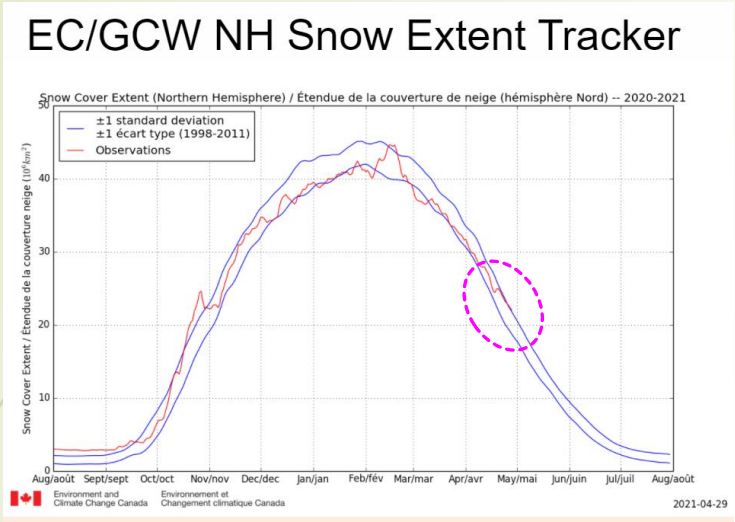
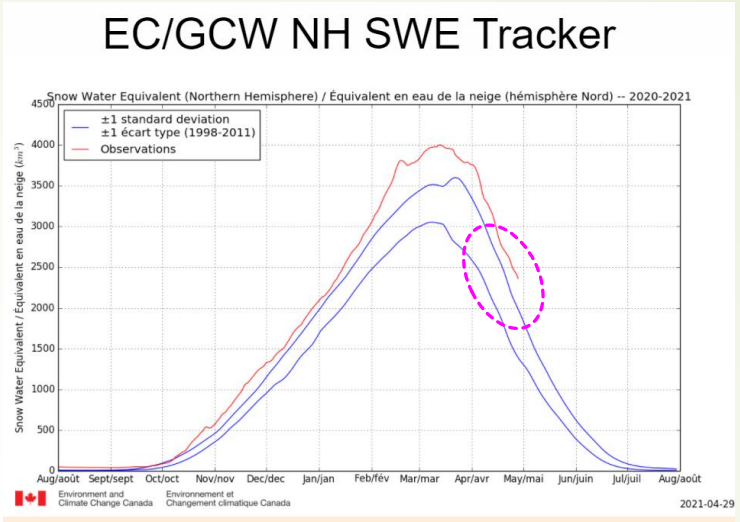
Northern Hemisphere (NH) Snow Extent

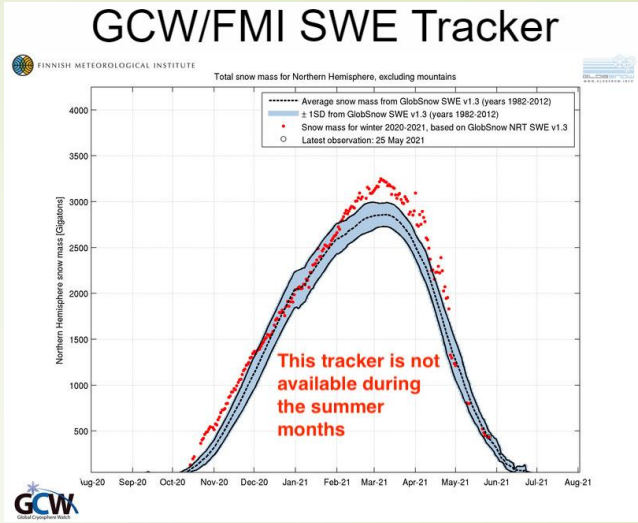
Time to WAKE UP and #delaythegreen (OPPS-14)

More detail? climatechangeandmusic.com

Here is the quick snow update. You know, that mythical water based substance that our grandkids would never experience. Al Gore may have stated an Inconvenient Truth (or more accurately an Inconvenient GREEN Lie). As per usual the CAGW alarmist narrative and reality are completely different. Northern Hemisphere snow has been well above average for many years. My previous posts (listed below) have the Global Cryosphere Tracker and Rutger Snow Lab plots for the previous three years. This last winter was no different. NH Snow Extent was at the high end when Environment Canada quit posting (not sure why they stopped). And their estimate of Snow Water Equivalent (SWE) was well above average throughout the year. The Finnish Meteorological Institute shows a similar story. Rutger's Snow Lab shows us the Snow Areal Extent trends for the NH. I have added the general trend lines since the IPCC was established (November 1988). Spring Snow Extent has declined over that period but both Fall and Winter Snow Extent have increased over the same period. The Fall and Winter Snow Extent increases were much larger than the spring decrease. Strange that you only hear Spring Snow Extents are decreasing in the Main Stream Media (MSM). Why is that? The whole "Global Warming" issue is based on narrative, not Science! That narrative is being used by Big Green financial and industrial complexes to fleece trillions from hard working tax payers and you can continue to allow them. Sure, Big Green is virtuous and Big Oil is not. Keep giving them your money to fix a problem that does not exist.

