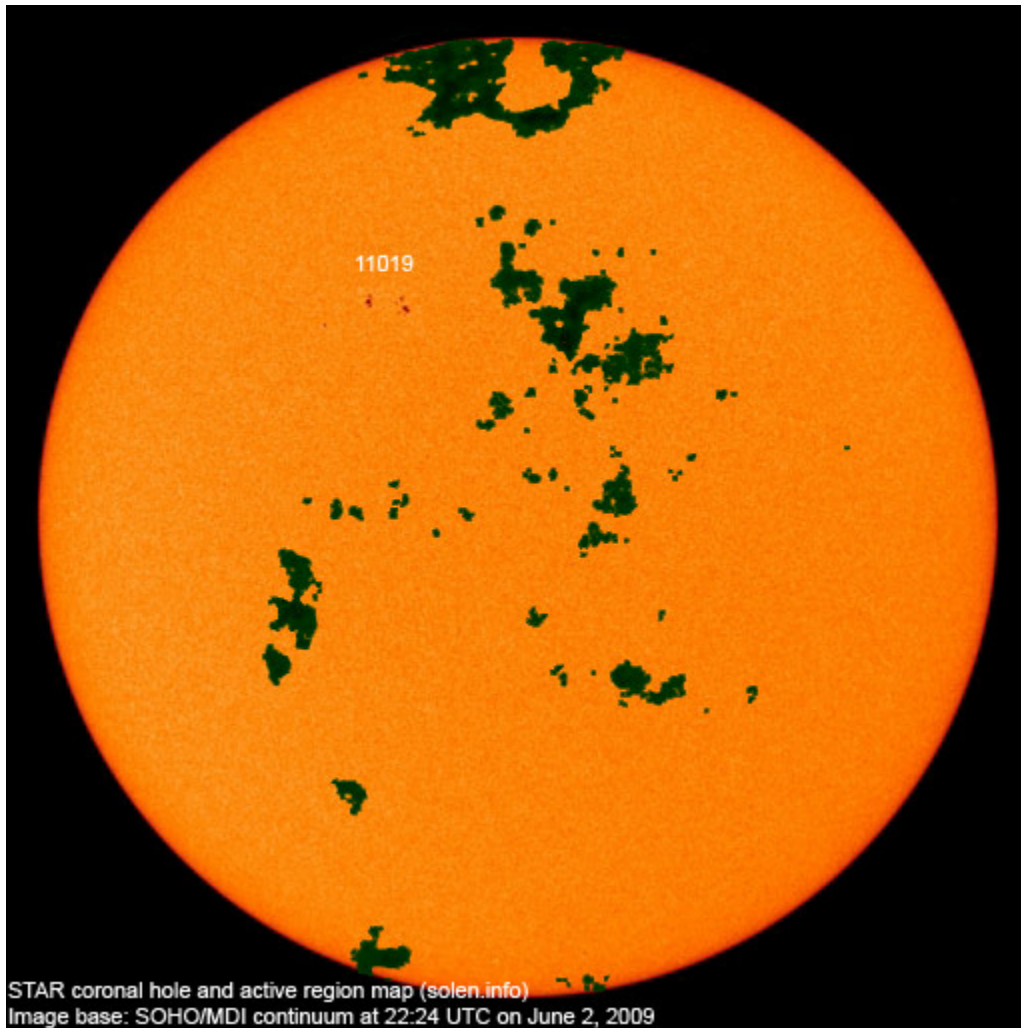


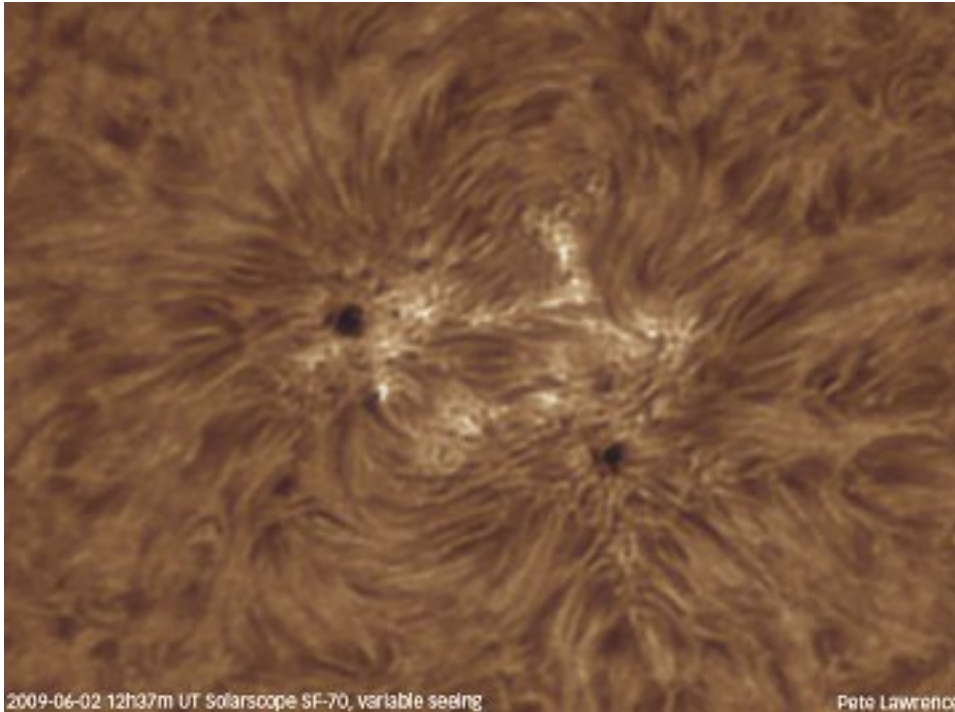
## ***SUNSPOT MINIMUM AT HAND***

*By Joseph D'Aleo*

The sun has become more active in recent days with cycles 24 spots in middle latitudes. See sunspot group number 11019 for group of red spots. This is slightly diminished since yesterday. The dark green