



This is the print version of the [Skeptical Science](#) article '[Temp record is unreliable](#)', which can be found at <http://is.gd/dDU2m>.

Are surface temperature records reliable?

What The Science Says:

The warming trend is the same in rural and urban areas, measured by thermometers and satellites, and by natural thermometers.

Climate Myth: Temp record is unreliable

"We found [U.S. weather] stations located next to the exhaust fans of air conditioning units, surrounded by asphalt parking lots and roads, on blistering-hot rooftops, and near sidewalks and buildings that absorb and radiate heat. We found 68 stations located at wastewater treatment plants, where the process of waste digestion causes temperatures to be higher than in surrounding areas.

In fact, we found that 89 percent of the stations - nearly 9 of every 10 - fail to meet the National Weather Service's own siting requirements that stations must be 30 meters (about 100 feet) or more away from an artificial heating or radiating/reflecting heat source." ([Watts 2009](#))

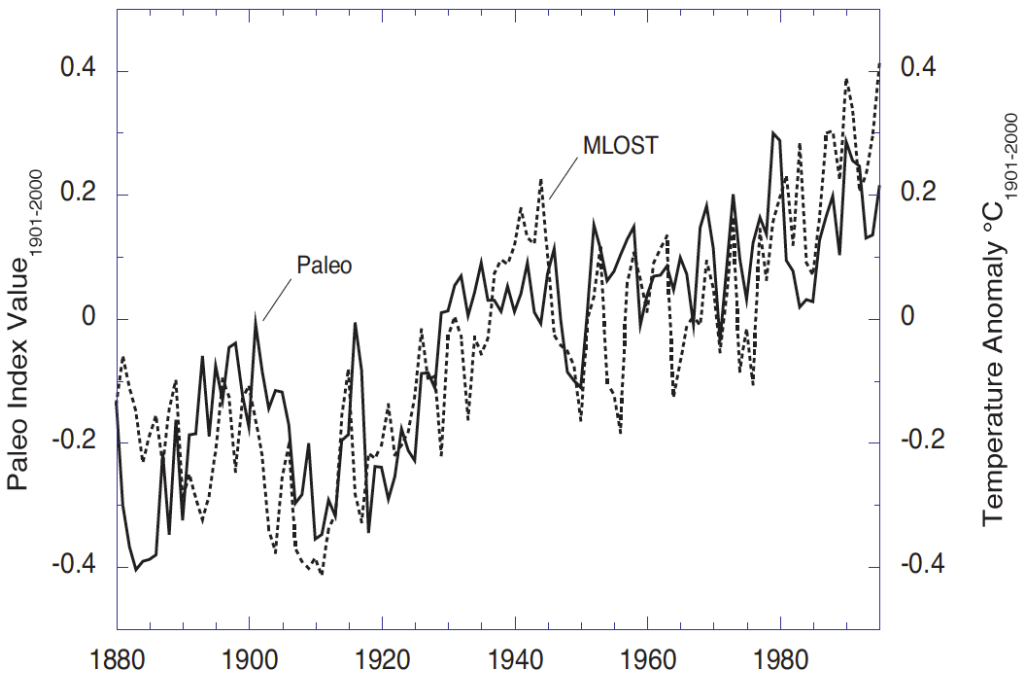
Surveys of weather stations in the USA have indicated that some of them are not sited as well as they could be. This calls into question the quality of their readings.

However, when processing their data, the organisations which collect the readings take into account any local heating or cooling effects, such as might be caused by a weather station being located near buildings or large areas of tarmac. This is done, for instance, by weighting (adjusting) readings after comparing them against those from more rural weather stations nearby.

More importantly, for the purpose of establishing a temperature trend, the relative level of single readings is less important than whether the pattern of all readings from all stations taken together is increasing, decreasing or staying the same from year to year. Furthermore, since this question was first raised, research has established that any error that can be attributed to poor siting of weather stations is not enough to produce a significant variation in the overall warming trend being observed.

It's also vital to realise that warnings of a warming trend -- and hence Climate Change -- are not based simply on ground level temperature records. Other completely independent temperature data compiled from weather balloons, satellite measurements, and from sea and ocean temperature records, also tell a remarkably similar warming story.

For example, a study by [Anderson et al. \(2012\)](#) created a new global surface temperature record reconstruction using 173 records with some type of physical or biological link to global surface temperatures (corals, ice cores, speleothems, lake and ocean sediments, and historical documents). The study compared their reconstruction to the instrumental temperature record and found a strong correlation between the two:



Temperature reconstruction based on natural physical and biological measurements (Paleo, solid) and the instrumental temperature record (MLOST, dashed) relative to 1901-2000. The range of the paleo trends index values is coincidentally nearly the same as the GST although the quantities are different (index values versus temperature anomalies °C).

Confidence in climate science depends on the correlation of many sets of these data from many different sources in order to produce conclusive evidence of a global trend.



Skeptical Science explains the science of global warming and examines climate misinformation through the lens of peer-reviewed research. The website won the Australian Museum 2011 Eureka Prize for the Advancement of Climate Change Knowledge. Members of the Skeptical Science team have authored peer-reviewed papers, a [college textbook on climate change](#) and the book [Climate Change Denial: Heads in the Sand](#). Skeptical Science content has been used in university courses, textbooks, government reports on climate change, television documentaries and numerous books.



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