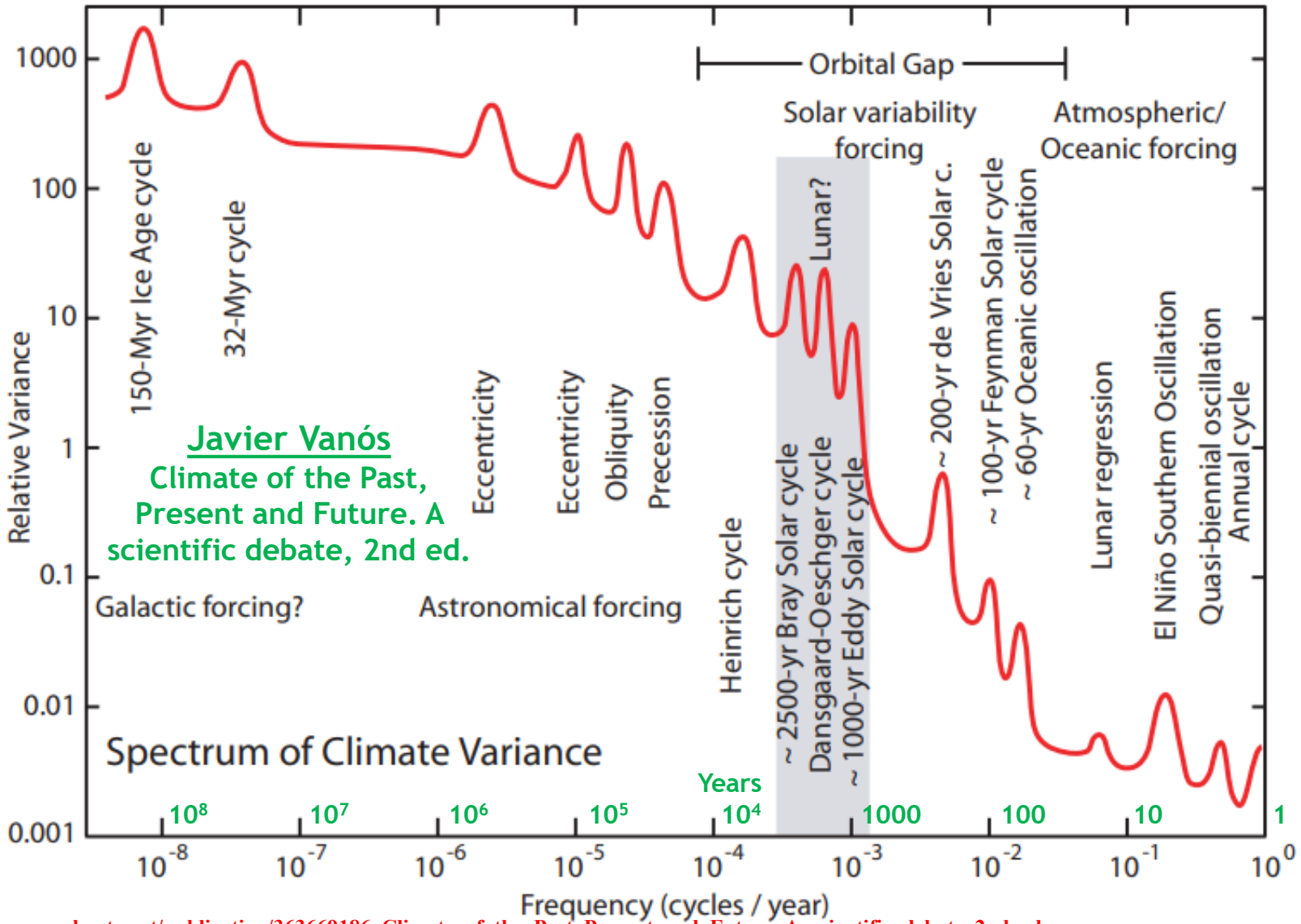
A Look at Solar Influences

Fourier Spectrum Analysis Gravitational and Electromagnetic Entanglement Complex Cycles

Climate Cycle Distributions
1 Year to 150,000,000 Years

Fig. 4.19 Climate cycles and periodicities dominate climate change at all temporal scales
Spectrum of climate variance showing the better studied climatic cycles and their proposed forcings, although some are not widely accepted. Cycles, quasicycles, and periodic oscillations are found over the entire temporal range, indicating they are a salient property of climatic variability. As a general rule, the lower the frequency, the more intense the climatic variance produced. The 150-Myr Ice Age cycle has produced three ice ages and a cold age in the last 450 million years. It is proposed to be caused by the crossing of the galactic arms by the Solar system. The 32-Myr cycle has produced two cycles during the Cenozoic era, the first ending in the glaciation of Antarctica and the second in the current Quaternary Ice Age. It is proposed to be caused by the vertical displacement of the Solar system with respect to the galactic plane. The orbital or Milankovitch cycles are the best studied, and between them and the Lunar nodal regression cycle of 18.6 years lies the orbital gap, where no astronomical cycle is known to affect climate. Our knowledge of this range is very insufficient, despite millennial climate cycles (grey band) determining most of Holocene climatic variability. Short term climate variability is dominated by the El Niño/Southern Oscillation. After Maslin et al. (2001).



https://www.researchgate.net/publication/363669186_Climate_of_the_Past_Present_and_Future_A_scientific_debate_2nd_ed

Solar Cycle Summary Table

Cycles from the previous slide

Other Cycles

Cycle Name	Duration	Comments
Daily Cycle	1 day/ 24 hours	Day and Night (Earth's Rotation)
Seasonal Cycle	1 year, 365 days	Spring, Summer, Fall, Winter (Earth's Revolution Around the Sun)
Annual Cycle	1 year	Atmospheric/Ocean Forcing
Quasi-biennial Oscillation	±2 years	Atmospheric/Ocean Forcing
El Niño Southern Oscillation	3 -7 years	Ocean Cycle, Atmospheric/Ocean Forcing
Schwabe (Sunspot) Cycle	10.7 years	Solar/Orbital Dynamics
Lunar Regression	18.6 years	Lunar/Orbital
Hale Cycle	22 years	2 Schwabe Cycles (The sun's Magnetic Polarity flips every 11 years)
Oceanic Oscillations	60 years	Atlantic Multi-decadal (AMO), Pacific Decadal (PDO), etc.
Gleissberg Cycle	22 years	2 Schwabe Cycles (The sun's Magnetic Polarity flips every 11 years)
Feynman Solar Cycle	100 years	Orbital Dynamics
Suess-de Vries Solar Cycle	210 years	Orbital Dynamics
Lunar Cycle (David Dilley)	220 years	Lunar/Solar Gravitational Forcings (also 9-, 72- & 1200-year cycles)
Grand Solar Minimum Cycle	363 years	Orbital Dynamics
Bond Solar Cycle	1,000 years	Orbital Dynamics
Eddy Solar Cycle	1,000 years	Orbital Dynamics
Dansgaard-Oeschger Events	1,200 years	Orbital Dynamics
Zharkova (?) Solar Cycle	2,000 years	Distance of the Earth from the Sun
Hallstatt Solar Cycle	2,300 years	Astronomical Forcing
Bray Solar Cycle	2,500 years	Astronomical Forcing
Heinrich Cycle	6,000 years	Astronomical Forcing
Sanchez-Sesma (?)	9,700 years	Planetary Gravitational Forcing (PGF)
Precession	23,000 years	Astronomical Forcing, Milankovitch Cycle
Obliquity	41,000 years	Astronomical Forcing, Milankovitch Cycle
Eccentricity	100,000 years	Astronomical Forcing, Milankovitch Cycle
Eccentricity	±405,000 years	Astronomical Forcing
Earth Ice Age Inflection	32,000,000 years	Vertical Displacement of the Solar System & the Galactic Plane
Deep Ice Age Events	150,000,000 years	Solar System Position in the Milky Way Galactic Arms

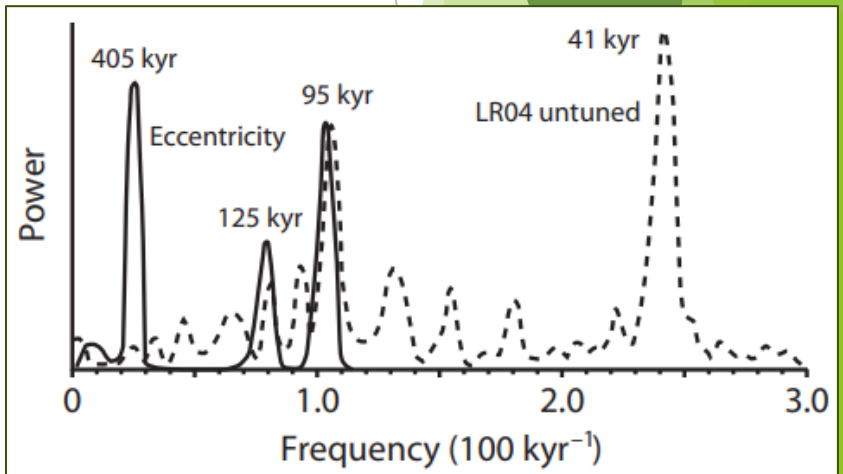
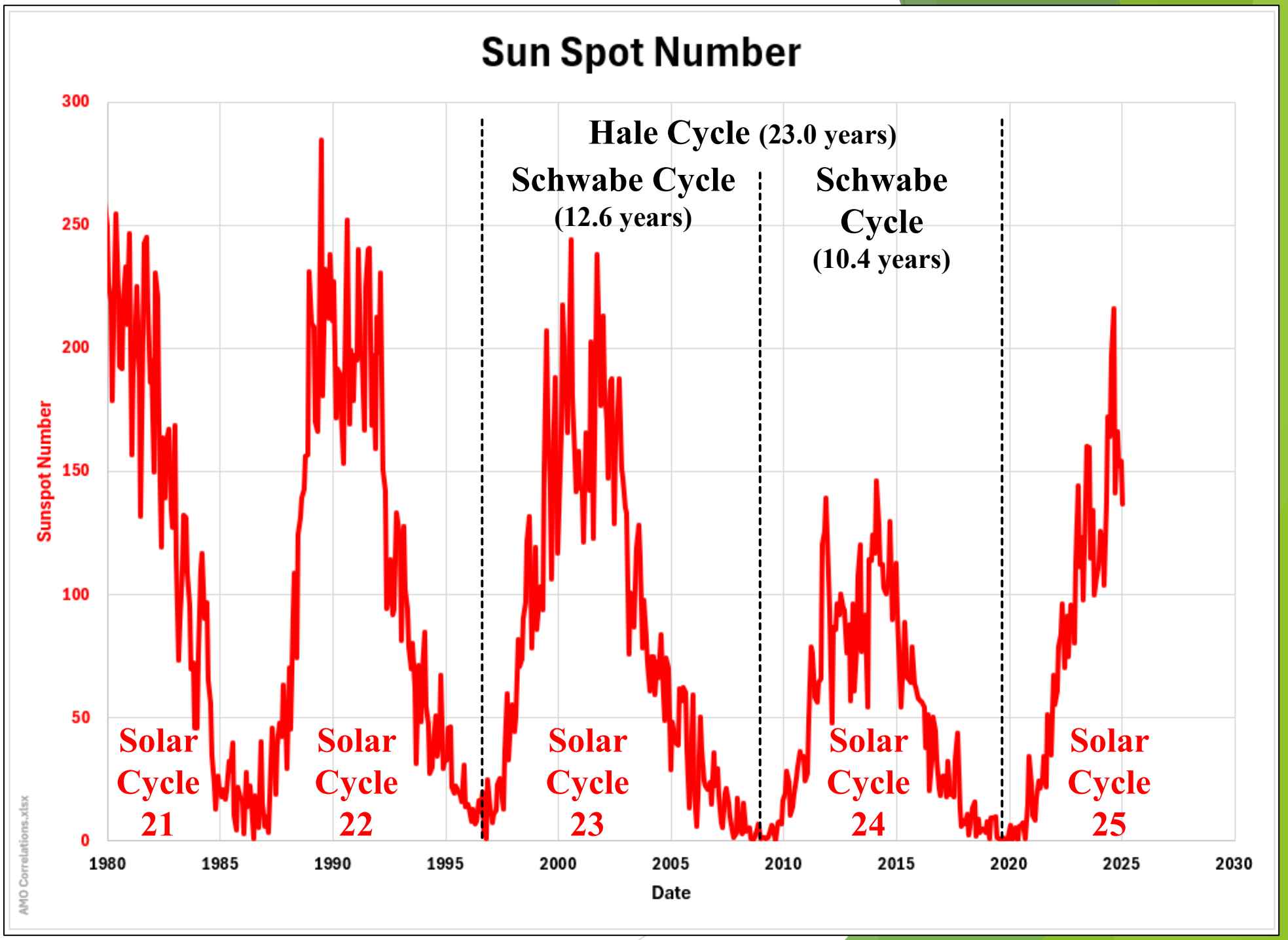


Fig. 2.3 Spectral differences between eccentricity and global ice-volume

Sunspot Number (SSN)
1980 to 2025
Monthly

The Schwabe Cycle
± 11 Years

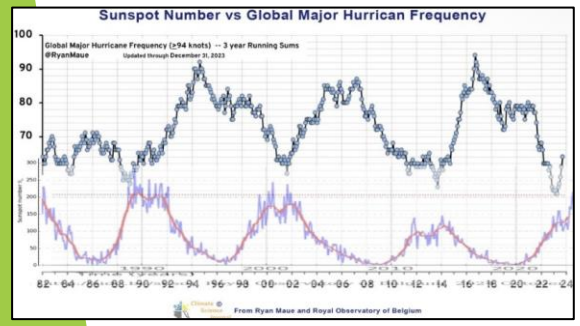
The Hale Cycle
± 22 Years
(2 Schwabe Cycles)



Is Hurricane activity driven by Solar Activity or the slow steady CO_2 Rise?

You decide!

