie

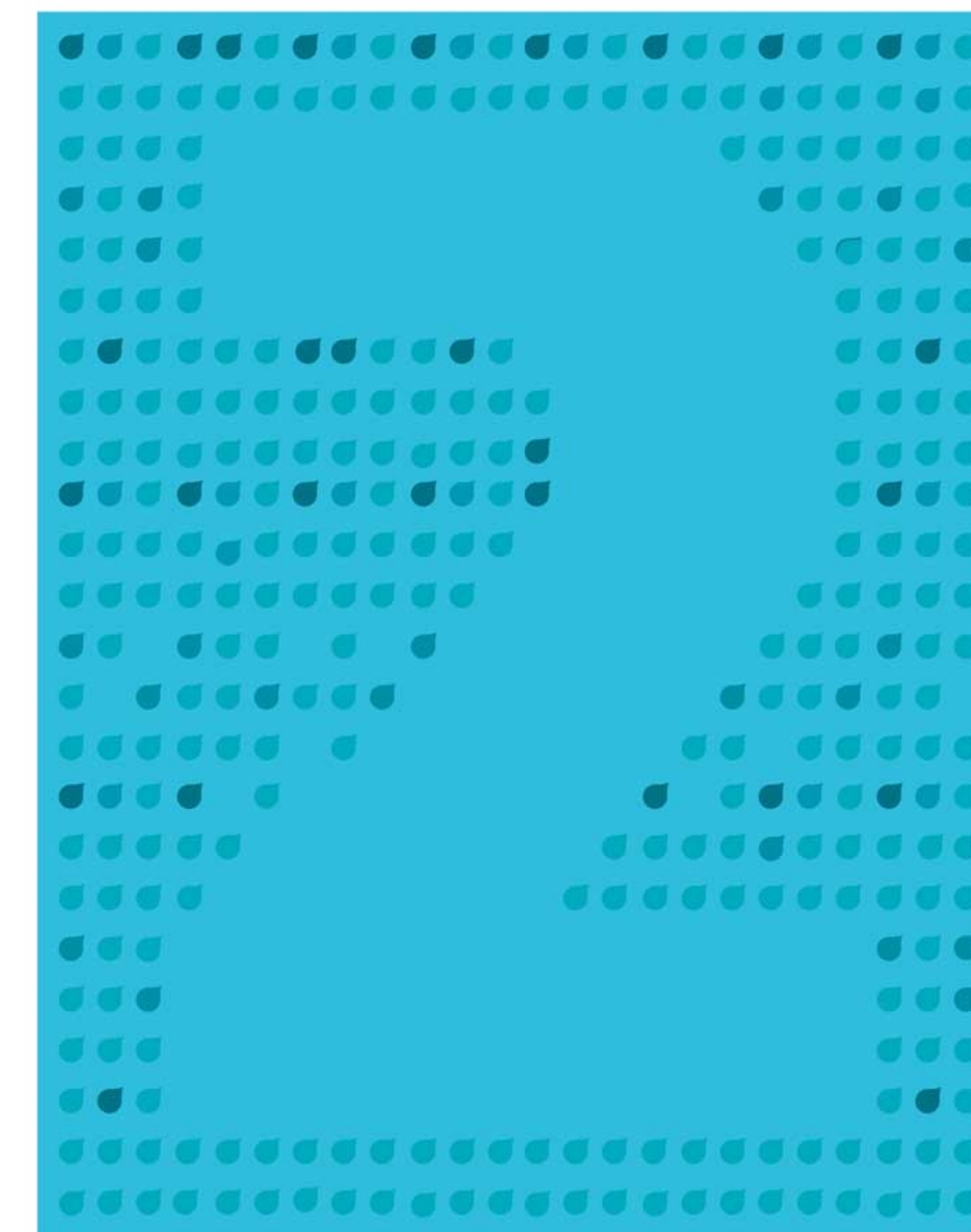
Studies carried out by the Environmental Protection Agency regarding the quality of our drinking water can be obtained from their website at: www.epa.ie/downloads/pubs/water/drinking/

