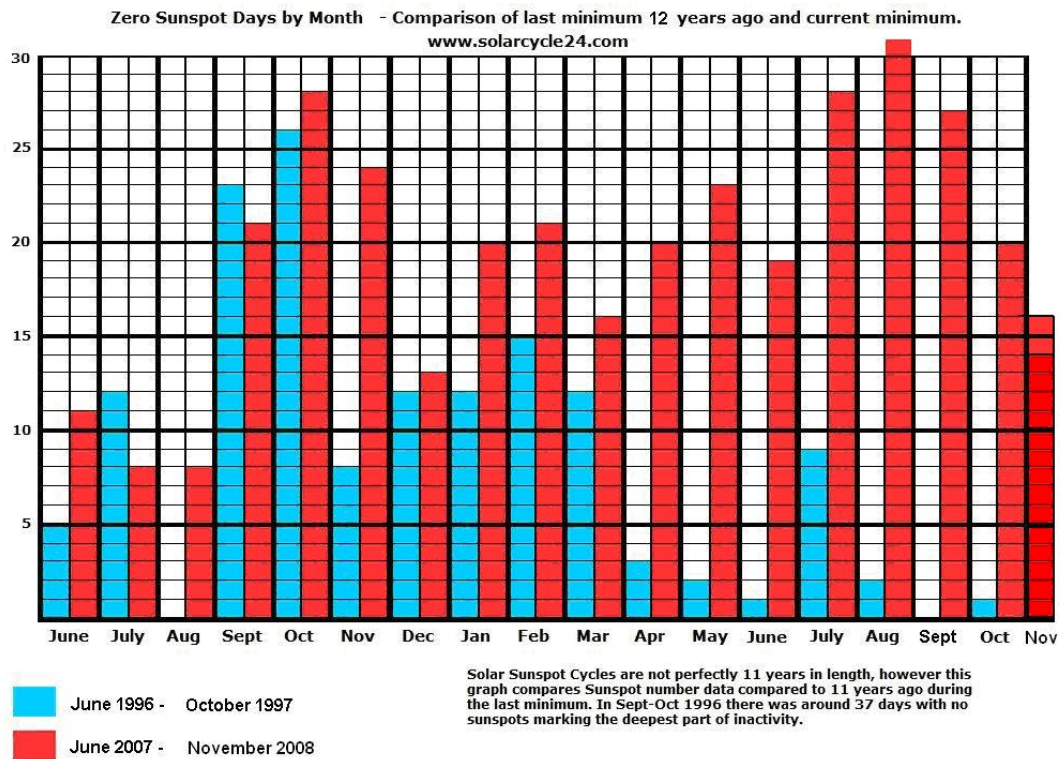


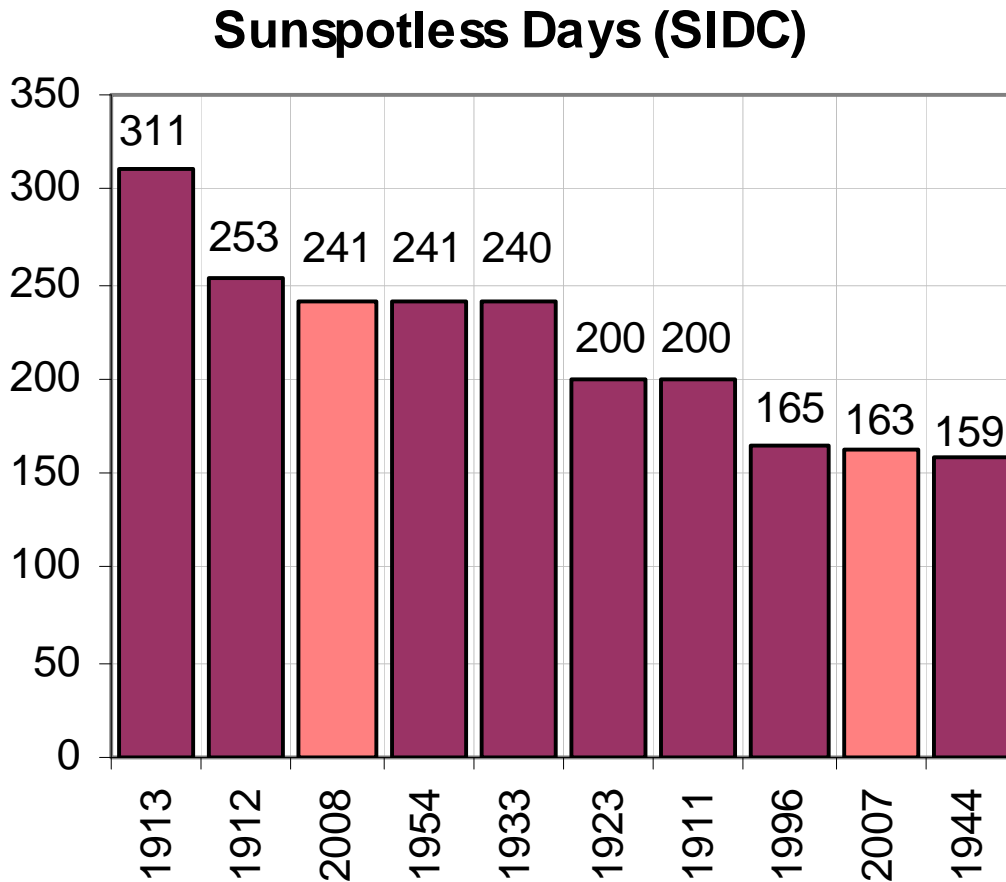
Cold Sun – Cold Earth: 2008 Now #3 Most Sunspotless Days – Could we Reach #2

