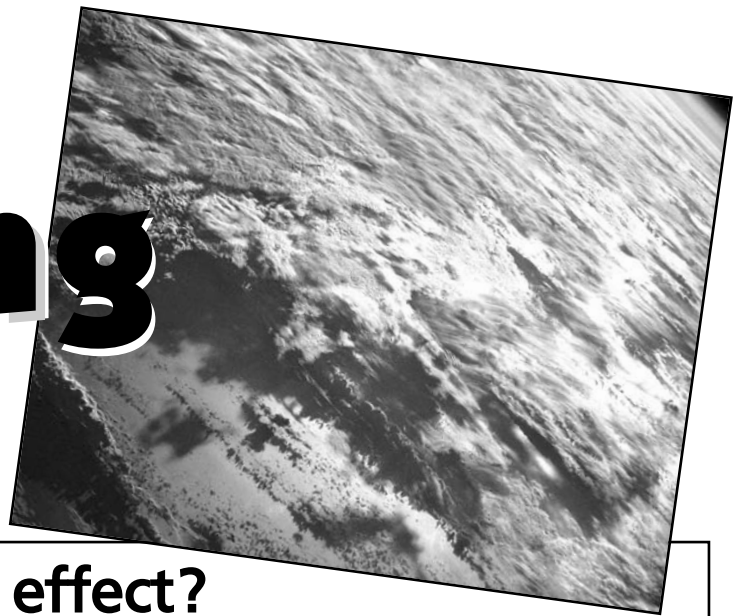


# Global Warming

Global warming is probably the greatest environmental threat facing planet earth today. This factsheet looks at the potentially devastating impact of this climate change on the earth's ecosystems and wildlife.

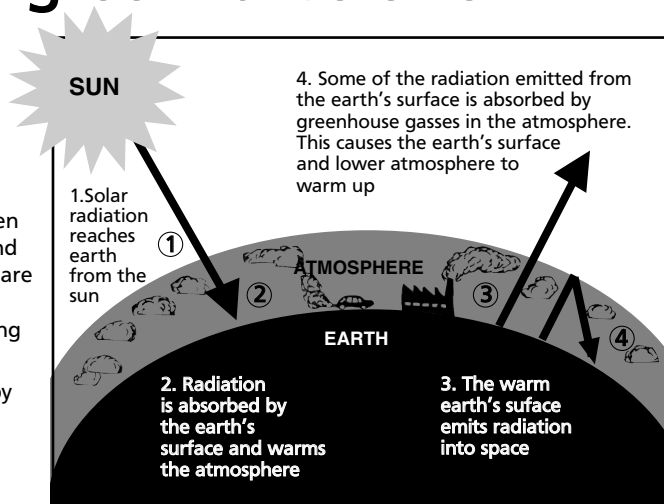


## What is the greenhouse effect?

When gases like carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) are released into the atmosphere, they act like a blanket keeping the earth's heat in.

CO<sub>2</sub>, the most important greenhouse gas, is released when fossil fuels (such as petrol, oil and coal) are burnt and when trees are burnt or felled. Much of the methane comes from the farming of livestock for food.

The earth's surface is warmed by the longwave radiation that reaches us from the sun (solar radiation)<sup>(1)</sup>.



The heat of the earth's surface warms the atmosphere and causes our weather <sup>(2)</sup>.

The warm earth gives off short wave radiation into space <sup>(3)</sup>. But water vapour and greenhouse gases in the atmosphere trap some of this radiation <sup>(4)</sup>. The more of these gases there are, the more radiation they trap and the warmer the earth gets.

This is a bit like how a greenhouse works - hence the name 'greenhouse effect'. It is this that is causing the earth's climate to warm up.

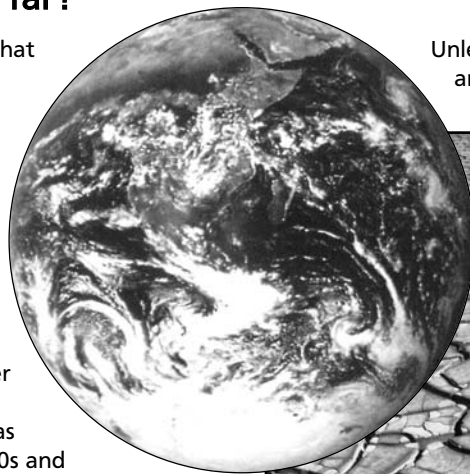
## What's the evidence so far?

