



Outlook—Sunspot Data May Indicate End of Global Warming Trend

Jonathan A. Lesser

In November 2013, yet another climate conference was held, this time in Warsaw. Like the United Nations Doha conference the previous year,¹ the Warsaw conference devolved into a demand by less-developed nations for climate “reparations” from developed nations, principally the United States. The demanders include China and India, which are the number-one and number-four carbon emitters, respectively. In fact, China led a walkout of 132 developing nations from the Warsaw conference to protest the lack of climate reparations. Nevertheless, the conference was a resounding success, assuming success to be an agreement by participating nations to publish intended carbon emissions reductions before the gabfest to be held in Paris in the fall of 2015.

Rather than examine the Warsaw conference’s allegations and fulminations, which are a fount of humor, this month’s column focuses on the observed decreases in sunspot activity and what that may portend for the world’s climate in the future. Understanding how the sun affects the earth’s climate is perhaps more important for climate policy than the never-ending whining for dollars to which UN climate conferences devolve.

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CHANGES IN SOLAR ACTIVITY ARE CORRELATED WITH GLOBAL TEMPERATURE CHANGES

Although the sun’s output, called *irradiance*, is remarkably constant, the sun has a well-known 11-year cycle, during which solar activity ebbs and flows.² Although sunspots are the most visible aspect of this cycle, other aspects of the sun change as well, such as X-ray emissions, ejections of material from the sun’s corona, and the sun’s magnetic field. Why the sun should have such a cycle is not known.

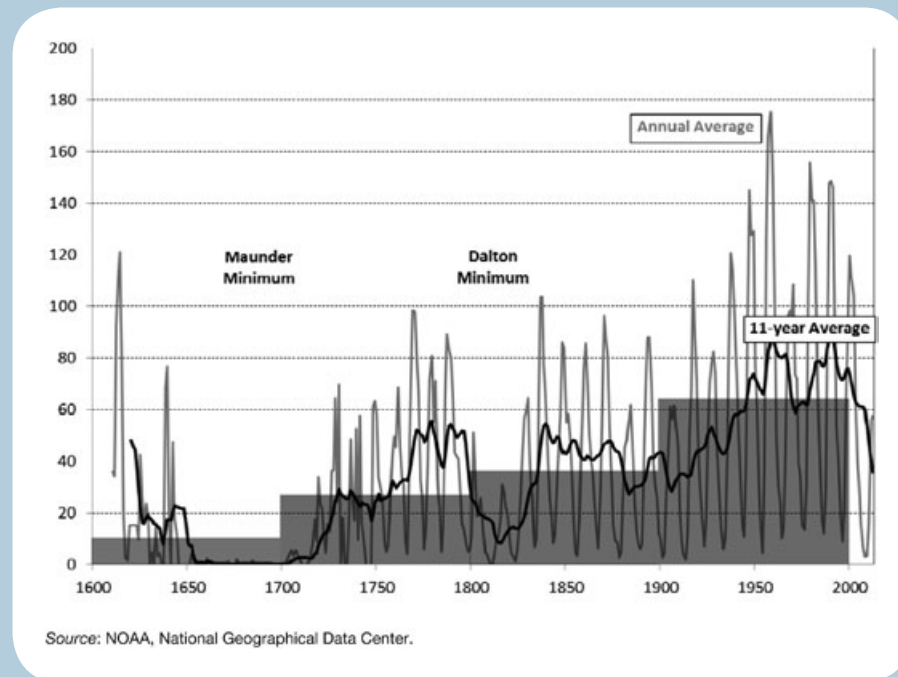
In addition to the 11-year cycle, observations of sunspot activity over the last 400 years have shown extended periods of relatively low and relatively high solar activity. **Exhibit 1**, for example, illustrates annual and 11-year averages from 1610 through 2012.

As shown in Exhibit 1, the 60-year period that began around the year 1645 was characterized by very few sunspots. This period, known as the Maunder Minimum, was also associated with an especially cool period during what has been termed the Little Ice Age, which began in the fourteenth century and lasted through the middle of the nineteenth century.

As Exhibit 1 also shows, sunspot activity increased significantly between 1900 and 1960. Another activity maximum took place around 1990. In fact, sunspot activity in the twentieth century was higher than the previous three centuries, as shown by the gray-shaded rectangles.

Since 1990, however, sunspot activity has decreased rapidly. And recent research suggests that the sun may be entering into another Maunder Minimum-like period.³ Thus, one key question for climate-change issues is, if the sun enters into

Exhibit 1. Sunspot Activity (1610–2012)



another extended period of low activity, does that mean global cooling is in our future?

Basically, the sun is the sole driver of the earth's climate: without it, earth would be rather chilly. Nevertheless, *correlation* is not *causation*, and there remains significant debate over the relationship between global temperatures and solar activity. Some, for example, have claimed that the Maunder Minimum had nothing to do with the cool period and suggest that volcanic activity was the cause.⁴

Moreover, the relationship between solar activity and global temperatures is further complicated because there is no simple way to take the earth's temperature. As a result, different temperature indices can be, and have been, developed, with each requiring its own level of data torture. For example, **Exhibit 2** shows sunspot activity and global temperature and total solar irradiance. The chart *appears* to show a sudden divergence between global temperatures and solar activity beginning around 1980. Temperatures increase rapidly while total solar irradiance has declined.