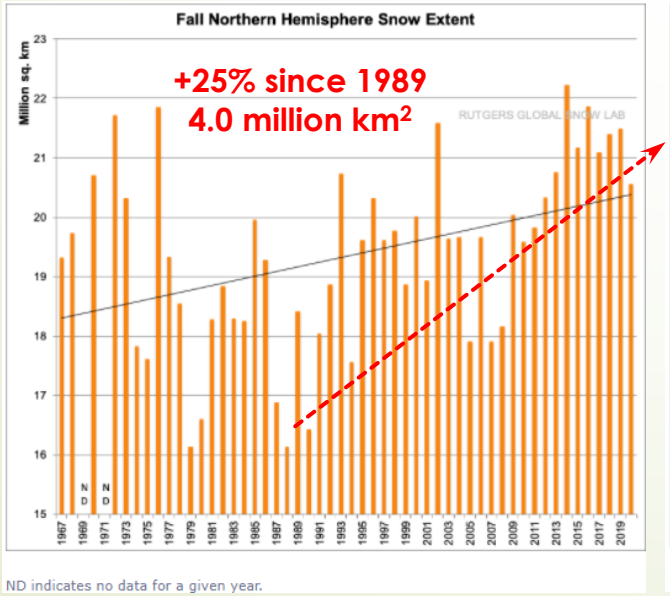


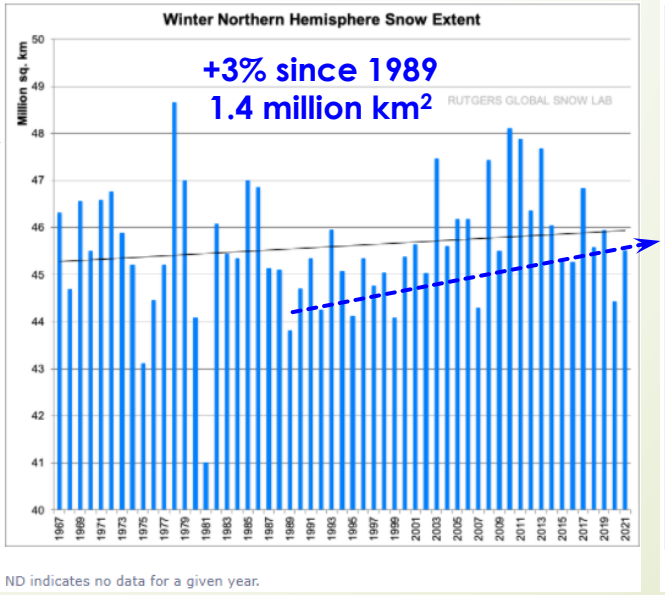


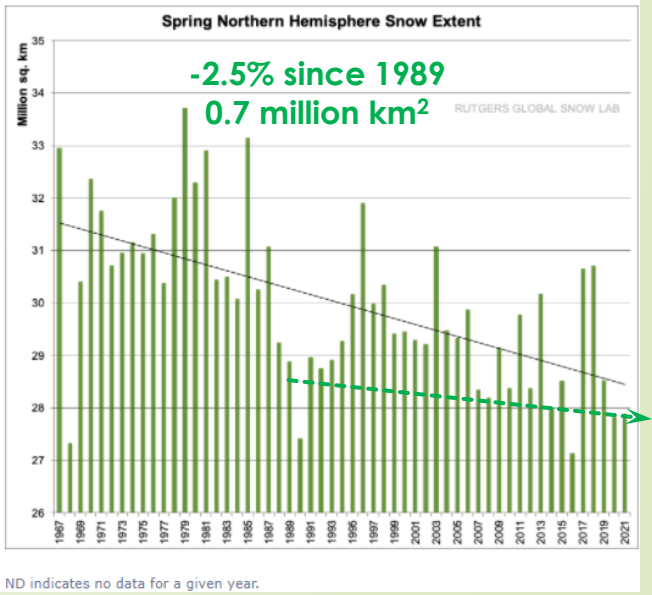


Northern Hemisphere Snow

CSS-5 – Snow and Ice – September 2020
OPS-24 – Northern Hemisphere Snow – December 2019
OPS-15 – Northern Hemisphere Snow – June 2019
Open Letter – Appendix 6 – August 2018

