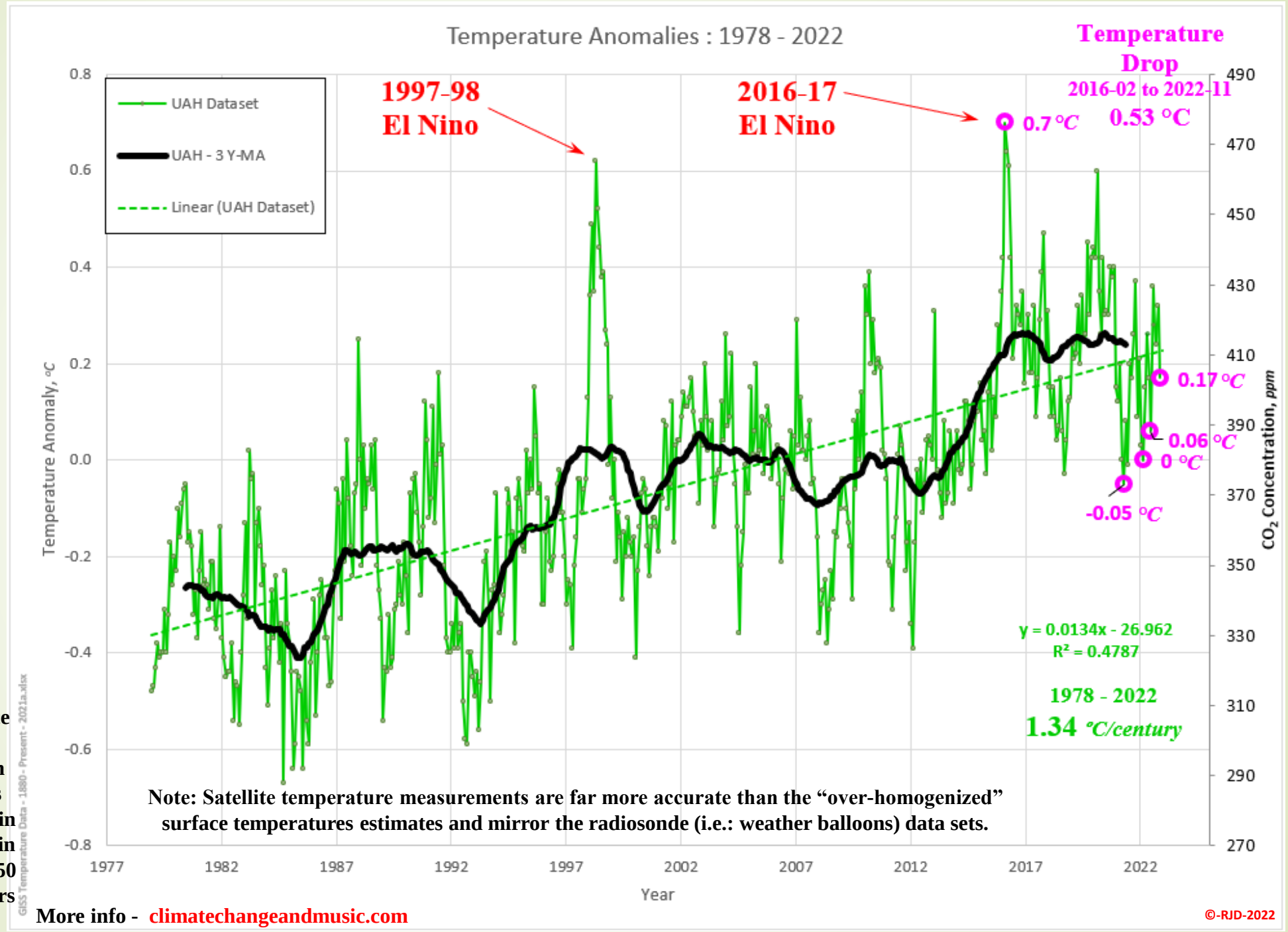
CSS-32a

UAH Lower Troposphere Temperatures 1978 - 2022

The University of Alabama, Huntsville (UAH) has been providing global satellite temperature estimates for a full 44 years now (December 1978 to November 2022) . The most recent global average temperature was +0.17 °C above the 1991 – 2020 average. That is a 0.53 °C drop from February 2016. The Hottest Temperature "EVER" according to the Catastrophic Anthropogenic Global Warming (CAGW) alarmist crowd. The temperatures over that 44 years has increased at a rate of 1.34 °C/century. However, the temperatures have not increased at a nice steady pace like those all powerful atmospheric CO_2 concentrations (shown on the next plot). The monthly numbers fluctuate significantly (as much as ±1 °C in a little over a year). Yet somehow we are in a climate emergency after 1.07 °C over 150 years. There are a lot more climate drivers acting on our planet than just CO_2.

UAH-LT 1978 - 2022



Note: Satellite temperature measurements are far more accurate than the "over-homogenized" surface temperatures estimates and mirror the radiosonde (i.e.: weather balloons) data sets.