ENFO
7 St. Andrew Street / Dublin 2 / Ireland

Phone + 353 1 888 2001 or 1890 200 191
Fax + 353 1 888 3946
E-mail info@enfo.ie
Web www.enfo.ie/



Ireland's Water Resources





Ireland's Water Resources

Water is one of the most important natural resources we have in Ireland. It is strongly associated with our heritage and culture. The green vegetation which identifies our landscape is due to our wet climate. Water is vital for daily life and for the running of our economy. Our waterways are renowned throughout the world and are the basis for much of our tourist and leisure industry. Ireland's aquatic environment supports an extremely diverse number of rare and unique animal and plant species. Our rivers, lakes, wetlands, estuaries and coastal areas are some of the most ecologically important and sensitive habitats in Europe. However, as in many regions around the world, Ireland's water resources have increasingly come under pressure from human activity.



Water Distribution

Ireland has one of the highest rates of water availability in Europe. On a national level we receive enough water in the form of precipitation to sustain the natural environment and to meet the needs of our population. However the water availability per head of population is much greater in the western half of the country when compared to the eastern half. The uneven distribution of water means that, despite our wet weather, some areas can experience water scarcity. The uneven distribution of our water is a result of regional variations in climate and the distribution of our population.

Regional Variations in Climate

The dominant influence on Ireland's climate is the Atlantic Ocean. Due to its proximity Ireland has a temperate maritime climate. Climate can be defined as the 'average weather' of an area or region. It is because of the nature of our climate that Ireland experiences as much rainfall as it does. Differences in the local climate across Ireland influence water availability, as it is the local weather conditions which determine the amount of rainfall an area experiences.

The average rainfall Ireland receives in a year is estimated to be 1150 millimetres (mm). The western half of Ireland has a much higher rainfall rate when compared to the eastern half. Most of eastern Ireland experiences between 750 and 1000 mm of rainfall per year, some parts of the Dublin area experience less than 750 mm of rainfall per year. Rainfall in the west of Ireland averages 1000-1250 mm and can reach up to 1500 mm in coastal areas. Figure 1 shows the distribution of rainfall across Ireland.

The presence of mountainous areas in western Ireland means conditions are more favorable for rainfall to occur. In some mountainous areas rainfall can exceed 2000 mm per year. Kerry, Galway and Donegal are among the wettest and most mountainous counties in Ireland, while counties like

Kildare, Dublin and Meath which are relatively flat are among the driest. The highest annual rainfall rates along Ireland's Eastern seaboard occur in the Wicklow mountains.

Despite the fact that Ireland receives a lot of rainfall we have all experienced hot dry summers when water has been in short supply. This is a result of the distribution of rainfall throughout the year. Rainfall rates tend to be highest in winter and lowest in early summer. The wettest months in Ireland are December and January while April is generally the driest. The human demands put on water resources tend to increase during periods of little rainfall as they coincide with the times of the year when temperatures are at their highest.

Rainfall rates are not the only aspect of our climate which affects water availability. High temperature levels and sunshine rates increase evaporation which reduces the amount of water in our rivers and lakes. In Ireland the 'sunny' South-East is known to be one of the warmest and driest parts of the country. This is partly due to the fact it has a low annual rainfall rate but also because it receives more hours of sunshine annually than anywhere in Ireland. It is predicted that climate change will alter the distribution of rainfall in Ireland with

the eastern region being most affected. In this region the summers are likely to be drier with the winters and autumns being wetter. As a result of climate change incidences of water shortages and flooding are anticipated to increase. For further information regarding Ireland's climate you can consult the Met Eireann website at www.meteireann.ie.