Original Image Courtesy Joseph Fournier

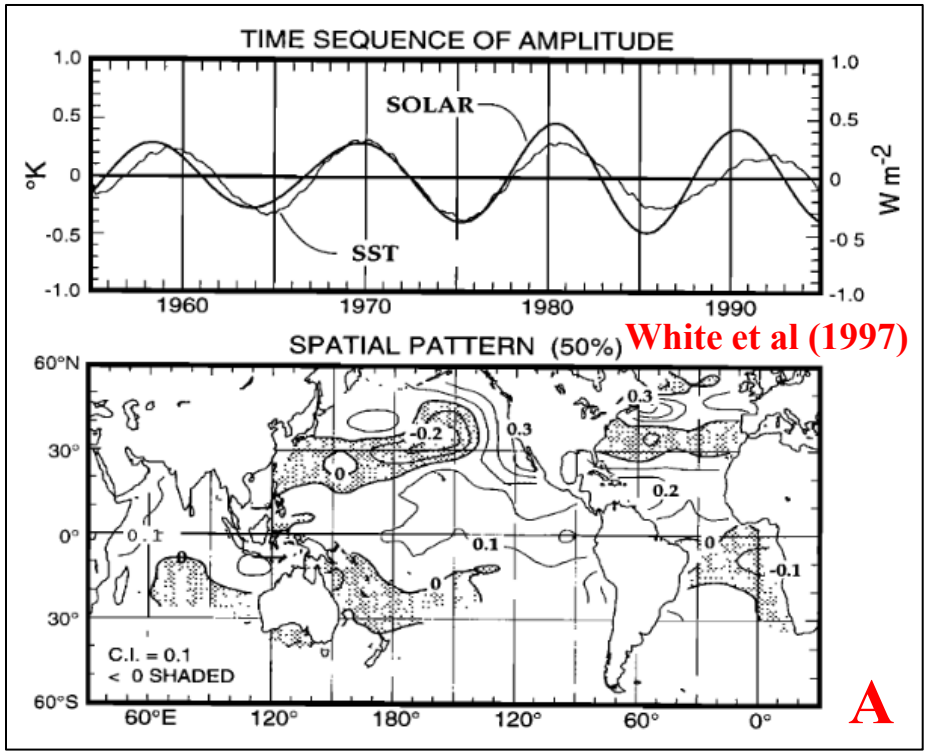


Hurricanes/Earth Spots (94+ knots, 3 Year, Running Sum) and Sun Spot Number

CSS-66 - Are Hurricanes Just Earthspots?
https://climatechangeandmusic.com/are-hurricanes-just-earthspots/

Number of Hurricanes
Sun Spot Number
Date
Number of Hurricanes - 94+ knots - 3 Year
Sun Spot Number
AMO Correlations.xlsx

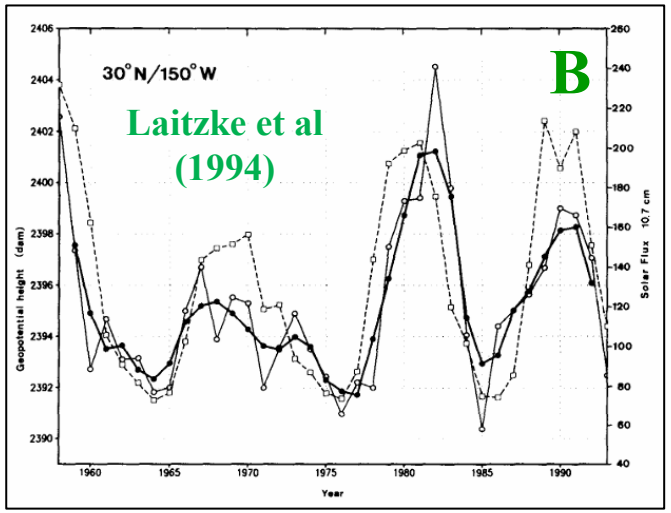
Other examples of solar-climate correlations



White et al (1997)

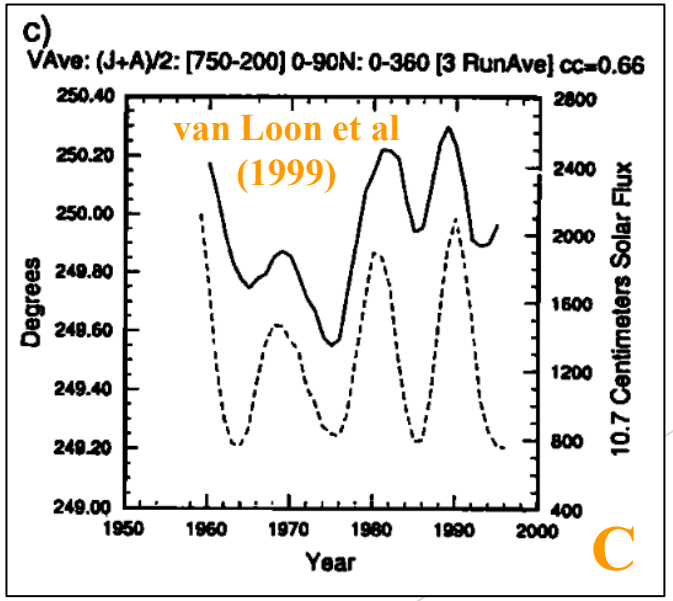
A – "Response of global upper ocean temperature to changing solar irradiance"
https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/96JC03549

For some additional research, here are 239 papers (from just 2016) highlighting connections between various parameters (solar, oceans, ozone, clouds, aerosols, CO_2 (limited sensitivity), etc.) and the climate.
Solar Influence On Climate (133)
https://notrickszone.com/skeptic-papers-2016-1/



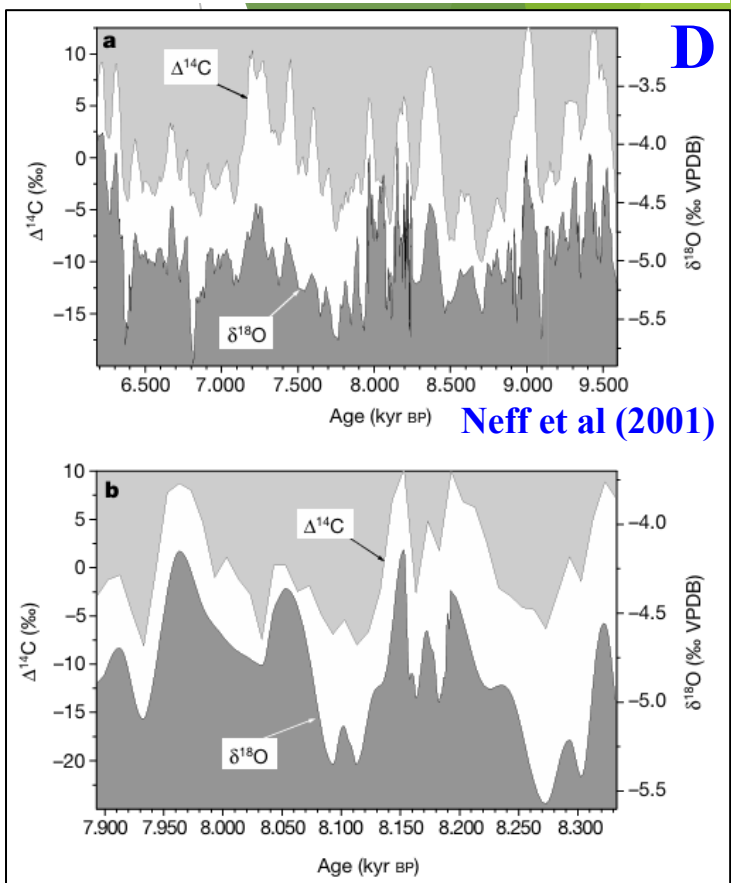
Laitzke et al (1994)

B – "Connection between the troposphere and stratosphere on a decadal scale"
https://www.researchgate.net/publication/312394397_Connection_between_the_troposphere_and_stratosphere_on_a_decadal_scale



C – "A probable signal of the 11-year solar cycle in the troposphere of the northern hemisphere"
https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/1999GL900596

D – "Strong coherence between solar variability and the monsoon in Oman between 9 and 6 kyr ago"
https://www.researchgate.net/publication/11981110_Strong_coherence_between_solar_variability_and_the_monsoon_in_Oman_between_9_and_6_kyr_ago



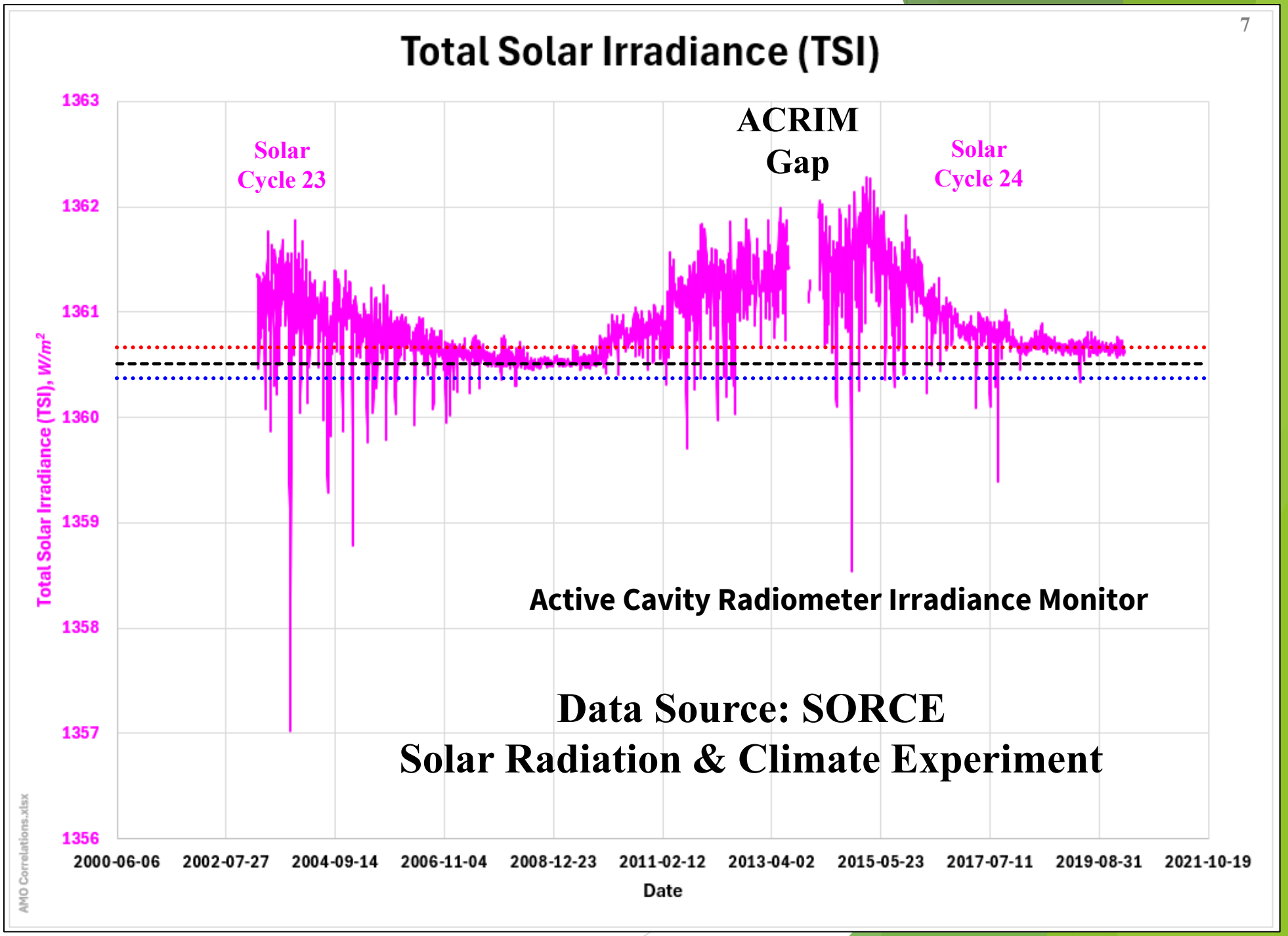
Neff et al (2001)

Figure 2 Profiles of H5 $\delta^{18}O$ values and atmospheric $\Delta^{14}C$. **a**, The entire H5 record (826 samples); **b**, the high-resolution interval. Both profiles in **a** were smoothed with 5-point adjacent averaging for better visual comparison. The $\delta^{18}O$ profile in **b** was filtered with 7-point fast Fourier transform smoothing (cut-off frequency, 0.1 yr^{-1}). The correlation coefficient of the unsmoothed data is $r = 0.60$, $P(>|r|) < 10^{-8}$ in **a**, and $r = 0.55$, $P(>|r|) = 1.1\times10^{-4}$ in **b**. Because of the apparent good relationship between the two profiles, we fine-tuned the peaks of the $\delta^{18}O$ age profile to the peaks of the $\Delta^{14}C$ record. The corrections of the Th–U timescale are shown in Fig. 3.

