

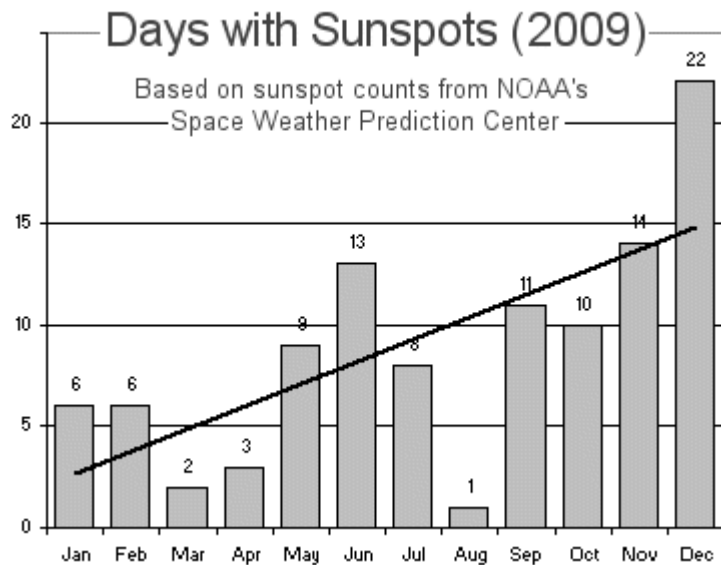
Climate Progress

December 31, 2009

The hottest decade ends and since there's no Maunder minimum — sorry deniers! — the hottest decade begins

2009 ends with a "sunspot surge" as solar cycle 24 revs up, though the sun is increasingly a bit player in the global warming trend

http://climateprogress.org/2009/12/31/science-the-hottest-decade-ends-maunder-minimum-solar-cycle-24-global-warming/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+climateprogress%2FICrX+%28Climate+Progress%29



The figure is from Spaceweather.com, in its "Sunspot Surge" post.

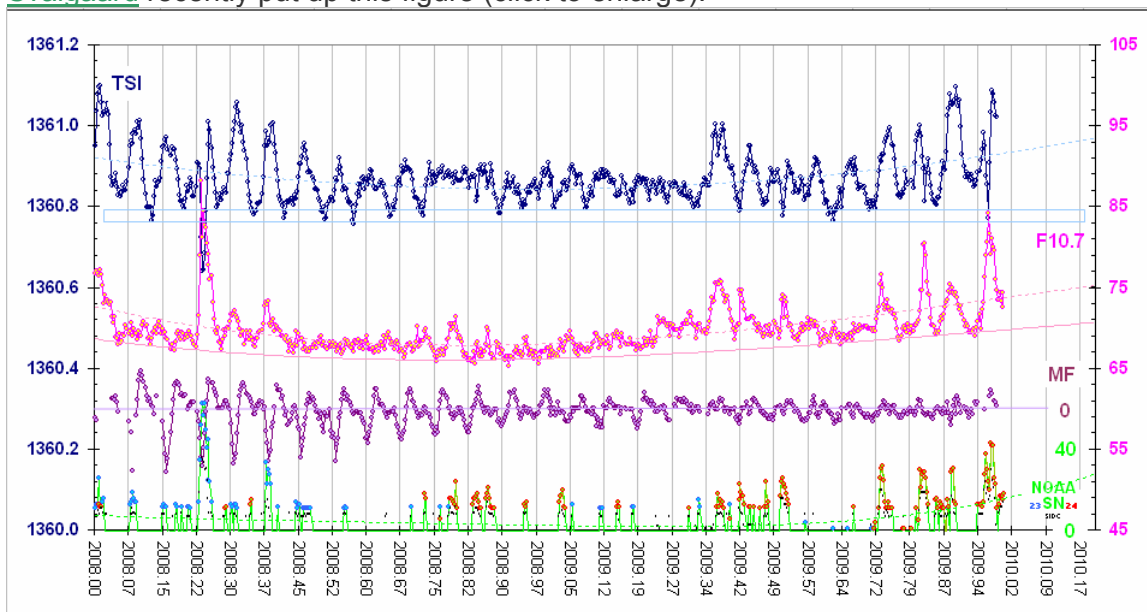
The 2000s were [the hottest decade in recorded history by far](#) — even though we're at "[the deepest solar minimum in nearly a century](#)." The 2000s were a full 0.2°C warmer than the 1990s, which of course had been the hottest decade on record, 0.14°C warmer than 1980s (according to the [dataset](#) that [best tracks planetary warming](#)). Hmm. It's almost like the warming is accelerating.