areas are coronal holes out of which the solar wind escapes at higher velocity.



Peter Lawrence has a close up view of that sunspot posted on [spaceweather.com](http://spaceweather.com).

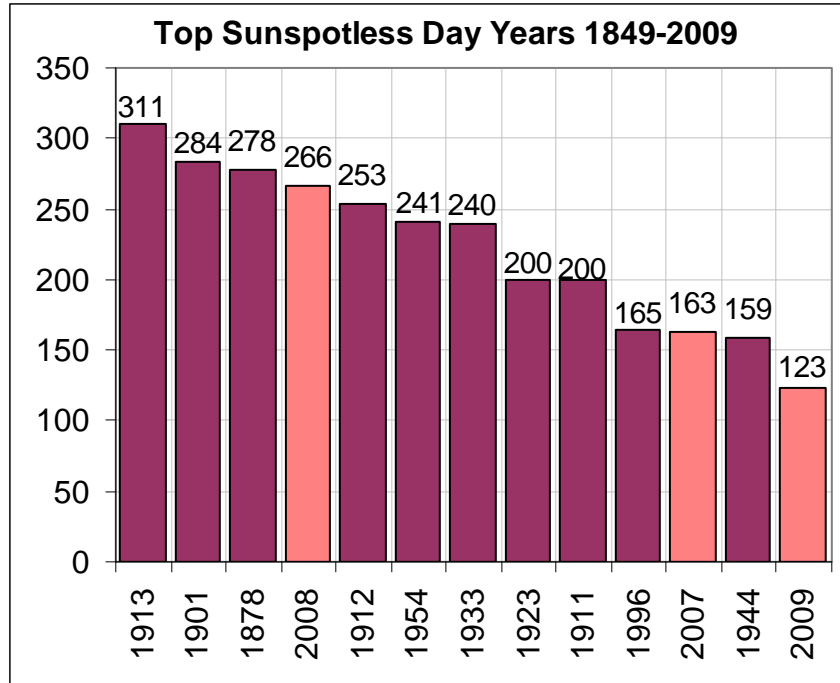


There is a loop of the sunspots develop and rotate around the solar disk the last few days [here](#).

