

GSM - Grand Solar Minimum. The real "Climate Change" existential threat is right around the corner. Do the Research!

CSS-27a

Is CO₂ Really the Primary Climate Driver?

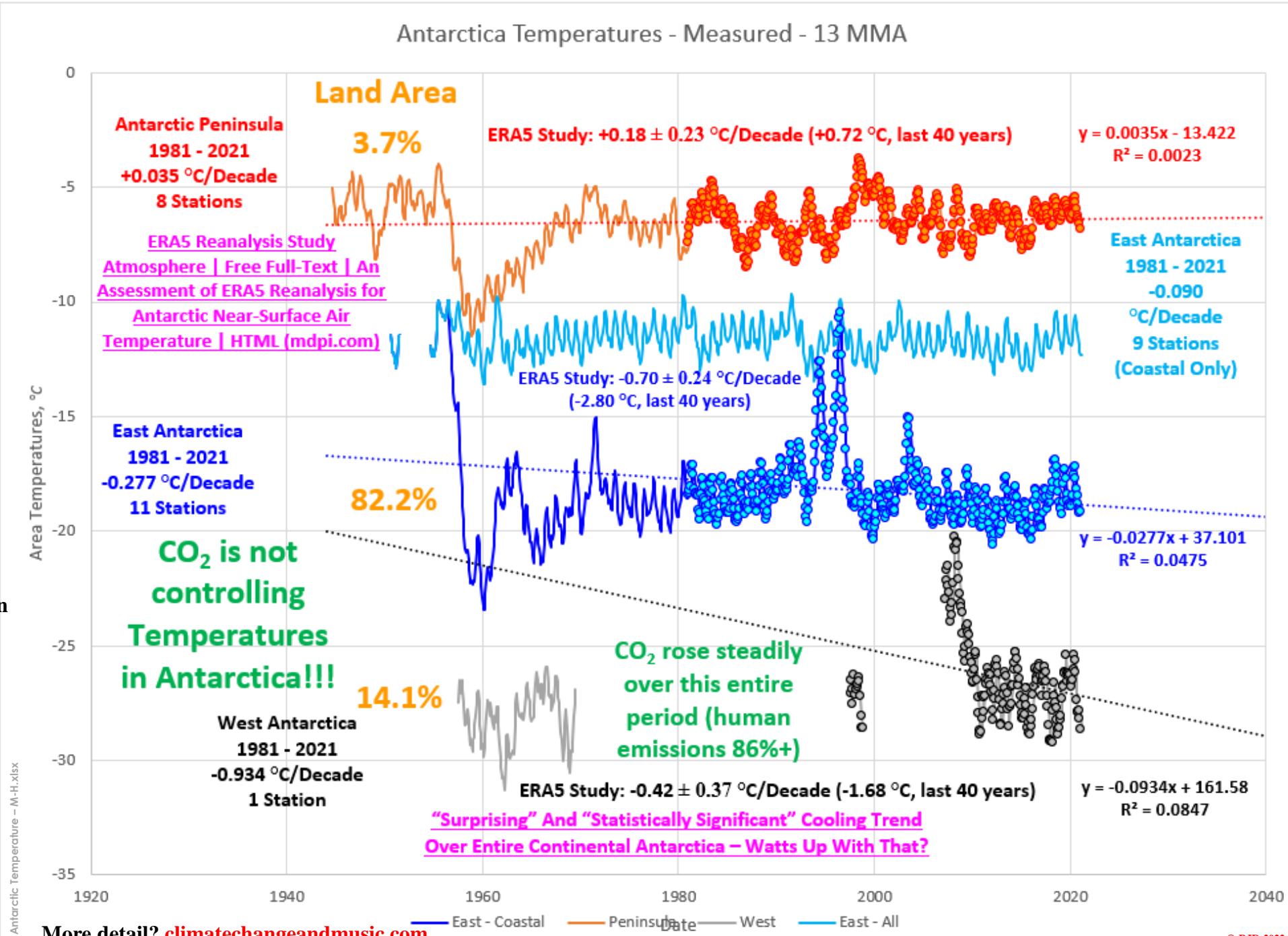
In Antarctica, NO!!

The temperatures in Antarctica have been declining for 40 years culminating in the coldest ever 6 month period ever recorded in Antarctica. The temperature data plotted to the right is just the arithmetic average of the weather stations. East and West Antarctica (96.3% of the land area) both show a decline in the arithmetic average and in Zhu et al's 2021 much more comprehensive study "An Assessment of ERA5 Reanalysis for Antarctic Near-Surface Air Temperature". More detail is provided in my CSS-13 - A Look at Homogenization post. What the data/study shows is that CO₂ is not playing the dominant role in the Antarctic climate. The steady atmospheric CO₂ concentration increases over this period do not fit the CAGW narrative very well. Most of humanity's CO₂ emissions have occurred since 1950 (86%+). Also, not good for the narrative.