Total Solar Irradiance
2003 to 2020
Daily

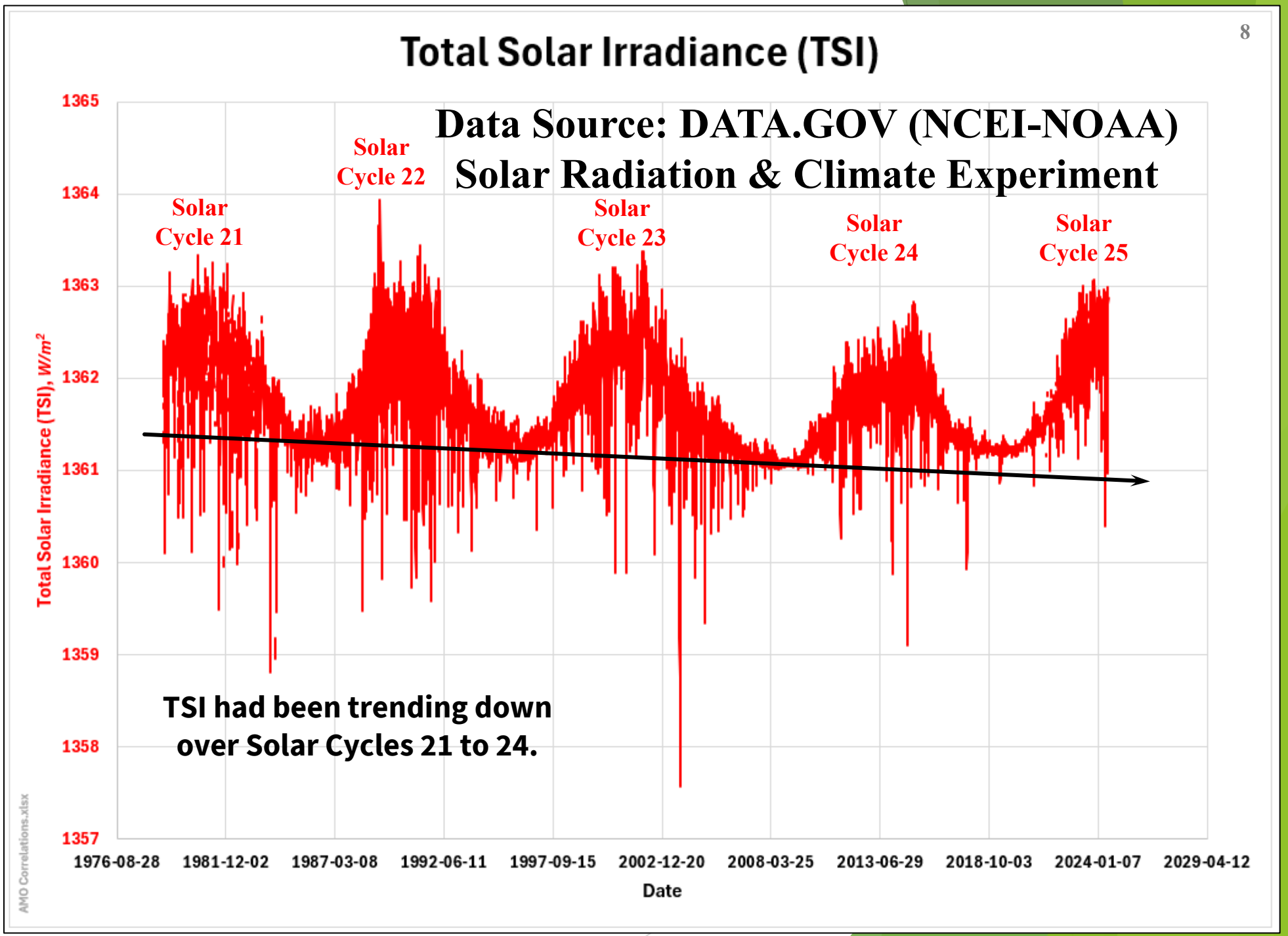
The lack of data during the ACRIM Gap has led to calibration question marks (i.e.: the science is not settled)

NOAA has chosen the work of Claus Frohlich and Judith Lean that raised the baseline (Solar Minimum between Solar Cycles 24 and 23) from the black dashed line to the dotted red line. Valid arguments (Soon, Connolly et al, CERES Science) have been made that show the calibration could just as easily have remained flat (the black dashed line) or continued to drop as represented by the blue dotted line.



Total Solar Irradiance
1978 to 2024
Daily

The data is sourced from the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) group. The data files were pulled from the DATA.GOV website. This TSI reconstruction was compiled by Claus Frohlich and Judith Lean (as mentioned on the previous slide).

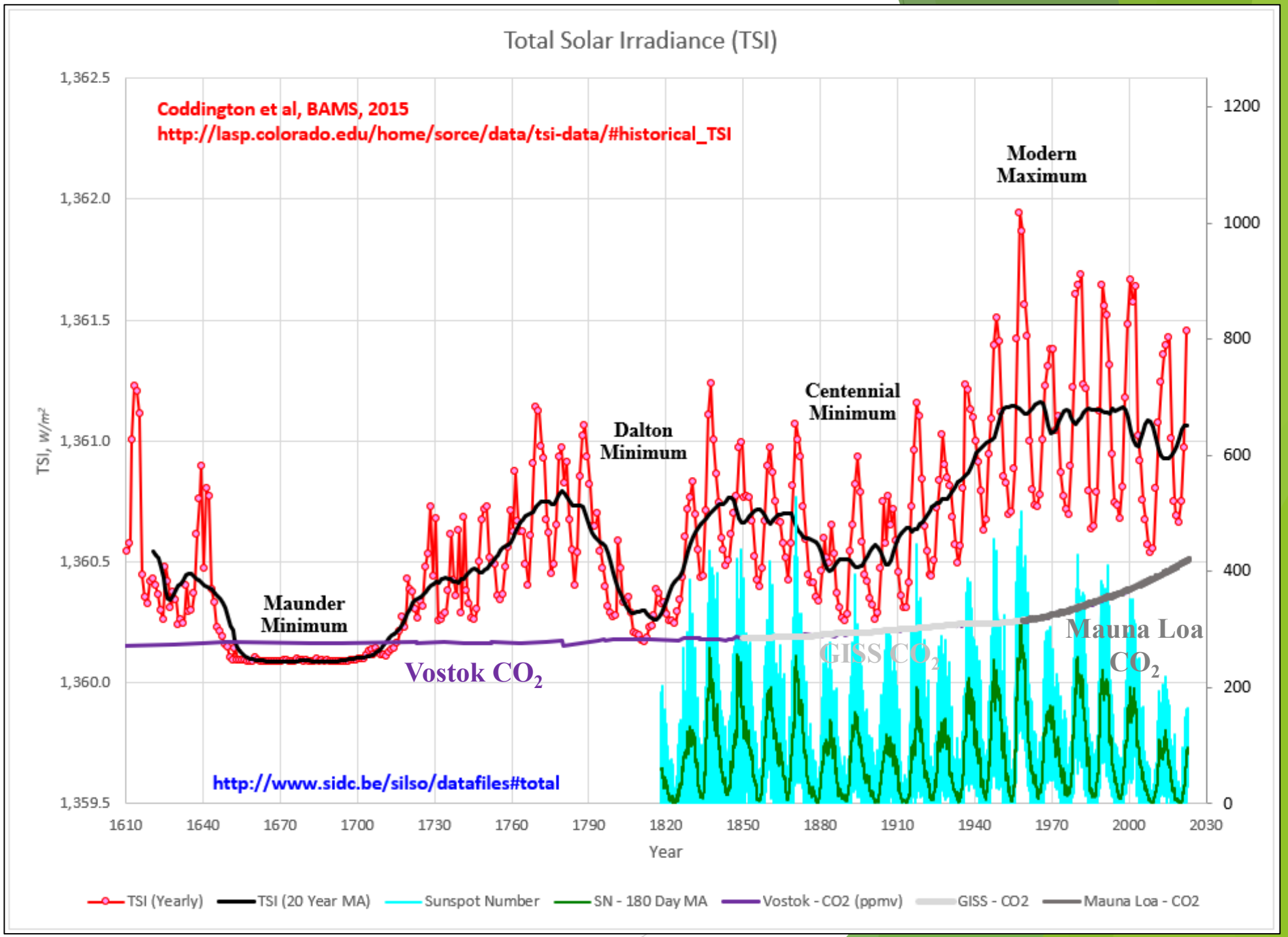


The Schwabe Cycle

Total Solar Irradiance
1610 to 2024
Yearly
20 Year Moving Average

Sunspot Numbers
1818 to 2024
Monthly
180 Day Moving Average

Atmospheric CO_2
1610 to 2024
From three sources:
Vostok, Antarctica
NASA/GISS
Mauna Loa, Hawaii

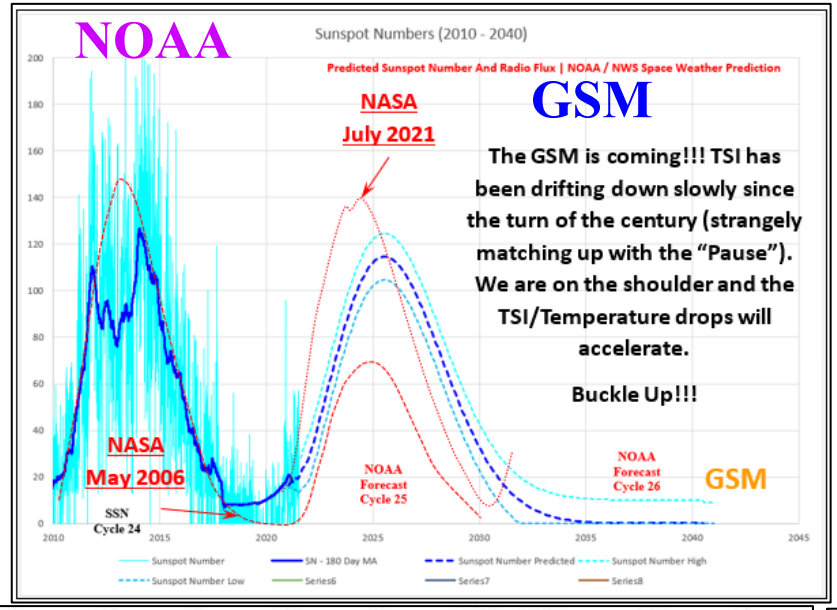


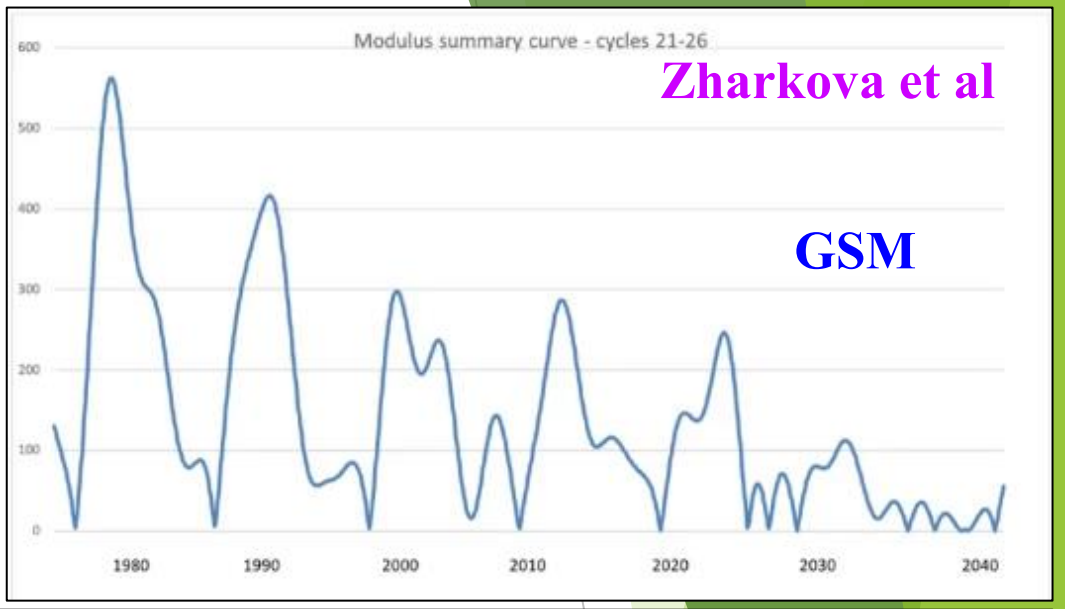
Solar Activity Forecast Cycle 26

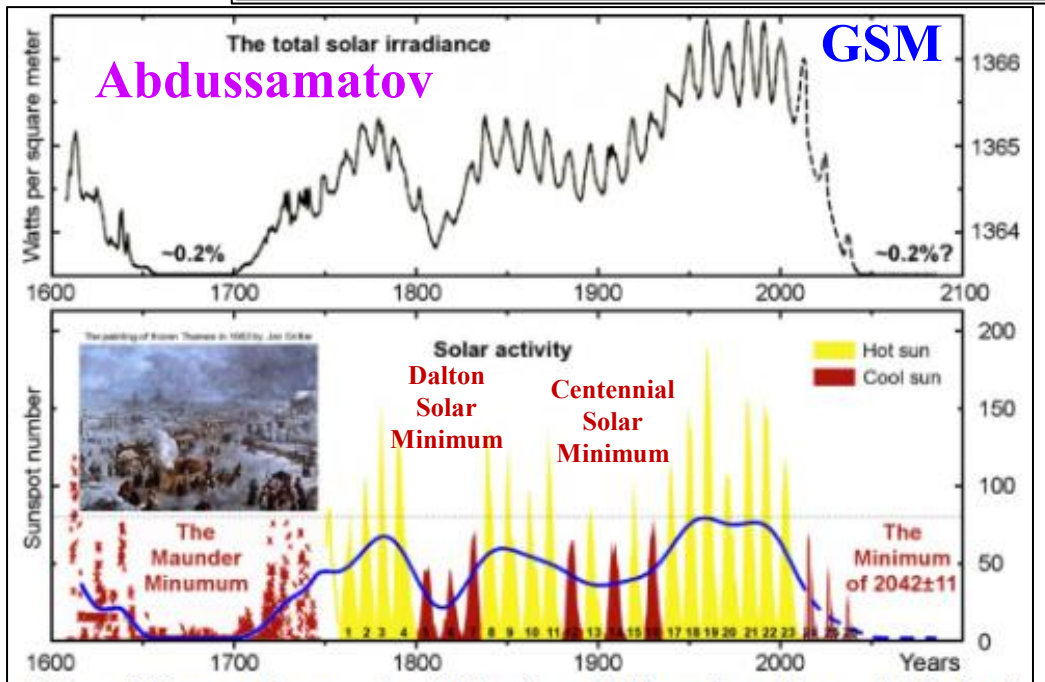
Total Solar Irradiance
Sunspots
1610 to 2024
Yearly

Grand Solar Minimum (GSM)