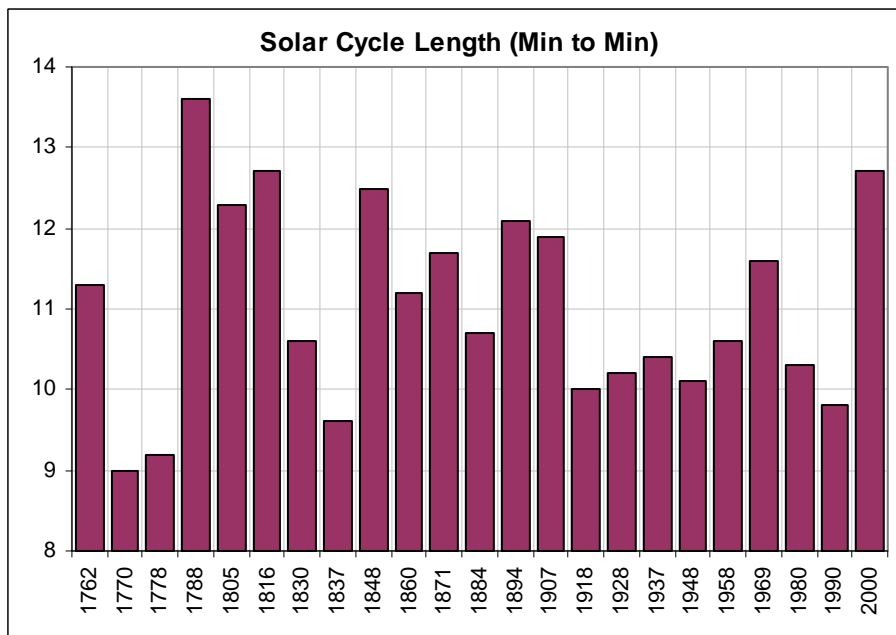
This activity came late enough in the month of May, to keep the monthly number for May below the value of 14 months ago of 3.2 which it is replacing in the 13 month running mean. That means the solar cycle minimum can't be earlier than November 2008, making it at least a 12.5 year long cycle 23.

The value needs to fall below 3.4 in June to move the minimum to December. That is still possible if the sunspot group continues to decay as most have done as they crossed the disk in recent months. If it stays below that value, we will likely see the solar minimum in December, 2008 as 14 months before that the sun was very quiet with just a sunspot number of 0.5. If not, the minimum will be November. It is my guess that November will win the prize.

We added 22 more sunspotless days to the total for this cycle transition which as of June 1 had now reached an amazing 614 days. We are likely to add additional days and add 2009 to 2007 and 2008 as recent years in the top ten since 1900. Only the early 1900s had a similar 3 year stretch of high sunspot days (1911, 1912, and 1913).



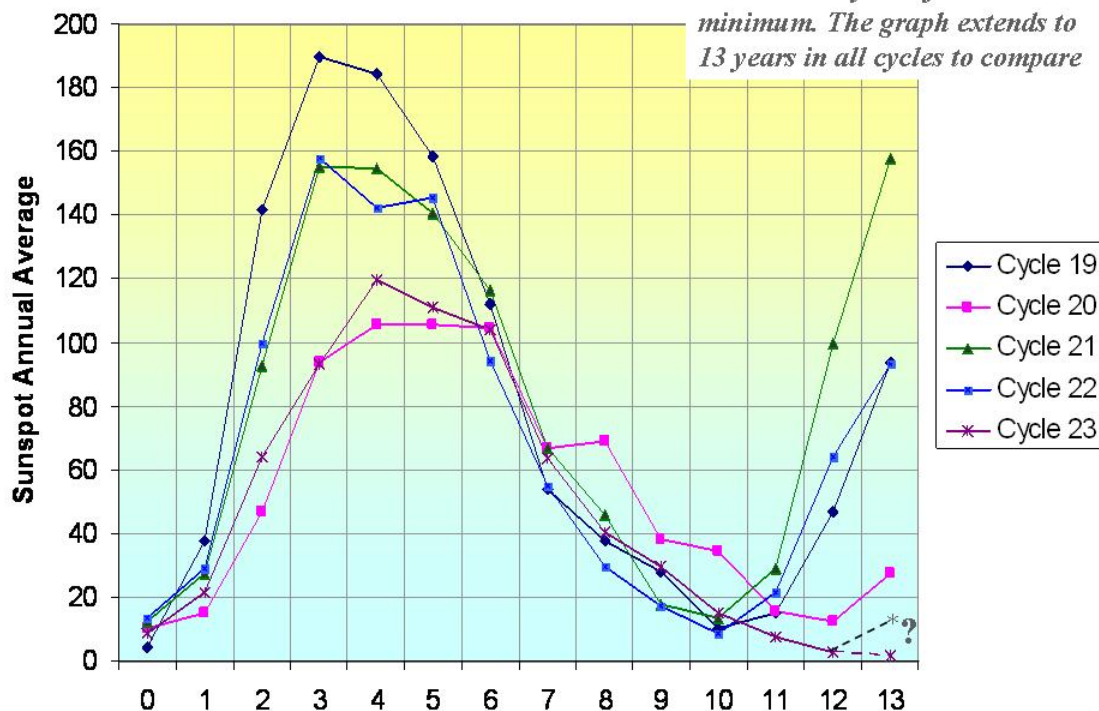
It also marks the longest cycle in 150 years, tying the one that peaked in 1848. You have to go back to the Dalton minimum in 1816 to find a longer cycle 12.7 years.



