

# Is the Earth Warming Up?

Number 8/4

Fact Sheet

All major climate models agree that there should be major climatic consequences due to greenhouse gas emissions over the past 150 years.

Climate Change

## Climate models

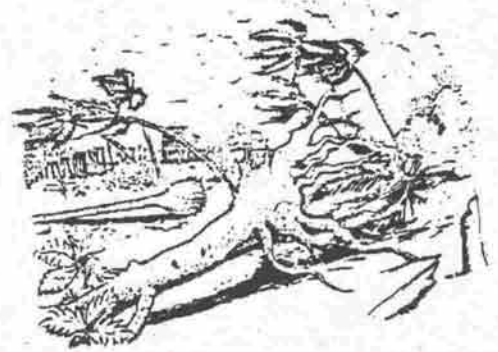
A number of computer models have been used to help predict climate changes. All major climate models agree that, due to greenhouse gas (GHG) emissions over the past 150 years, there should be significant climatic consequences. These include a sustained rise in the earth's average near-surface temperature. So, a clear symptom of climate change would be global warming.

Models still differ as to if we could yet detect a significant temperature rise. Oceans could delay climate change for several decades, and it is unclear how much climate change is due specifically to recent emissions. However, records of the past 100 years show a rise in global average temperatures strong evidence that climate is changing.

## Global records

Global temperature records began around 1860, coming from meteorological land stations and observations made by merchant ships. These include measurements of marine air temperatures and sea-surface temperatures.

Data is often scarce, particularly before 1900, and so it must be analysed carefully so as not to introduce systematic biases.



## Checking the observations

Observation methods not consistently applied throughout an observation period may affect climate trend records. Methods change and the effect of some out-dated methods, such as the pre-1940s use of uninsulated canvas buckets to measure sea-surface temperature, means that temperatures can only be approximated. Heavily "contaminated" data, such as erratic marine air temperatures during the day-time, are avoided by researchers by only using night-time temperatures.

Replacing forests with cities starts "urban warming". These affect temperature records, and many meteorological stations in or near large cities show that this is possibly the most serious source of error and uncertainty for land-based measurements.

While some measurement can exaggerate the apparent warming trend others might cause underestimation. The net effect is that there has been a warming trend observed over the past century, and that it is too large to dismiss because of measurement errors.

This warming trend is supported by the theory on GHG emissions and it combines statistical evidence with a plausible mechanism.

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