

# Key Argument for Global Warming Critics Evaporates

by Ker Than, LiveScience  
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For years, skeptics of global warming have used satellite and weather balloon data to argue that climate models were wrong and that global warming isn't really happening.

Now, according to three new studies published in the journal *Science*, it turns out those conclusions based on satellite and weather balloon data were based on faulty analyses.

The atmosphere is indeed warming, not cooling as the data previously showed.

While surface thermometers have [clearly shown](#) that the Earth's surface is warming, satellite and weather balloon data have actually suggested the opposite, that the atmosphere was cooling.

Scientists were left with two choices: either the atmosphere wasn't warming up, or something was wrong with the data.

"But most people had to conclude, based on the fact that there were both satellite and balloon observations, that it really wasn't warming up," said Steven Sherwood, a geologists at Yale University and lead author of one of the studies.

## Oops!

Sherwood examined weather balloons known as radiosondes, which are capable of making direct measurements of atmospheric temperatures.

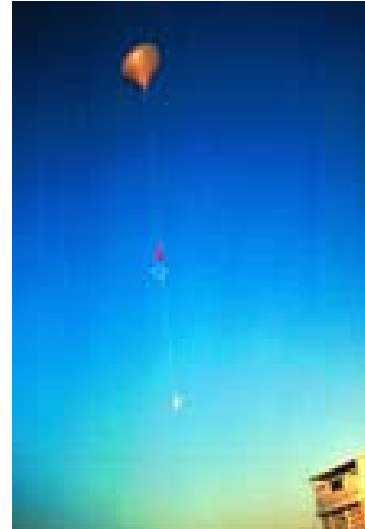
For the past 40 years, radiosonde temperature data have been collected from around the world twice each day, once during the day and once at night.

But while nighttime radiosonde measurements were consistent with climate models and theories showing a general warming trend, daytime measurements actually showed the atmosphere to be cooling since the 1970's.

Sherwood explains these discrepancies by pointing out that the older radiosonde instruments used in the 1970's were not as well shielded from sunlight as more recent models. What this means is that older radiosondes showed warmer temperature readings during the day because they were warmed by sunlight.

"It's like being outside on a hot day—it feels hotter when you are standing in the direct sun than when you are standing in the shade," Sherwood said.

Nowadays, radiosondes are better insulated against the effects of sunlight, but if analyzed together with the old data—which showed temperatures that were actually warmer than they really were—the overall effect looked like the troposphere was cooling.



The discrepancy between surface and atmospheric measurements has been used by for years by skeptics who dispute claims of global warming.

"Now we're learning that the disconnect is more apparent than real," said Ben Santer, an atmospheric scientist at the Lawrence Livermore National Laboratory in California and a lead author of another of the studies.

### **Argument evaporates**

According to Santer, the only group to previously analyze satellite data on the troposphere -- the lowest layer in Earth's atmosphere -- was a research team headed by Roy Spencer from University of Alabama in 1992.

"This was used by some critics to say 'We don't believe in climate models, they're wrong,'" Santer told *LiveScience*. "Other people used the disconnect between what the satellites told and what surface thermometers told us to argue that the surface data were wrong and that earth wasn't really warming because satellites were much more accurate."

The Alabama researchers introduced a correction factor to account for drifting in the satellites used to sample Earth's daily temperature cycles.

But in another *Science* paper published today, Carl Mears and Rank Wentz, scientists at the California-based Remote Sensing Systems, examined the same data and identified an error in Spencer's analysis technique.

After correcting for the mistake, the researchers obtained fundamentally different results: whereas Spencer's analysis showed a cooling of the Earth's troposphere, the new analysis revealed a warming.

Using the analysis from Mears and Wentz, Santer showed that the new data was consistent with climate models and theories.

"When people come up with extraordinary claims -- like the troposphere is cooling -- then you demand extraordinary proof," Santer said. "What's happening now is that people around the world are subjecting these data sets to the scrutiny they need."