You can see in 3 of the 5 most recent cycles, the sun had rebounded significantly by years 12 and 13 well into the next cycle.

### Cycles 19 to 23

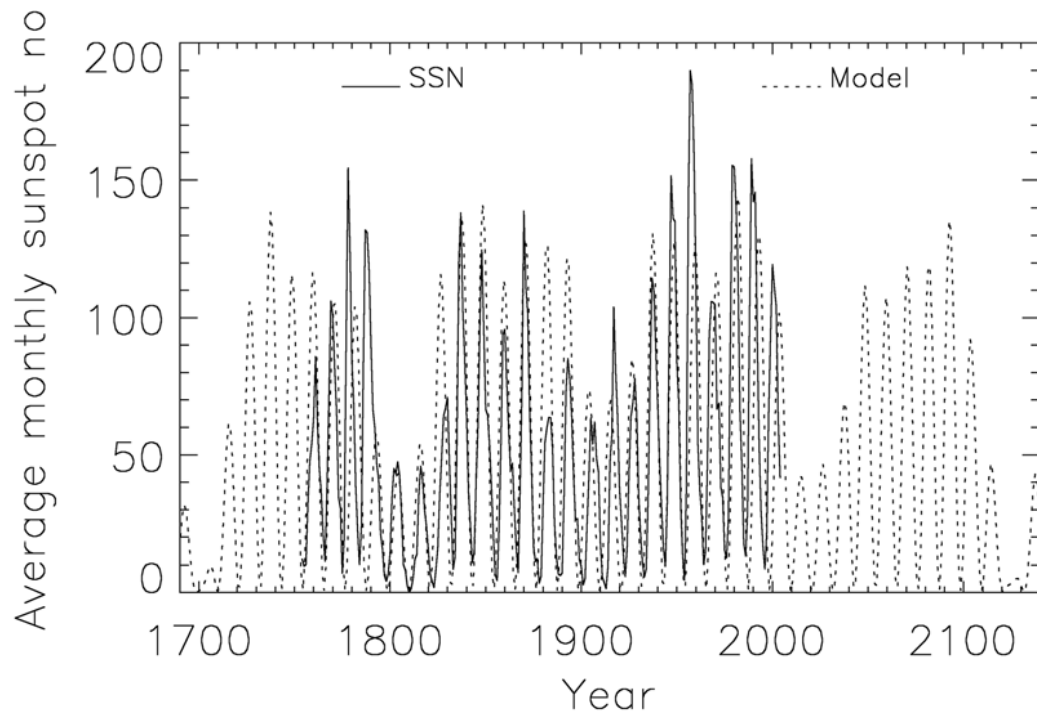
*Year 0 was arbitrarily chosen as the calendar year of the solar minimum. The graph extends to 13 years in all cycles to compare*



Theodore Landscheidt in New [Ice Age Instead of Global Warming](#) warned the decline could continue in solar activity until a Maunder Minimum like level was reached about 2030. The Russians appear to agree. [Khabibullo Abdusamatov](#) of the Russian Academy of Science said he and his colleagues had concluded that a period of global cooling similar to one seen in the late 17th century - when canals froze in the Netherlands and people had to leave their dwellings in Greenland - could start in 2012-2015 and reach its peak in 2055-2060.