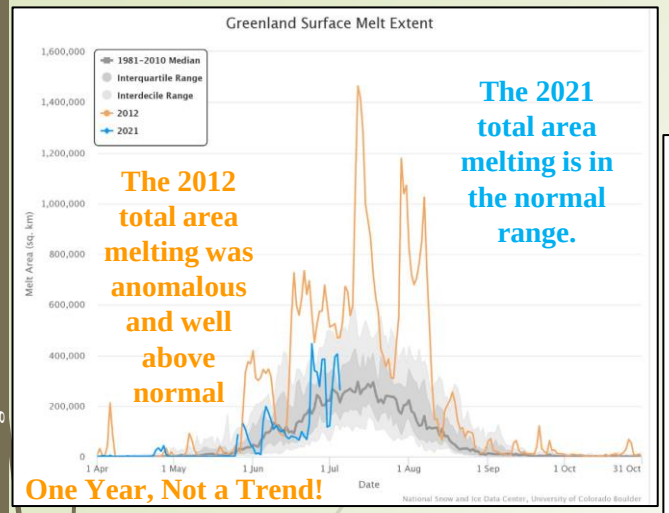






Greenland Ice

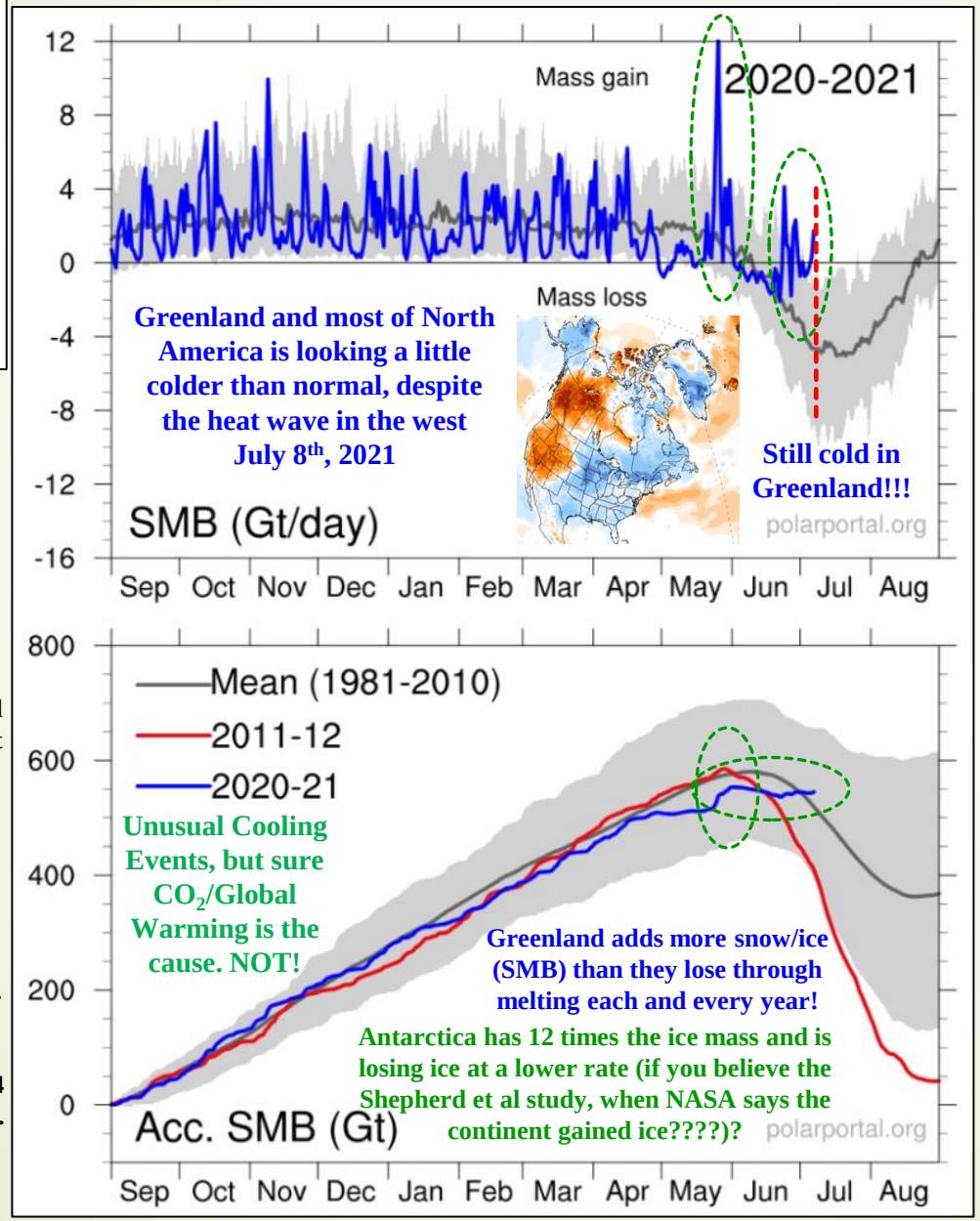
When you talk about ice in the Northern Hemisphere (NH) you need to talk about Greenland. So, what is happening in Greenland? Well, nothing good for the CAGW alarmist crowd. Just as the melt season is kicking off (late May) Greenland was hit with a huge winter storm that added over 12 Gigatons (Gt) of new mass in one day. That was literally off the charts. And then to add insult to injury, the CAGW alarmist Gods forgot to properly initiate the melt season. They need to step up their prayer services. That melt season will kick in shortly, but that is an unusual profile. Greenland is not melting away anytime soon!

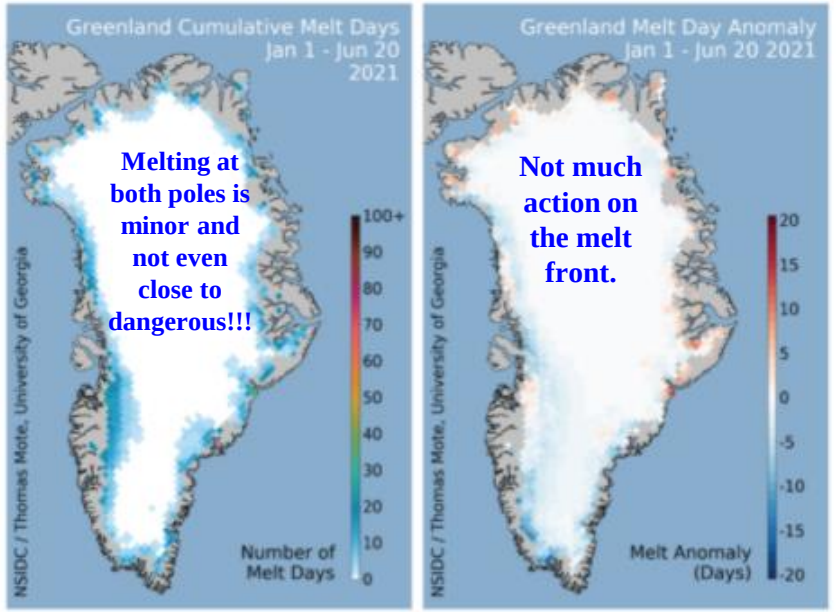


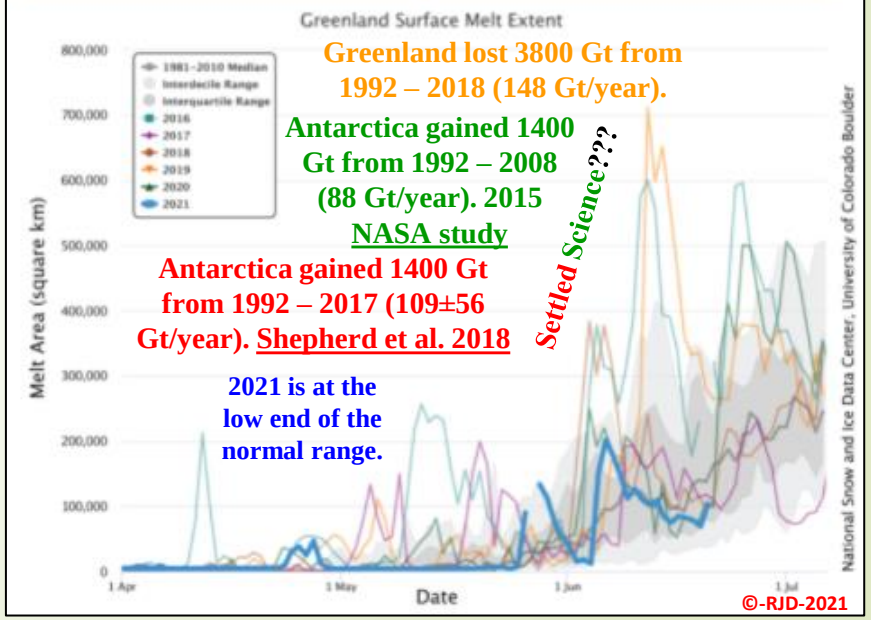
As with previous posts, the Surface Mass Balance (SMB) has been positive every year since records were kept. There is more snow/ice added than melted every year. Even the very high 2012 melt season still added 40 Gt of ice. And before the CAGW alarmists get their shorts in a knot, this does not include glacier calving. If you want to talk CAGW "Climate Change", you are talking about CO_2 and its relationship with temperature. Melting is temperature related. CO_2 would have little to no effect on calving. In a typical year, Greenland adds 370 Gt to its SMB. Not melting anytime soon! To the end of June (far right), the acreage melting is at the low end of the scale. Greenland lost 3800 Gt (roughly 150 Gt/year) over the 1992-2018 period (according to NASA). What they did not bother to point out was that Greenland will still have 28.4 of its existing 28.5 million Gt. Oh, Scary! Antarctica is an order of magnitude less scary (109 Gt/year)