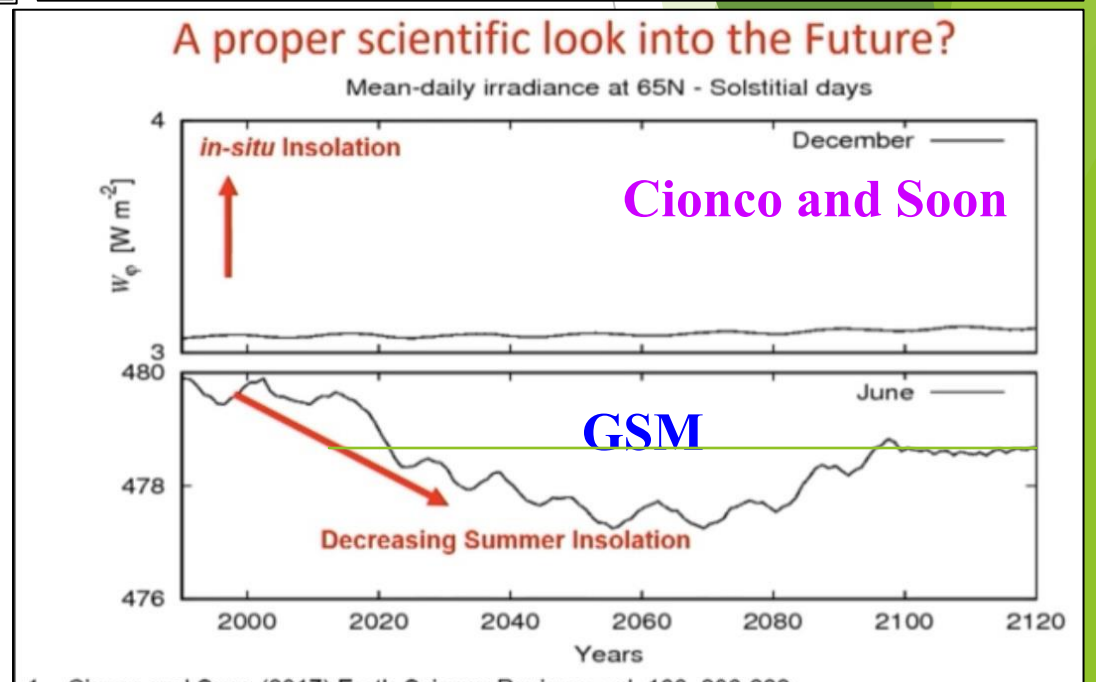
Colder Temperatures are Coming







TSI variations and sunspot activity since 1611 and our forecast (dashed lines) (Abdussamatov H. I. The Sun Dictates the Climate of the Earth. 2009, St. Petersburg, "Logos", – 197 p.; The Sun Dictates the Climate. 4th International Conference on Climate Change in Chicago, May 2010.



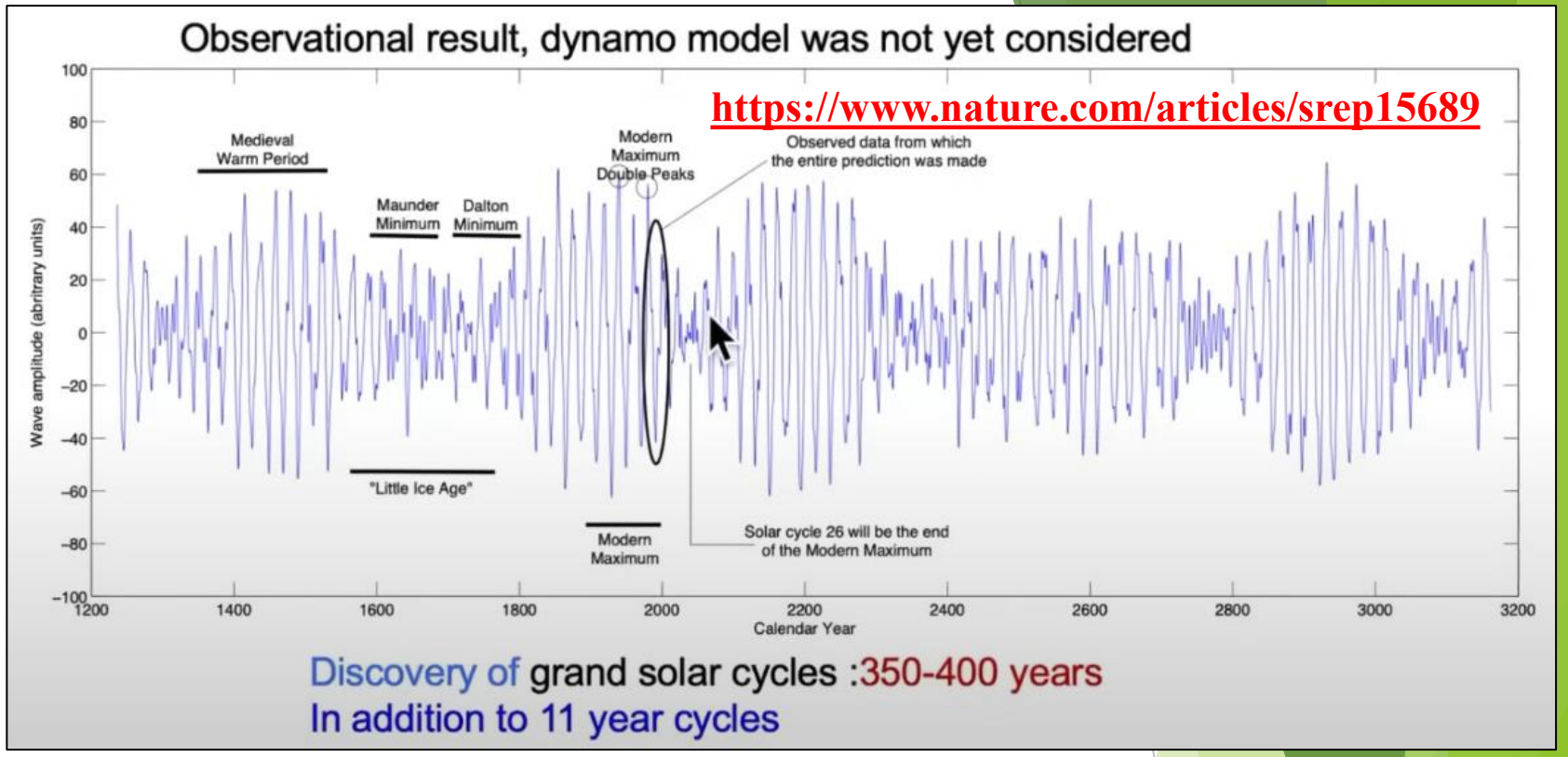
1. Cionco and Soon (2017) Earth-Science Reviews, vol. 166, 206-222;
2. Cionco, et al. (2018) New Astronomy, vol. 58, 96-106
3. Cionco, Soon et al. (2020a) Advances in Space Research, vol. 66, 720-742
4. Cionco, Soon et al. (2020b) Advances in Space Research, vol. 66, 1992-2000
5. Cionco et al. (2021) Earth and Space Science, vol. 8, e2021EA001805

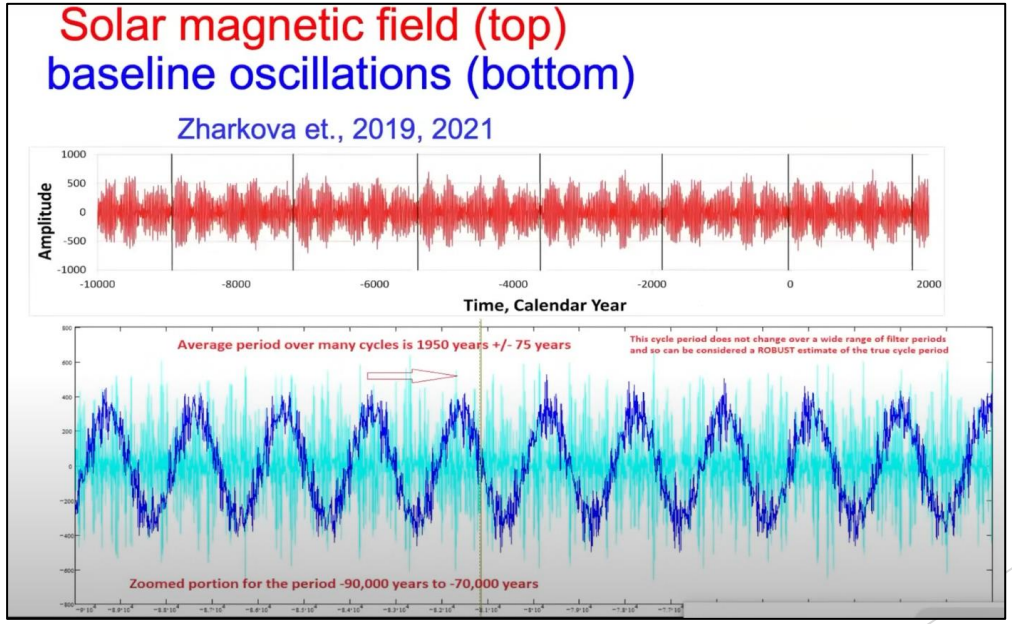
Heartbeat of the Sun from Principal Component Analysis and prediction of solar activity on a millennium timescale

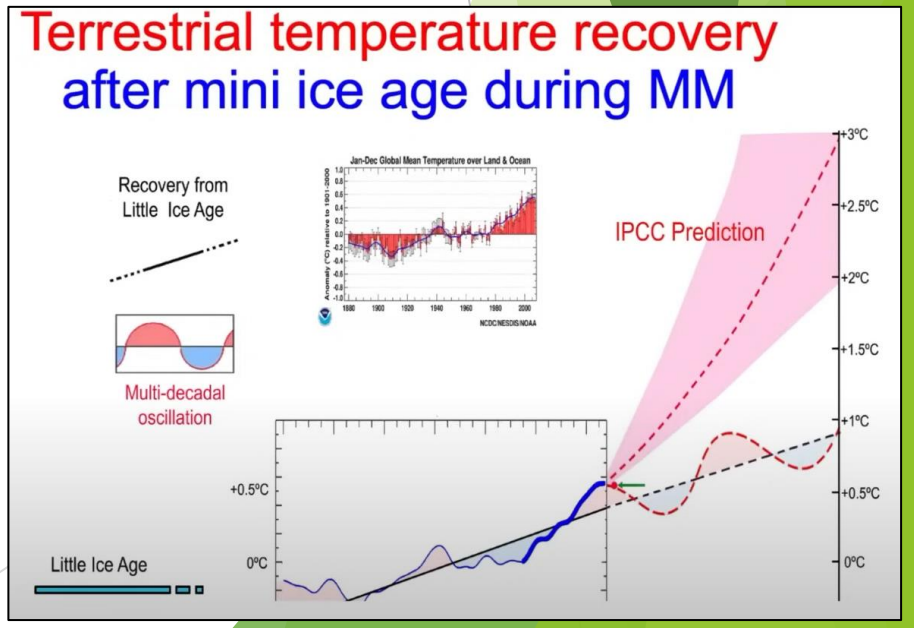
Zharkova et al 2015

Shows grand solar cycles of 350 – 400 years where the Schwabe Cycles weaken and strengthen.

The baseline oscillates on a 2,300-year cycle (Hallstatt, warming and cooling). We reached the bottom of the cycle around 1600 and should continue to warm until 2600. The general trend is warming with warmer or cooler temperatures off trend.







Climate Change is Complicated

HadCRUT5 – Surface Temperature
1850 to 2022

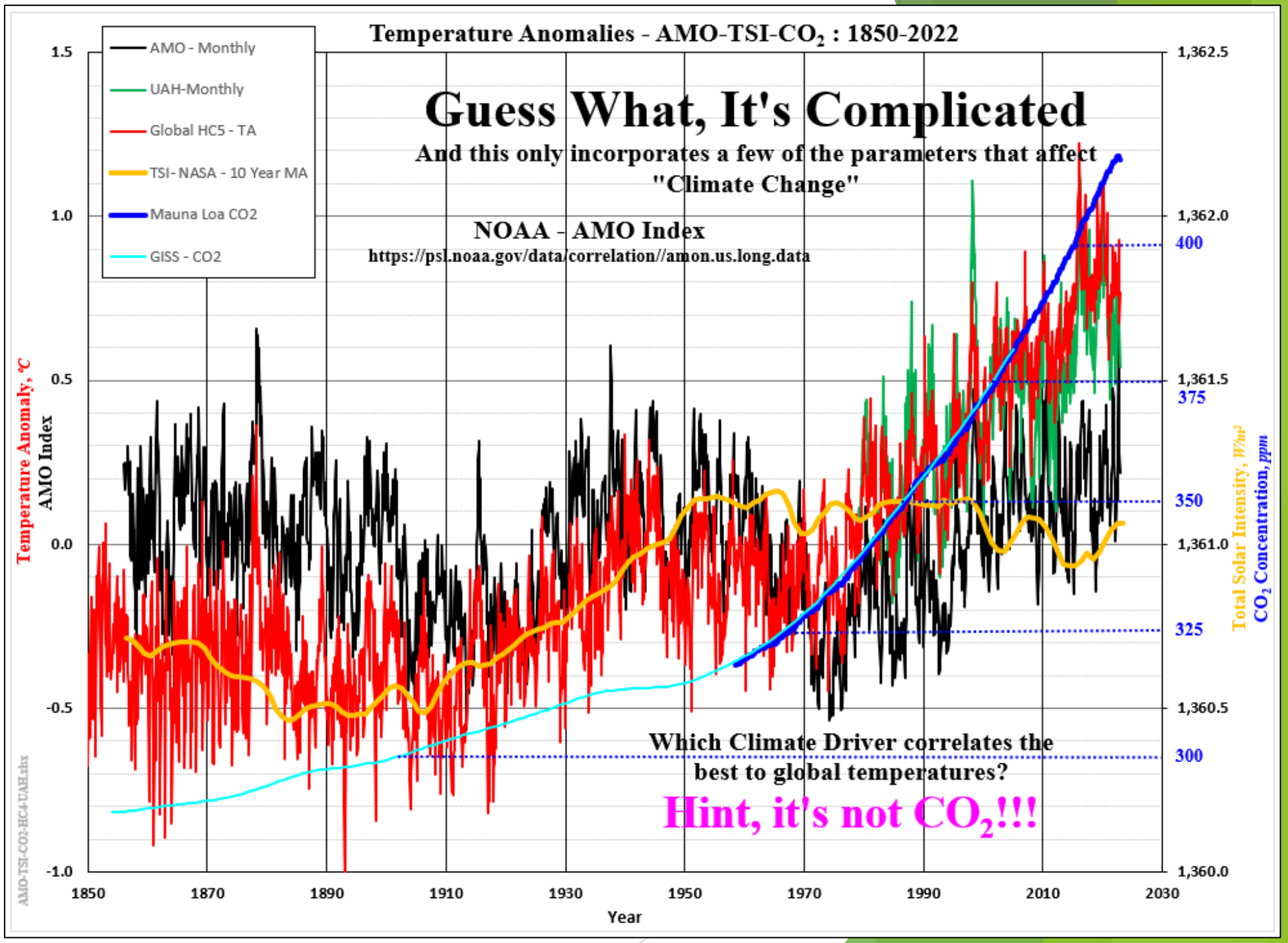
University of Alabama, Huntsville
UAH - Satellite Temperature
1978 to 2022