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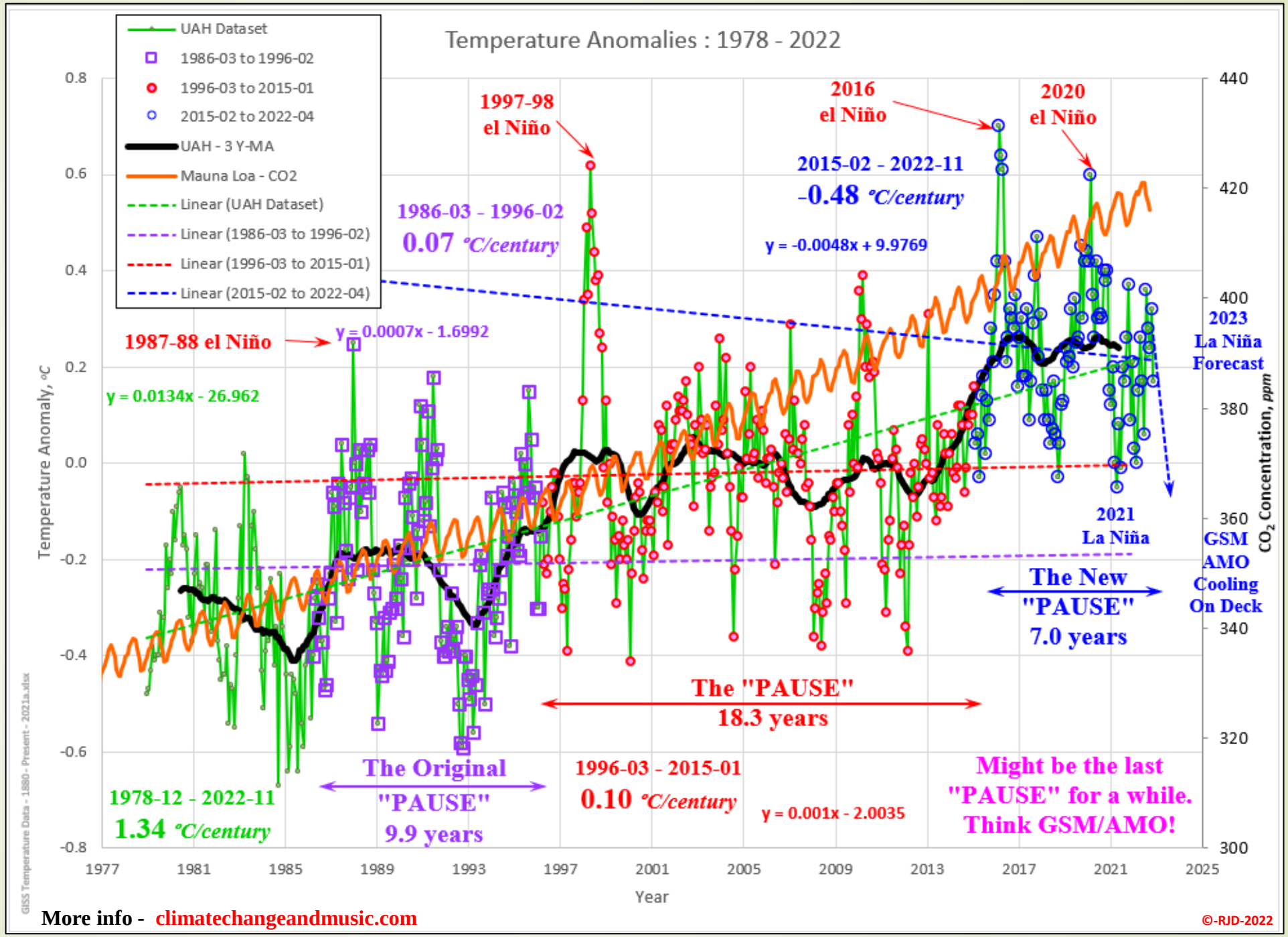
GSM – Grand Solar Minimum. You really should do the Research!

GSM – Grand Solar Minimum. You really should do the Research!

UAH Lower Troposphere Temperatures 1978 – 2022 - Pauses

As mentioned on the previous slide, the atmospheric CO_2 concentration data has been laid over the UAH Temperature data. The CO_2 data was correlated with the early UAH data. Why, you might ask? Well, that is the only period (1978 to 1996) where temperatures have risen at a pace that might be consistent with the CO_2 rise. The most prominent PAUSE began after that rise, in 1996 (for 18.3 years). After the PAUSE, temperatures jumped sharply (not a CO_2 warming response) and then began declining immediately (again not a CO_2 warming response). The general temperature response appears to be strong positive El Niño Southern Oscillation (ENSO) step increases followed by El Niño/La Niña fluctuations that tend to produce the pauses shown here. Remember, the AMO is always active (warming from 1975 to 2005) and solar activity has declined slightly (post-2005), overpowering CO_2 (i.e.: the PAUSE (?)).

UAH-LT 1978 – 2022 PAUSES



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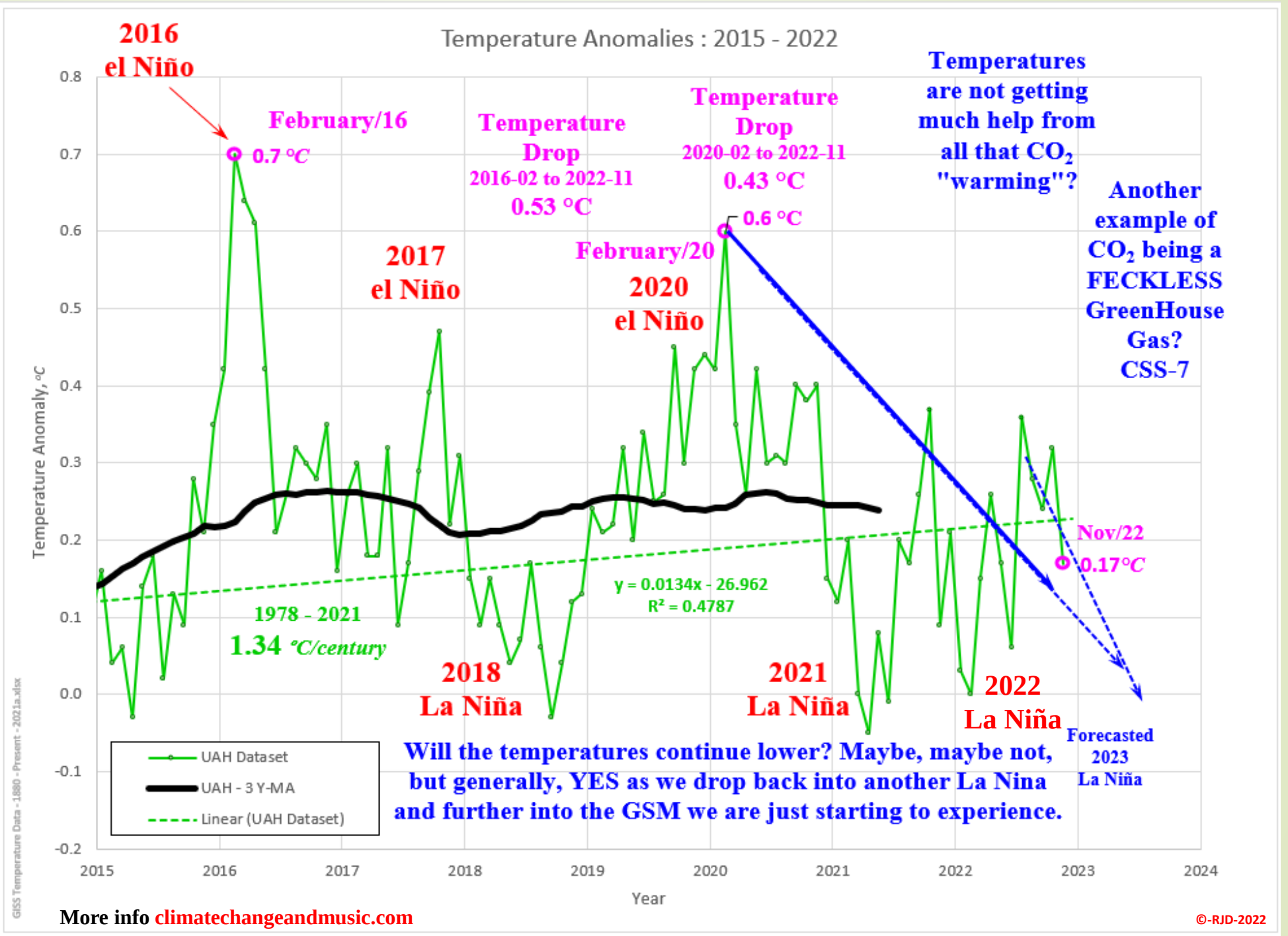
CSS-32c