CO₂'s Role Antarctica

More detail is provided in my CSS-13 - A Look at Homogenization post. What the

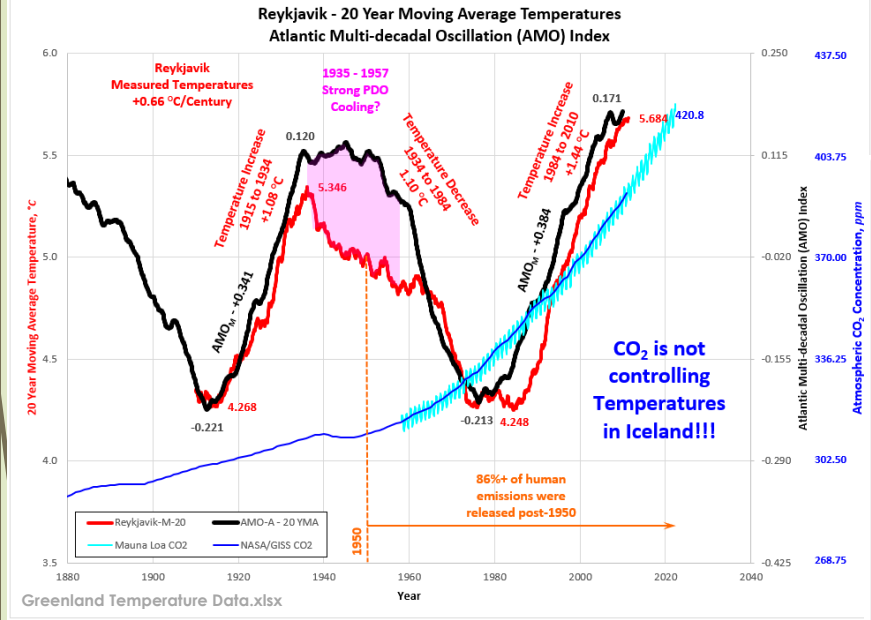
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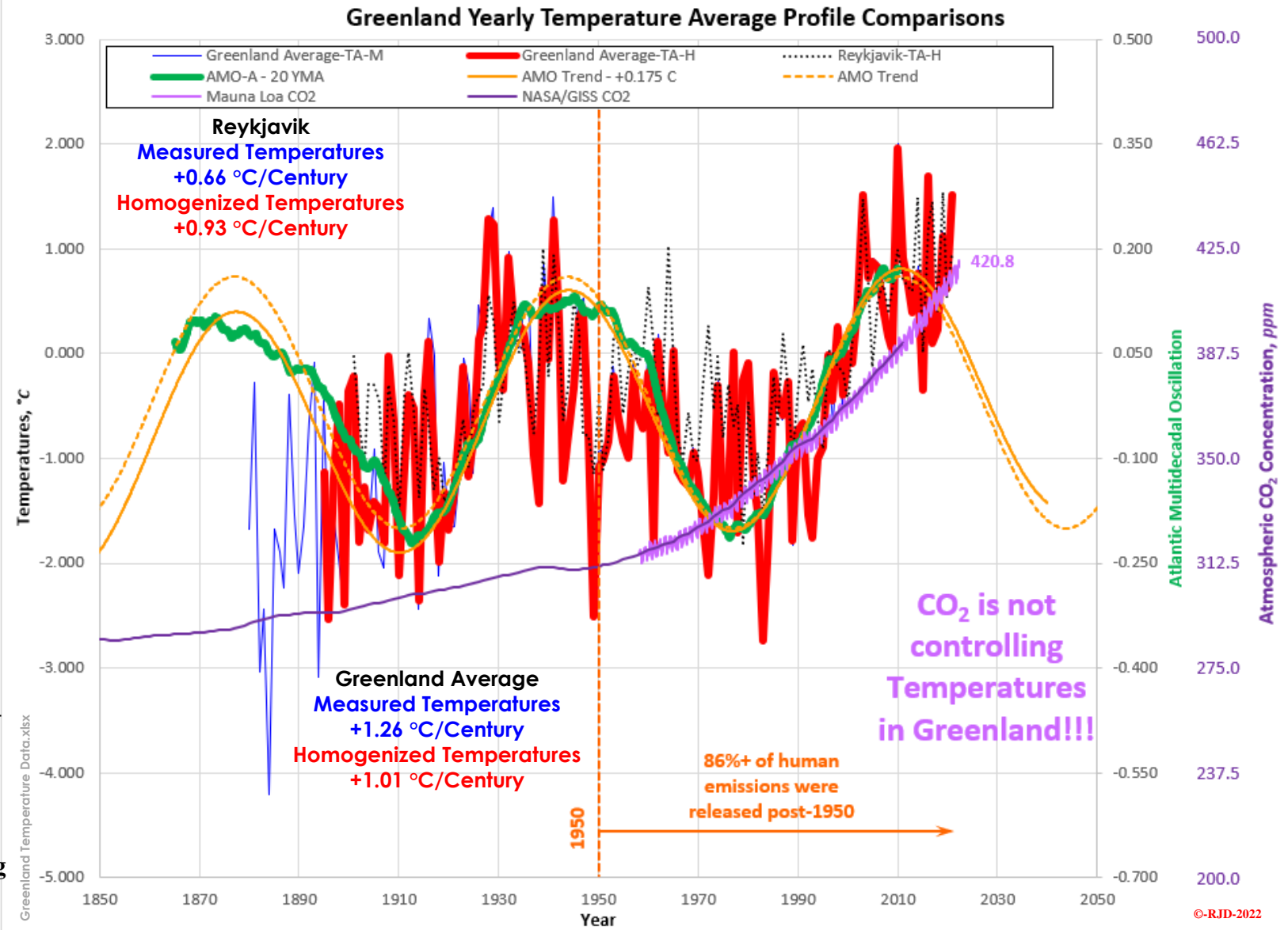
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CSS-27b Is CO₂ Really the Primary Climate Driver? In Greenland/Iceland, NO!! More detail? climatechangeandmusic.com



Temperatures in Antarctica strongly suggest that the Antarctic Ice Sheet is not destined to melt away anytime soon, given that East and West Antarctic temperatures have been declining at a rate of 7.0 and 4.2 °C/century (respectively, 96.3% of the land mass). Not much support for the CAGW alarmist narrative. So, what is happening in the Northern Hemisphere's largest ice-covered land mass (Greenland/Iceland)? Well, the temperatures (overall) are increasing.