The late [Rhodes Fairbridge](#) of Columbia University had found with the help of NASA and the JPL, every 179 years or so, the sun embarks on a new cycle of orbits. One of the cooler periods in recent centuries was the Little Ice Age of the 17th century, when the Thames River in London froze over each winter. The next cool period, if the pattern holds, began in 1996, with the effects to be felt starting in 2010. Some predict three decades of severe cold. See recent story on Rhodes's findings also [here](#).

Clilverd et al (2006) in a [paper](#) "Predicting Solar Cycle 24 and Beyond" found by using an harmonic analysis of the multiple cycle frequencies of solar cycles in a model that correctly has caught the activity the past 250 years with a sunspot number standard deviation of 34. Their analysis suggest cycles 24 and 25 will be the lowest (quietest and thus coolest) in nearly 200 years. The two cycles should be like those of the Dalton Minimum.



That was the Dicken's era, a period with snow frequently in London, much as we saw last winter.

David Archibald in *Energy and the Environment* and in the paper [The Past and Future of Climate](#) this last year agreed with this projection.

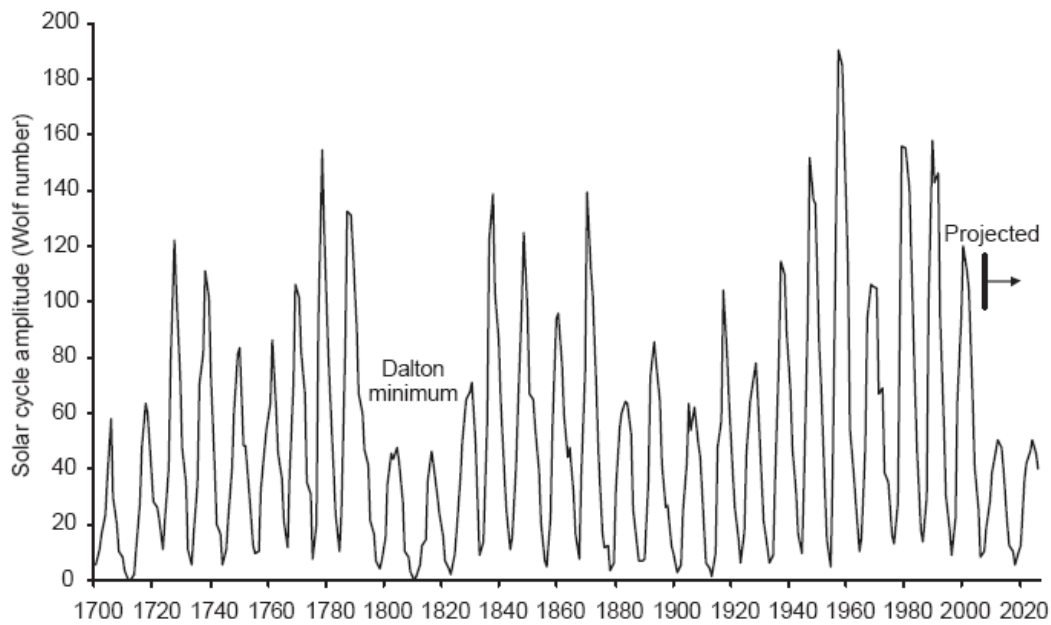
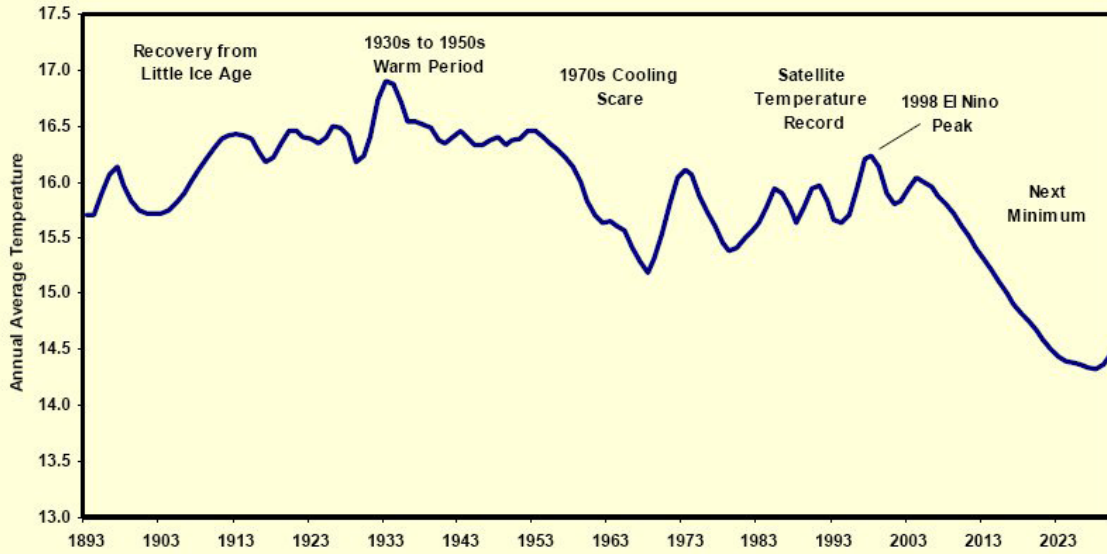