Total Solar Irradiance Momentum
TSI_M – (10 Year Moving Average)
1855 to 2022

Atlantic Multi-decadal Oscillation
AMO - 1855 to 2022

Atmospheric CO_2 Concentration
NASA/GISS CO_2
Mauna Loa CO_2
1855 to 2022

Temperatures Cycle, CO_2 Does NOT

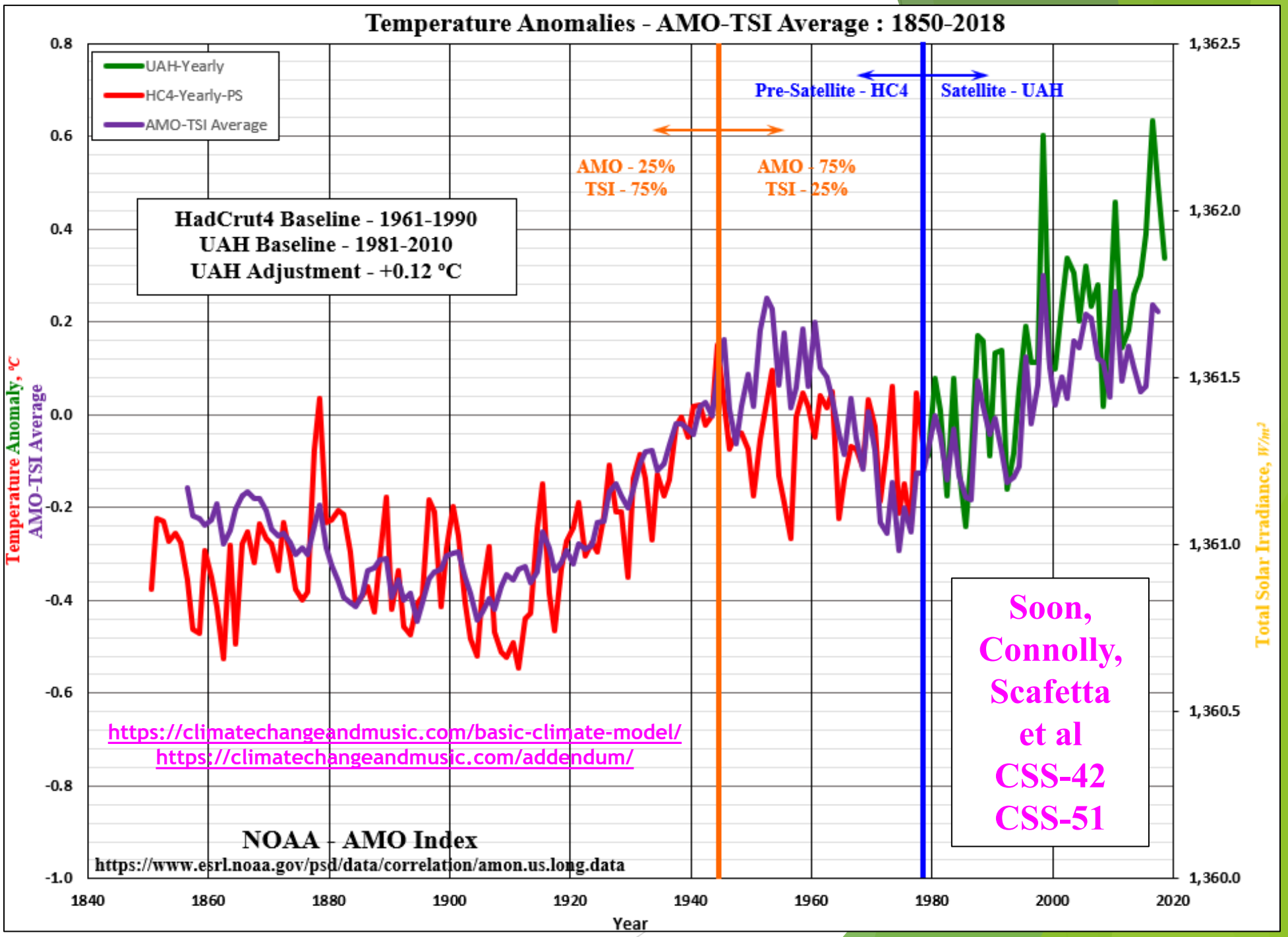


Basic Climate Model

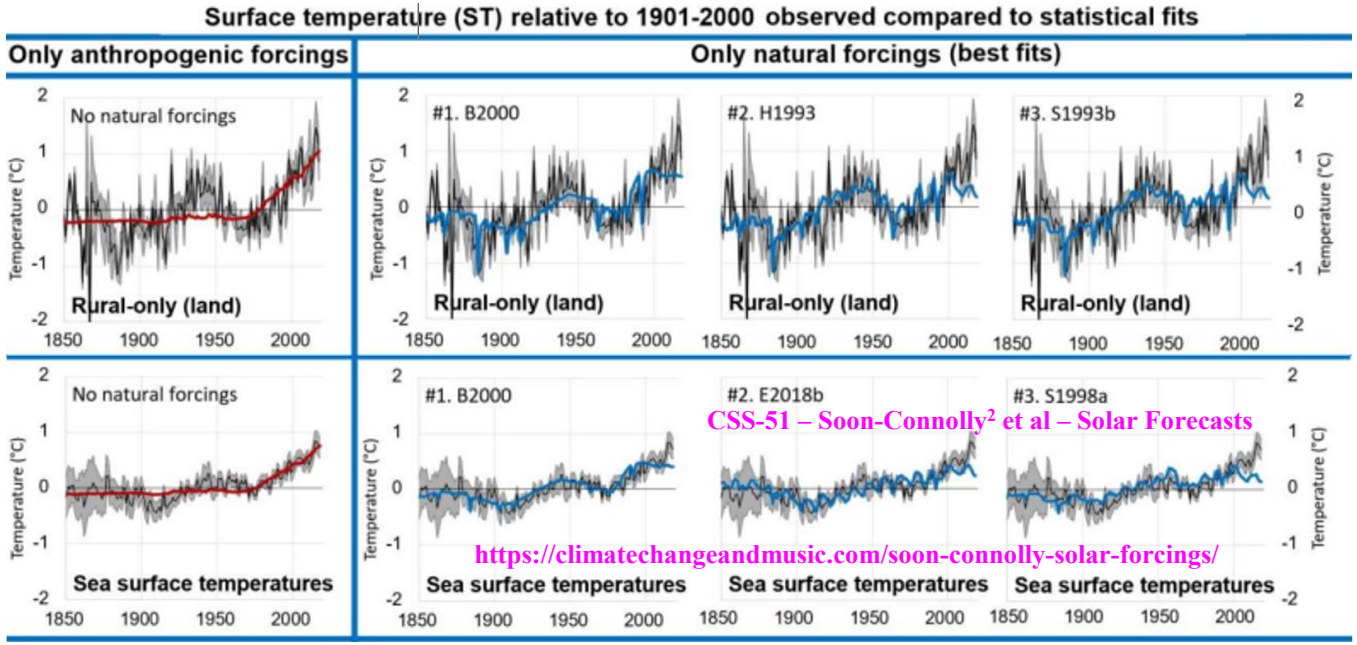
Simple Spreadsheet 2 parameters (TSI/AMO) to model the Modern Temperature Record (MTR, 1850 to the Present)

Not all encompassing, but a much better match than the CO_2 on its own.

And a lot cheaper than the billions they spend on the current models that are self-acknowledged to "run way too hot".



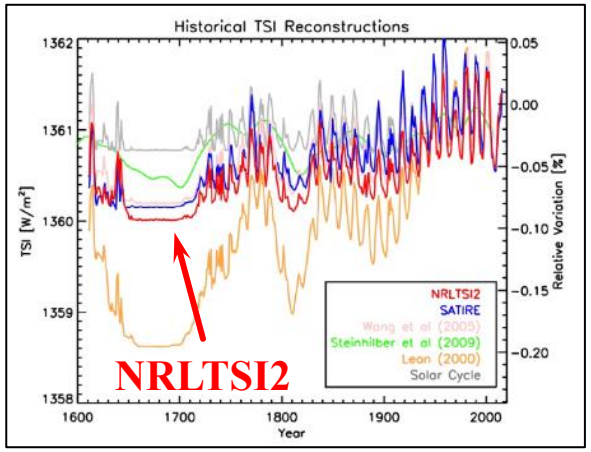
Comparing Anthropogenic and Natural Forcings

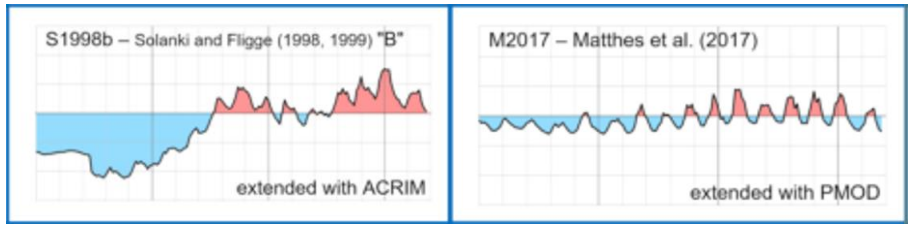


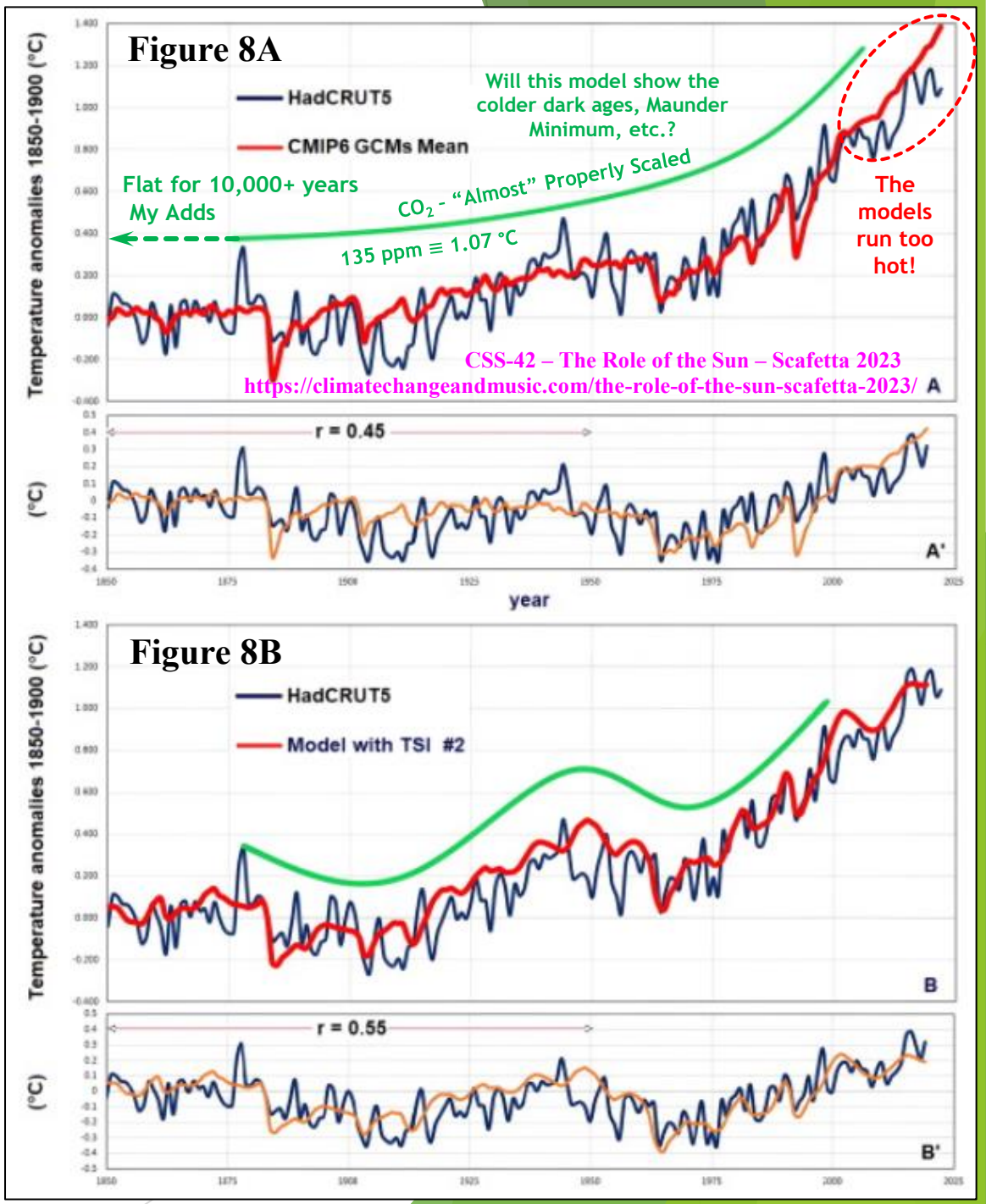
Solar Forcing models correlate better to the Modern Temperature Record (MTR, 1850 to the present) than Anthropogenic (primarily CO_2) models.