UAH Lower Troposphere Temperatures 2015 - 2022

This plot focuses in on the 2015 to 2022 data. This period is dominated by the ENSO (not CO_2 (20 ppm is insignificant), not the AMO (just transitioning to cooling) but with some complimentary minor solar cooling). The 2016 El Niño kicked things off adding over 0.7 °C to global temperatures in less than a year (hitting a satellite LT temperature record high). Temperatures have generally declined (erratically) since that high. A series of alternating El Niños and La Niñas have dropped global temperatures by 0.53 °C. Since the 2020 El Niño, the planet has been hit with 3 straight La Niñas (dropping to +0.17 °C). The latest La Niña will likely continue to drive temperatures lower over this winter, piling on to the lower temperatures expected from the cooling phase of the AMO and the potentially dangerous temperatures typical of Grand Solar Minimums.

UAH-LT 2015 - 2022



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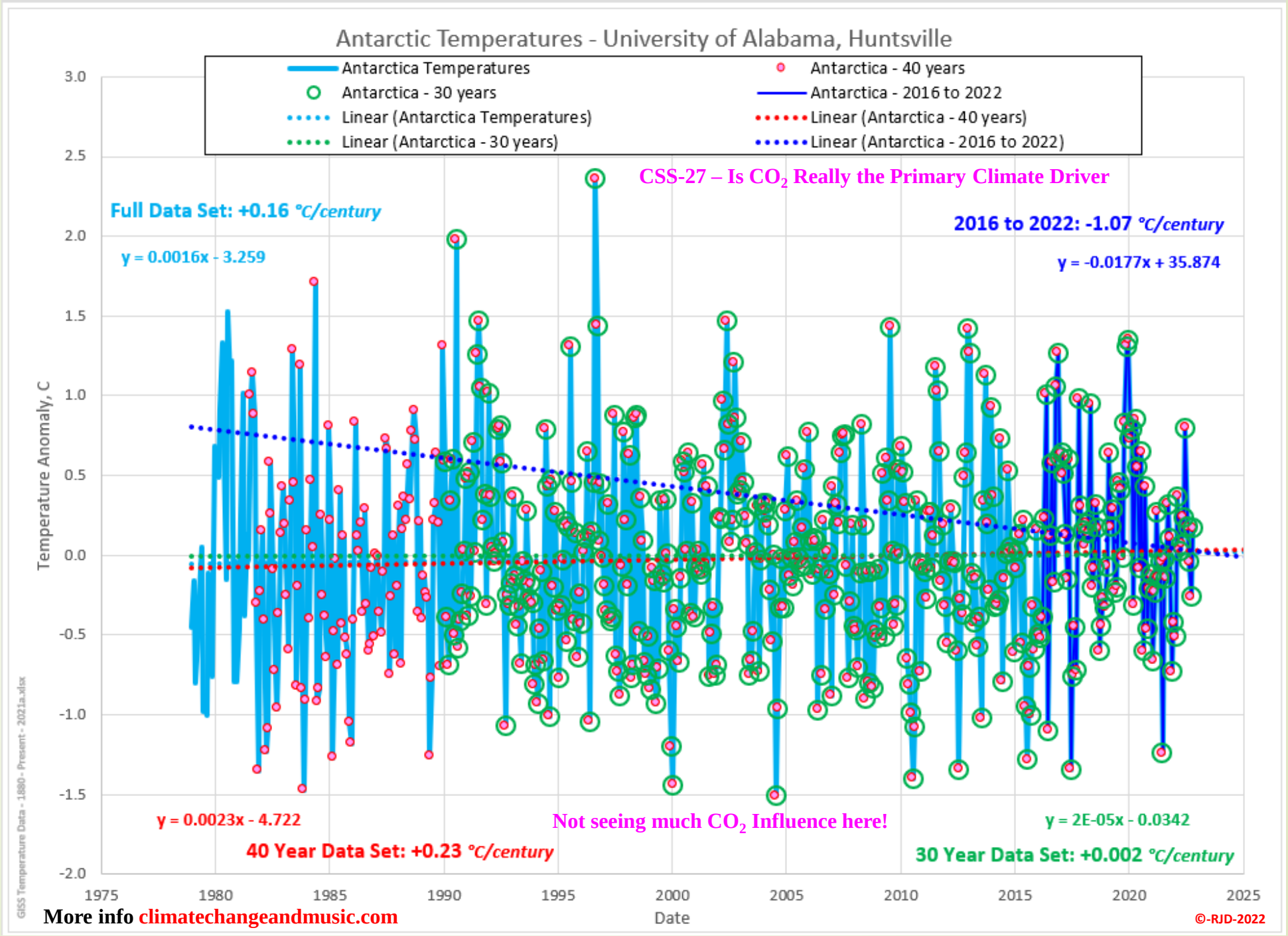
AMO – Atlantic Multi-decadal Oscillation GSM – Grand Solar Minimum. You really should do the Research!