There is already plenty of evidence that global warming is happening. Measurements from all over the world show that the earth is getting warmer. The average global temperature has risen by 0.6 °C in the last 100 years. 1998 is reported to be the warmest year, and the 1990's the warmest decade in the last 1,000 years.

Because of the warmer climate, the earth's ice cover is melting at a faster rate than at any time since records began. Sea-ice in the Arctic ocean has thinned by about 40% since the 1970s and there are signs that several ice sheets in the Antarctic are already beginning to disintegrate.

As the water of the oceans warms, it expands - causing the sea level to rise. Scientists estimate that sea levels have risen globally by about 10 - 20 cm in the last 100 years.

There is evidence that the coral reefs in the Indian ocean are already dying because of the warmer water temperatures.



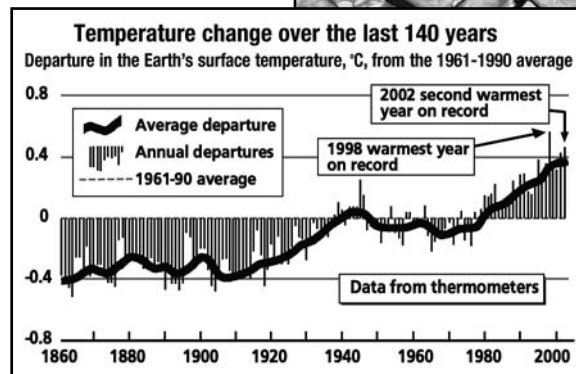
Unless we stop burning so much petrol in cars, and coal and oil in power stations, carbon dioxide levels in the atmosphere will keep rising. In fact, it is predicted that CO<sub>2</sub> levels will double by the year 2100. It is also vital to make a switch to a non-animal diet to reduce methane emissions.

## So what will happen?

It is very difficult to judge what will happen to the world's climate as a result of this increase in greenhouse gases. Scientists use complex computer models of the earth's climate and oceans to try and make predictions.

These models indicate that the world's average global temperature will rise by up to 6°C and that sea levels will rise by between 0.09m and 0.88m by 2100.

This may not sound like much but the consequences could be catastrophic for the planet. And it will not stop there. Greenhouse gases will continue to affect the climate for generations to come. Sea levels could eventually rise by between 7 and 13 metres over the next 500 years.



# The impact on wildlife

Around the world, a great variety of ecosystems have evolved in balance with their local climate. These ecosystems range from tropical rainforest, savanna and hot dry desert in the tropics, to frozen Arctic tundra and ice at the poles.

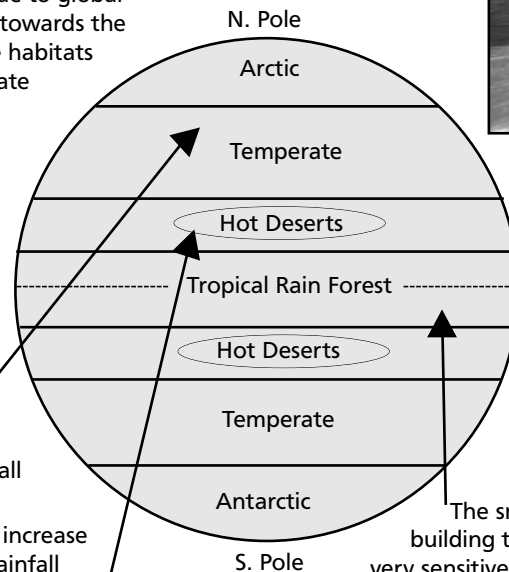
As the world's temperature increases due to global warming, these climate zones will shift towards the poles. The ecosystems and their wildlife habitats will have to try and migrate as the climate changes. Some adaptable plants and animals will be able to keep up. But others which are less adaptable will be threatened with extinction.

A World Wildlife Fund study predicts that "Extensive areas of habitat may be lost to global warming".

It is feared that much of the coniferous boreal forest of north America and Russia will disappear. Siberian tigers, Canadian lynx, beavers, black and grizzly bears and moose will all be threatened.