The IPCC models use one (M2017, below right) out of 40+ available TSI reconstructions.

The NRLTSI2 TSI reconstruction is a better single option than M2017.





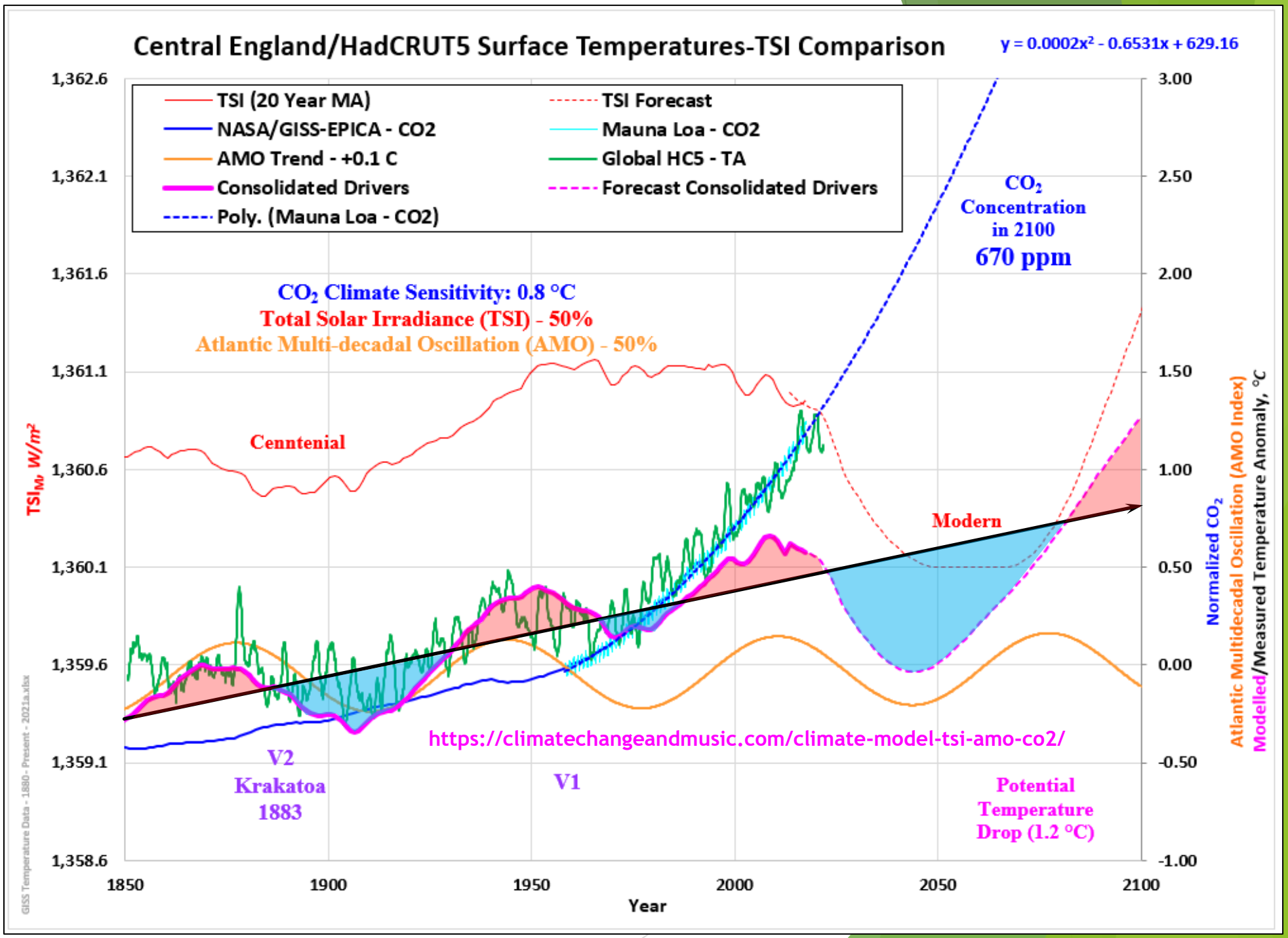


Climate Model 1850 to 2100 TSI/AMO/CO_2

Upgraded Simple Spreadsheet with 3 parameters to model the Modern Temperature Record (MTR, 1850 to the Present)

Still not all encompassing, but a much better match than the CO_2 on its own.

And still cheaper, with a forecast similar to the Zharkova forecast shown on Slide 10.



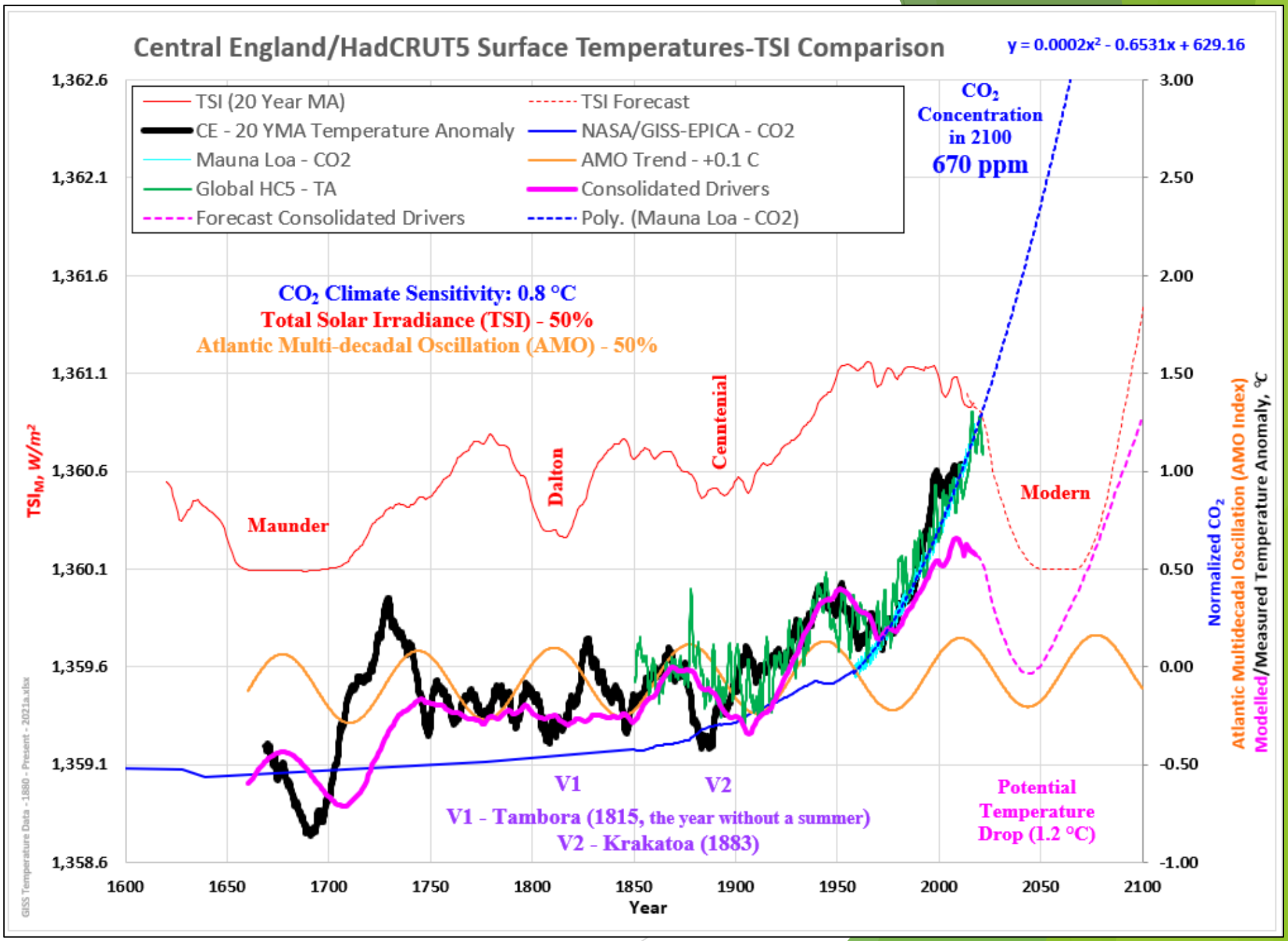
Climate Model 1659 to 2100 TSI/AMO/CO_2

Same history match from the previous slide extended out over the Central England Temperature (CET) record.

CO_2 simply cannot explain the temperature changes in the CET data.

There are more parameters in play than just TSI, AMO & CO_2.

Note the conformance between the HadCRUT5 and CET temperature data.



The Solar System Barycentre

The earth (and other planets) do not revolve around the centre of the sun. They revolve around the barycentre. The earth's distance from the sun varies depending on the barycentre's position.

As the distance from the sun changes, the amount of energy from the sun changes affecting the earth's climate/temperature. This change happens on a roughly 60-year cycle and the much longer Hallstatt 2300-year cycle.

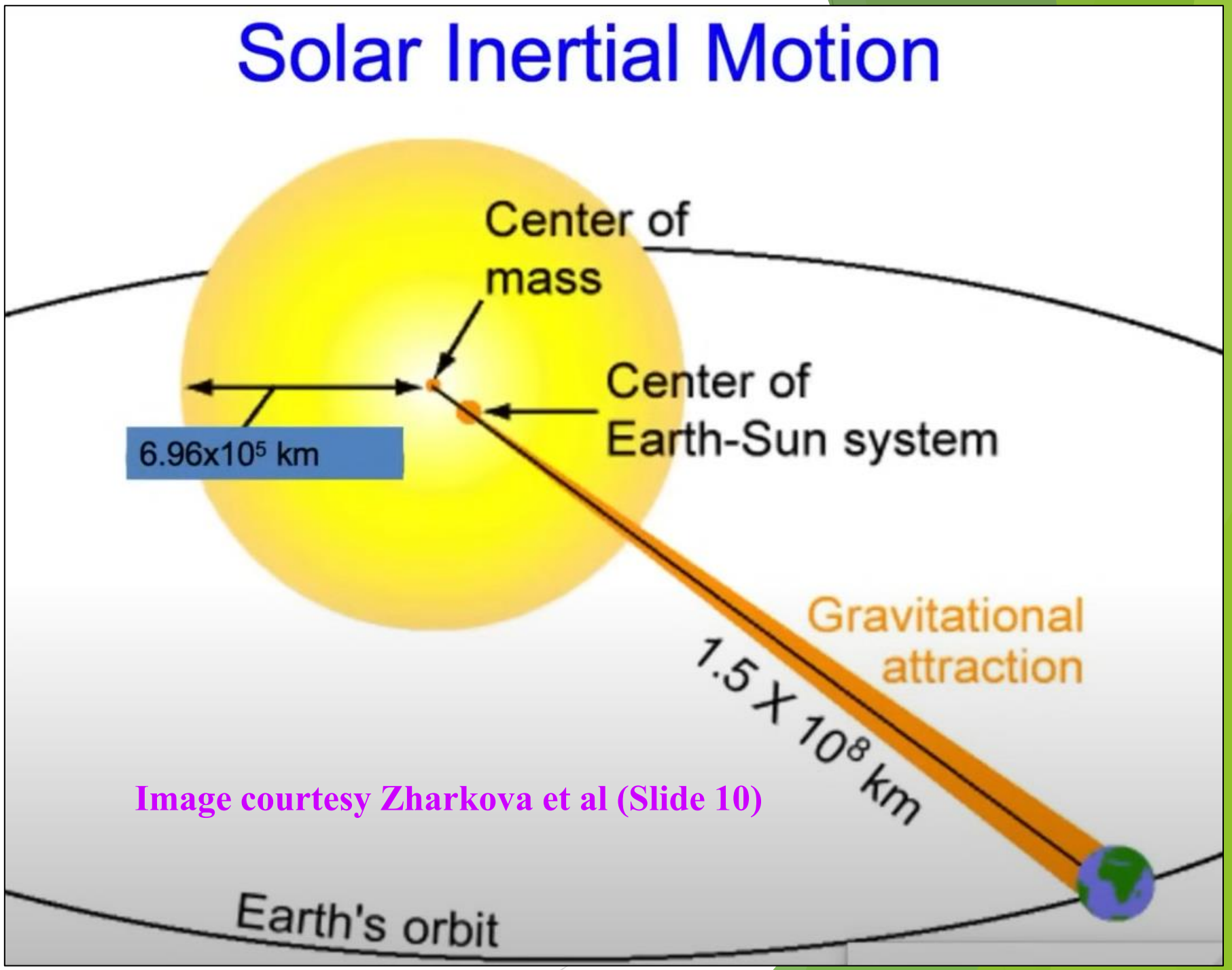
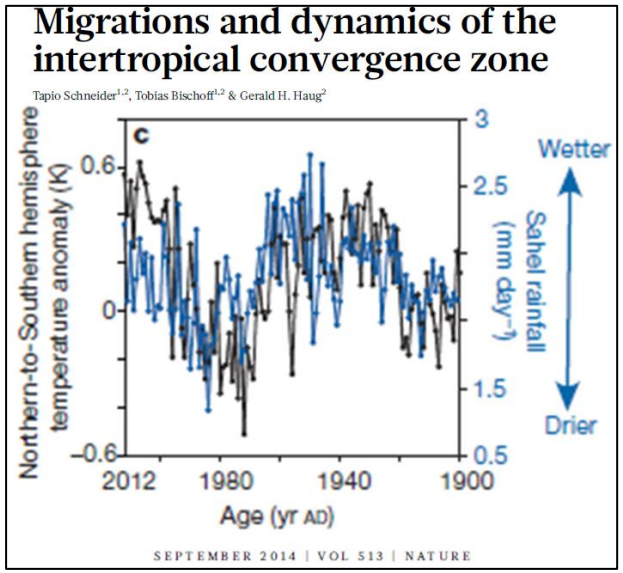
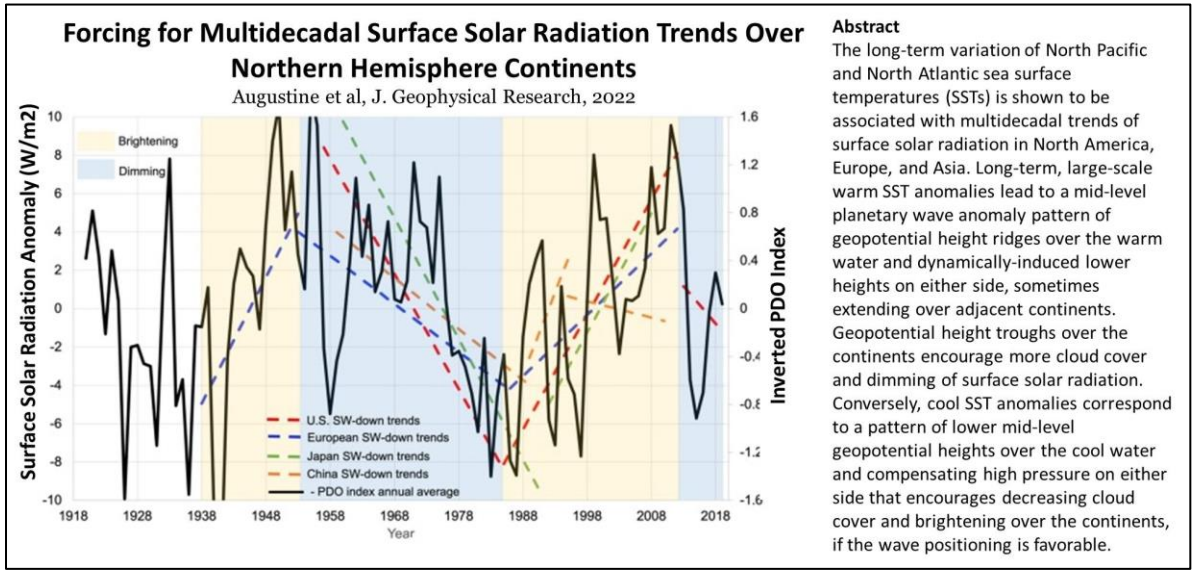