GSM – Grand Solar Minimum. You really should do the Research!

UAH Lower Troposphere Temperatures Antarctica Declines

To date, I have focused on the UAH global dataset. However, the UAH data does include regional breakdowns as well. This slide shows the Antarctic temperature trends over the last 44 years. The biggest takeaway from this plot, rising CO_2 concentrations do not appear to causing much warming on the coldest place on the planet. Might take a while to melt that ice cap. The full dataset shows a slight temperature increase (+0.16 °C/century). The 40 year temperature trend is slightly higher at +0.23 °C/century. But over the last 30 years the temperatures in Antarctica have been statistically flat at +0.002 °C/century. Over the last seven years, temperatures have been dropping (much like the global temperature) at a rate of 1.07 °C/century. There does not seem to be much evidence in Antarctica that CO_2 is melting the south pole anytime soon (more detail in CSS-27).

UAH-LT Antarctic Declines



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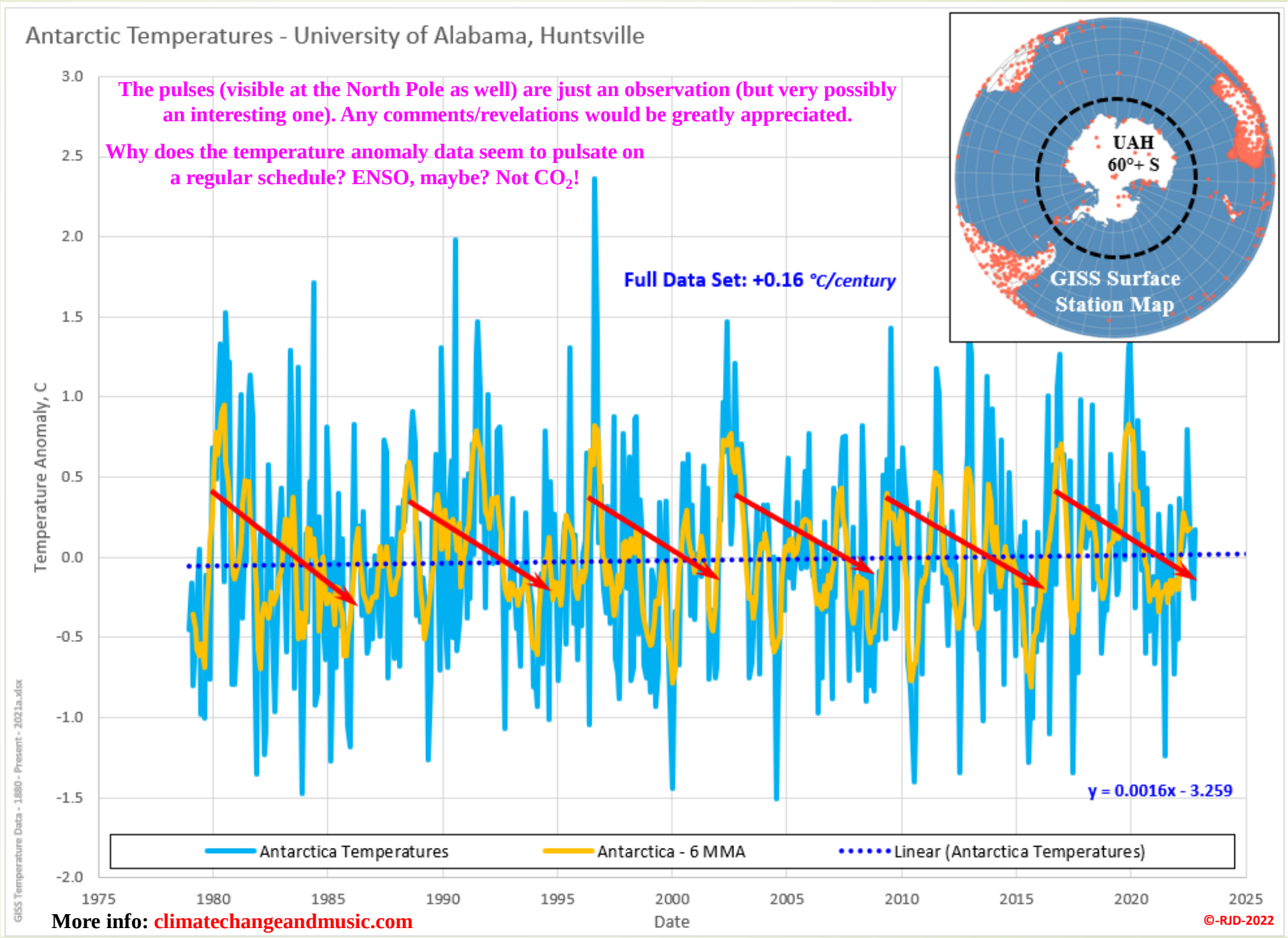
GSM – Grand Solar Minimum. You really should do the Research!

UAH Lower Troposphere Temperatures Antarctic Pulses

This slide shows the same data with the 6 Month Moving Average (MMA) added. The overall temperature trend is essentially flat, but the data appears to generally consist of strong temperature increases, followed by a more gradual temperature decline (on a ±7 year cycle). Just an observation, but definitely interesting. These temperature fluctuations are not CO_2 driven (since CO_2 concentrations rose only 80 ppm with only minor seasonal fluctuations (as shown on CSS-32b). On this time scale, the most significant driver is most likely ocean cycles. Antarctica is strongly influenced by the Antarctic Circumpolar Current (ACC). The ACC keeps Antarctica cold and isolates the continent a bit from other ocean and/or atmospheric influences. ENSO or other southern ocean cycles could be a factor in the pulses. CO_2 not so much!