Greenland Ice

CSS-5 – Snow and Ice – September 2020
OPS-24 – Northern Hemisphere Snow – December 2019
OPS-15 – Northern Hemisphere Snow – June 2019
Open Letter – Appendix 6 – August 2018



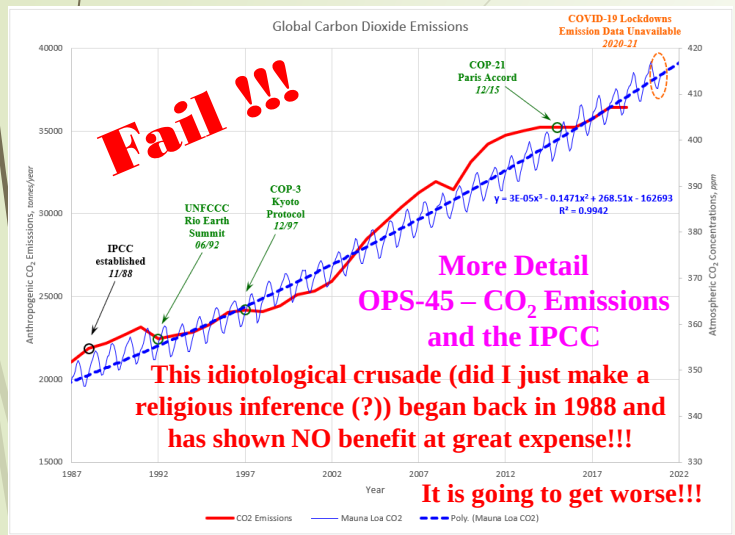


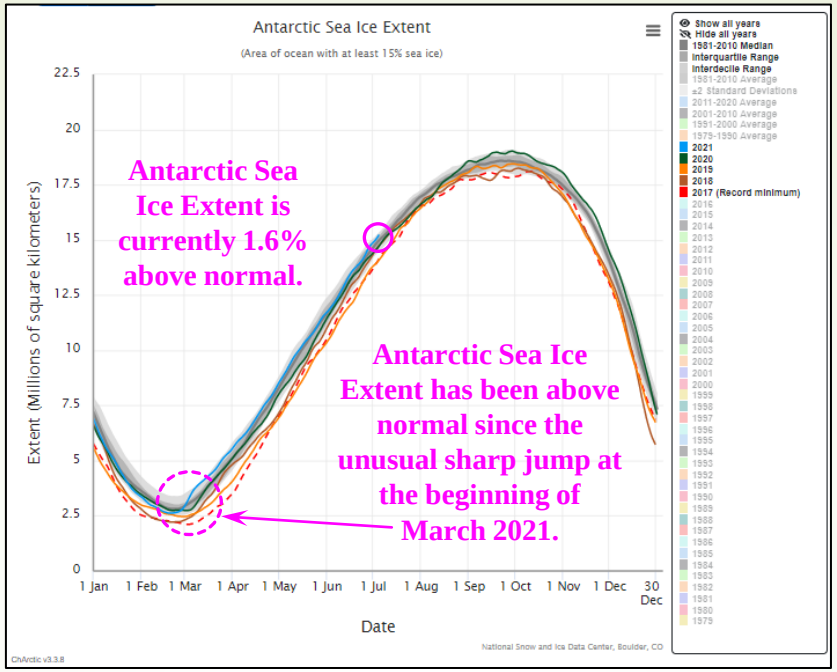


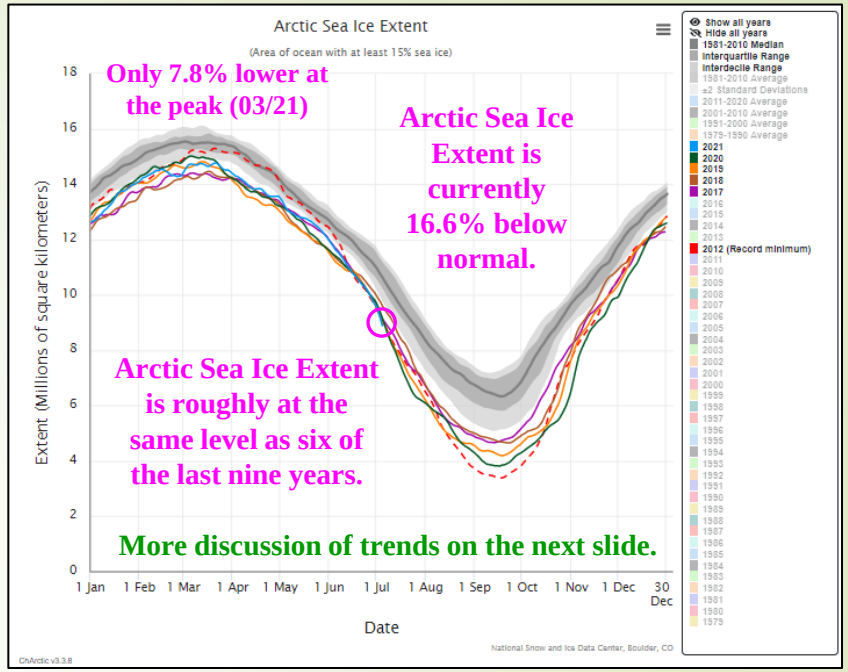
More detail? climatechangeandmusic.com

Antarctic/Arctic Sea Ice

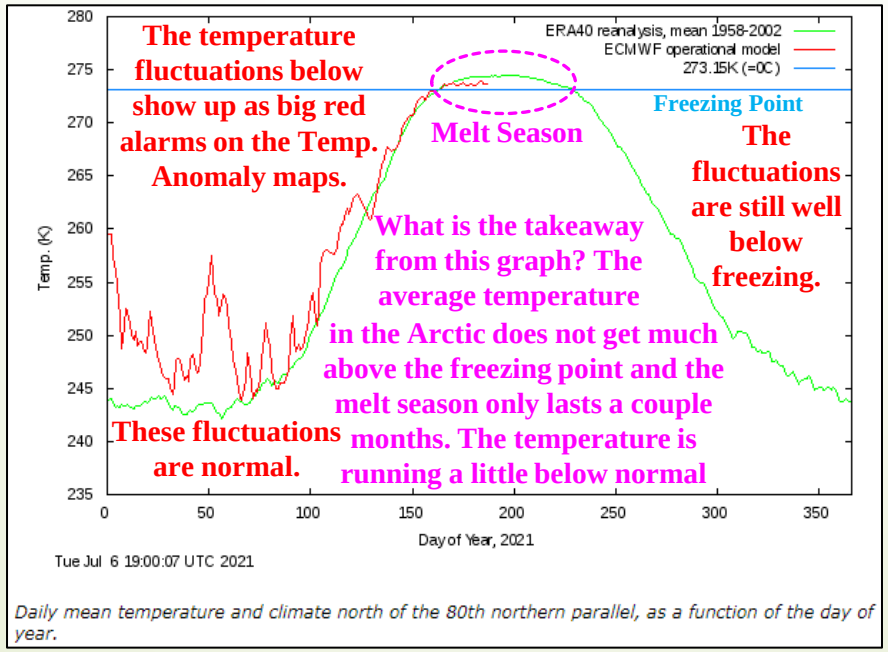
Sea Ice is always a big topic with the CAGW alarmist crowd. How many times have they forecasted that summer ice would be gone by ???? if we did not address "Climate Change" within the next 10 years. The IPCC report card is shown below (a solid failure)!!!. CO_2 emissions and atmospheric concentrations have continued to rise. Emissions dropped through the COVID-19 lockdowns , but concentrations rose unabated. Hmmmmm….