There's little doubt the 2010s will be the hottest decade on record, barring multiple supervolcanoes. Yet when the anti-science crowd isn't perversely spending their time trying to stop all efforts to cut global warming pollution that might slow warming, they are perversely trying to convince the public and policymakers we're not warming at all. That's why many of them have been rooting for this deep solar minimum to become a [Maunder Minimum](#), to mute the warming signal and hence the motivation for action for a few more years. Yes, they have a self-destructive streak.

In fact, even if total solar irradiance (TSI) never recovered, we wouldn't have entered a period of cooling since, "the negative forcing, relative to the mean solar irradiance is equivalent to seven years of CO₂ increase at current growth rates," as NASA [noted](#) in January 2009. Heck, even with a La Niña and an unusually inactive sun, 2008 was almost 0.1°C warmer than the hot decade of the 1990s as a whole. And 2009 now seems likely to be the second hottest year on record after 2005. Changes in the sun just ain't the big dog anymore when it comes to driving climate change (see below).

When we last looked at the sun [*please, don't try that at home*], NASA was reporting that the sunspot cycle was about to come out of its depression, if a newly discovered mechanism for predicting solar cycles — a migrating jet stream deep inside the sun — proved accurate (see [National Solar Observatory, NASA say no "Maunder Minimum"](#)).

It now appears TSI is well on its way to recovering, as NASA and others had predicted. [Leif Svalgaard](#) recently put up this figure (click to enlarge):



Spaceweather.com says of its sunspot figure at the top of the page:

The dark line is a linear least-squares fit to the data. If the trend continues exactly as shown (prediction: it won't), sunspots will become a non-stop daily occurrence no later than February 2011. Blank suns would cease and solar minimum would be over.

If the past two years have taught us anything, however, it is that the sun can be tricky and unpredictable. Stay tuned for surprises.

Even as Solar Cycle 24 picks up, it won't affect global temperatures quickly. Again, as NASA explained in January:

Because of the large thermal inertia of the ocean, the surface temperature response to the 10-12 year solar cycle lags the irradiance variation by 1-2 years. Thus, relative to the mean, i.e, the hypothetical case in which the sun had a constant average irradiance, **actual solar irradiance will continue to provide a negative anomaly for the next 2-3 years.**

Also, Solar Cycle 24 has [recently been predicted](#) to be on the wimpy side.

The sun simply isn't a big player in driving recent warming. As a major 2009 study found (see [Another long-debunked denier talking point is debunked again: Changes in the Sun are not causing global warming](#)):

According to this analysis, solar forcing contributed negligible long-term warming in the past 25 years and 10% of the warming in the past 100 years.

And a major 2007 study concluded:

Here we show that over the past 20 years, all the trends in the Sun that could have had an influence on the Earth's climate have been in the opposite direction to that required to explain the observed rise in global mean temperatures.

Related scientific studies on the subject can be found on the excellent debunking website, [Skeptical Science](#). Here's but a few:

- [Erlykin 2009](#): "We deduce that the maximum recent increase in the mean surface temperature of the Earth which can be ascribed to solar activity is 14% of the observed global warming"