UAH-LT Antarctic Pulses



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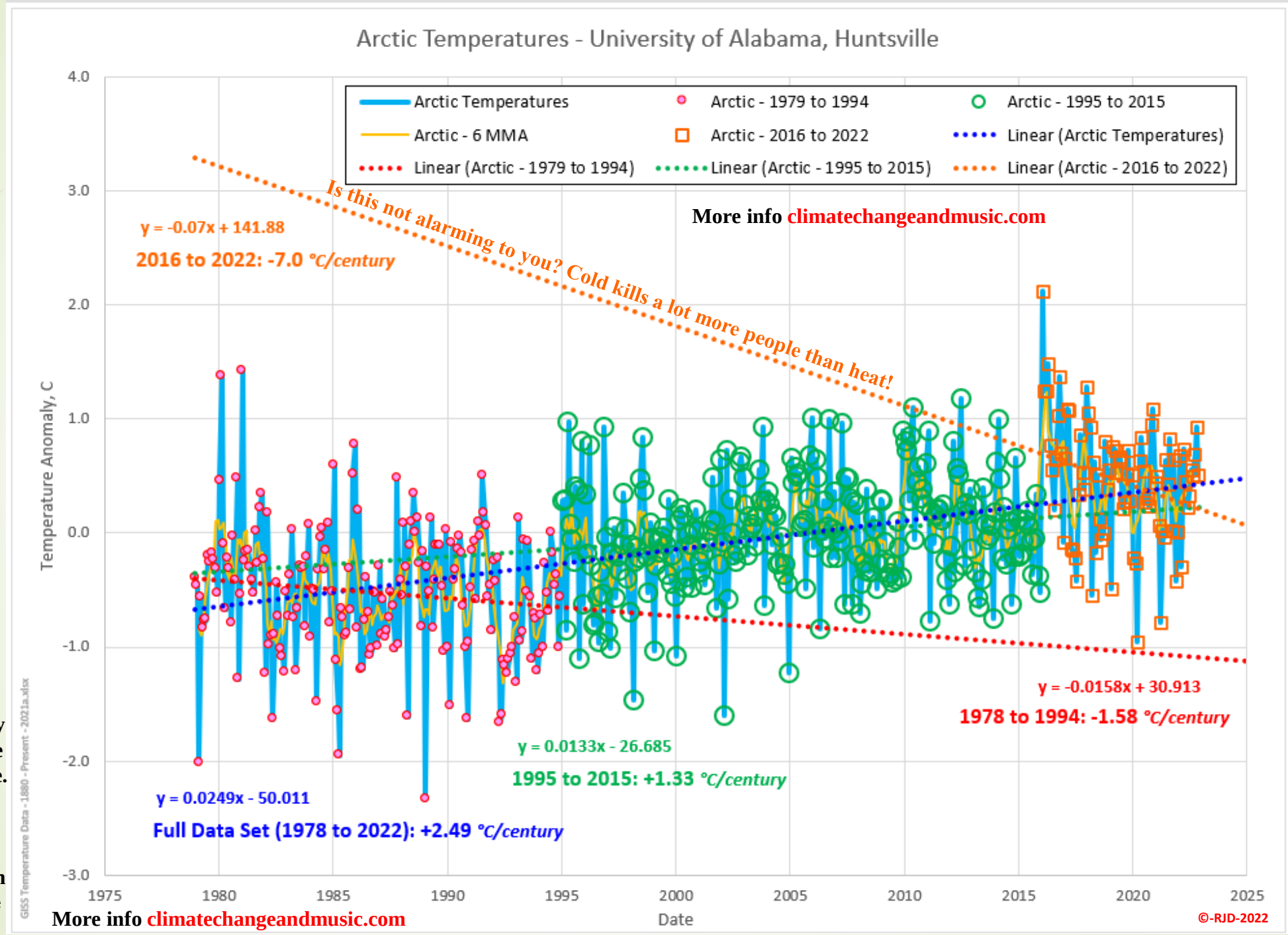
GSM – Grand Solar Minimum. You really should do the Research!

UAH Lower Troposphere Temperatures Arctic Declines

This slide transitions us to the Arctic. The temperature response at the North end of our planet is noticeably different than the Southern polar region. The overall temperature anomaly is increasing at a rate of 2.5 °C/century, but that increase is very erratic on both short and long time intervals. From 1978 to 1994, Arctic temperatures were declining at 1.58 °C/century. From 1995 to 2015, temperature trends reversed and began increasing at 1.33 °C/century.

UAH-LT Arctic Declines

The latest trend reversal is now showing a 7.0 °C/century decline (over the last seven years). And we have barely started our temperature descent into the forecasted GSM and AMO cooling phase. There are a whole lot more climate forcings affecting our climate than just CO_2 (even on this short time scale). But as in the models (that self admittedly run too hot), our "leaders" keep pushing the dangerous CO_2 alarmist narrative.