1961-90 Mean Annual Rainfall (mm)

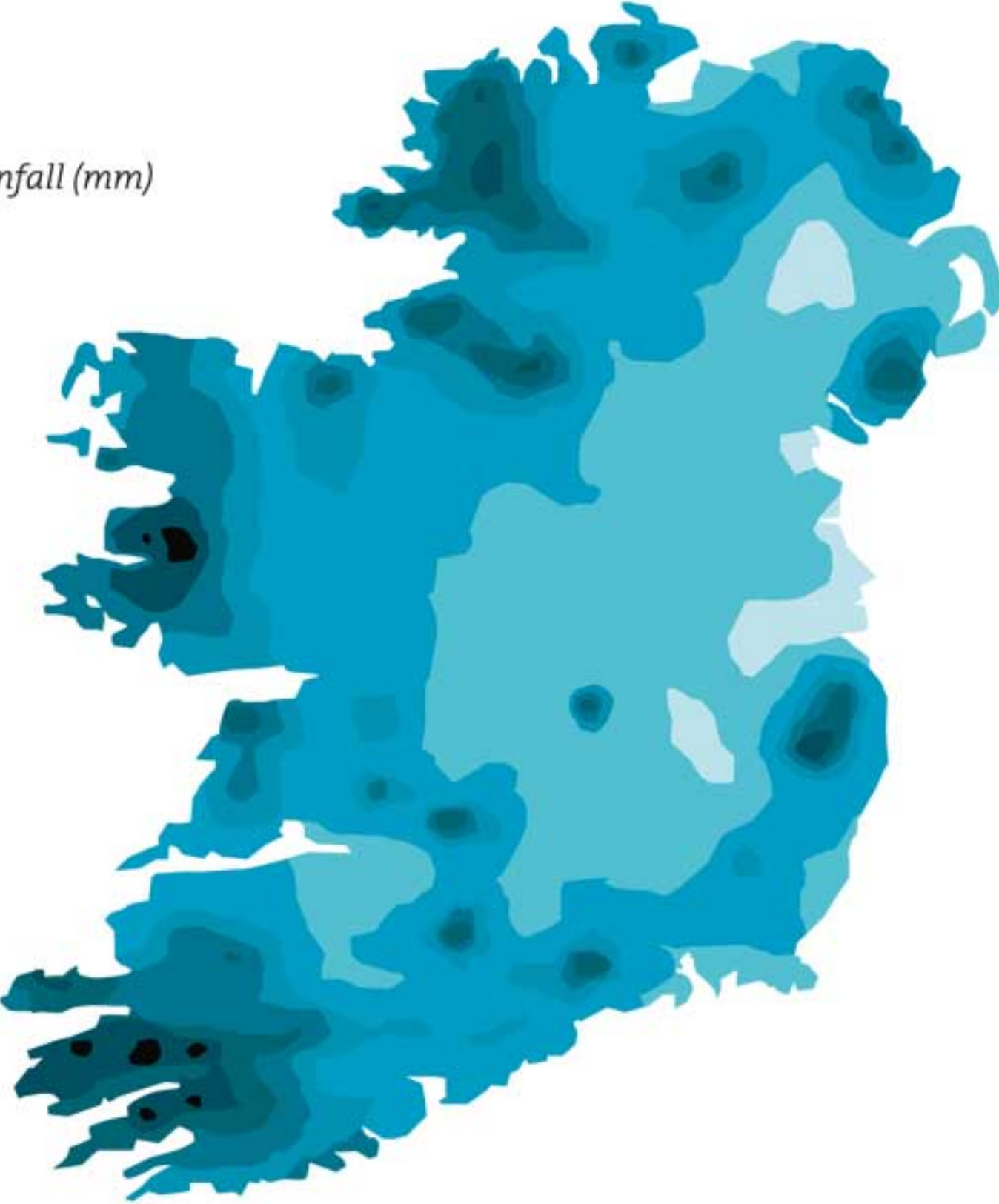
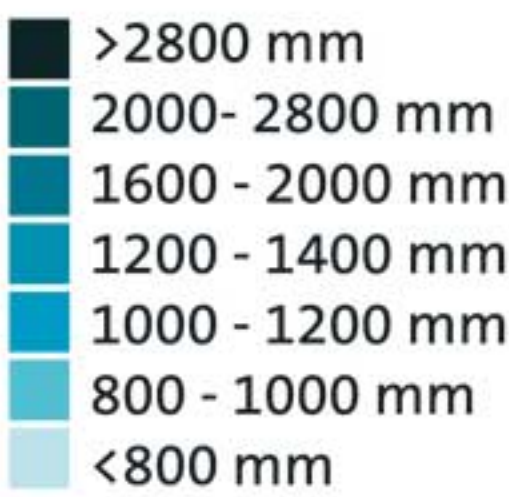