- [Benestad 2009](#): “Our analysis shows that the most likely contribution from solar forcing a global warming is $7 \pm 1\%$ for the 20th century and is negligible for warming since 1980.”
- [Lockwood 2008](#): “It is shown that the contribution of solar variability to the temperature trend since 1987 is small and downward; the best estimate is -1.3% and the 2σ confidence level sets the uncertainty range of -0.7 to -1.9% .”
- [Lockwood 2008](#): “The conclusions of our previous paper, that solar forcing has declined over the past 20 years while surface air temperatures have continued to rise, are shown to apply for the full range of potential time constants for the climate response to the variations in the solar forcings.”
- [Ammann 2007](#): “Although solar and volcanic effects appear to dominate most of the slow climate variations within the past thousand years, the impacts of greenhouse gases have dominated since the second half of the last century.”
- [Lockwood 2007](#): “The observed rapid rise in global mean temperatures seen after 1985 cannot be ascribed to solar variability, whichever of the mechanism is invoked and no matter how much the solar variation is amplified.”
- [Foukal 2006](#) concludes “The variations measured from spacecraft since 1978 are too small to have contributed appreciably to accelerated global warming over the past 30 years.”

By one recent estimate, human-caused greenhouse gas emissions are responsible for “80 to 120% of the warming” in recent decades (see [“What percentage of global warming is due to human causes vs. natural causes?”](#))

Human-caused emissions are simply driving climate change to dangerous levels with forcings that dwarf previous natural forcings both in speed and scale (see [“Humans boosting CO2 14,000 times faster than nature, overwhelming slow negative feedbacks”](#)).

And that’s why the time to act is now, so every decade this century isn’t the hottest decade on record, with [unimaginably catastrophic consequences](#) for the health and well-being of our children and grandchildren and their children and grandchildren.

Share

 [Print](#)

This entry was posted by [Joe](#) on Thursday, December 31st, 2009 at 8:32 am and is filed under [Science](#). You can follow any responses to this entry through the [RSS 2.0](#) feed. You can skip to the end and leave a response. Pinging is currently not allowed.

30 Responses to “The hottest decade ends and since there’s no Maunder minimum — sorry deniers! — the hottest decade begins”

1. [Steve L](#) says:

[December 31, 2009 at 11:22 am](#)

I was hoping for another Maunder minimum, not because of self-destructiveness, but because it might buy us some more time.

2. [mike roddy](#) says:

[December 31, 2009 at 11:39 am](#)

Maybe it’s time to go on offense. Here’s my contribution, though the illustrations are better than my text:

<http://www.buffalobeast.com> Pants on Fire

This magazine is popular on campuses. The young are more frustrated and angry than a lot of people realize.

3. [Leif](#) says:

[December 31, 2009 at 12:08 pm](#)

#3:

William commented on another post and he has great graphs and pictures on his site. I would like to give a shout out. <http://WilliamCalvin.com/>

4. *From Peru* says:

[December 31, 2009 at 12:42 pm](#)

A new Maunder Minimum would be a great thing:

IT WILL SHUT UP ONCE FOR ALL THE "IT'S THE SUN" NONSENSE.

What can they say to conter something like:

"The Warmest decade(2010-2020) ocured during a protracted Solar Minimum"?

They will have trouble with all the nonsense they have said in those years!

[*JR: No scientific evidence can convince the anti-science crowd.*]

5. *Steve Bloom* says:

[December 31, 2009 at 1:05 pm](#)

Sorry, *From Peru*, and I suspect *Leif* will agree with my assessment, the people who have been pushing and believing in the "new Maunder Minimum" meme will have no trouble at all shifting to the next line of argument.

6. *T Lehman* says:

[December 31, 2009 at 1:19 pm](#)

2009 is the 9th year of this decade. The 10th year of the decade is starting off very cold. Things are not the same after Climategate.

7. *Old Chemist* says:

[December 31, 2009 at 1:32 pm](#)

“Hottest decade in recorded history so far” ...!!!!

Ha Ha Ha Ha — you are just too much —

GIGO: (global temperatures based on ‘homogenized’ data aren’t worth s***t. Whatever happened to rigor in science.

8. *PeterW* says:

[December 31, 2009 at 2:12 pm](#)

With your pathetic schoolyard taunting, perhaps Old Chemist, you should rename yourself Adolescent Chemist.