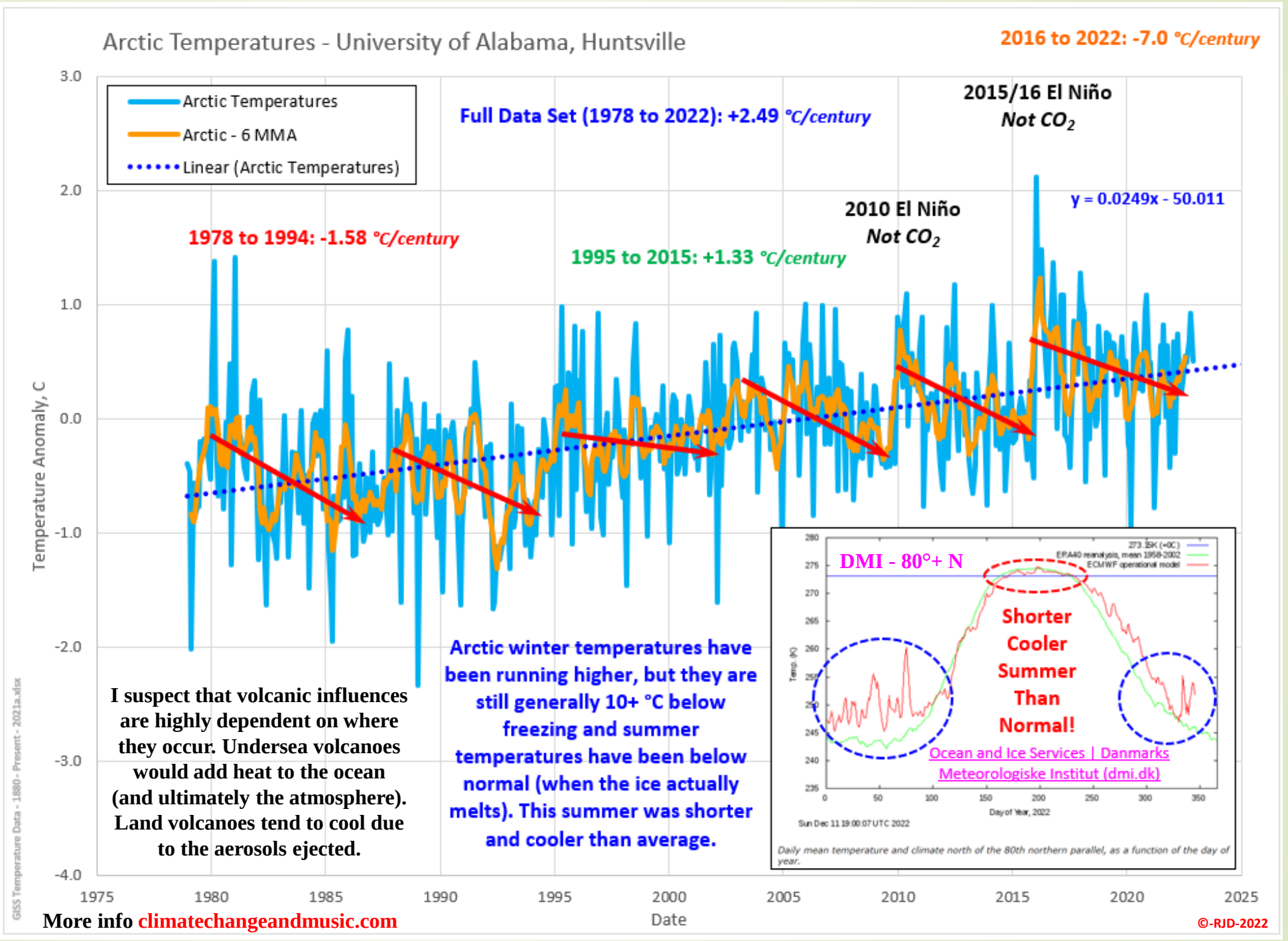
CSS-32g

UAH Lower Troposphere Temperatures Arctic Pulses

GSM – Grand Solar Minimum. You really should do the Research!

The same general pulsing that shows up in the Antarctic data also appears in the Arctic data. The last two temperature spikes are definitely linked to ENSO. The 2010 and 2015/16 El Niños were responsible for those temperature increases. In general, each major El Niño produces a step jump in temperature followed by several years of El Niño/La Niña cycling. Again, these are unrelated to CO_2 concentration increases. I will refer you to work done by Prof. Wyss Yim that links these strong ENSO cycles with volcanic activity. More detail is included in my last post CSS-31 – Volcanic Activity. There are strong intermittent pulses in Volcanic/ENSO activity (i.e.: the 2010 and 2016 El Niños), but the general volcanic trend over the last 122 years has been rising (possibly contributing some of the warming over that period). Volcanic activity tends to rise during GSMs.

UAH-LT Arctic Pulses



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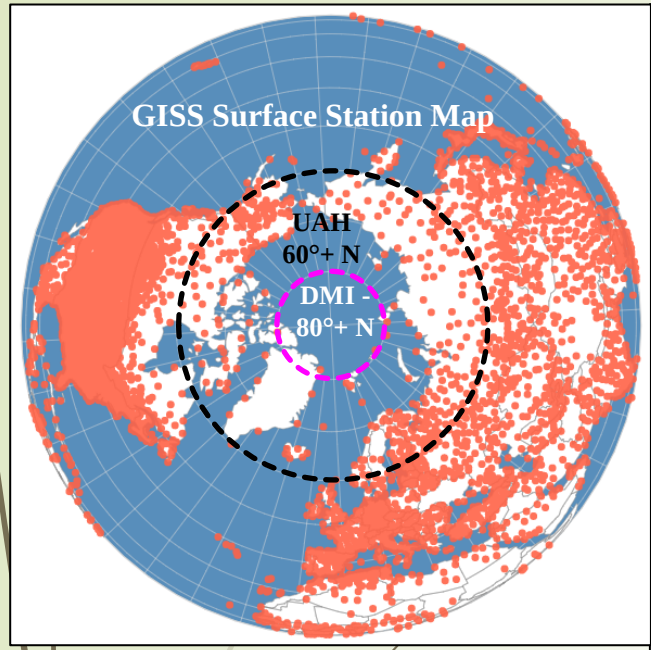
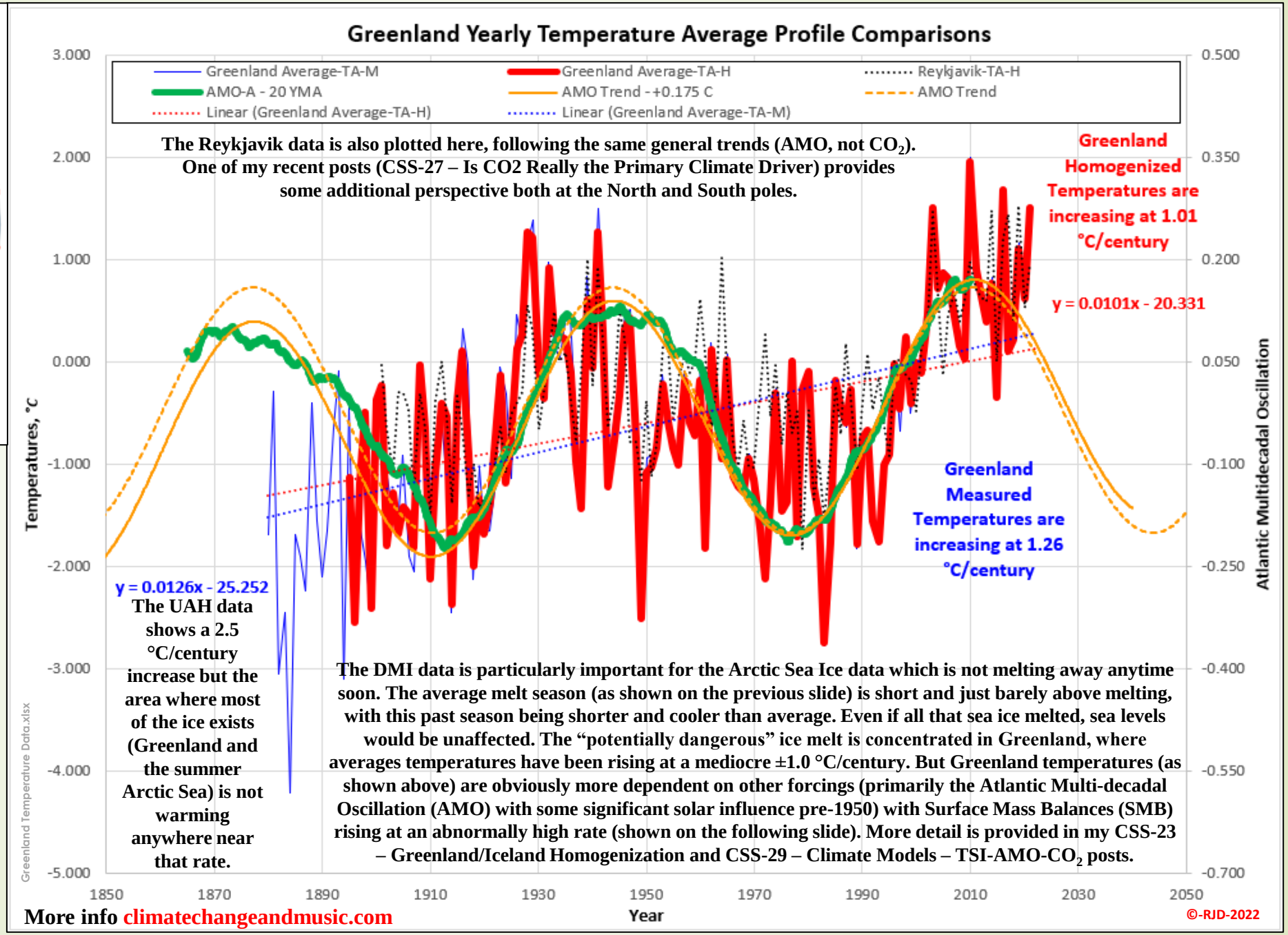
UAH Lower Troposphere Temperatures Greenland/Iceland Perspective