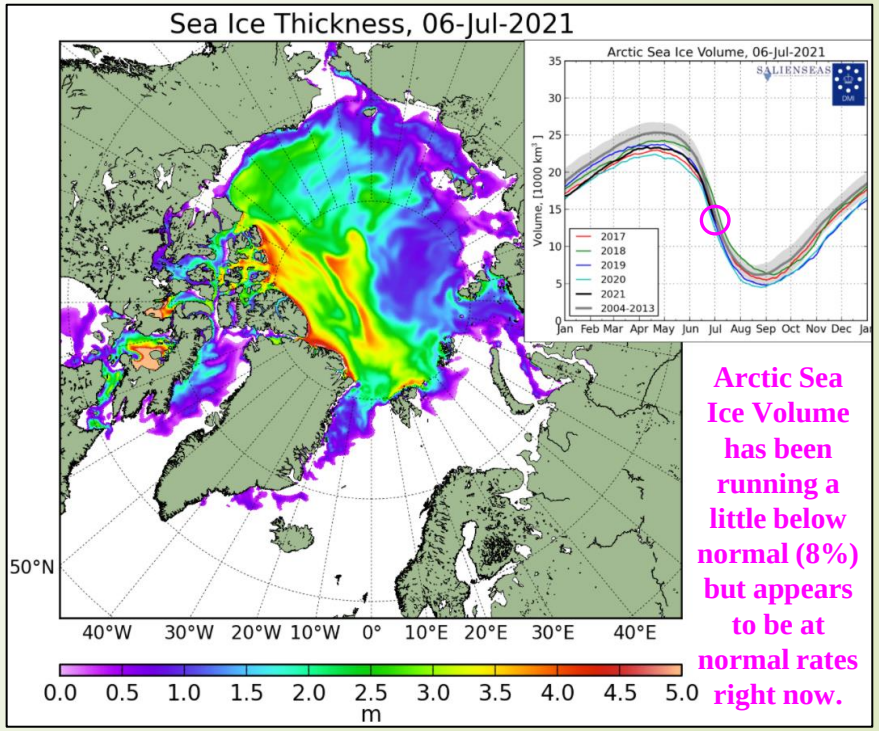






It is time to #delaythegreen (OPPS-14)





Antarctic Arctic Ice

The sea ice extent and volume graphs speak for themselves. Is the Arctic sea ice extent lower than normal? Yes, but the Arctic is subject to cyclical temperatures (i.e.: this year's sea ice extent is irrelevant on its own). The trends are shown on the next page. The Antarctic sea ice extent has a much tighter range which is not surprising since it is always cold). The world's coldest temperature (Antarctica) was measured back in June 2018 and they are having a brutal winter this year.

CSS-5 – Snow and Ice – September 2020
OPS-24 – Northern Hemisphere Snow – December 2019
OPS-15 – Northern Hemisphere Snow – June 2019
Open Letter – Appendix 6 – August 2018