Alas, this chart, and the website that publishes it, would have us toss the solar activity causation argument into the rubbish bin. However, the chart itself would have made a fine example for Darrell Huff's classic 1954 book *How to Lie with Statistics*.⁵ First, note that the scale on the left is

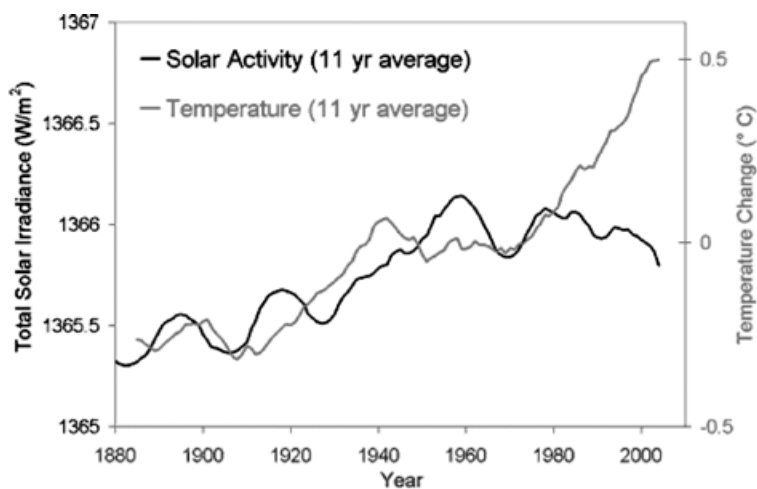
solar *irradiance*, which as previously mentioned stays almost constant. The variation is 2 watts per square meter, or less than 0.2 percent. Thus, the solar "activity" measure is not sunspots.

Second, the temperature data used in the chart, which was developed by NASA's Goddard Institute of Space Studies (GISS) scientist James Hansen, has been shown to be error-riddled and artificially manipulated to show warming temperatures. In fact, GISS itself has admitted the data is flawed.⁶ Ironically, in 1999, Hansen, who is one of the most ardent proponents of global warming, said, "In the United States there has been little temperature change in the past 50 years, the time of rapidly increasing greenhouse gases—in fact, there was a slight cooling throughout much of the country."⁷

GLOBAL TEMPERATURES HAVE NOT RISEN FOR PAST 15 YEARS

Today, there *is* broad agreement that global temperatures have not risen for the last 15 years. Yet none of the climate models has been able to capture this *observed* lack of warming. In other words, none of the climate models that have been used to predict future temperature increases can re-create observed past temperatures. This is like relying on a forecast of electricity demand to determine the need for new generating supplies using a model

Exhibit 2. Temperature vs. Solar Activity



Source: Skeptical Science, <http://www.skepticalscience.com/solar-activity-sunspots-global-warming.htm>. This website's subtitle is "Getting skeptical about global warming skepticism." The discussion accompanying the chart also states, "Since the sun and climate are going in opposite directions, scientists conclude the sun cannot be the cause of recent global warming."

that consistently overestimates past demand. Such a forecasting model would be dismissed (rightly) as inaccurate and unreliable.

Nevertheless, rather than admit to problems with the climate models, those who insist global warming is real and taking place suggest that the missing heat is hiding in the oceans. Perhaps it is. In fact, new research purports to show that rising ocean temperatures are causing fish to become more anxious.⁸ Who knows, this may increase the demand for piscine psychiatric services and create schools of Prozac-gulping guppies.

Many individuals who believe in human-caused climate change say "the science is settled." But science is *never* settled. The inability of current climate models to explain the lack of warming over the past 15 years, plus predictions that the sun may be entering a prolonged period of low activity, suggest that much more analysis must be done before we impoverish ourselves by choking off economic growth.

This analysis is especially important for less-developed countries, which rightly wish to improve their citizens' standard of living and are unlikely to receive any climate reparation payments to do so. ☪

NOTES

1. See my previous column, Talk is cheap: The UN Doha Conference strikes out again. (2013, February). *Natural Gas and Electricity*, 29(5), 27–29.

- Hathaway, D. (2010). The solar cycle. *Living Reviews in Solar Physics*, 7(1).
- Ahluwalia, H. (2013, December). An empirical approach to predicting the key parameters for a sunspot number cycle. *Advances in Space Research*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0273117713007473>.
- See Lockwood, M. (2013, November). *Solar activity and the so-called "Little Ice Age."* The Carbon Brief. Retrieved from <http://www.carbonbrief.org/blog/2013/11/solar-activity-and-the-so-called-%E2%80%9Clittle-ice-age%E2%80%9D/>.
- A copy of the book may be downloaded for free at: <https://archive.org/details/HowToLieWithStatistics>.
- See Snow, B. (2010, March 30). NASA data worse than Climate-Gate data, GISS admits. Retrieved from <http://www.foxnews.com/scitech/2010/03/30/nasa-data-worse-than-climategate-data/>.
- See Hansen, J., Ruedy, R., Glascoe, J., & Sako, M. (1999, August). Whither US climate? NASA GISS. Retrieved from http://www.giss.nasa.gov/research/briefs/hansen_07/. For a comparison, in 2012, Hansen claimed in a YouTube feature, "The oceans will boil." Retrieved from https://www.youtube.com/watch?feature=player_embedded&v=1uxftuKB_R8. In a December 6, 2013, column, Hansen discusses a lawsuit brought by children against the US EPA and the National Association of Manufacturers, "What we owe our kids on climate." http://www.cnn.com/2013/12/06/opinion/hansen-climate-last-chance/index.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+rss%2F+cnn_topstories+%28RSS%3A+Top+Stories%29. The appellants' brief can be found at: <http://ourchildrenstrust.org/sites/default/files/FiledOpeningBrief.pdf>.
- Rising ocean acidification leads to anxiety in fish. (2013, December 4). *Science Daily*. Retrieved from <http://www.sciencedaily.com/releases/2013/12/131204182219.htm>.