By Joseph D'Aleo, CCM, AMS Fellow

One of our loyal Canadian Icecap readers asked us to comment on the fact we are now at the end of November, in the top five years with the most sunspotless days the last century and heading towards a #3 or even #2 finish depending on how many spotless days we have in December. Here is a comparison of monthly spotless days in this cycle 23 minimum (red) versus the last cycle 22 minimum in the mid 1990s (blue).



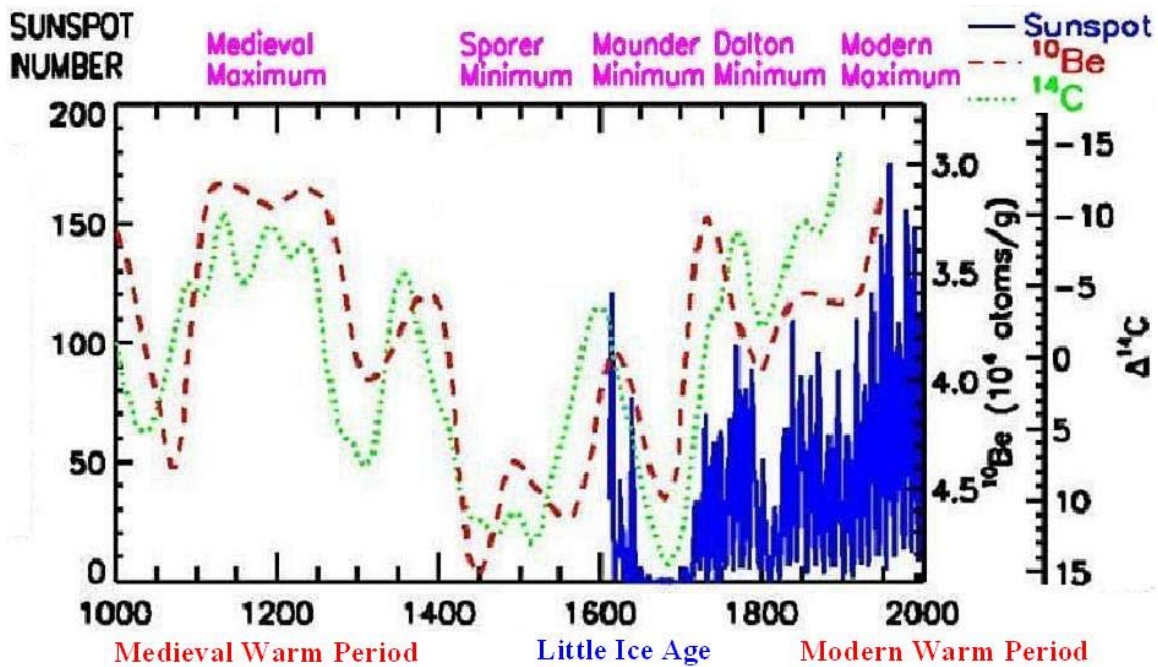
Notice how quiet and prolonged this minimum has been compared to the last minimum. As of December 3, we have had 241 spotless days in 2008, enough to put us in a tie for 3rd place with 1954. Today will extend the latest string of sunspotless days to 14, 3 this month. If we match November's 16 spotless days in December, we will be in a virtual tie for second place with 1912 (with 253 spotless days) behind just 1913 (311 days).