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

CSS-11d Sea Ice Trends – Global and NH/SH

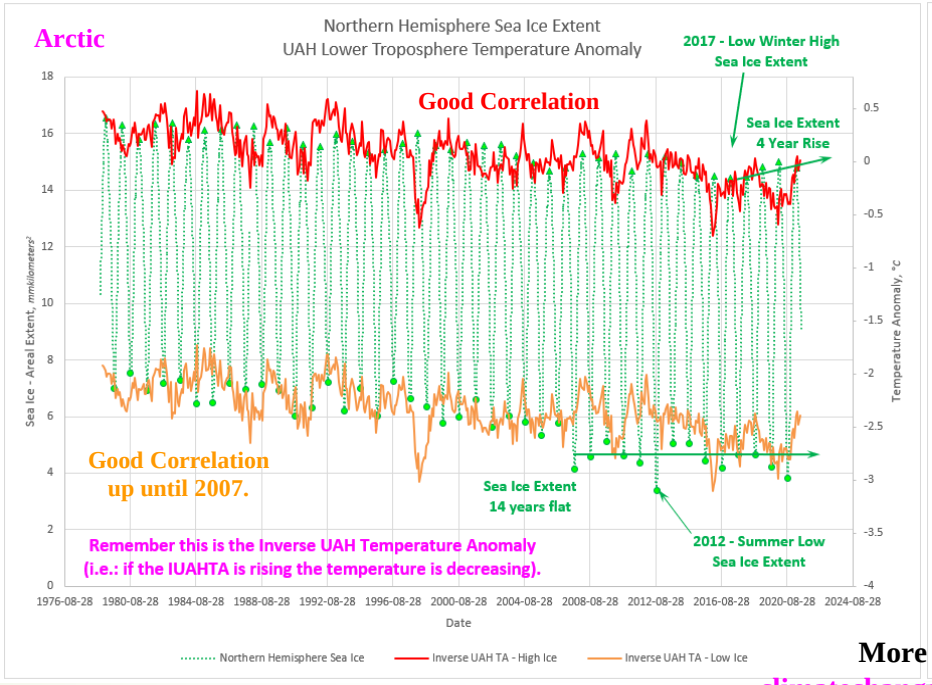
The Arctic correlation is better than the Antarctic correlation. Not surprising, since the Northern Hemisphere (with significantly more land mass) reacts more and quicker to the natural cycles (which are consistently ignored by the CAGW alarmists).

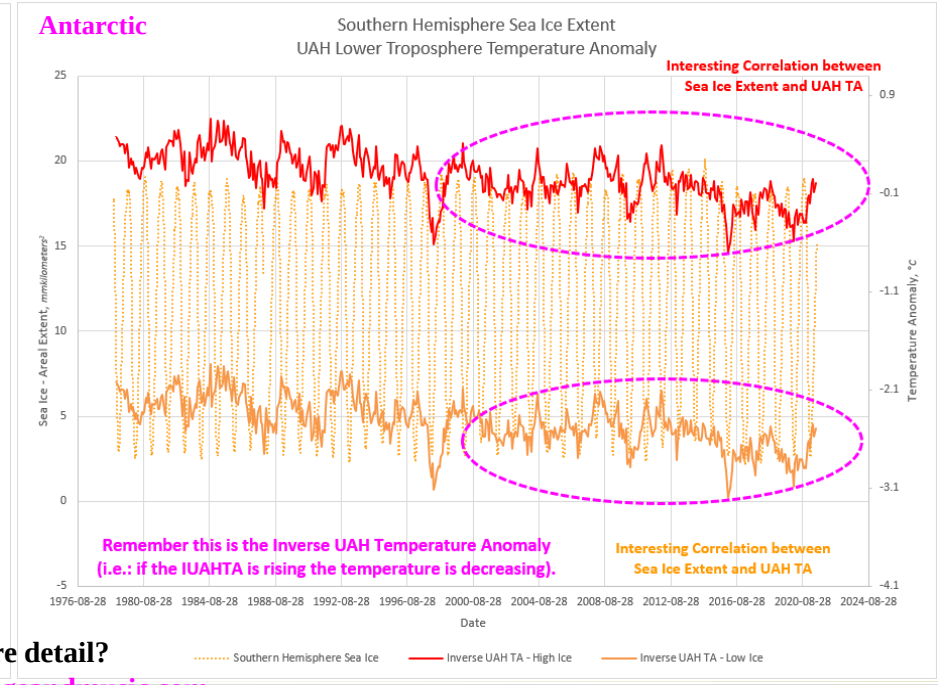
GSM – Grand Solar Minimum. The real "Climate Change" existential threat is right around the corner. Do the Research!

As mentioned on the previous slide, the trends are more important than any individual year. I have presented more detail in my CSS-5 – Snow and Ice – September 2020 post. The UAH Lower Troposphere Temperature versus Global Sea Ice plot (CSS-5f) was pulled from that post. The first thing that jumps out is the general correlation. The two curves act in concert (inversely) and is one of the main reasons I choose the UAH satellite temperature data set for recent global temperatures. That, and satellite measurements are more accurate than all the "over-homogenized" surface temperature data sets used by the overzealous CAGW alarmist crowd. The Arctic Sea Ice trends match the Inverse UAH Temperature dataset quite well at both Maximum and Minimum sea ice extent. At Arctic sea ice Minimum, the sea ice extent from 2007 – 2020 was lower than UAH temperatures would suggest. Antarctic sea ice extent has a very good correlation after the turn of the century (2000 to the present) for both the Maximum and Minimum. Prior to 2000, the Maximum and Minimum extents are both below what the UAH temperatures would suggest (with the Minimum being slightly more pronounced). CSS-5f showed the temperature drop we would experience as we moved into the La Niña cold phase of the ENSO cycle. The next step is further temperature drops as we move further into the GSM. NOAA has projected a repeat of Cycle 24 for Cycle 25, but NO sunspots for 26!