Figure 1. The Average Annual Distribution of Rainfall Across Ireland

Population Distribution

The distribution of our population means that water availability per head of population differs greatly across the country. Ireland is more heavily populated in the east and south-east than in the west or north-west. The distribution of our population means that water demand is much greater in the eastern half of the country. In general the more heavily populated areas of Ireland also receive the least amount of rainfall. Of the 4.2 million people who live in Ireland over 1 million of them live in the Greater Dublin Area, yet this area encompasses some of the driest parts of the country. This has significant implications for our management of water resources in this region. The growth experienced by large cities such as Limerick, Cork and Galway, has increased their demand for water resources. The continued growth of Ireland's population and urban centres is one of the key challenges to future water resource management. It is anticipated that population growth, especially in urban areas, will continue. By 2021 there may be an additional 1 million people living in Ireland all of whom will require access to safe, clean water which will increase the pressure on our water resources.

Ireland's Drinking Water

A good quality water supply is essential for day to day living and for our economy. In Ireland we use more than 1,700 million litres of water every day. We require water for our homes, businesses and industries which is of a high standard, and does not pose a risk to our health. The average daily water consumption per person in Ireland is over 148 litres. Depending on the source of our drinking water it may require treatment to remove any impurities which may be harmful to us.



Water Supply

In Ireland there are four systems through which water is supplied.

Public water supplies -are operated by the 34 City and County Councils around Ireland. This water is supplied predominantly to homes and businesses in urban areas. The majority of households in Ireland are supplied by the public mains. The Local Authorities are responsible for the sourcing and distribution of public water supplies. They are also responsible for monitoring the quality of drinking water from private and public sources. In the past domestic users were charged for water supplied from public sources however, since 1997, only commercial premises incur water charges. Public water supplies are treated to ensure they are fit for human consumption.

'Public' Group Water Schemes -are schemes where water is provided by the Local Authority from public water sources but responsibility for distribution rests with the group scheme. These schemes are formed by a number of households (two or more) coming together to provide their own common water supply. Group schemes are usually established where the Local Authorities do not supply water from the public mains. There is a fee involved for the water supplied by group schemes.

'Private' Group Water Schemes -are schemes in which the owners of the scheme, usually representatives from the local community, source and distribute their own water from a private source such as a local lake or river. Both 'public' and 'private' group water schemes supply water to around 10% of Ireland's population. Although it is not the responsibility of the Local Authorities to maintain or oversee private schemes they do have an obligation to test the quality of the water supplied by them. Due to the level of investment needed to bring private group schemes up to current European standards, many of them have been taken over by the Local Authorities. The upgrading and renewal

of rural water supply infrastructure, particularly group water schemes, has been given high priority by the Government. In future group schemes will require a licence from the Local Authority to operate.

Small Private Supplies -include a large group of different supplies which are privately sourced. In many rural areas connection to the public mains or a group scheme is not possible. Small private supplies include wells which source groundwater for single rural dwellings, or abstractions from local rivers or lakes to supply industries. Currently there are over 200,000 private wells being used to supply groundwater in Ireland.