Notice how 2007 and 2008 are both in the top 10. So far for the minimum of cycle 23, we have had 484 days, the most since cycles 14-16, in the early 1900s. Note in cycle 14, three years came in the top 10 for spotless days, 1911, 1912, 1913. This is the second year in this cycle in the top 10. 1912 was the second high spotless year after cycle 14.

QUIET SOLAR PERIODS ARE COLD PERIODS

Case in point the Maunder Minimum during the little ice age, virtually spotless for decades/centuries from the late 1400s to early 1700s.



The early 1800s known as the Dalton Minimum was a mini ice age.
Cold returned in the late 1800s and early 1900s with an again declining sun.

See [this story](#) in the Toronto Star by Adam Mayers from February 2007. It talks about 1911/12 winter, the worst winter of the century.

"It may seem cold this week, but it is nothing, nothing, compared with the winter of 1912, a year that remains in the record books as the worst winter of the past 100 years.

By mid-January, it was so cold Toronto harbour was frozen solid. By early February, the near-shore lake ice was a metre thick, and you could skate from Toronto to Hamilton if you had the time. By the middle of the month, everyone was taking bets on whether the lake was frozen over. By month-end, it was.

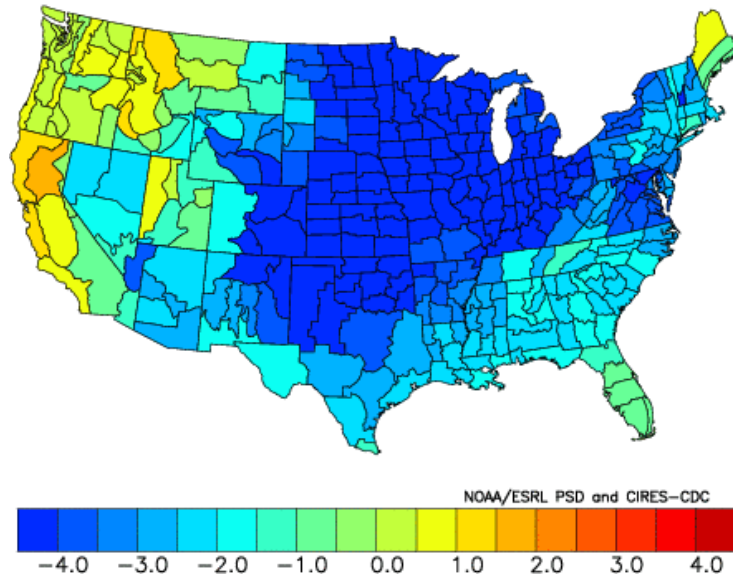
It was the rumour that the lake ice was finally solid from Toronto to Rochester that brought a huge crowd to Sunnyside Park on the afternoon of Feb. 11, 1912. They wanted to witness what the Star called a once-in-a-lifetime experience, "a spectacle they had never seen before and may never witness again."



The shore from Sunnyside to Humber Bay was packed with people, and by 3 p.m. there were hundreds of people spilling out onto the ice. About 50 kept going until the paper estimated they were three miles out and from shore looked like "so many flies on a gigantic plate." When they were mere specks, they turned around – not because the ice was thin, as they later told the reporter, but because they feared getting lost. All around was grey in the fading light.

