

# PRIMER ON CLIMATE CHANGE

by Tom Kuennen

## 'Degree Day' Data Contradict Climate Change Claims

August 1999 -- Forty-five years of "degree day" temperature trends show nothing to support assertions that the world is heating up, new analysis at Arizona State University (ASU) demonstrates.

The data cast more doubt on allegations that long-term climate change is taking place, or that recent localized heat waves in the continental United States are evidence of global warming.

In one instance this summer, Vice President Al Gore -- along with a children's television personality, "Bill Nye, the Science Guy" -- told fifth graders in Washington, D.C. that 1999's summer heat waves were the result of global warming.

"You may have been seeing on the television news the effects of this heat wave on kids and old people and families, and it's really been very hot," Gore told the grade schoolers at the National Geographic Society in August 1999. "Of course we had heat waves long before there was a threat of global warming, but because the atmosphere of the whole earth is warming up, it's more common now to have these very, very hot days."

### *'Real world' shows no change*

But as the ASU analysis shows, real-world conditions indicate no climate change, nor any impact of climate change on summer heat waves. In fact, they don't indicate any change one way or the other.

Dr. Robert C. Balling, Jr., director of the Arizona State University Office of Climatology, analyzed United States "degree days" trends between 1950 and 1995 to see if they contain evidence of global warming.

Many observers maintain that release of "greenhouse gases" such as carbon dioxide -- mostly the result of combustion of fossil fuels in automobile and truck driving, and electricity generation -- will cause the earth to irreversibly heat up, with

catastrophic environmental consequences.

These observers use computer models to postulate alarming future conditions, employ them to develop public opinion, and then demand major public policy changes to forestall presumed environmental disasters.

Balling, a science advisor to the Greening Earth Society, said that trends in "heating degree days" in northern latitudes and "cooling degree days" to the south should serve as an indicator in detecting changes in climate, because they represent the energy required to control climate in buildings throughout the year.

But Balling's study reveals no statistically significant trends over the period of study (1950-1995).

According to Balling, heating degree days in the United States have decreased by 0.2 percent, and cooling degree days have decreased by 5.7 percent over the 1950 to 1995 period. The largest change is in the decrease in cooling degree days, which actually should be increasing if climate is warming, as predicted by computer-based climate change models.

"Despite all the publicity about increasing mean temperatures, increasing extreme high temperatures, and an increase in the frequency, duration, and magnitude of summer heat waves," Balling said, "cooling degree days in the United States have declined slightly, indicating a small reduction in the energy needed to cool buildings."

### ***What are 'degree days'?***

Heating and cooling "degree days" are terms often used by television weathercasters. The term was devised by heating, ventilation and air conditioning (HVAC) engineers to relate each day's temperatures to the demand for fuel to heat or cool buildings.

To determine heating degree days for a particular day, a day's average temperature is derived by adding that day's high and low temperatures and dividing by two. If the number is above 65, there were no heating degree days that day. If the number is less than 65, it's subtracted from 65 to find the number of heating degree days, an index of the need to heat buildings in that region.

Cooling degree days are also based on the day's high/low temperature average, minus 65, and relate the day's temperature to the need to air condition structures in that region.

Warm-weather cities will have more cooling degree days than cooler weather cities, which will have more heating degree days. For example, a warm weather city, Key West, Fla., on average each year has 68 heating degree days, with 4,820 cooling degree days. But Bismarck, N.D., a cooler weather city, on average each year has 8,932 heating degree days, with only 499 cooling degree days.

Balling used Daily Historical Climatology Network temperature data -- a database prepared by the National Oceanic and Atmospheric Administration (NOAA) -- that contains daily maximum and minimum temperature values for over 1,000 stations in the continental United States.

But can degree-days be used to gauge global warming, or the lack of it? Balling pointed out that National Aeronautics and Space Administration (NASA) climatologist James Hansen and colleagues incorporated degree days in their "common-sense climate index", which supports their allegations that global warming is taking place.

### ***Build-up of greenhouse gases***

Balling also noted that his study period corresponds with a time of substantial build-up of greenhouse gases in the earth's atmosphere. "Numerical climate model predictions suggest a decrease in heating days and an increase in cooling degree days for rising levels of greenhouse gases," he said.

Instead, virtually the opposite was found by the ASU analysis, with a slight decrease in both heating and cooling degree days. "Our analyses of degree day patterns from the historical climate records do not provide empirical [observable and verifiable] support for the [computer] model simulations," Balling said.

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