But those temperature increases since the early 1880s, are rising at a very moderate overall rate (± 1.0 °C/century) with significant short-term erratic fluctuations with a longer-term sinusoidal oscillation. None of which fits with the CAGW alarmist narrative. The obvious driver in Greenland/Iceland is (not surprisingly) the Atlantic Multidecadal Oscillation (AMO). As shown in my previous post (CSS-26 – Greenland/Iceland – AMO/PDO/CO₂ Distribution), based on the AMO_M temperature contribution over the 1912 to 1935 period, CO₂'s contribution to the 1976–2010 warming would be around 0.23 °C (16%) based on just AMO_M, increasing to 0.66 °C (45.8%) using an AMO_M/PDO_M consolidation. A more detailed look at Greenland/Iceland's temperature data is available in my CSS-23 – Greenland/Iceland – Homogenization. CO₂'s share of warming will drop as other parameters (solar, PDO, ENSO, etc.) are included and CO₂ is not the main climate driver here.

CO₂'s Role Green/Iceland

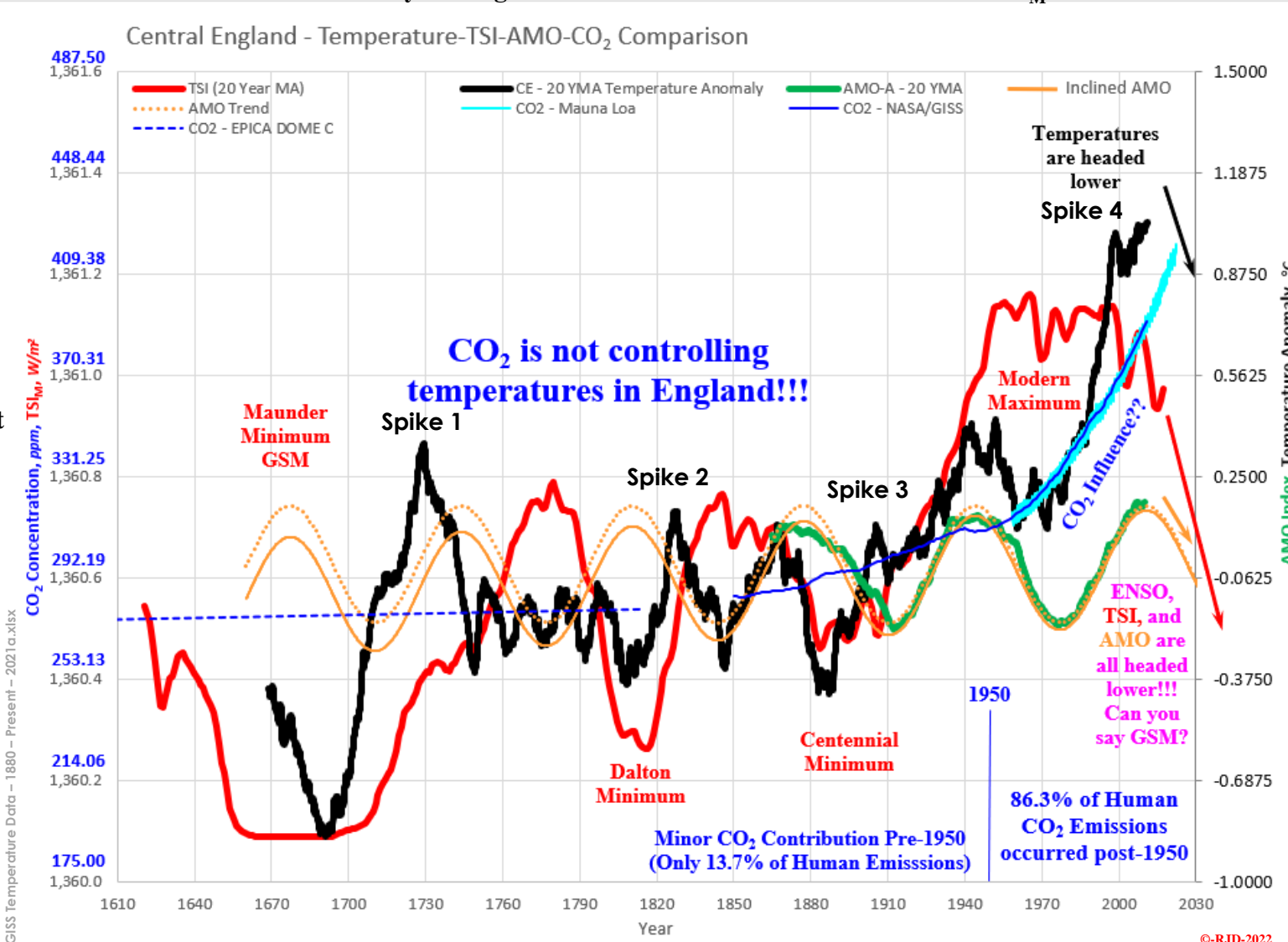
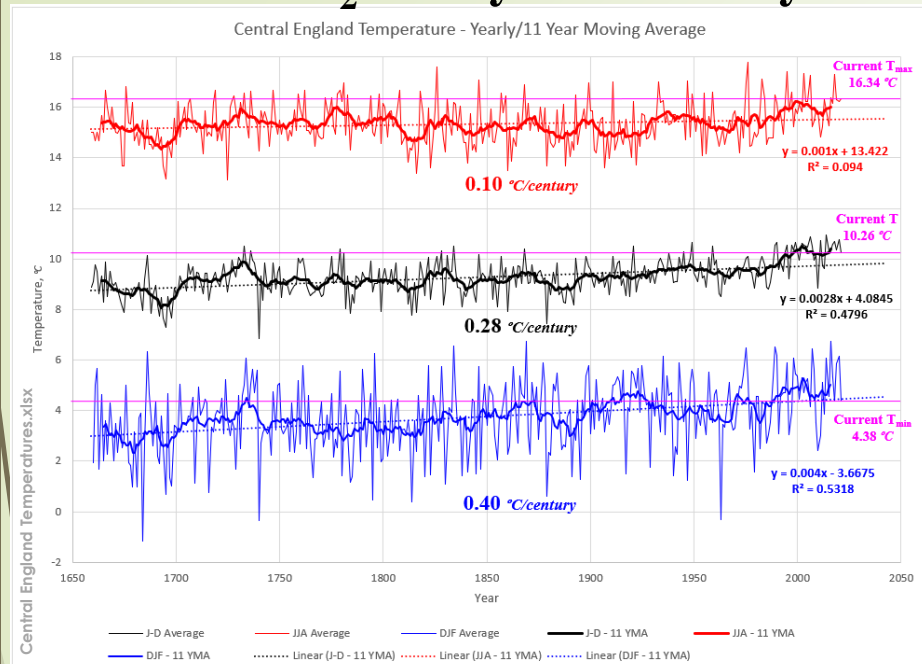
Greenland/Iceland – Homogenization. CO₂'s share of warming will drop as other parameters (solar, PDO, ENSO, etc.) are included and CO₂ is not the main climate driver here.