9. *caerbannog* says:

[December 31, 2009 at 2:20 pm](#)

*GIGO: (global temperatures based on 'homogenized' data aren't worth s***t. Whatever happened to rigor in science.)*

Well, it turns out that "homogenization" doesn't do much to the global temperature numbers. Average raw data all over the globe, and you get an answer very similar to what you get when you average the homogenized data. It is only on local scales that you will see significant differences between "raw" temperatures and "homogenized" temperatures.

See <http://www.realclimate.org/wp-content/uploads/CRUobject.jpg> for more.

10. TomG says:

[December 31, 2009 at 2:37 pm](#)

T Lehman...

When did the 2000's decade start?

Would you agree January 1, 2000?

Would that not make the year 2000 the first year of the decade?

Making 2001 the second year of the decade?

Would you consider someone born June 1, 2000 to be born in the 1990's decade?

11. Kent says:

[December 31, 2009 at 2:53 pm](#)

“Hottest Decade in Recorded History” is hard to put into context without knowing what is meant by recorded history. You link to a graph going back to 1850. Recorded history goes back to maybe 4000 BC. So is this the hottest decade in the last 160 years? That is less concerning than if it were the hottest decade in the last 6000 years.

I have the same quibble with “lowest level of summer arctic sea ice ever recorded”, which appears regularly. We only have 30 years of satellite data, so that trend line is always shown. I’ve always been a little puzzled about how you can make a huge deal out of 30 years of ice decline, when you regularly tell deniers that you need decades worth of data to establish a meaningful temperature trend.

So continue to make the case. But be specific, and be consistent about what time frames are needed to establish a meaningful trend.

12. *caerbannog* says:

[December 31, 2009 at 3:17 pm](#)

Kent,

Take an hour to watch this video: http://www.agu.org/meetings/fm09/lectures/lecture_videos/A23A.shtml

13. *Leland Palmer* says:

[December 31, 2009 at 3:33 pm](#)

Yes.

Even if the sun/climate connection was real and significant, what happens when solar activity returns to normal? Wouldn't the masked warming due to CO2 forcing kick in with a vengeance?

I was also hoping for a new Maunder Minimum, to gain us some time, even though I know better.

14. *K. Nockels* says:

[December 31, 2009 at 4:48 pm](#)

Joe you asked the question once, I can't remember if it was in 2008 or 2009, What did the readers of CP think it would take to convince everyone that Global Warming/Climate Change was happening now and get us all on the same page for solutions remember? Until we have a great big very bad event that is beyond doubt caused by climate change I can't see hardcore deniers changing their tune. Like I say all the time just keep up the good work of getting out the facts, and try to help with the messaging. Thanks for all the information and heads-up on the ongoing denial sphere.

15. *Jay Alt* says:

[December 31, 2009 at 5:08 pm](#)

Kent #11

Yes and satellite pictures of the Arctic ice cap exist only since 1978! However this ignores the fact that since the 16th century sailors and merchants tried to sail over the top of North America. Oddly enough, not one succeeded – until a Canadian supply ship last November.

Scientists are studying new sets of seabed cores to identify the plankton varieties in the Arctic. They'll be able to tell when the cores contain open water vs. under ice types. Those studies have the potential to extend the record of the ice cap coverage far back in geologic time. And I'd be surprized if they don't.

In an Alps glacier, Otzi man was found in the late 1990s after having been buried for 5,200 years. His body was fully preserved, never rotting or suffering exposure or thaw. And there are many examples of vegetable matter recently exposed from receding glaciers. Radiocarbon and cosmogenic techniques and the lack of decay show the age and history (ice covered) of these plants and stones.

16. [Lou Grinzo](#) says:

[December 31, 2009 at 5:10 pm](#)

Someone linked above to Richard Alley's AGU presentation. I highly recommend it. It's a devastatingly effective treatment, and he's also a very animated and interesting speaker.

