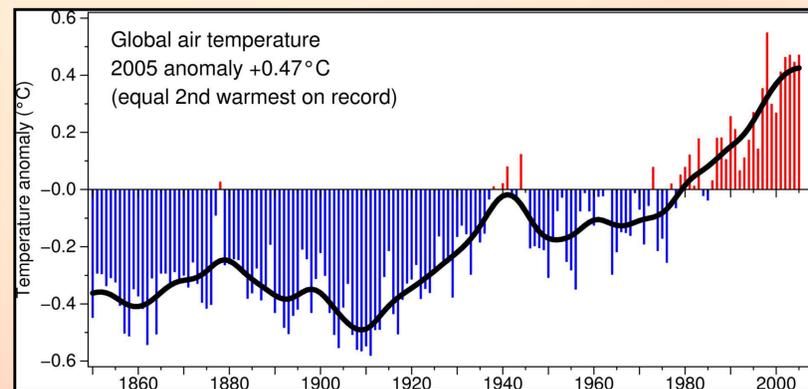


Is our climate changing?

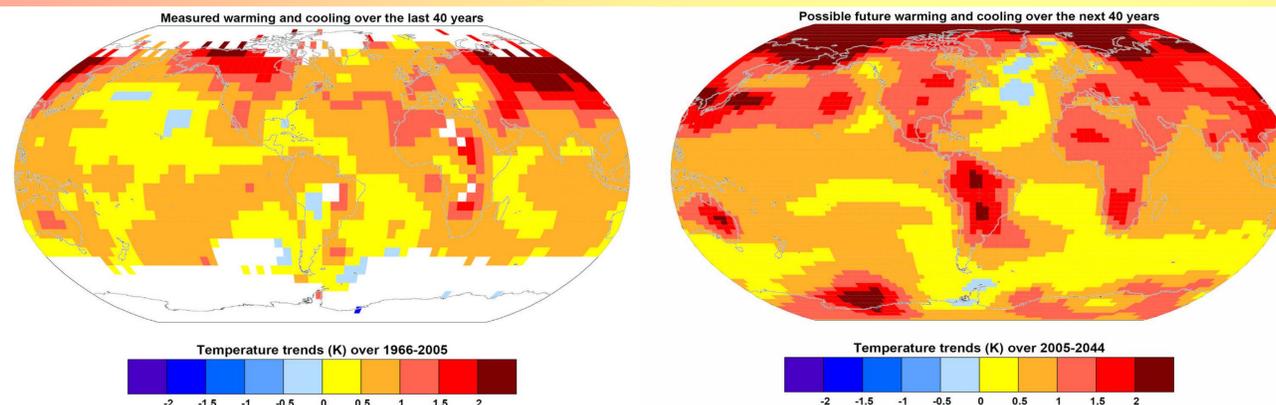
At the Climatic Research Unit we calculate the average air temperature of the Earth by gathering data from thousands of land stations and ships. The graph below shows how the global average air temperature has changed between 1850 and 2005. The changes are relative to the average temperature between 1961 and 1990.



The warmest year in the entire series is 1998 (0.55°C above 1961-1990). 10 of the 11 warmest years in the series have occurred in the last 11 years (1995-2005). Analyses of over 400 climate series reconstructed from trees, corals, ice cores and historical records show that the 1990s is the warmest decade of the last thousand years and the 20th century the warmest century.

Measured warming and cooling over the last 40 years

Possible future warming and cooling over the next 40 years



The pattern of observed warming over the last 40 years is shown on the left. The right-hand map shows predictions from one global climate model of how temperatures might change over the next 40 years if we don't change our lifestyles. By 2050, this model gives a global temperature change of 2°C, and 4°C at 2100.

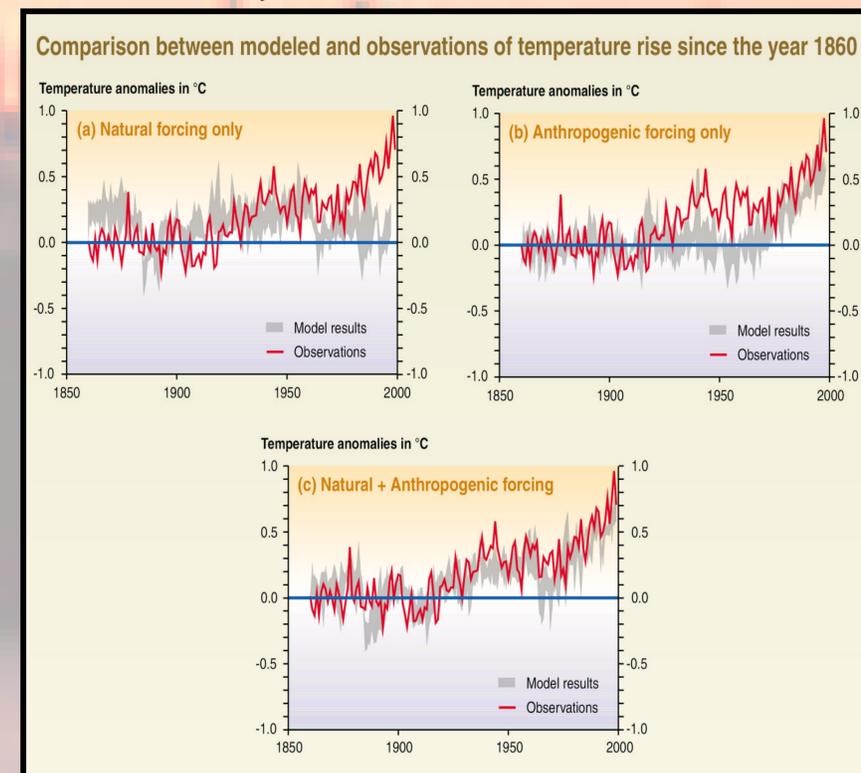
Why is climate changing?

The observed changes in global climate are likely to be due to a combination of both natural and human causes (or forcings).

✓ **Natural causes:** The Earth's climate varies naturally due to interactions between the ocean and the atmosphere, changes in the Earth's orbit, fluctuations in energy received from the sun and volcanic eruptions which affect the amount of energy reaching the Earth's surface.

✓ **Human causes:** The main human influence on global climate is likely to be emissions of greenhouse gases such as carbon dioxide (CO₂) and methane. At present, about 6.5 billion tons of CO₂ is emitted globally each year. Changes in land use mean a further net annual emission of 1-2 billion tons of CO₂. Increasing concentrations of these greenhouse gases in the atmosphere over the last 200 years have trapped more energy in the lower atmosphere, altering global climate.

The graphs below show that climate models can reproduce the observed temperature record when they have information about natural and human forcings.



From modelling studies like these, the world's scientists conclude that most of the global warming over the last 50 years was caused by human activities.

For further information see:

<http://www.cru.uea.ac.uk/> & <http://www.ipcc.ch/pub/online.htm>

We would like to thank the Hadley Centre for Climate Prediction and the UK Met. Office for the model used and their support developing the observed data.