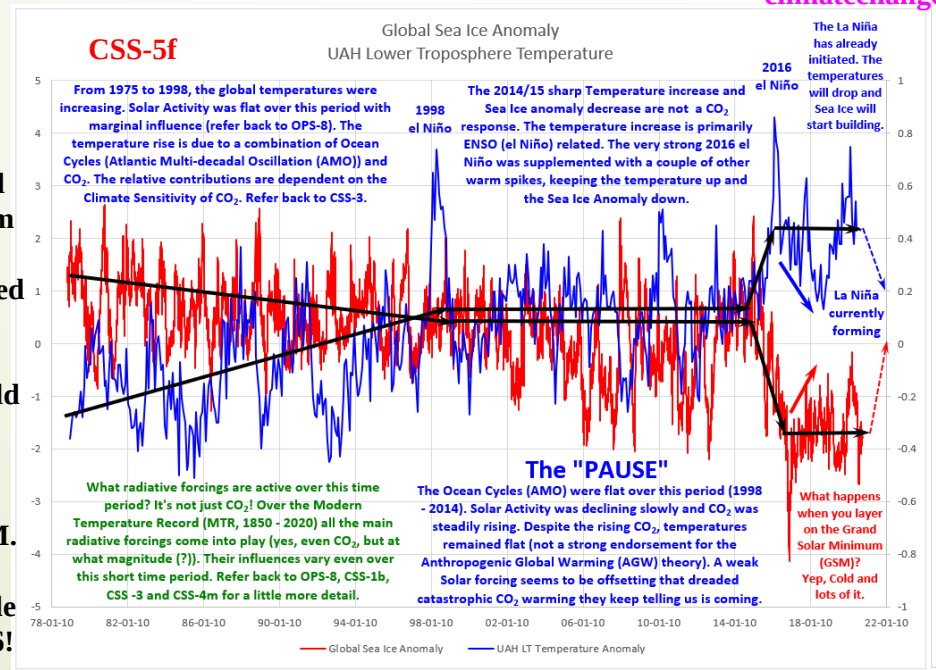
Sea Ice Trends Global

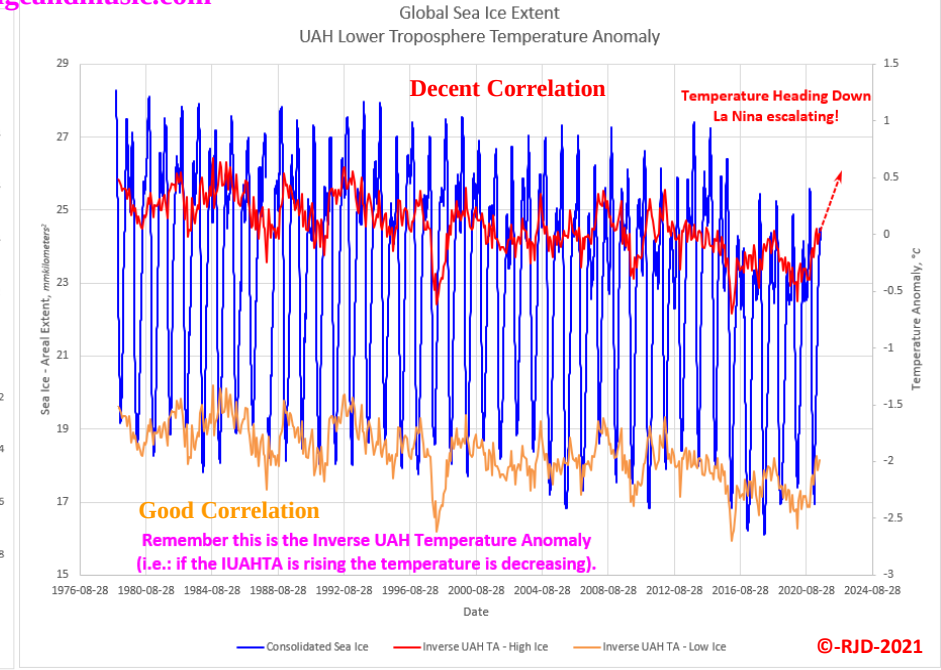
CSS-5 – Snow and Ice – September 2020
OPS-24 – Northern Hemisphere Snow – December 2019
OPS-15 – Northern Hemisphere Snow – June 2019
Open Letter – Appendix 6 – August 2018





More detail?
climatechangeandmusic.com

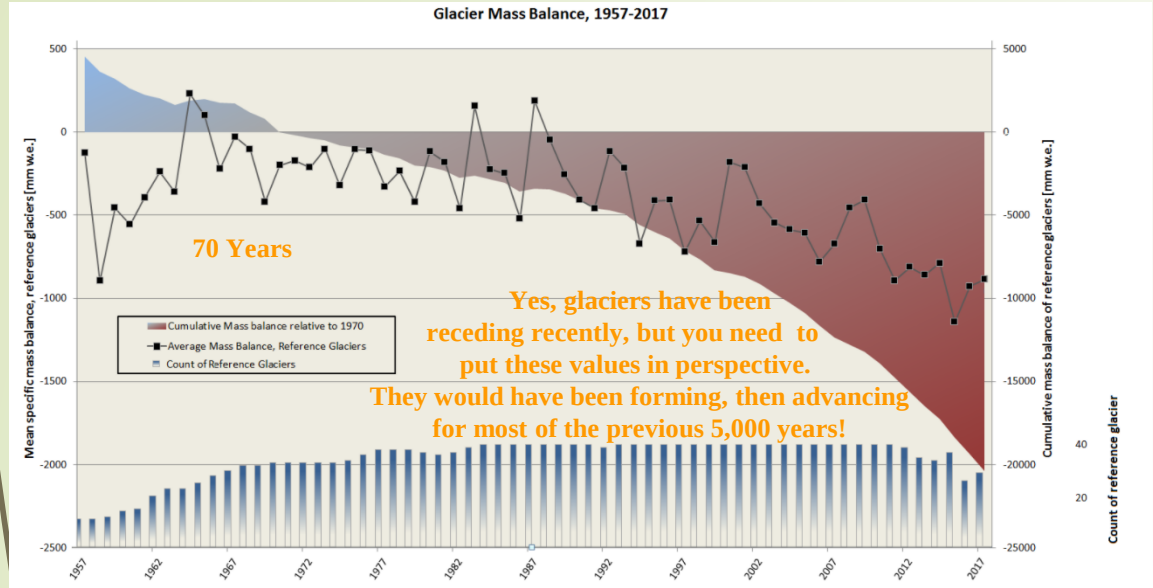




Glacier Discussion

More detail? climatechangeandmusic.com

Original Paper (Mikkelsen et al 2018)
https://www.researchgate.net/publication/322316861_Influence_of_temperature_fluctuations_on_equilibrium_ice_sheet_volume



5,000 to 10,000 years ago a lot of those glaciers would not have even existed (hence the forests exposed as they recede).

Glacier mass balance data were provided by the World Glacier Monitoring Service (WGMS). Mass balance values in mm water equivalent. Note that 'reference' glaciers are those with long-term observation series, i.e. > 30 years. All but one of reference glaciers are in the Northern Hemisphere. Reference: WGMS (2012): Fluctuations of Glaciers 2005-2010 (Vol. X): Zemp, M., Frey, H., Gärtner-Roer, I., Nussbaumer, S.U., Hoelzle, M., Paul, F. & W. Haeberli (eds.), ICSU (WDS)/ IUGG (IACS)/ UNEP/ UNESCO/ WMO, World Glacier Monitoring Service, Zurich, Switzerland. Based on database version doi: 10.5904/wgms-fog-2012-11.