GSM – Grand Solar Minimum. You really should do the Research!



UAH-LT Greenland Iceland

Just as an additional reference, the measured temperatures in Greenland have risen at a rate of 1.26 °C/century (measured) and 1.01 °C/century (homogenized). Iceland has trended similarly (Reykjavik trends are +0.66 °C/century (measured) and +0.93 °C/century (homogenized). More detail is provided in my CSS-23 – Greenland/Iceland Homogenization. The GISS Surface Station map is shown above to provide reference for where the temperature data applies. UAH (North Pole) refers to the average temperature above 60° Latitude. The South Pole is similar. The DMI data is focused above 80° Latitude.



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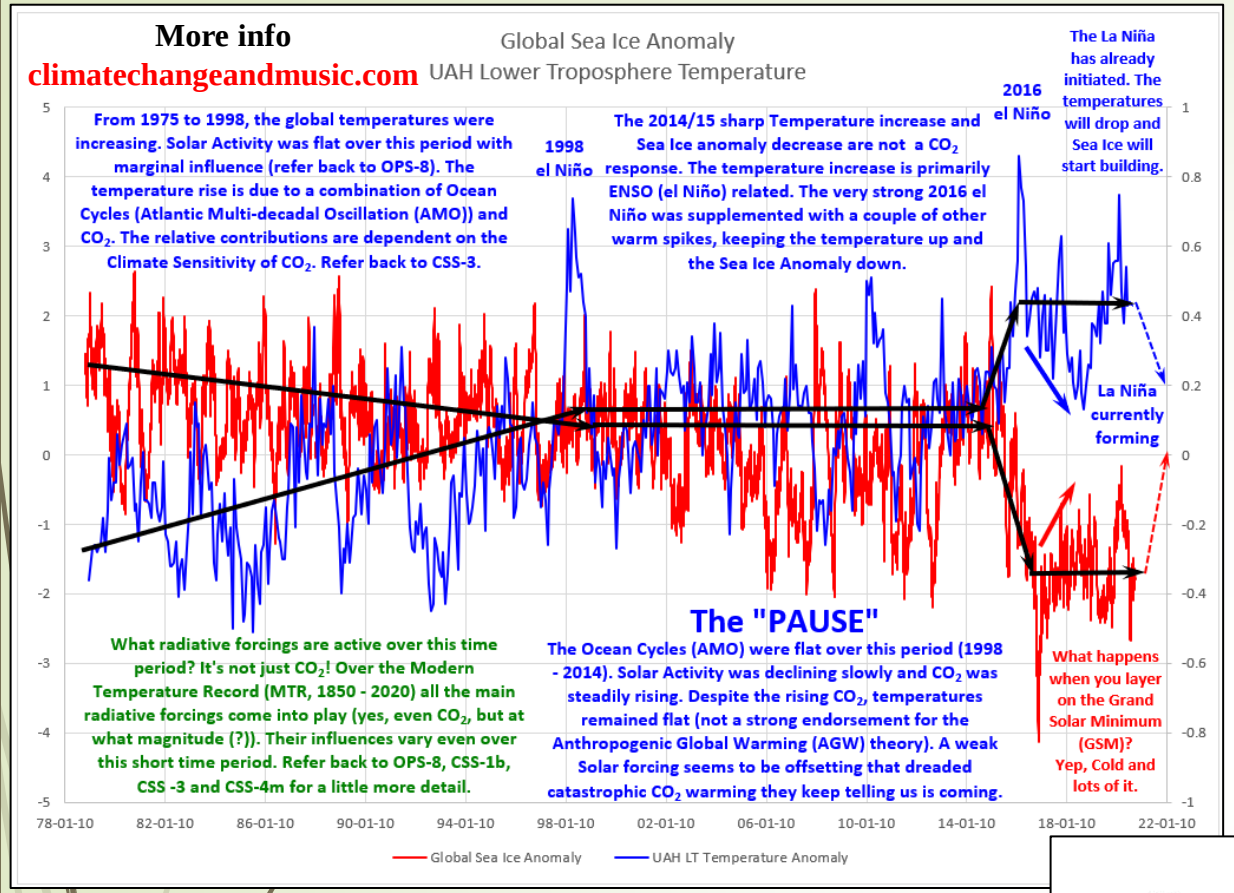
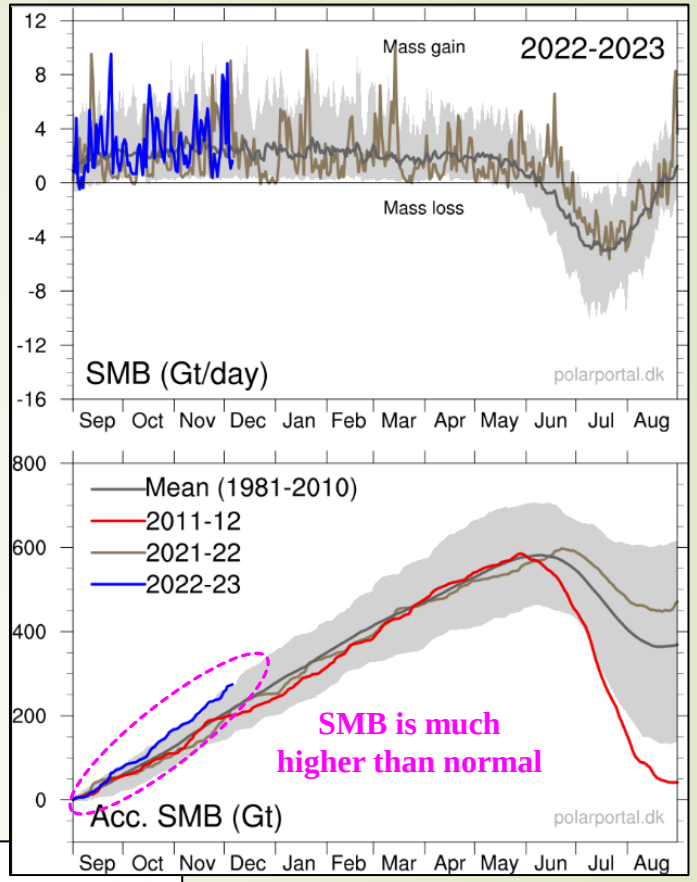
UAH Lower Troposphere Temperatures

