

# Climate Change

## What is Climate Change?

MEA factsheet #1a



Changes in the Earth's climate are caused by changes in the mixture of gases that make up the atmosphere. Climate change is not new; there is clear evidence that throughout the Earth's history the climate has gone through many changes. The type of climate change that is happening now is different however, and a cause of concern. This is because it is happening much faster than any of the earlier incidents of climate change that we know of, and because there is compelling evidence that it is caused by human activities.

## The Greenhouse Effect

The greenhouse effect describes the way that some of the gases in the atmosphere trap heat that would otherwise be lost to space, and so make the surface of the Earth warmer than it would be otherwise. The gases that cause the greenhouse effect are called greenhouse gases, and the strength of the greenhouse effect (how much warmer it makes the climate) depends on the concentration of these gases in the atmosphere.

The greenhouse effect is not a modern phenomena, or in itself a problem, but a natural part of the Earth's climate system. Without it the average surface temperature would be some 33 degrees C lower; an icy -19 °C rather than the current level of about 15 °C.

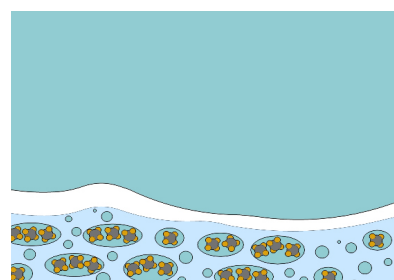
However, while we depend on the greenhouse effect being strong enough to prevent the Earth freezing, if it becomes too strong it could make the earth too warm for most species to survive. This is sometimes known as a 'Goldilocks' effect – we need the greenhouse effect to be not too cold, not too hot but 'just right'!

## Runaway Climate Change

One of the most alarming aspects of climate change is that as the climate gets warmer, it causes changes on the Earth's surface which lead to further warming, which in turn cause more changes on the Earth's surface, and this cycle of cause and effect keeps going in a positive feedback loop. This kind of cyclical effect is called runaway climate change, and there are several ways this could happen. An

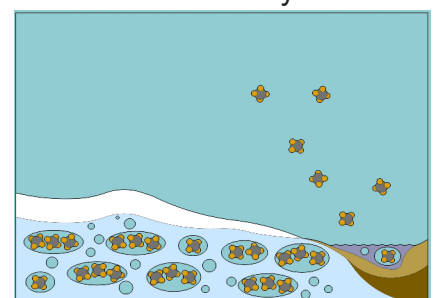


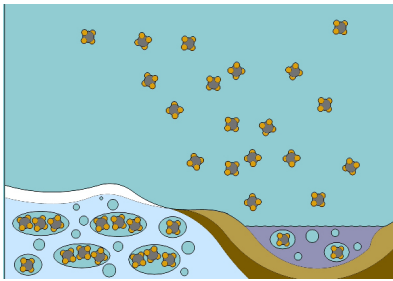
example of runaway climate change which is already starting to happen is the recent melting of the Siberian permafrost. Frozen peat bogs of



Western Siberia cover an area of one million square kilometres – the same as France and Germany combined, and contain billions of

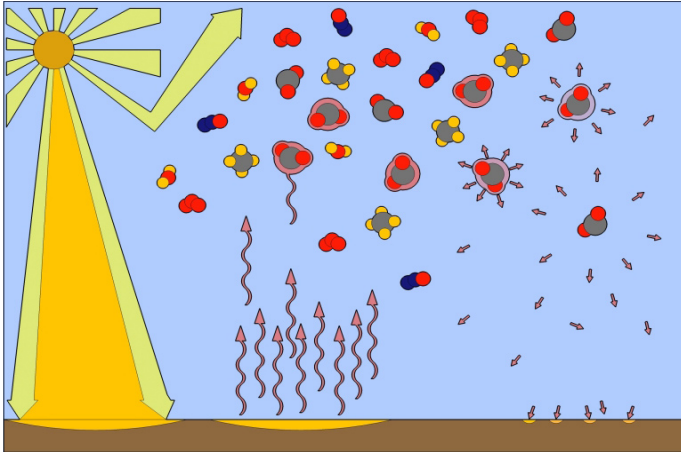
tonnes of methane trapped in the icy ground. However, due to a warmer climate this vast peat bog has begun to melt in the last few years. As it melts, the land - which has been frozen for 50,000 years - becomes a landscape of small lakes, and methane is released.





Methane is a potent greenhouse gas, and large quantities of it being released into the atmosphere will cause the climate to become

still warmer, which will cause more permafrost to melt, which will release more methane, and so on in an uncontrollable, self-propelling cycle of warming and climate change.



## Predicted Global Impacts

Because the climate is an extremely complex system it is very difficult to work out how fast climate change may occur, but we do know what the main global impacts of climate change are likely to be.

Without serious intervention to reduce greenhouse gases, ice caps and glaciers will melt, and there will be a worldwide rise in sea levels, causing catastrophic flooding of low-lying islands, coastal settlements, and prime farmland. Hurricanes, storms, floods, droughts and extreme weather events of all kinds will become more common, more severe, and start to happen in areas where they have not previously been experienced. Diseases of plants and animals will spread into new areas. Many species of plants and animals will be unable to cope with the changing conditions they find themselves in, and widespread species extinction is likely within this



century. Many of the species at risk of extinction are ones which provide important sources of food for people, such as fish which are the main source of protein for roughly one billion people worldwide.

Food shortages and crop failures will be more common, leading to famine and starvation and creating large numbers of refugees. As these natural resources fall short, there will be negative effects on the global economy and on national and international security.

## Predicted UK Impacts

There is clear evidence that global warming may already have had a significant effect on the climate in the UK. Four of the five warmest years for more than three centuries have occurred in the last 10 years. A warmer climate may bring some benefits for the UK, such as a longer growing season and the ability to grow crops such as peaches, sweetcorn and grapes.

However, the benefits may be outweighed by the problems climate change may cause. The floods and storms of recent years in the UK could be part of a pattern of more extreme weather occurring as a result of climate change. Bloodsucking ticks, scorpions and poisonous spiders and even malaria-carrying mosquitoes all might become a feature of life in a hotter UK. And of course if we don't cover up in the sun, increased levels of skin cancer and cataracts are also a possibility.

Despite the potential problems we may face in the UK we can be sure that other parts of the world will be far worse off.

## Further Information:

Indicators of Climate Change in the UK  
[ecn.ac.uk/iccuk/](http://ecn.ac.uk/iccuk/)

UK Climate Impacts Programme  
[ukcip.org.uk/](http://ukcip.org.uk/)

Intergovernmental Panel on Climate Change  
[ipcc.ch/](http://ipcc.ch/)

What is global warming? – National Geographic presentation  
[green.nationalgeographic.com/environment/global-warming/gw-overview.html](http://green.nationalgeographic.com/environment/global-warming/gw-overview.html)

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