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Royal Meteorological Society

# Anticyclones



# Background Information for Teachers

## “High and Dry”

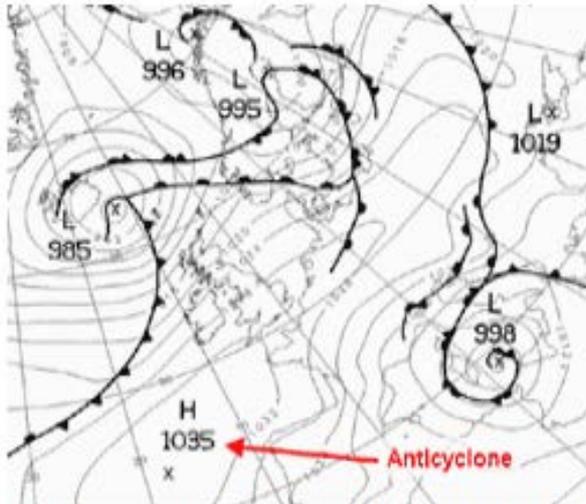


Fig 22: Synoptic chart, 11 Apr 2005, 1200 GMT

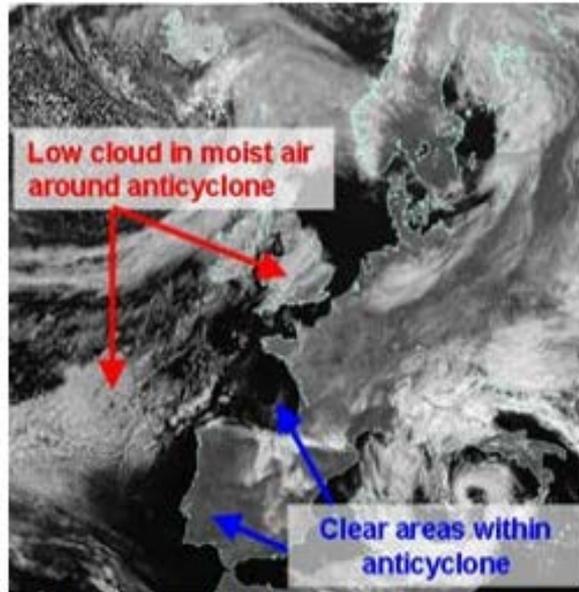
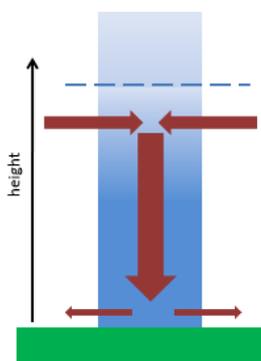


Fig 23: Visible satellite image, 11 Apr 2005, 1200 GMT

A high pressure system, also known as an anticyclone, occurs when the weather is dominated by stable conditions. Under an anticyclone air is descending, maybe linked to the large scale pattern of ascent and descent associated with the Global Atmospheric Circulation, or because of a more localized pattern of ascent and descent.

As shown in the diagram below, when air is sinking, more air is drawn in at the top of the troposphere to take its place and the sinking air diverges at the surface. The diverging air is slowed down by friction, but the air converging at the top isn't – so the total amount of air in the area increases and the pressure rises.



Sinking air gets warmer as it sinks, the rate of evaporation increases and cloud formation is inhibited, so the weather is usually clear with only small amounts of cloud cover.

In **winter** the clear, settled conditions and light winds associated with anticyclones can lead to frost. The clear skies allow heat to be lost from the surface of the Earth by radiation, allowing temperatures to fall steadily overnight, leading to air or ground frosts. In 2013, persistent High pressure led to cold temperatures which caused particular problems for hill sheep farmers, with sheep lambing into snow.

In **summer** the clear settled conditions associated with anticyclones can bring long sunny days and warm temperatures. The weather is normally dry, although occasionally, localized patches of very hot ground temperatures can trigger thunderstorms. An anticyclone situated over the UK or near continent usually brings warm, fine weather.

Sometimes in the winter or early spring, the ground can cool considerably overnight, and can in turn cool the air in contact with the ground to the point where cloud forms – fog. Because of the light winds associated with anticyclones, this fog stays put. The Sun is not warm enough in the day to evaporate the fog and it can last as an extended period of **Anticyclonic Gloom**. It is associated with an unusual temperature pattern – the air is colder closer to the ground than higher up. This reversal of the usual fall of temperature with height above the ground is called a "temperature inversion" and it acts as a sort of atmospheric lid, trapping pollution, cloud, and mist in the cool layer of air near the ground. Such weather may last several days, until the high pressure system collapses, or until a weak front introduces cleaner air from outside the anticyclone's circulation. When anticyclones are over the sea, the weather can vary from fine and sunny to overcast cloud. This cloud may be thick enough to give drizzle and may fall low enough to produce fog. This happens most often during spring and is least frequent in autumn. If the anticyclone extends over both land and sea, cloud and fog can spread across coastal regions, sometimes reaching quite far inland.