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CSS-27c Is CO₂ Really the Primary Climate Driver? In Great Britain, NO!!

More detail? climatechangeandmusic.com

No help for the CAGW alarmist narrative coming out of the Central England Temperature (CET) data, either. The CET data goes all the way back to 1659 (in the middle of the Maunder Minimum, the last Grand Solar Minimum (GSM)). The three potential climate drivers shown here (TSI_M, AMO_M and CO₂) all play a role in the CET. Through most of the CET history, CO₂ is a minimal (insignificant) factor. Post-1950, CO₂ may be playing a more prominent role, but the AMO_M is still significant and TSI_M is just beginning to exert its influence since the turn of the century. Strange that the "PAUSE" correlates to a minor TSI_M decline?



I have included a more detailed breakdown of temperatures here (above). The summer temperatures have been increasing at the "blistering" pace of 0.10 °C/century. Winter temperatures increased at a higher, "horrific" pace (0.40 °C/century). The overall average temperature is rising at a beneficial rate of 0.28 °C/century.

CO₂'s Role Great Britain

Obviously, these temperatures are not rising faster than the rest of the world, like every other area of the world (CSS-26e). A more detailed discussion on the CET was laid out in an earlier post (CSS-16 - Central England Temperature - Model). The CET can be modelled more closely using AMO, TSI (as a proxy) and CO₂, than just CO₂ on its own. A model using TSI_M (50%), AMO_M (25%) and CO₂ (25%) is shown in CSS-16g. Apart from the four highlighted temperature spikes (active El Nino, homogenization, etc. (?)), the match is very good. CO₂ is certainly not a significant factor in Spikes 1, 2, or 3. Spike 4 would have more CO₂ influence, but CO₂ is not acting alone. The AMO_M is significant.