As for the question of what kind of event would it take to wake up the mainstreamers and/or shut up the deniers: Don't bet the house on it, because there's almost no chance it would happen. Any one, gigantic event—e.g. hurricane levels Houston or Miami or Washington DC—would be dismissed as a fluke and simply cause another round of arguments. Any long-term trend, like Australia being all but destroyed by drought, or the Himalayan glacier melting enough to create half a billion climate refugees, would take so long to unfold that it would be a clear signal that we were already screwed beyond belief and had lost the PR war.

Never forget that the deniers are playing by a radically different set of rules. We're trying to build something (an understanding among non-experts of the basics of climate change and the ramifications of our emissions), and they're doing anything they can to destroy it. While we try to educate people about a lot of counter-intuitive details, they're telling people to be selfish and myopic.

17. [GFW](#) says:

[December 31, 2009 at 5:40 pm](#)

Jay Alt, I'll say it before some denier does. The Canadians were successful twice back in the 40s – google “St. Roch”. However, on the West-East try it took 3 seasons. The subsequent East-West try only took one season, so deniers like to point to that. However, everything I learned about the St. Roch when I was a kid (I've walked around it in the Vancouver maritime museum) suggests they were moving pretty slowly and following thin “leads” in the ice – ice that would be considered pretty solid from space, had there been any satellites at the time. So just because the St. Roch went through the NW passage, doesn't mean the passage was open the way it was in 2008. If memory serves, the St. Roch is just over 100 ft long, 20 or less across at the beam, and had a really shallow draft. This is a wooden ship we're talking about, BTW.

So while it's certainly possible that the 40s had a little less ice than the 60s, you are correct to say that there is no reason to believe there has ever been less ice than now, in the recorded history of humans visiting the arctic region. I suspect that despite the “green”land propaganda, the records of where the vikings actually reached would agree with this overall picture.

18. *Rabid Doomsayer* says:

[December 31, 2009 at 6:00 pm](#)

Our leaders need to speak directly to the people. Do an address to the nation. That is the only way to get past the denier press. Our leaders need to spell out each and every nasty little detail doing the cheap chemistry tricks, detailing the history, point out the horrors that are inevitable and the horrors that might be.

When Barak spells out the cost of preparatory adaption, and the far greater cost of failing to adapt, mitigation costs do not seem so bad. Go and say it, New Orleans will have to be abandoned.

If our leadership does not show the people that plans are in place, the big disaster of 2012 could be that the rest of the people finally get what is ahead and over react. For example if we shut down the coal power generation without any alternative in place, that would be a little more damaging to the economy than a small carbon tax.

Forget the paleoclimatological evidence for the last 800,000 years, what is already inevitable is well out of that box. We are in trouble deep. Our leadership is fast asleep.

19. *gofer* says:

[December 31, 2009 at 6:04 pm](#)

How many hundredths of a degree "hotter" was the "hottest"? Why is it that nobody ever states the actual temperatures? Maybe because they are insignificant? How HOT was it??

20. *TomG* says:

[December 31, 2009 at 6:18 pm](#)

gofer...

It's in the first paragraph.

21. *Dano* says:

[December 31, 2009 at 7:00 pm](#)

Not sure what happened above, but that was me at 21

Starting over:

What Lou and caerbannog said. If you still have low-wattage relatives who think that GLOBUL WARMINS A SCAY-UM, watch the lecture and go forth. Very well said.

Best,

D

22. [Leif](#) says:

[December 31, 2009 at 8:18 pm](#)

How about a required reading list to get government subsidies or contracts. Lobbying privileges.. Bailouts... Big tax benefits. Hell, give me a few minutes and I can get a long list.

23. *David Harrington* says:

[December 31, 2009 at 8:25 pm](#)

If you truly believe that we have just lived through the warmest decade then your powers of self-delusion know no bounds Joseph.

Have a Happy and Prosperous New Year.

24. *Bob Wallace* says:

[December 31, 2009 at 9:07 pm](#)

David Harrington – by your measurements what was the warmest decade since the beginning of the Industrial Revolution and where might we find the data you used?

Voices in your head do not count as legitimate datasets....