Glacier Discussion

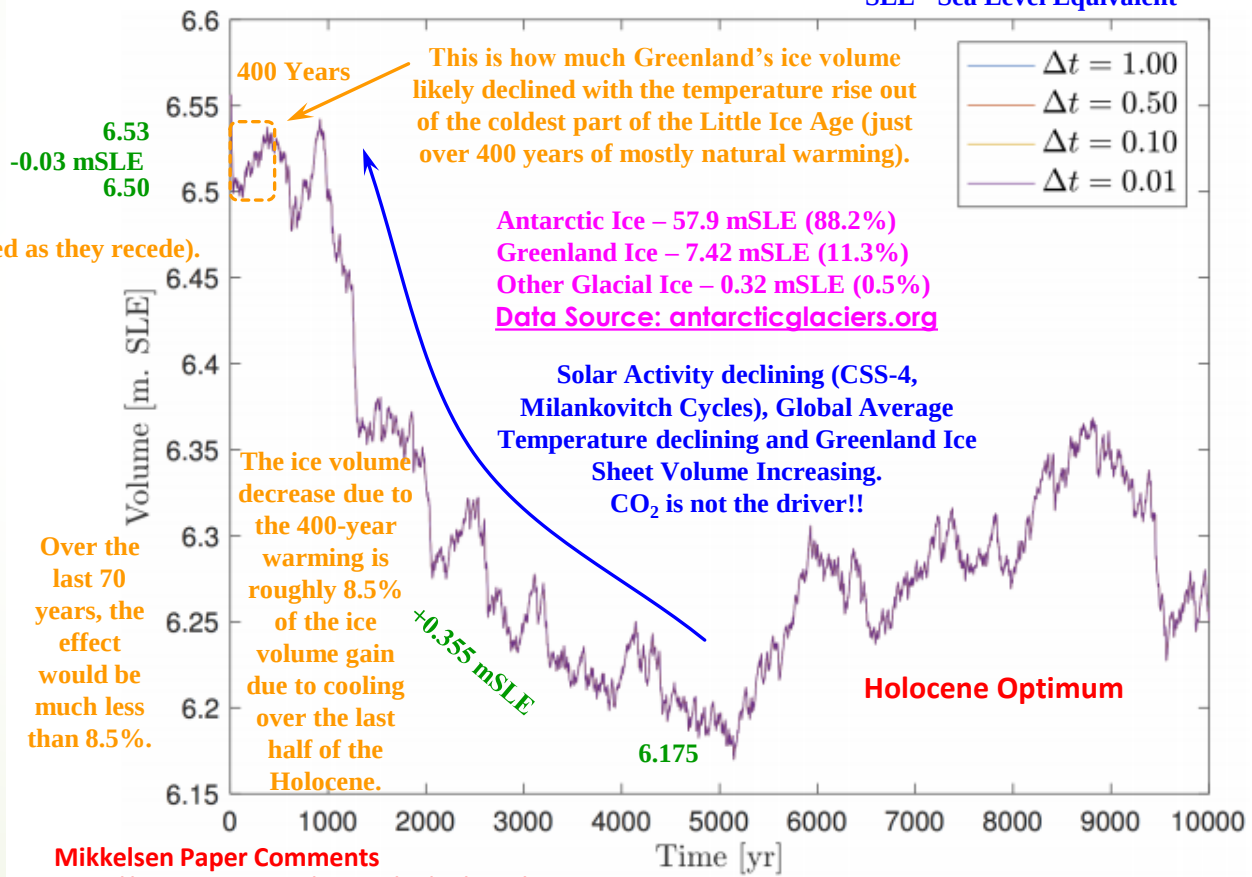
I have not yet found a good data source for the total amount of ice on the planet. The plot to the right (Greenland's ice volume fluctuations over the Holocene) was included in my CSS-5 post. The plot above came from the Global Cryosphere Watch website. The typical CAGW alarmist focuses on very recent history, ignoring the realities of "Climate Change". I suspect the graph above is correct and I do not know the leanings of the author (both of which are irrelevant to the discussion). A good CAGW alarmist would (and probably has) locked onto this data to confirm CO_2 is killing our planet. "Climate Change" occurs on much longer scales than 70 years and that perspective is important to science. The same tactic is used with temperature. The CAGW alarmists focus on the Modern Temperature Record (MTR), trying to use their unvalidated computer models that can model neither the current nor historical temperatures. But sure, they can forecast the future. All hail CO_2, the FECKLESS GreenHouse Gas – CSS-7.

CSS-5 – Snow and Ice – September 2020
OPS-24 – Northern Hemisphere Snow – December 2019
OPS-15 – Northern Hemisphere Snow – June 2019
Open Letter – Appendix 6 – August 2018

Time step size Δt used for numerical integration

To determine an adequate time step size Δt to use for numerically integrating Eq. 1, we first generate a time series of fluctuating temperatures $\{T_t\}$ as described by Eq. (8) in the main article. With $\{T_t\}$ as input, and a similar initial condition as the simulations shown in Fig. 2 in the article, Eq. 1 is numerically integrated for varying Δt using the Euler scheme. Δt is varied in such a way that the temperature is the same for each whole year, regardless of the time step size. The results of varying Δt from 0.01 year to 1 year are shown in Fig. 1. As the resulting graphs of the ice sheet volume $V(t)$ practically coincide, we consider a time step size of one year to be sufficient.

SLE - Sea Level Equivalent



Mikkelsen Paper Comments
https://tc.copernicus.org/articles/12/39/2018/tc-12-39-2018-supplement.pdf

Figure 1. Varying the integration stepsize Δt from 1 year to 0.01 years for a simulation with $\overline{T} = 0$, such that the (random) fluctuating temperature T_t is the same for each whole year. A visual inspection confirms qualitatively that the graphs for varying Δt coincide and we do not further analyze the consequences of varying Δt.