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CSS-27d

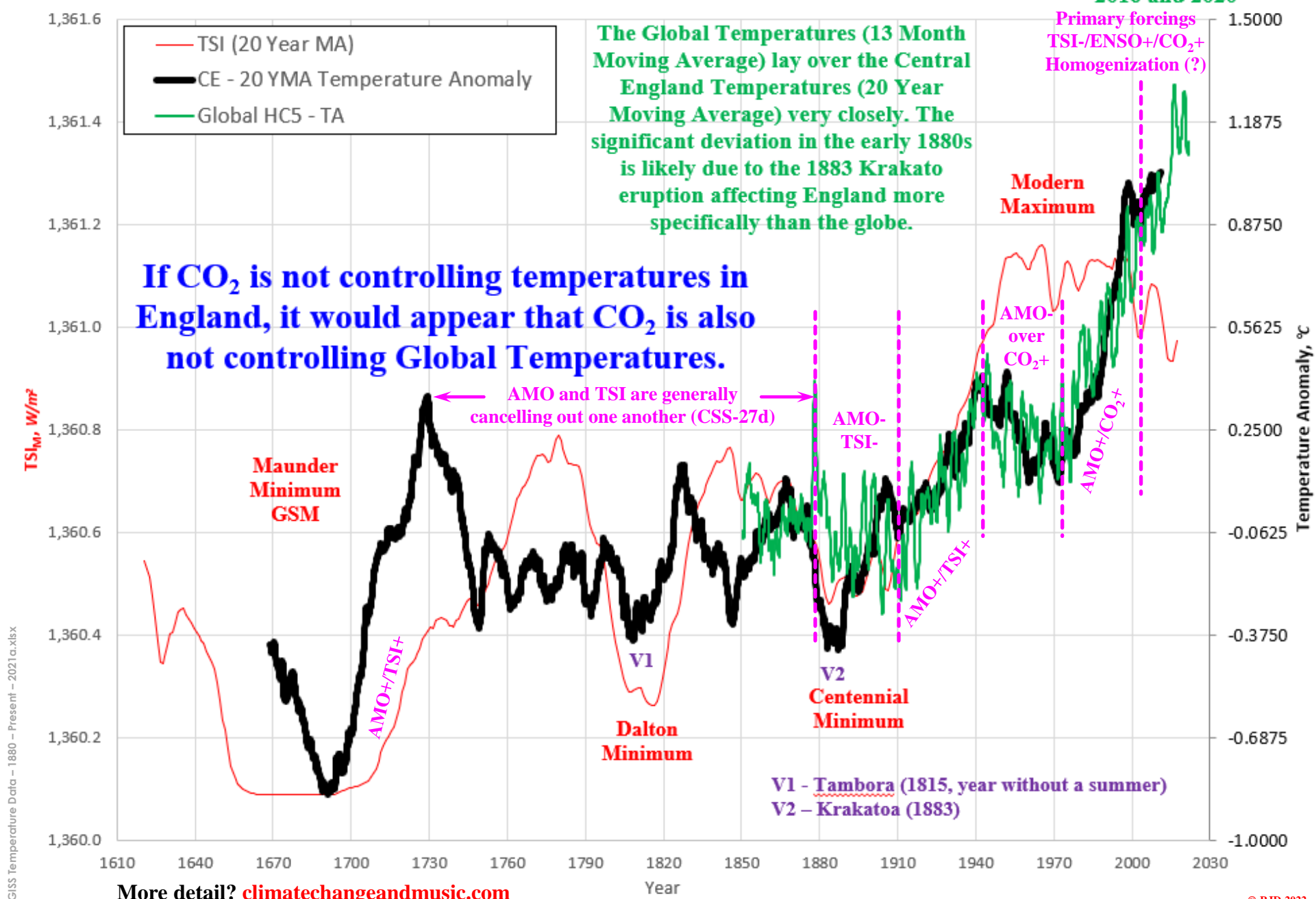
Is CO₂ Really the Primary Climate Driver? CET/Global Comparison

This slide transitions us from the CET to the HadCRUT5 Global Surface temperature estimate. The HadCRUT5 data (green, 13 Month Moving Average (MMA)) fits nicely over the CET (20 Year Moving Average (YMA)). The recent data (2014+) deviates due to the different averaging methods. The early 1880 deviation would likely be due to 1883 Krakatoa Eruption, with more direct effect in Britain than globally. Given the similarities, the global temperatures appear to be strongly influenced by

CO₂'s Role CET/HadCRUT5 Transition

the same forcings laid out in the previous slide. Over the MTR, the 30-year AMO cycle is very visible with the AMO overpowering CO₂ from 1940 to 1975, AMO and CO₂ moving in unison from 1975 to 2005. Prior to 1950, anthropogenic CO₂ has only minor influence. Post 2014, TSI appears to overpower CO₂, with ENSO warming.

Central England/HadCRUT5 Surface Temperatures-TSI Comparison



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CSS-27e

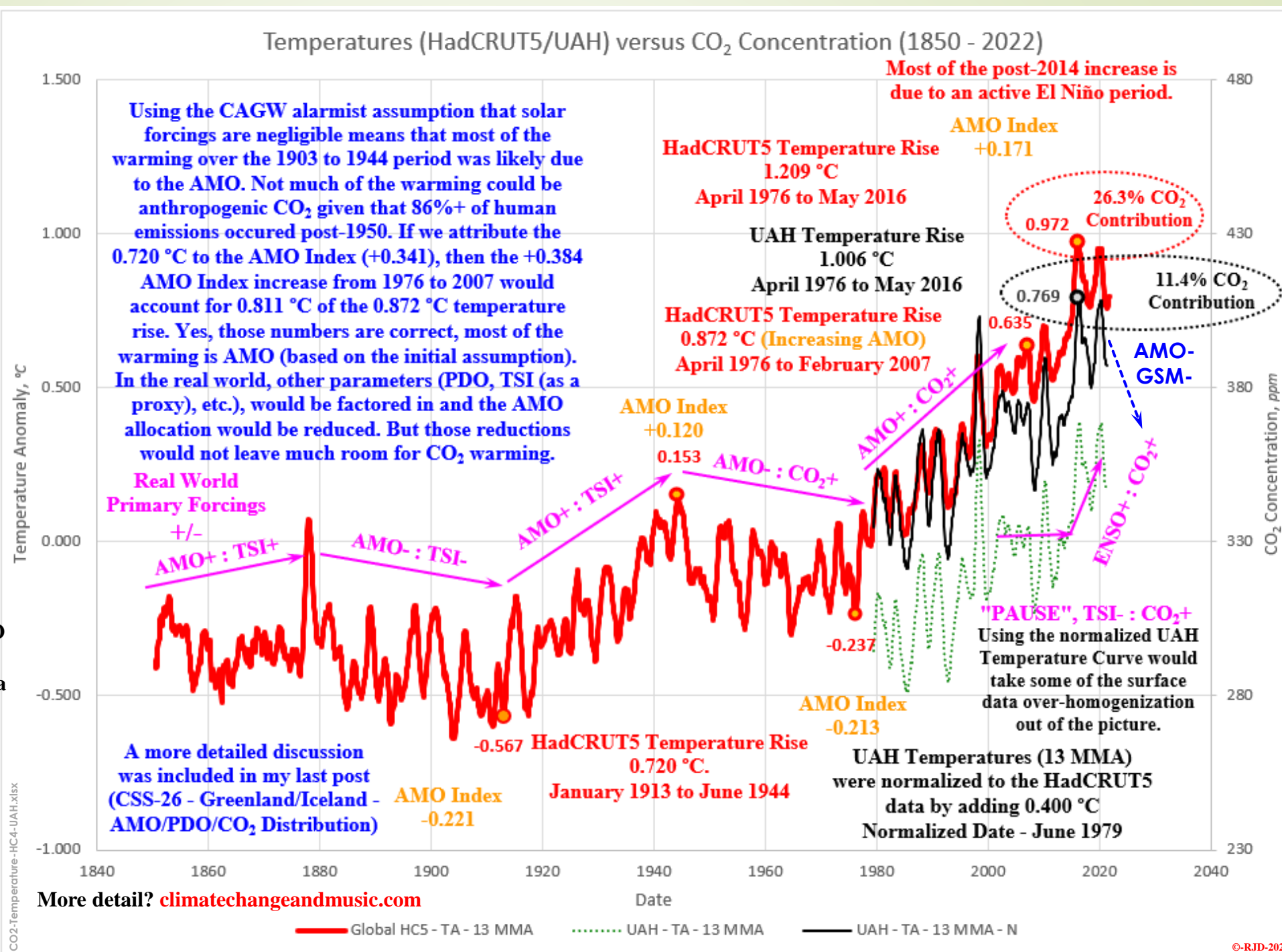
Is CO₂ Really the Primary Climate Driver? Over the MTR, NO!!