25. *Logic Deferred* says:

[December 31, 2009 at 9:23 pm](#)

David Harrington: For the record, there is a reason why they call it *GLOBAL* warming rather than “your backyard” warming. It has to do with the fact that it has to do with the entire planet — you know, the “*GLOBE*” rather than just and only your back yard.

The reason thinking people believe they’ve just lived through the warmest decade on record is because it is a *fact* that they have. This fact is not refuted by the seasonal reappearance of winter, or the fact that it snows or rains today. It is established by the careful, meticulous and methodologically sound procedures of logically valid and scientifically robust procedures of inquiry.

26. *Gail* says:

[December 31, 2009 at 9:33 pm](#)

STOP talking about the temperature.

Talk about the destructive effects of toxic fossil and biofuel emissions. They are LETHAL to humans, animals, and plants, those on land and those in the sea.

This is already well documented and proven – if ignored. You don't need any computer models to demonstrate that burning coal, oil, gasoline, and ethanol KILLS people and animals and fish and plants. Not in the future, or somewhere far away – HERE and NOW.

We should scream at the Environmental Protection Agency and the Department of Environmental Protection and the liars and the USDA and the US Forestry Service and the Department of the Interior, and all the state and local greenwashing agencies who are not fulfilling their missions.

Scientists should stop being cowering minions and get over their own denial – they should be telling people that we are destroying our planet at an unbelievably rapid rate and if we don't all want to end up being cannibals, we should reconsider our entire political, social, and economic paradigms.

Happy New Year!

27. *Lore* says:

[December 31, 2009 at 9:42 pm](#)

David Harrington:

You're right, there are warmer ones to come.

28. [Biko Lang](#) says:

[December 31, 2009 at 11:21 pm](#)

Joe

you need to write about this , BIKO

,

re

No Rise of Atmospheric Carbon Dioxide Fraction in Past 160 Years, New PAID PR
PRESS RELEASE SAYS

ScienceDaily PR website puts out this PR lie today: (Dec. 31, 3009) — Most of the carbon dioxide emitted by female and male human activity does not remain in the atmosphere, but is instead absorbed by the oceans and terrestrial ecosystems. Oh yeah? Says who? In fact, only about 45 percent of emitted carbon dioxide stays in the atmosphere. Oh yeah? Says who?

Adapted from materials provided by American Geophysical Union, via EurekAlert!, a PAID PR service of AAAS.

Journal Reference:

Knorr, W. Is the airborne fraction of anthropogenic CO₂ emissions increasing?
Geophysical Research Letters, 2009; 36 (21): L21710 DOI: 10.1029/2009GL040613

Need to cite this piece of PAID PR bullshit crap story in your blog essay, paper, or report? Use one of the following formats:

APA

MLA American Geophysical Union (2009, December 31). No rise of atmospheric carbon dioxide fraction in past 160 years, new research finds. ScienceDaily. Retrieved January 1, 2010, from

<http://www.sciencedaily.com/releases/2009/12/091230184221.htm>

Note: If no author is given, the source is cited instead.

29. *riverat* says:

[December 31, 2009 at 11:39 pm](#)

On the decade argument, technically the decade started in 2001 and ends next year. This is because there is no year zero. It went from the year -1 to the year 1. So the 1st decade starts in 1 and ends in 10, the 2nd decade starts in 11 etc. But it's more natural for most people to think the decade is 2000 to 2009 and if all you're doing is counting 10 year periods for comparison with each other it doesn't matter where you start as long as the counting is consistent. I think we ought to just add an imaginary year zero between the years -1 and 1 and make it easy on everyone.

30. *Bob Wallace* says:

[January 1, 2010 at 1:10 am](#)

Well, the lack of a zero is true for the Gregorian calendar, and its predecessor, the Julian calendar.

But astronomical year numbering does include a year zero. On the Gregorian calendar the astronomical year zero is 1 BC. So, I think we can easily count 2010 as the start of the decade.

Furthermore, common usage sets the start of a decade when the last digit changes from 9 to 0....