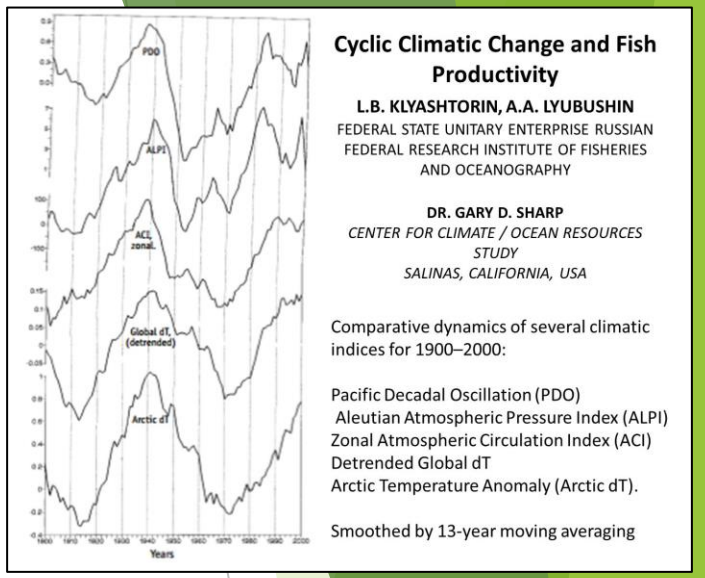
Image courtesy Zharkova et al (Slide 10)



Intertropical Convergence Zone



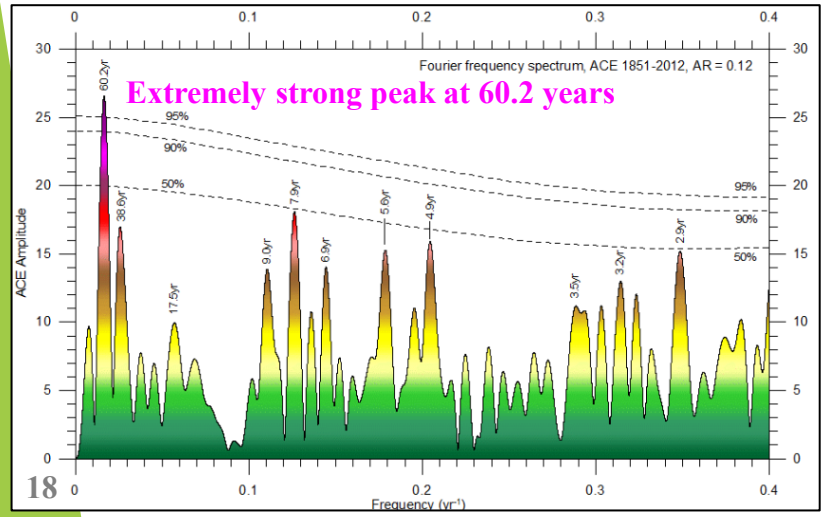
Surface Solar Radiation Trends - NH



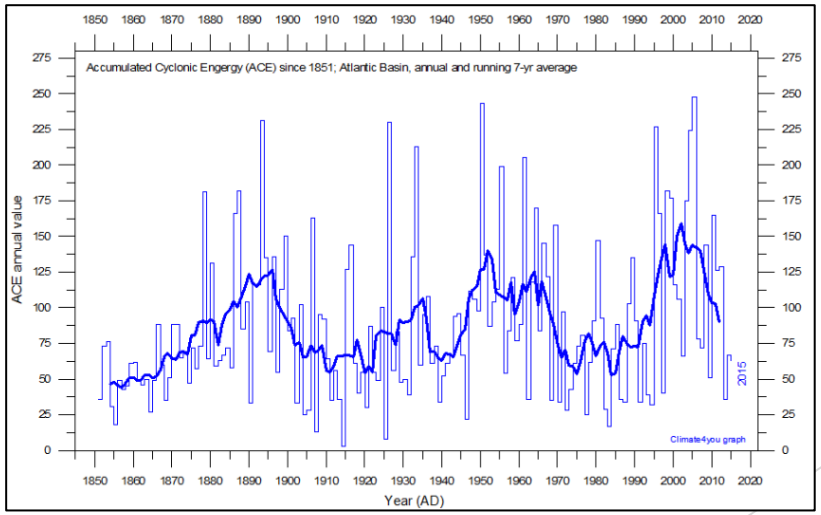
Fish Productivity

60-Year Cycles are endemic in our Climate System (Images Courtesy Joseph Fournier)

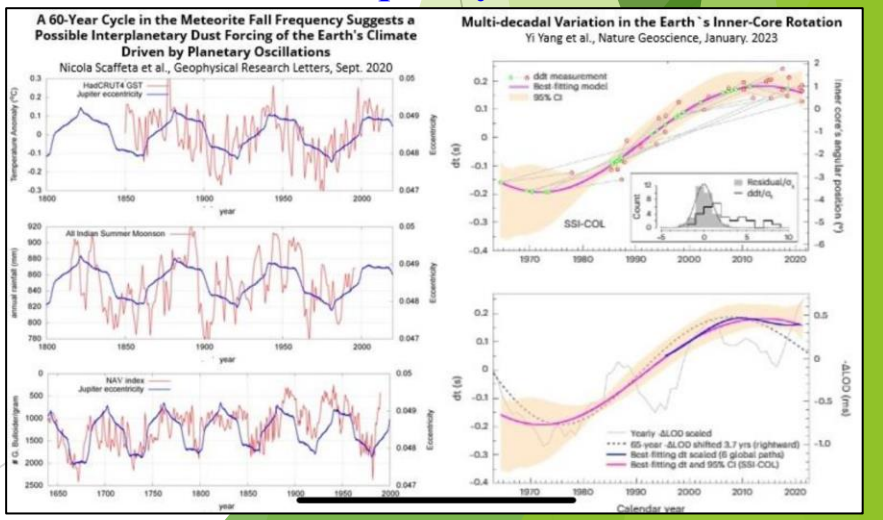
Fourier Wavelet Spectrum Analysis (ACE)

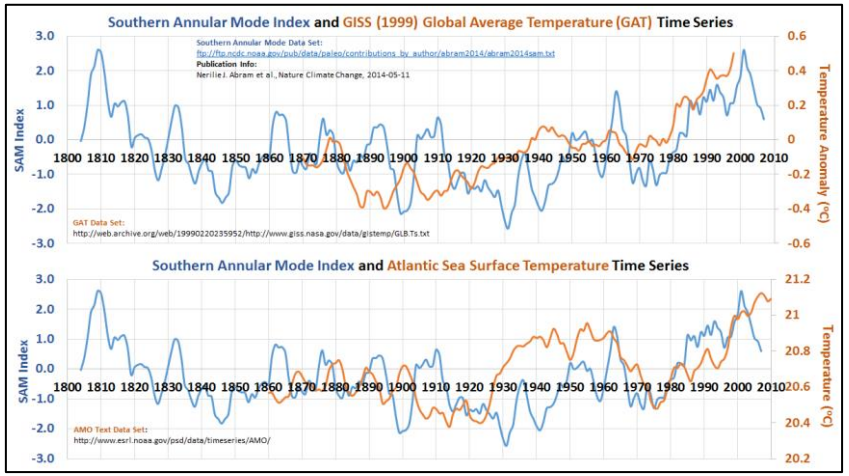


Accumulated Cyclone Energy (ACE)

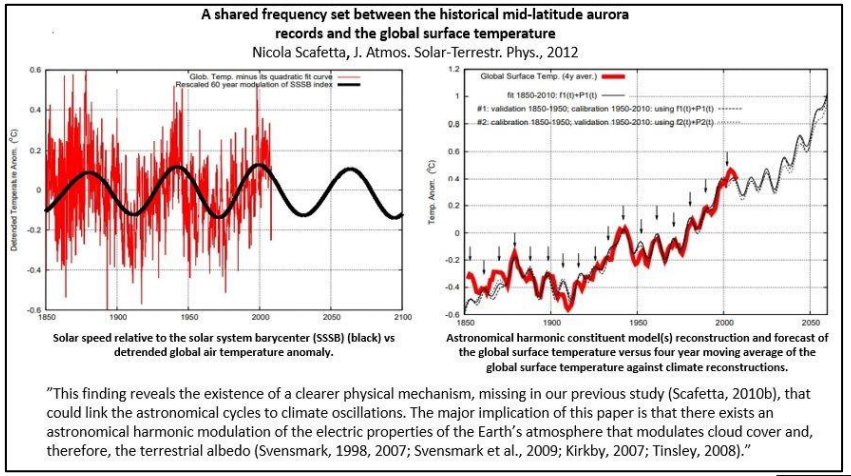


Meteorite Fall Frequency

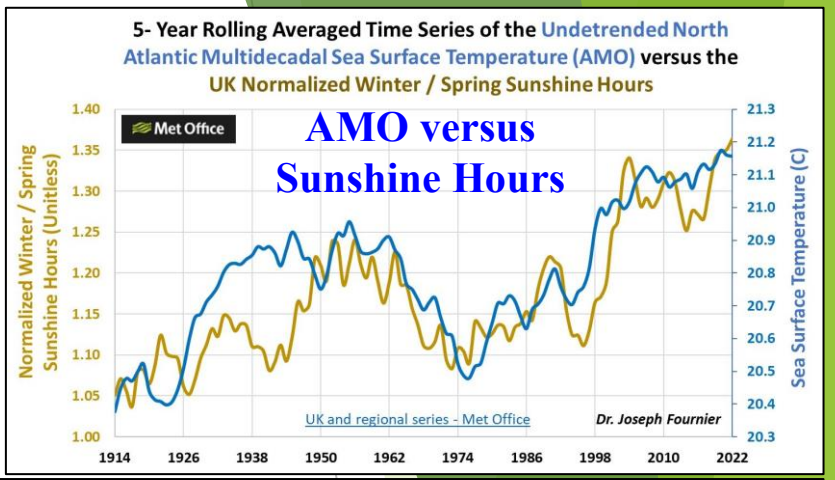




Southern Annular Mode Index



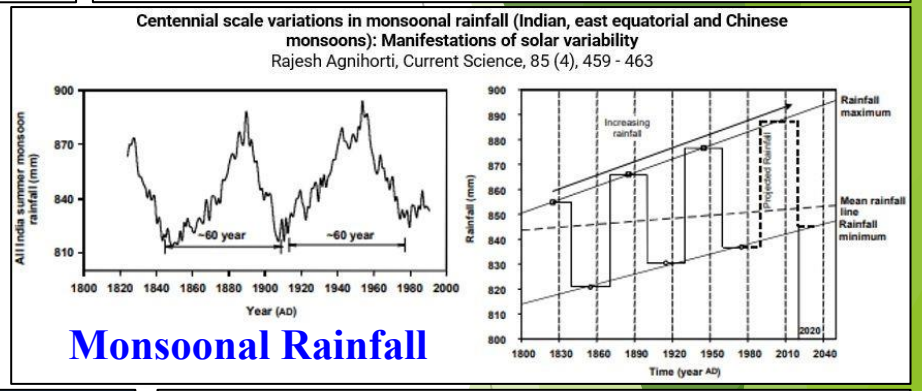
Mid-Latitude Aurora & Global Surface Temperature