Over the MTR, the global temperature is being influenced by many natural forcings. CO₂ is not the only climate driver. Prior to 1950, CO₂ was only a minor player, since 86%+ of our anthropogenic CO₂ emissions occurred post-1950. Solar Activity influences are visible (CSS-27d) pre-1950, during the 1970s "the Ice Age is Coming Scare" (Cycle 20 - low sunspot number) and the turn of the century where a minor TSI decline was overpowering CO₂ (the

PAUSE). The AMO/PDO/ENSO were active throughout, with a particularly

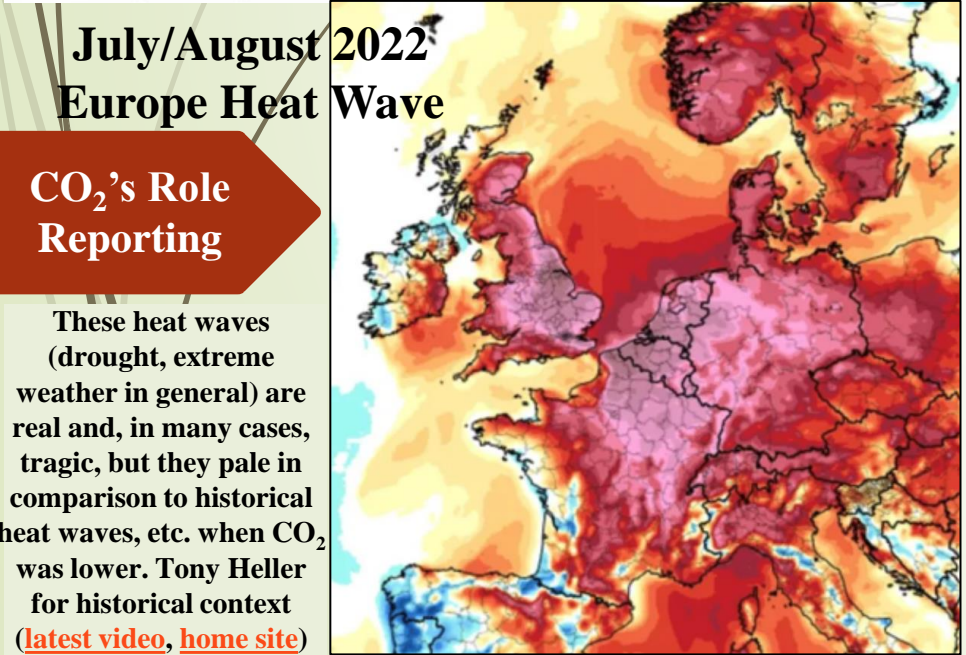
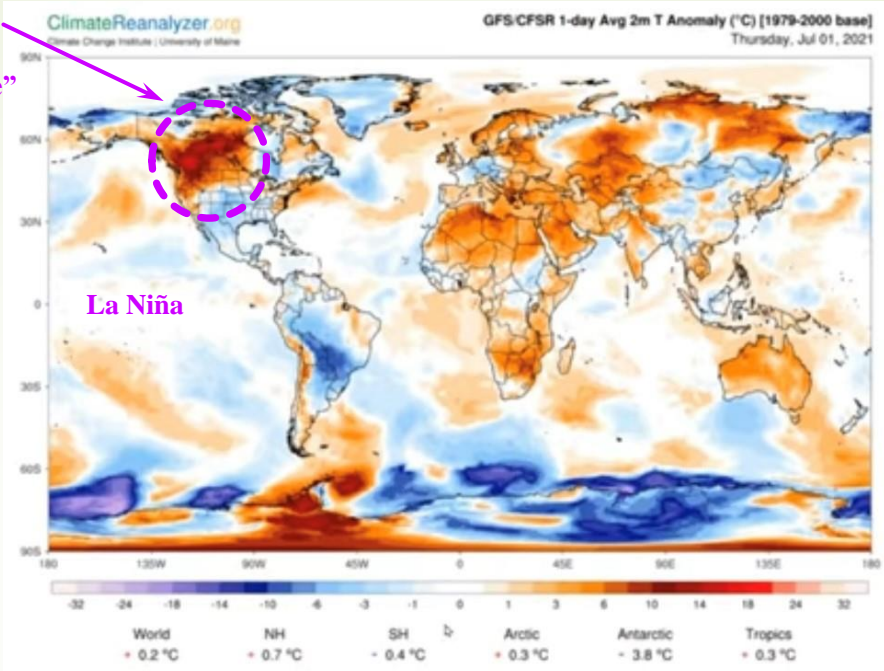
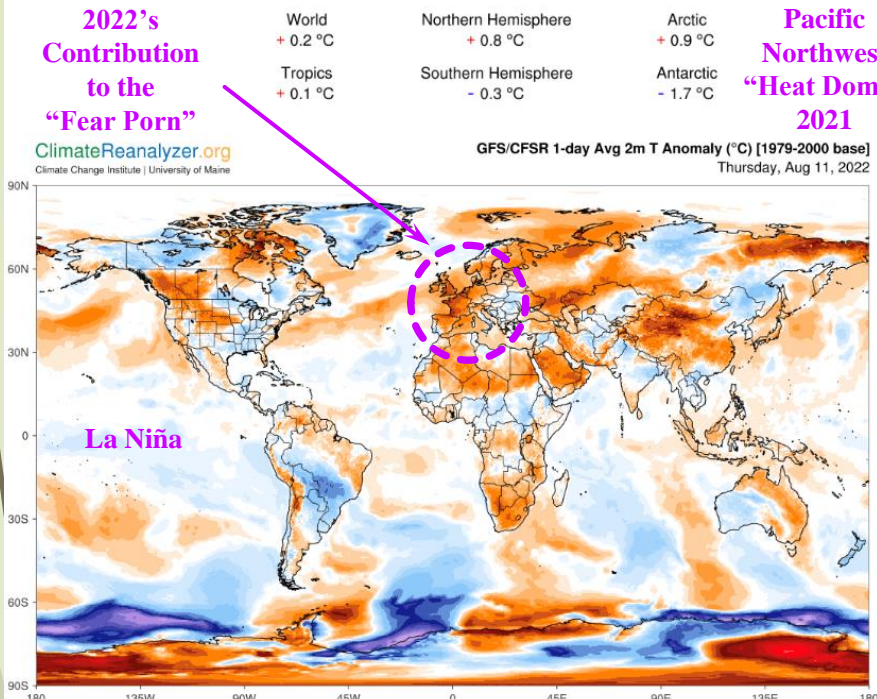
CO₂'s Role HadCRUT5