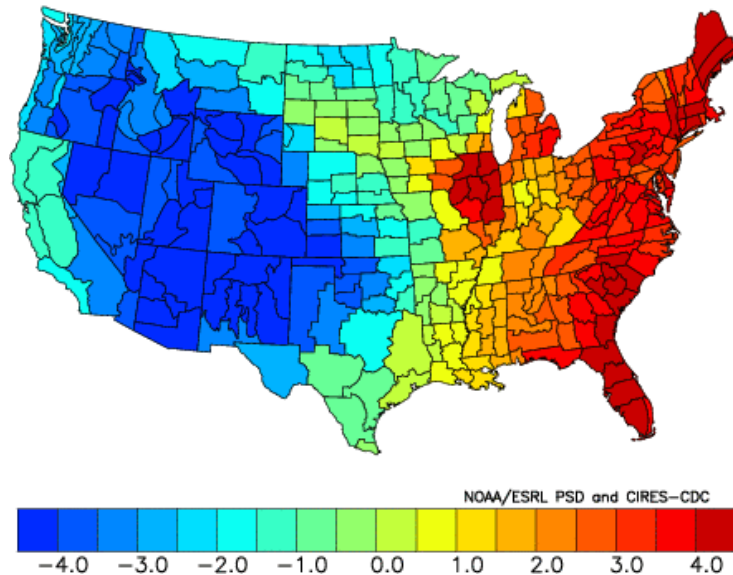
The lake did freeze over by the end of the month, the only time in the past century that it has. Superior did too. Although Michigan, Huron and shallow Erie have frozen in many winters since, Superior and Ontario are so deep and wide it is rarely cold enough to do the trick. But the winter of 1912 was the coldest January-March period of the 20th century and the second-coldest ever recorded. See the temperatures that winter here:

Temperature Anomalies (F)
Dec to Feb 1911–12
Versus 1950–1995 Longterm Average



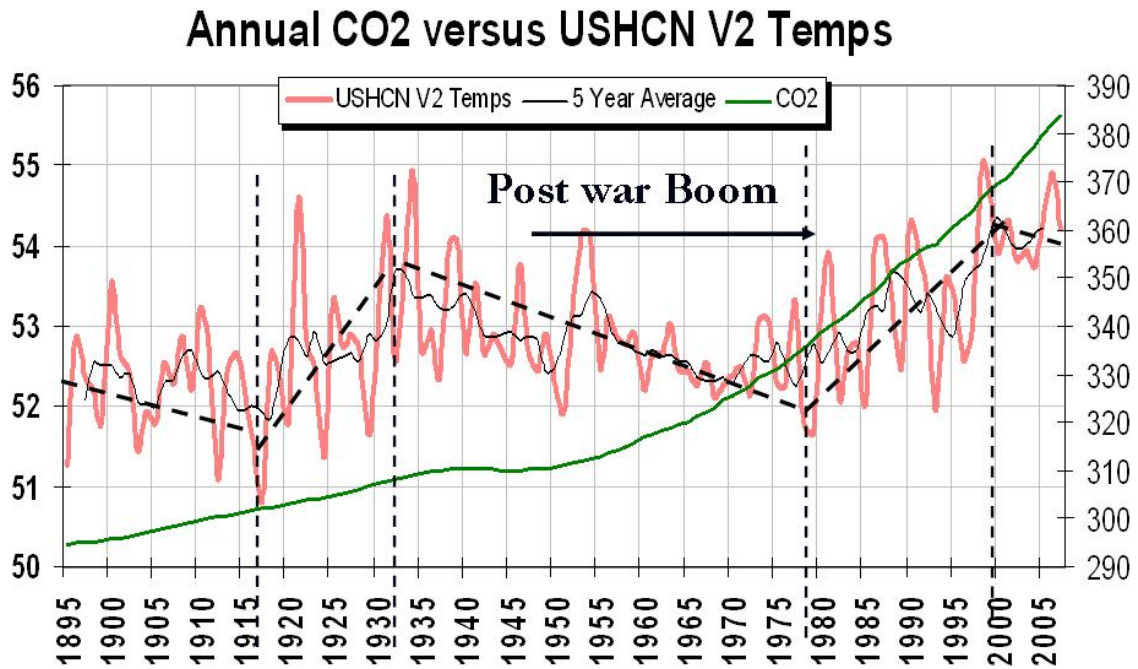
The following winter was a very different story. It was a neutral ENSO (biased slightly towards El Nino), with a slightly positive PDO, and negative AMO. Yet, the pattern in 1912/13 looks like a La Nina with coldest weather biased west.

Temperature Anomalies (F)
Dec to Feb 1912–13
Versus 1950–1995 Longterm Average



In general, low solar activity, is associated with colder temperatures for the United States and globe. See the USHCN annual below. Note the drop in temperatures during the quiet

sun of the early 1910s followed by rapid warming into the 1930s as the solar activity returned with shorter and more intense solar cycles.



There is even more similarity to the late 1700s and early 1800s with the behavior of the last several cycles. The next two cycles form the minimum of the 213 and 106 year cycles, suggesting a similar Dalton like minimum.

11 year solar cycles vary in their strength on a longer term on cycles of 22, 53, 88, 106, 213, 429, etc. years

