

# Separate Studies Rank '90 As World's Warmest Year

By WILLIAM K. STEVENS

The earth was warmer in 1990 than in any other year since people began measuring the planet's surface temperature, separate groups of climatologists in the United States and Britain said yesterday.

A third group, in the United States, reported record temperatures from one to six miles above the earth's surface. These were recorded from balloons from December 1989 through November 1990.

Some scientists said the new reports, taken together with the series of very warm years in the 1980's, strengthened the possibility that a feared global warming caused by an increase of heat-trapping atmospheric gases, had already begun.

These gases, chiefly carbon dioxide, chlorofluorocarbons and methane, are increasing, mostly as a result of human activity. This type of greenhouse warming could cause sharp changes in climate, agriculture and even sea levels.

Other scientists noted the difficulty of detecting the tiny initial signal of greenhouse warming amid the much greater temperature swings caused by nature.

"I would agree that it is of concern that we've had these hot periods," said Tim Barnett, a

The 10 warmest years since 1880 and average temperatures in Fahrenheit.

<b>1990</b>	<b>59.81</b>
<b>1981, 1988</b>	<b>59.64</b>
<b>1987</b>	<b>59.56</b>
<b>1980, 1983</b>	<b>59.51</b>
<b>1989</b>	<b>59.45</b>
<b>1973</b>	<b>59.31</b>
<b>1977, 1986</b>	<b>59.30</b>

*Source: NASA/Goddard Institute for Space Studies*

climatologist at the Scripps Institution of Oceanography in La Jolla, Calif. "But at this point you can't attribute it to any single cause. Is it the greenhouse gases, or is it natural variability?" He said it was impossible to draw any conclusion based on the average global temperatures alone.

The seven warmest years since 1880 all occurred in the last 11 years, according to climatologists at the space agency's Goddard Institute for Space Studies in New York. And six of the seven warmest years since 1850 have all occurred since 1980, according to a somewhat different set of surface measurements by scientists at

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