strong positive ENSO cycle beginning in late 2015. Temperatures since February 2016 have declined around 0.5 C. What do you think will happen when the AMO fully transitions to its cold phase and the cooling associated with the Grand Solar Minimum (GSM) we are just entering really kicks in? Cold is far more deadly than Heat!!!

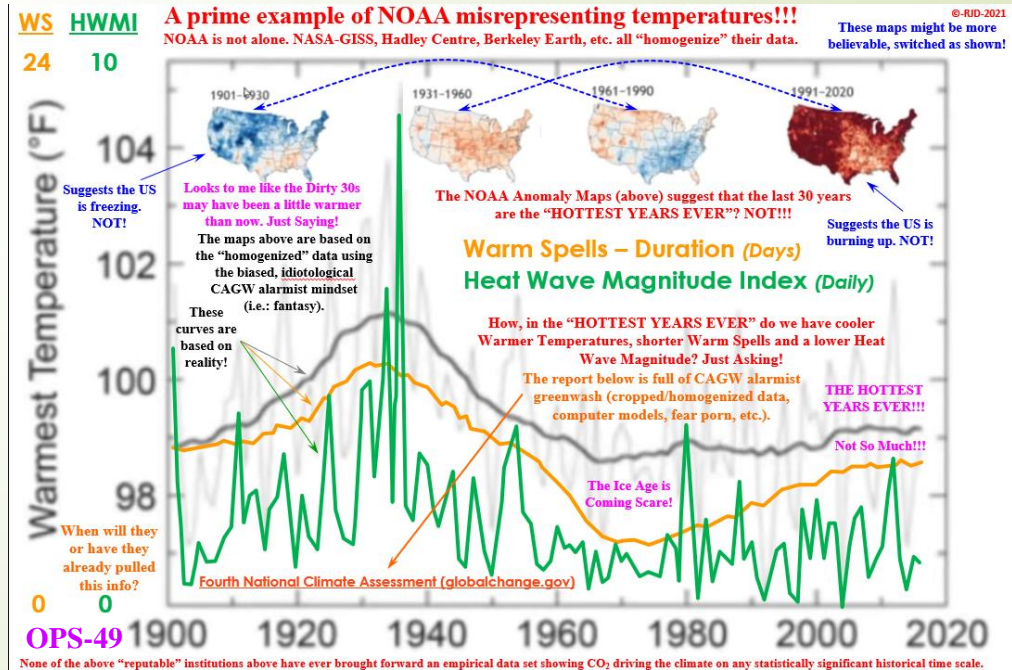


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CSS-27f Is CO₂ Really the Primary Climate Driver? Based on Reporting, You Would Think So!!