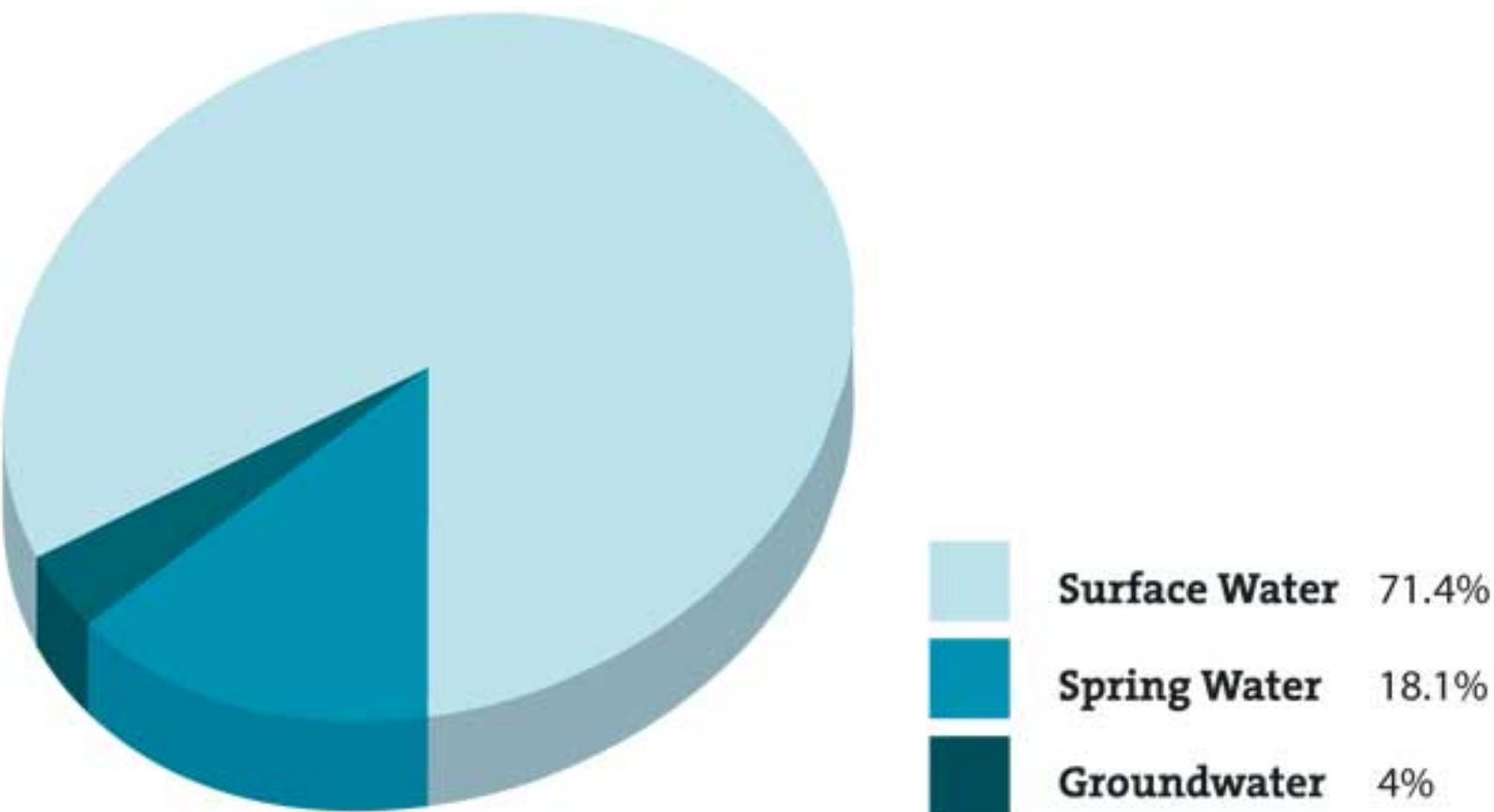


Figure 2. The Sources of Our Drinking Water