A Few Quick Add-ons

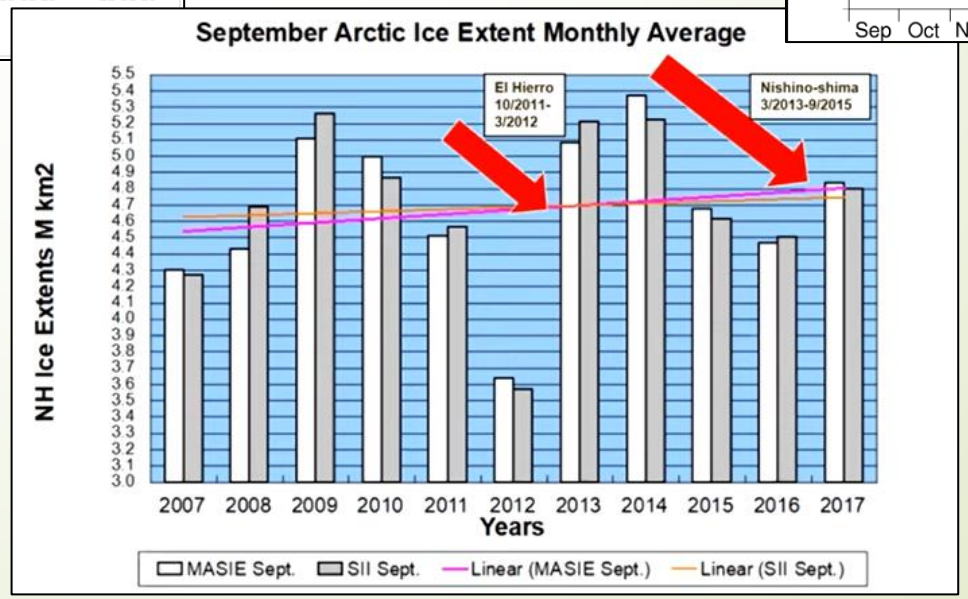
One of the reasons I like the UAH satellite data is the correlation (almost a mirror image) between the temperature and global ice cover (plot to the right from CSS-11 – Snow and Ice – July 2021 Update). In general, when the UAH temperature goes up, global ice cover declines and vice versa. This plot is a year out of date but the general forecast was representative (an unusual triple La Nina event (we are still experiencing the 2023 version) has reduced and will continue to reduce global temperatures).





UAH-LT Quick Add-ons

Remember, the AMO (cooling phase) and GSM will layer on to the ENSO cooling over the next few decades (despite the relentless CAGW/CO_2 alarmist propaganda). The plot to the right comes from Prof. Yim's recent presentation and shows the Arctic ice response to the 2011/12 El Herro (Canary Islands). 2012 was the lowest recorded Arctic ice cover over the last 47 years (based on the NOAA dataset). A series of volcanic eruptions (starting with the Nishino-shima (2013/15) and followed by Hunga (2014/15), Axial Seamount (2015) and Wolf (Galapagos, 2015)) produced the Pacific blob, the 2015/16 El Nino and declining Arctic sea ice extent. The 2012 response was likely stronger in the Arctic due to the Atlantic eruption (El Herro) versus the Pacific eruptions in 2013/15. As we move further into the GSM/AMO cooling, temperatures will drop and sea ice extent will continue to rise.



The above chart is the December 7th, 2022 Greenland Surface Mass Balance (SMB) status. The SMB is definitely not co-operating with the CAGW alarmist narrative this year. Somehow, record levels of snow/ice are being laid down despite constantly rising atmospheric CO_2 concentrations. Funny how any large melt days get immediate and widespread reporting, but any large mass gains are completely ignored. In real science, all the data is important.