So, what is happening globally? Well, generally the same thing that happens every year. The alarmist media hyperventilates over every heat wave and ignores every cold spell. Those heat waves and cold spells that happen every year. What has changed is the reporting style. This year a nice summer day is shown as a bright, scary, hair on fire red as shown to the left and top right. But globally, temperatures last year and this year were only +0.2 °C above the 1979 – 2000 year average. Not scary, not dangerous, CO₂ is not a problem. To the right (OPS-49), the US had real heat problems in the 1930s (Fourth National Climate Assessment 2018).



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CSS-27g

Is CO₂ Really the Primary Climate Driver? Over the pre-MTR Holocene, NO!!

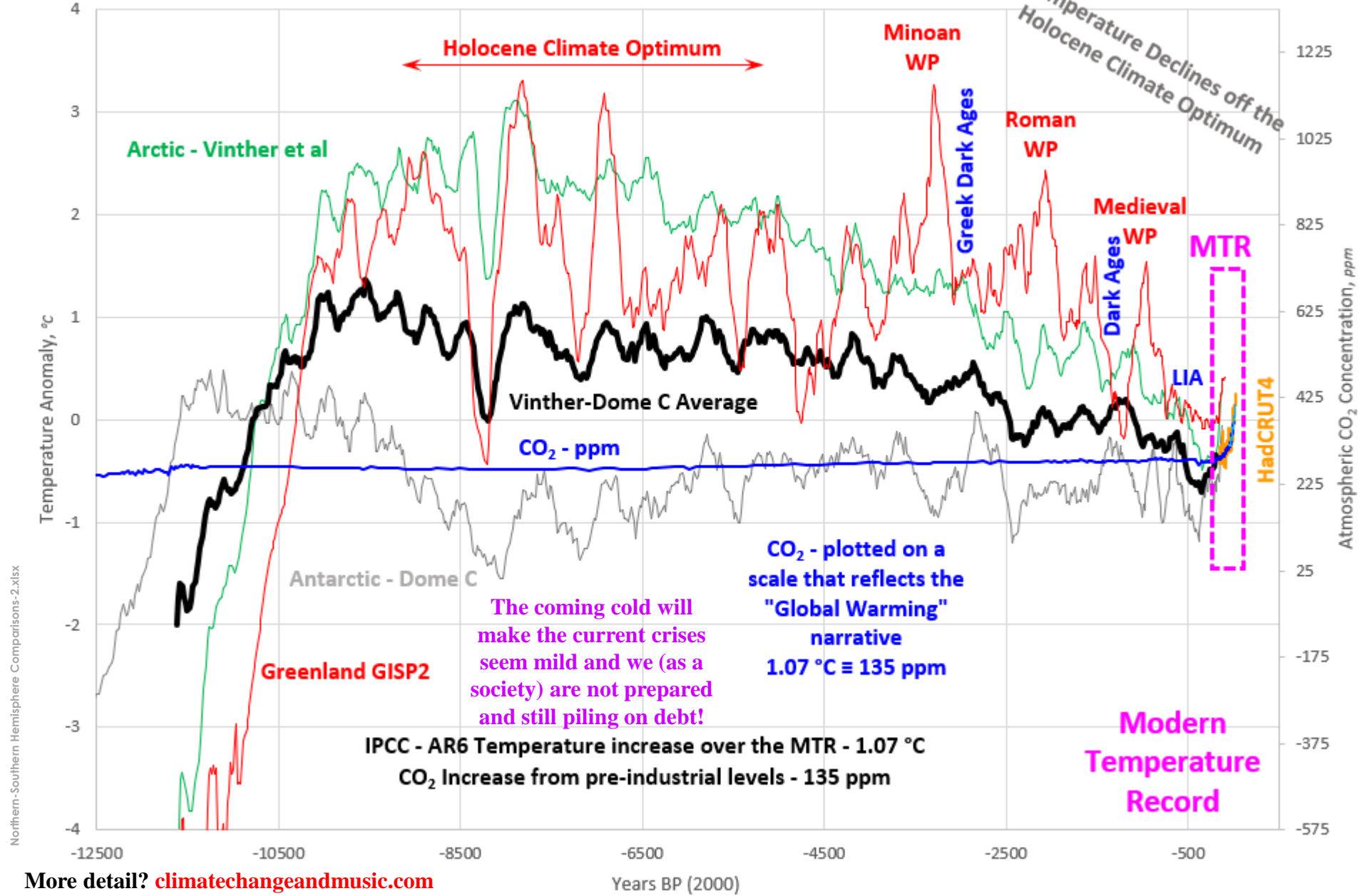
You do not have to look any further than the pre-MTR Holocene to see how important natural forcings are to our climate system. Over the pre-MTR Holocene, CO₂ was essentially flat. Yet somehow, temperatures still seemed to fluctuate significantly. Those natural forcings (primarily solar or solar related) were still active during the MTR and will still be active in the future. The only place they are not active is in the virtual reality world created by the IPCC programmers.

Will the IPCC models recognize the real existential climate threat

CO₂'s Role Holocene

posed by the dual cooling effect of the negative AMO and the GSM (that even NOAA/NASA are forecasting)? No, they will continue to waste trillions on unnecessary, uneconomic, non-pollutant emission reductions (CO₂ and now fertilizer (?)), when the world is already facing severe energy, food and supply chain crises. It will get much worse!

Global Holocene Temperature-CO₂ Correlations



More detail? climatechangeandmusic.com