In the Northern Hemisphere winds blow in a clockwise direction around an anticyclone (see Chapter 8). As isobars are normally widely spaced around an anticyclone, winds are often quite light.

Anticyclones can be identified on weather charts as a large area of widely spaced isobars, where pressure is higher than surrounding areas. Anticyclones are usually much larger than depressions and tend to last longer.

It's also worth pointing out that there is no critical threshold for high pressure – you can't say that anything over 1000 millibars is High pressure and anything lower is Low pressure. Whether something is high or low simply depends on what surrounds it – if the pressure in one place is higher than the pressure all around, then it is a High. As our pressure values, in general, tend to be higher in the summer than in the winter, then a

winter High might have a maximum value that is under 1000hPa, and a summer Low may have a minimum pressure that is over 1000hPa.

### Blocking Highs

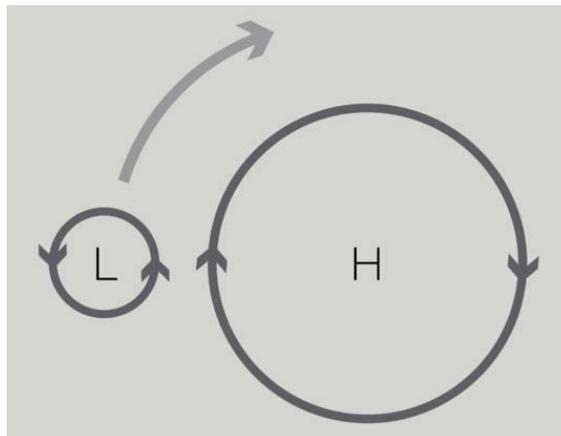
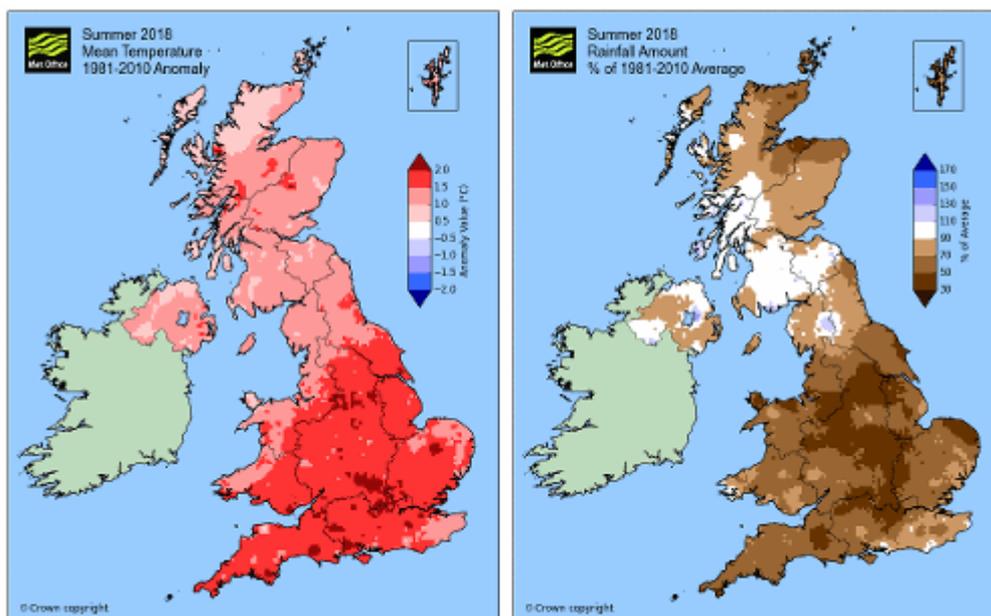


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Sometimes, an anticyclone doesn't move and remains stationary over the UK or nearby for a longer period of time. These 'Blocking Highs' divert the much smaller depressions away and lead to a longer period of clear weather. During the summer, these blocking anticyclones can lead to drought conditions, as rain-bearing fronts are 'diverted' around the country. This is what happened in 2018 when an anticyclone sat over the UK for much of the summer, causing a noticeable drop in rainfall and leading to fires such as the one on Saddleworth Moor.



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Satellite image showing cloud free skies and the smoke from the Saddleworth Moor fire

## Sources of Information

<http://earth.nullschool.net> is a great place to view current anticyclones around the world, linking them with the global atmospheric circulation.