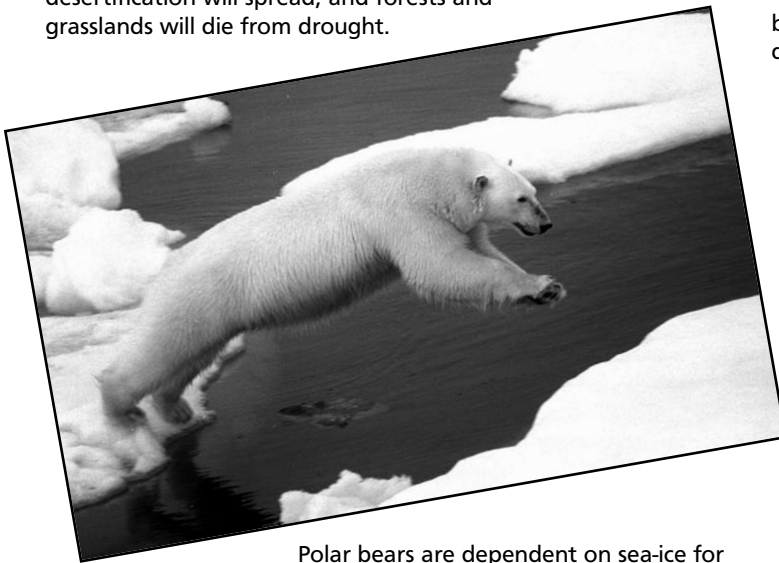
In some areas of the world, rainfall will increase causing flooding, while in other areas rainfall will decrease.

In arid areas, such as parts of Africa around the Sahara, desertification will spread, and forests and grasslands will die from drought.



In the future, as the ice sheets melt and the ocean waters warm up and expand, the world's sea level will rise. This will lead to the flooding of low-lying ocean islands such as the Maldives and coral atolls. Coastal land areas will flood and low-lying coastal habitats, such as salt marshes, mangrove swamps, coastal wetlands, and river estuaries and deltas will be at risk.

The small animals who are responsible for building the world's coral reefs in tropical waters are very sensitive to water temperature. There is evidence that many of the coral reefs in the Indian Ocean are dead or dying because of higher sea temperatures. One study predicts that 'coral reefs could be eliminated from most areas of the world by 2100' and that most of Australia's Great Barrier Reef will be dead in 30 years unless climate change is stopped.



Polar bears are dependent on sea-ice for hunting and transportation. They exist largely on ringed seals, who they catch through holes in the ice - they cannot catch them in the water. Polar bears could become extinct if the Arctic Ocean is free of summer ice for long periods. A recent study has shown that polar bears in Hudson's Bay are losing weight and having fewer cubs, possibly due to climate change.

## Arctic Wildlife

The Arctic is home to many of the world's most distinctive animals, including polar bears, seals, walruses, Arctic foxes, caribou (reindeer), lemmings, Arctic hares, whales and millions of migratory and resident birds.

It is in the Arctic and Antarctic regions that global warming is predicted to be greatest. As already noted, there is evidence that Arctic sea-ice, an important element of the region's habitat, is beginning to melt due to global warming.

Computer models predict a reduction of sea-ice area of between 10 - 50% due to a doubling of atmospheric CO<sub>2</sub> levels. This could spell serious trouble for many Arctic species.

Most Arctic marine species depend on the presence of sea-ice. The Arctic marine food web begins with ice algae which cling to the underside of the winter pack ice. The algae and phytoplankton bloom in summer forming the food source for the whole Arctic marine community. The dependent food web includes zooplankton, sea floor shell fish, fish such as Arctic cod, walruses, seals, cetaceans (such as belugas, narwhals, gray and bowhead whales) and polar bears.

## Things you can do to help make a difference

1. Write to Tony Blair, urging the UK government to ratify the Kyoto Protocol. Also urge him to commit the UK to an 80% reduction in CO<sub>2</sub> emissions from 1990 levels by the year 2050, and to take steps to utilise renewable energy sources such as wind, wave and solar power.
2. Join the boycott of Esso petrol. Esso is a massive financial supporter of President George W. Bush and its influence is thought to be a significant factor in the US refusal to sign the Kyoto protocol. For more info visit [www.stopesso.com](http://www.stopesso.com).

3. Help cut down CO<sub>2</sub> emissions by saving energy in your everyday life. Drive the car less - cycle, walk or use public transport whenever possible. Take steps to reduce energy consumption at home.
4. Boycott non-sustainably produced tropical timber products. Tropical rain forest destruction is a major source of the CO<sub>2</sub> released into the atmosphere.
5. Adopt an animal-free diet. Farm animals contribute more than 12% of the methane emitted into the atmosphere.

For more information on animal issues contact Animal Aid, The Old Chapel, Bradford St, Tonbridge, Kent TN9 1AW  
Tel: (01732) 364546 • fax: (01732) 366533 • website:[www.animalaid.org.uk](http://www.animalaid.org.uk) • email: [info@animalaid.org.uk](mailto:info@animalaid.org.uk)