Chapter 13 UK Climate



https://www.metlink.org/resource/13-uk-climate/

Lesson overview: In the accompanying online lesson resources, we revisit climate zones before exploring regional climate differences across the UK and the reasons for them.

Skills: Extracting data | Reading climate maps | Comparing and describing | Synthesis

Although the climate of the UK is largely Oceanic, some upland areas are Subpolar Oceanic and some small regions of Scotland are Subarctic or Tundra. Physical factors including prevailing winds, topography, altitude, latitude, distance to the sea, aspect and urbanisation are the primary factors influencing smaller scale regional variations within the UK's climate.



?

Learning objectives of online lesson resources:

- To understand how the UK's climate varies regionally.
- To be able to explain why the UK's climate varies regionally.
- To be able to relate the UK's climate to where you live.

Thunk: We don't get extreme weather in the UK.

Misconception

We don't get extreme weather in the UK.

Although extreme weather, by definition, is uncommon in the UK, it does occur. Defined as any weather which is significantly different to normal weather and which occurs less than 10% of the time, extreme weather can occur over hours or weeks, for example flash flooding caused by heavy localised precipitation or a summer heatwave.

The UK has around 30 tornados each year and in 1981 had 104 in the space of 24 hours. UK tornados are generally small, although occasionally cause damage, as was the case in Birmingham in July 2005 when tornado damage cost £40 m.

Some of our most extreme weather events are associated with Sting jets - narrow areas of damaging high winds that can form near the centre of depressions (the Great Storm of 1987 being an exceptional example). The jet forms when descending cold air is cooled further by evaporation, accelerating its descent towards the ground.

Many factors such as latitude, altitude, proximity to the sea and aspect can have an impact on climate. However, in the UK, the location relative to the prevailing, westerly, winds also has a significant impact on both precipitation and, to a lesser extent, temperature.



CLIMATE ZONES

PAST CLIMATE CHANGE

CHANGING GLOBAL CLIMATE

The UK has four Köppen-Geiger climate types - Oceanic, Subpolar oceanic, Subarctic and Tundra. Most of the UK is Oceanic, with Subpolar oceanic restricted to upland areas in the Lake District, Pennines, Scottish Borders and the Highlands and Islands. Areas of Subarctic and Tundra are largely confined to the Cairngorms plateau.

However, within the dominant Oceanic climate type, there are distinct variations. The north-east has cold winters, cool summers and consistent rainfall throughout the year. The south-east has cold winters, warm summers and little rainfall. The south-west has mild winters, warm summers and regular rainfall, and the north-west has mild winters, cool summers and the highest rainfall, as shown by choropleth maps of the UK climate showing mean temperature, annual average rainfall, wind speed and 'days of

snow lying' (Figure 13.1).

The distribution and characteristics of the regional variations in the UK's oceanic climate are the result of several factors.



The prevailing wind direction determines the characteristics of

the air masses as they arrive in each region (such as temperature and humidity), strongly influencing regional rainfall. Moist Polar maritime and returning Polar maritime air masses, for instance, are the primary source of moisture for the rainfall in the north-west and west of the UK

Misconception

It rains more in the winter than it does in the summer.

Many parts of the UK have fairly consistent year-round rainfall as the prevailing wind direction does not change much with the seasons. However, depressions, which can bring rainfall to the whole of the UK, usually track further north in the summer than in the winter, as the Inter Tropical Convergence Zone (ITCZ) and so the whole global atmospheric circulation moves. In addition, depressions tend to be less active in the summer. As a result, there can be a summer dry season, particularly in the south-east of England.

The level of rainfall on the western side of the UK is also enhanced by the relief which encourages cloud formation and rainfall as moist maritime air is forced to rise over high ground in western areas. Rainfall on the west leads to rain shadow on the east of the country. In addition, the further air travels over land, the drier it gets.

The influence of the sea on the climate of the UK is clear given the dominance of the oceanic climate type. Heat capacity is a physical property of matter and describes the amount of energy needed to heat a substance. It takes just 1000 Joules to warm 1kg of air by 1°C but 4200 Joules to warm 1kg of water. This is how the ocean moderates climate - it warms and cools more slowly than air. The closer you are to any large body of water, the smaller the daily and seasonal variation in climate - water is nature's storage heater! The North Atlantic Drift (the poleward extension of the Gulf Stream) brings warm water to the UK, which further warms and moistens westerly winds and can increase temperatures by up to 5 °C in winter.

Urbanisation has a series of complex and interrelated effects that extend far beyond the urban areas themselves. The larger the urban area, the bigger the area it influences.