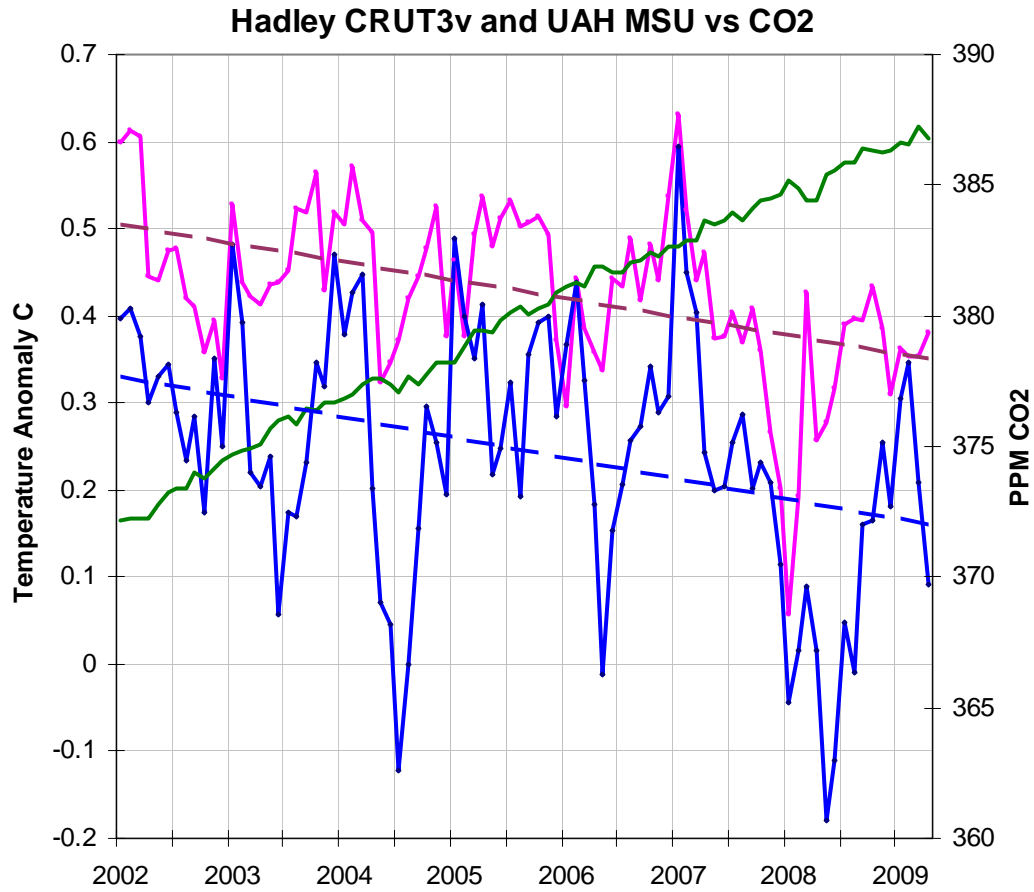
Figure 1: Past Solar Cycles with a Projection of Solar Cycles 24 and 25.

The temperatures with such a decline projected by [Archibald](#) are significant.

## Projected Temperature Profile to 2030



That decline has already begun even as CO2 has continued to rise.



Needless to say much will be learned the next 5 years if the solar cycle decline with cooling temperatures continues. Read more on the possible solar factors [here](#).