

Extreme hazardous weather events in the UK

- 1. An extreme heat wave and drought - caused by a lack of rain.**
- 2. Flash floods - caused by too much rain in a short period of time.**
- 3. Strong winds and storms, including occasional tornadoes.**
- 4. An extreme cold spell with snow.**
- 5. Ice, fog and smog.**

1. This can occur with an anticyclone (high pressure) zone. If an anticyclone sits over the UK in summer it can stagnate for a period of time. The anticyclone brings light winds or calm conditions and very little cloud or rain in the stable conditions. If this lasts the extreme heat that builds up can cause medical problems particularly with the elderly. It may also cause water levels in reservoirs to fall significantly and water companies may implement hosepipe bans or cut the water off for a time to conserve supplies.

2. Flash floods occur if more water reaches a river than can be contained within its banks. The water will overflow onto the surrounding flood plain. This usually occurs in winter with a depression (low pressure system). Westerly winds bring moist air, depressions and heavy rainfall, and if the ground is already saturated by high antecedent (previous) rainfall rapid overland flow occurs to cause a flood. Flash floods may also occur in summer when a thunderstorm brings intense rainfall that exceeds the capacity of the ground to absorb the water and it flows quickly into streams and rivers.

3. Strong winds can be associated with winter depressions. These form over the Atlantic ocean and if the system deepens significantly (pressure falls rapidly) extremely strong winds may form especially if it becomes a cyclone bomb or sting jet. The winds may reach hurricane strength. Tornadoes may also form beneath intense summer thunderstorm cells bringing winds over 150mph but to small areas only.

4. In winter maritime Arctic air from the north or continental Polar air from the east may bring extremely cold air to the UK. Air from the east may be particularly cold coming, as it does, from the continental interior of Europe which is extremely frigid in winter. This cold weather may bring heavy snowfall that can isolate communities and disrupt the transport system of the UK. This can cause hypothermia particularly amongst the elderly population who may not be able to afford to heat their homes sufficiently well.

5. Ice and fog may form with a winter anticyclone. The calm conditions and lack of cloud allows heat to be lost from the earth's surface which can cool the lower air layers to the dew point temperature. Ice and fog are particularly hazardous on roads and every year deaths occur because of these two hazards. The fog is trapped beneath a temperature inversion and if industrial pollutants combine with the fog, a smog forms which can cause lung and breathing problems and deaths particularly in the elderly.

1. The longest UK heatwave and drought on record was 1976. Temperatures hit a record of 36 C and in London it was over 30 for 16 consecutive days. Reservoir levels were very low and it is estimated that there were 30% more excess deaths that year. Our driest year ever was 1995 when there were hosepipe bans in July and August and over 800 extra deaths due to the heat and pollution. In the UK the top ten warmest years ever have all occurred since 2002. This may be evidence for global warming and we should probably expect more frequent periods of extreme weather in the future.
2. In August 2004 an intense summer thunderstorm hit the village of Boscastle in Cornwall. 74mm of rainfall fell in 24 hours on already saturated land and the resulting flash flood carried away 75 cars and did £15m worth of damage. In November 2009 a severe winter depression stagnated over Cocker mouth in the Lake District and deposited 316mm of rainfall in 24 hours, the resulting flood killed 1 person and destroyed bridges.
3. In late January 1953 a deep depression over the North Sea caused a northerly gale which combined with a high tide to cause a tidal surge that flooded large areas of the low lying east coast of England from Lincolnshire to Essex. As well as a vast amount of damage, equivalent to over £1 billion in present prices, 307 deaths were recorded and 30,000 people were evacuated from their homes. In October 1987 hurricane strength winds hit the south and centre of England with speeds of over 120 mph recorded. 15 million trees were blown down and 18 people were killed. Storm Eunice an intense depression and bomb cyclone hit England in February 2022. A sting jet with winds of 122mph hit, killing 3 and leaving 400,000 homes without power. Surprisingly the UK does occasionally get summer tornadoes that develop beneath intense super cell thunderstorms. In fact we average about 30 a year. Wind speeds can be in excess of 200mph but this only affects a small area for a short period of time.
4. There have been several very cold and snowy winters in the UK, notably 1947, 1963 and 2010. 1947 was probably the snowiest year ever, exceptional snowfall caused 7 metre snowdrifts. The transport network was shut down and helicopters had to be used to take supplies to isolated settlements. In mid march milder weather caused a massive and rapid snow melt that led to widespread flooding. Although not as snowy the winter 1963 was probably colder. Called the Big Freeze it saw the coldest temperatures for more than 200 years. The river Thames froze over and in places even the sea froze. In the winter of 2010 heavy snowfall and record low temperatures caused travel chaos, power failures, school closures and 25 deaths. More recently the Beast from the East hit the UK in February 2018 causing 17 deaths from hypothermia.
5. The great smog of December 1952 caused over 4000 excess deaths particularly in London. High pressure stagnated over the south of the UK causing a temperature inversion and fog. Industrial and coal fire pollutants added to this to form a thick smog that lasted for 5 days. Following this the Clean Air Act was introduced to cut down on pollution and this type of event is less likely to happen now. Over 1000 people are killed every year in the UK due to accidents caused by snowy or icy roads.