

It's the Sun, stupid!

New direct evidence demonstrate that changes in solar activity influence climate

Willie Soon

The theory that climate change is chiefly caused by solar influences “is no longer tenable,” says US National Academy of Sciences president Ralph Cicerone. Carbon dioxide, he argues, is the key driver of recent climate change. I beg to differ.

The amount and distribution of solar energy that we receive varies as the Earth revolves around the Sun and also in response to changes in the Sun's activity. Scientists have now been studying solar influences on climate for 5000 years.

Chinese imperial astronomers kept detailed sunspot records. They noticed that more sunspots meant warmer weather on Earth. In 1801, the celebrated astronomer William Herschel noticed that when there were few spots, the price of wheat soared – because, he surmised, less “light and heat” from the Sun resulted in reduced harvests.

Is it true then that solar radiation, which supplies Earth with the energy that drives our climate, and caused so many climate shifts over the ages, is no longer the principal influence on climate change?

The UN's climate panel claims there is scientific “consensus” that man-made CO₂ emissions are causing “dangerous” climate change. However, its 2007 Climate Assessment is fraught with serious scientific shortcomings in its discussion of the Sun's influence on Earth's climate.

The UN said direct measurements of solar radiation since 1979 show little increase. However, this conclusion depends upon disparate and adjusted measurements that were combined from several satellites and may be incorrect.

Between 1645 and 1715, sunspots were very rare and temperatures were low. Then sunspot frequency grew until, between 1930 and 2000, the Sun was more active than at almost any time in the last 10,000 years. The oceans can cause up to several decades of delay before air temperatures respond fully to this solar “Grand Maximum.” Now that the Sun is becoming less active again, global temperatures have fallen for seven years.

Next, the UN said estimates of the increase in solar radiation over the past 400 years should be reduced. The basis for this claim was a modeling study by the US Naval Research Laboratory. However, the Navy computer program was not designed to reach such conclusions, as it has no routine to calculate solar radiation.

We have known for nearly 80 years that small changes in solar activity can cause large climatic changes. Where sunlight falls, for how long, and with what effect, determine how climate will respond.

The most recent scientific evidence shows that even small changes in solar radiation have a strong effect on Earth's temperature and climate.

In 2005, I demonstrated a surprisingly strong correlation between solar radiation and temperatures in the Arctic over the past 130 years. Since then, I have demonstrated similar correlations in all the regions surrounding the Arctic, including the US mainland and China.

The close relationships between the abrupt ups and downs of solar activity and of temperature that I have identified occur locally in coastal Greenland; regionally in the Arctic Pacific and north Atlantic; and hemispherically for the whole circum-Arctic, suggesting that changes in solar activity drive Arctic and perhaps even global climate.

There is no such match between the steady rise in atmospheric CO₂ concentration and the often dramatic ups and downs of surface temperatures in and around the Arctic.

I recently discovered direct evidence that changes in solar activity have influenced what has been called the “conveyor-belt” circulation of the great Atlantic Ocean currents over the past 240 years. For instance, solar-driven changes in temperature, and in the volume of freshwater output from the Arctic, cause variations in sea surface temperature in the tropical Atlantic 5-20 years later.

These previously undocumented results have been published in the journal *Physical Geography*. They make it difficult to maintain that changes in solar activity play an insignificant role in climate change, especially over the Arctic.

The hallmark of good science is the testing of a plausible hypothesis that is then either supported or rejected by the evidence. The evidence in my paper is consistent with the hypothesis that the Sun causes climatic change in the Arctic.

It invalidates the hypothesis that CO₂ is a major cause of observed climate change – and raises serious questions about the wisdom of imposing cap-and-trade or other policies that would cripple energy production and economic activity, in the name of “preventing catastrophic climate change.”

Bill Clinton used to sum up politics by saying, “It’s the economy, stupid!” Now we can fairly sum up climate change by saying, “It’s the Sun, stupid!”

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