AMO versus Sunshine Hours

60-Year Cycles are endemic in our Climate System

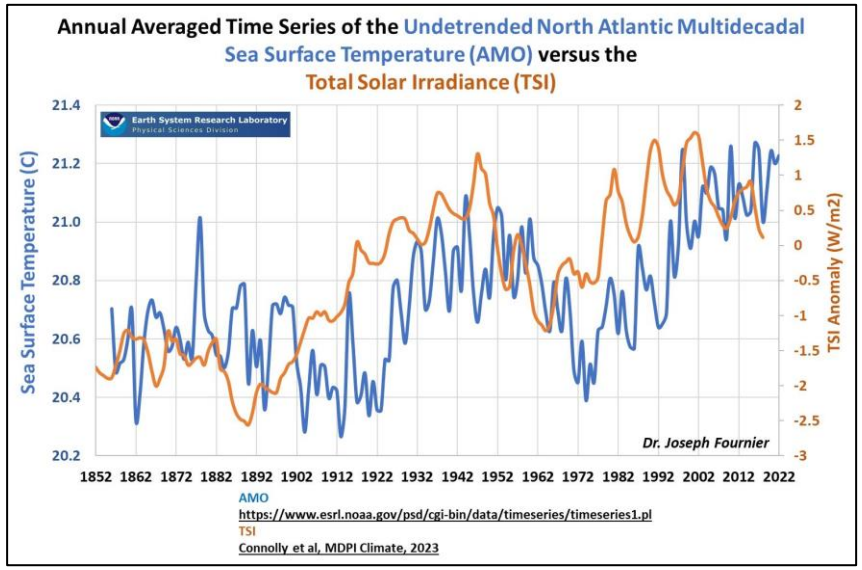
(Images Courtesy Joseph Fournier)

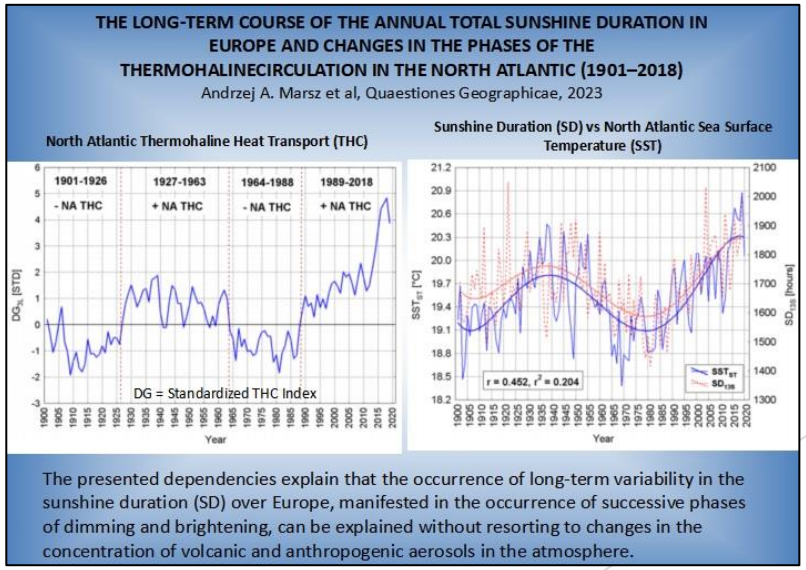


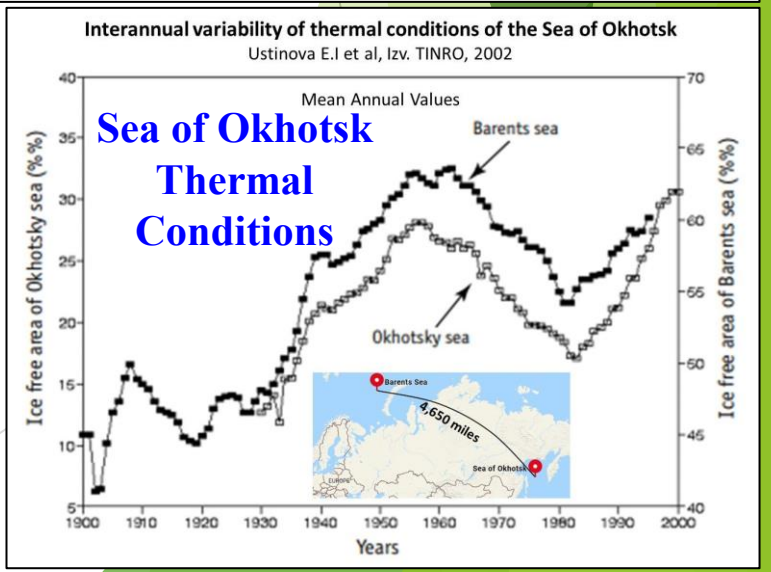
Monsoonal Rainfall

Total Sunshine versus NA ThermoHaline Circulation

AMO versus TSI



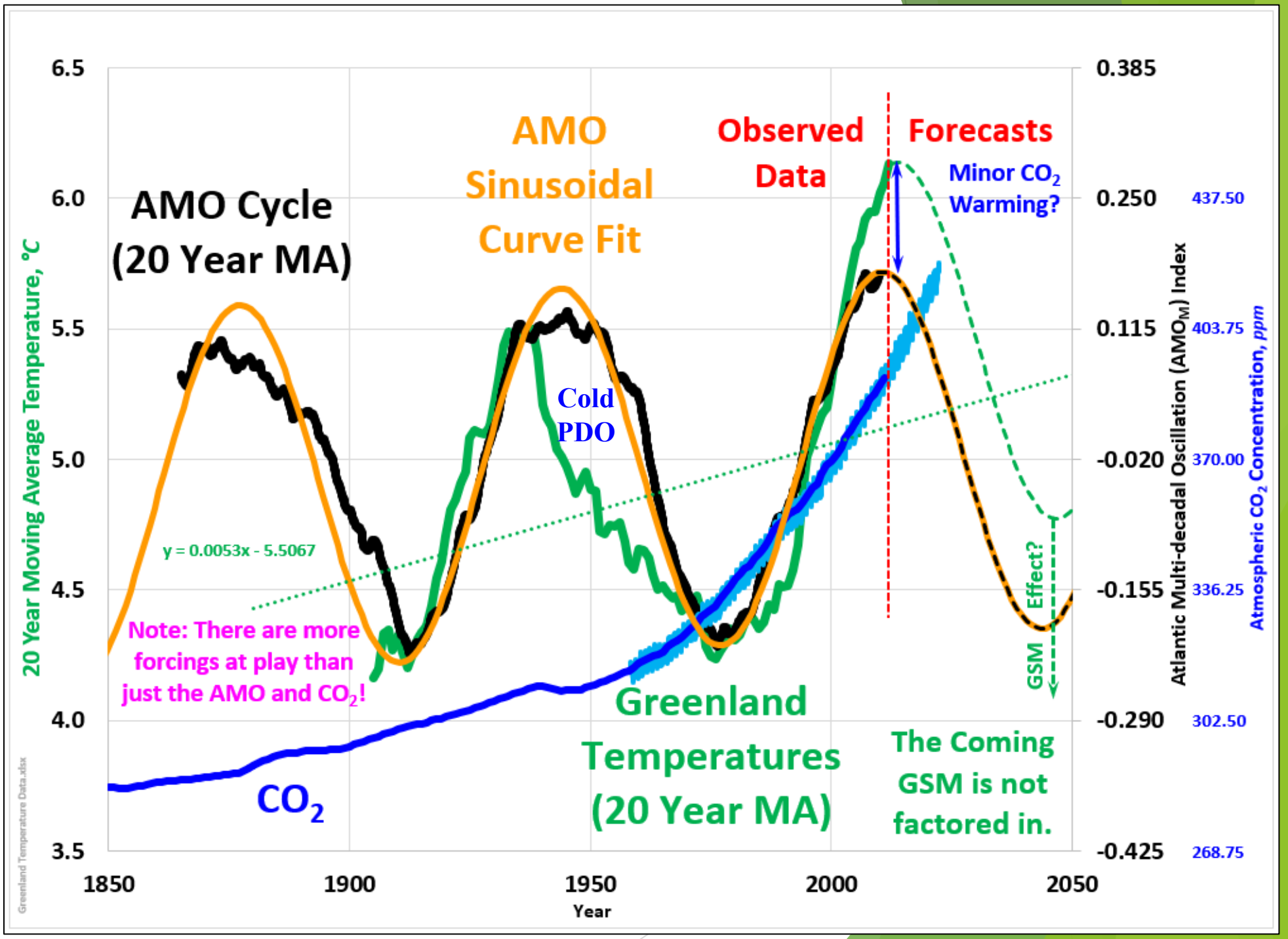




Greenland and the 60-year Cycle

Temperatures in Greenland are much more responsive to the AMO than CO_2. Temperatures will decline with the AMO and will be augmented by the GSM cooling.

The correlation deviation around 1950 is likely due to a very strong Pacific Decadal Oscillation (PDO) cooling.



Harmonic Analysis of Worldwide Temperature Proxies for 2000 Years

A 2017 paper that conducted a detailed Fourier Spectrum Analysis on the Climate data summarized below. The G7 averages (65, 188, 463, and 1003 year frequencies) were consolidated and used to generate sinusoidal curves that were then compared to historical temperatures.

https://www.researchgate.net/publication/318366114_Harmonic_Analysis_of_Worldwide_Temperature_Proxies_for_2000_Years

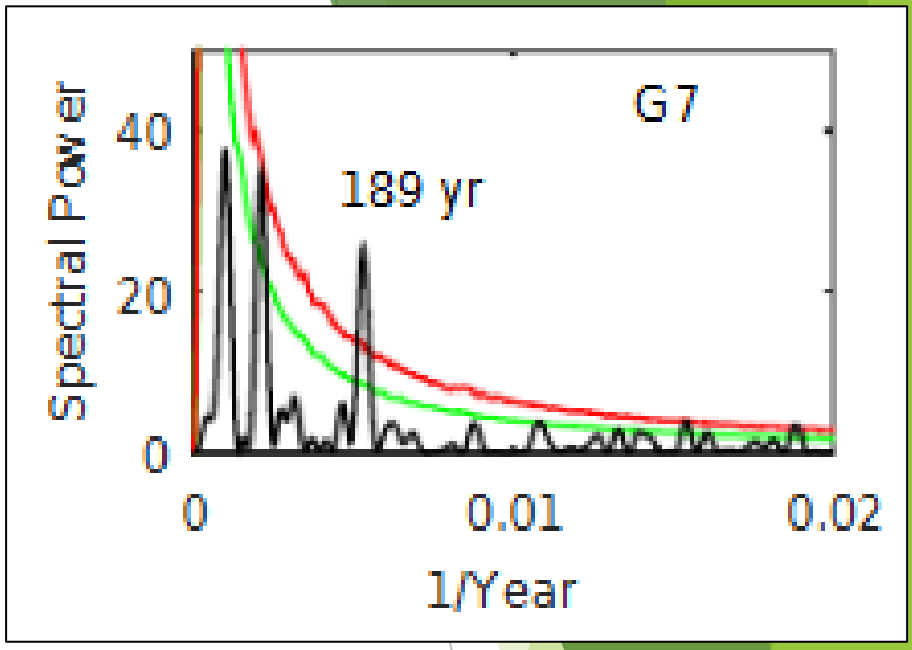


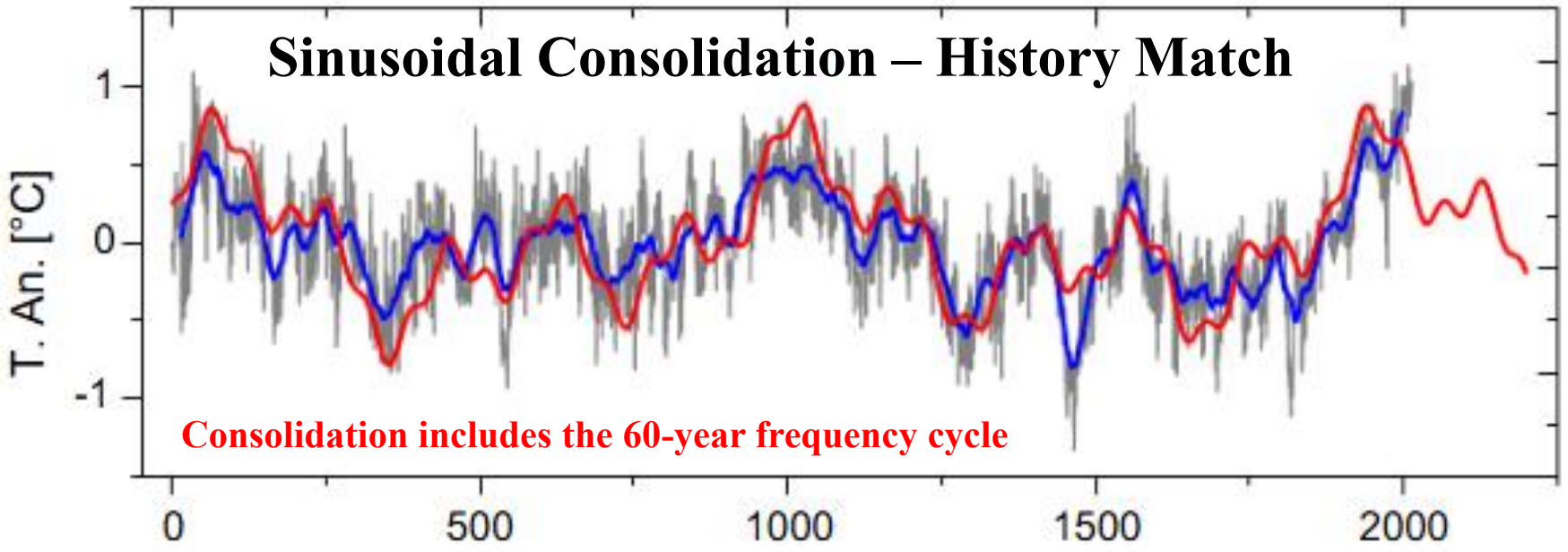
Table 2. Strongest spectral peaks for the records Chr, Bün, McK, Vill-N, Vill-S, Pet, G7, and Stei for periods > 700 years, from 700 to 300 years, from 300 to 100 years, and < 100 years.

H/T Joseph Fournier for bringing the paper forward.

Record	> 700 years	700 to 300 years	300 to 100 years	< 100 years
Chr	998	467	189	48
Bün	1250	608	186	53
McK	964	491	193	72
Vill-N	/	/	177	/
Vill-S	/	/	189	51
Pet	948	499	188	/
G7	1003	463	188	65
Stei	991	508	203	/

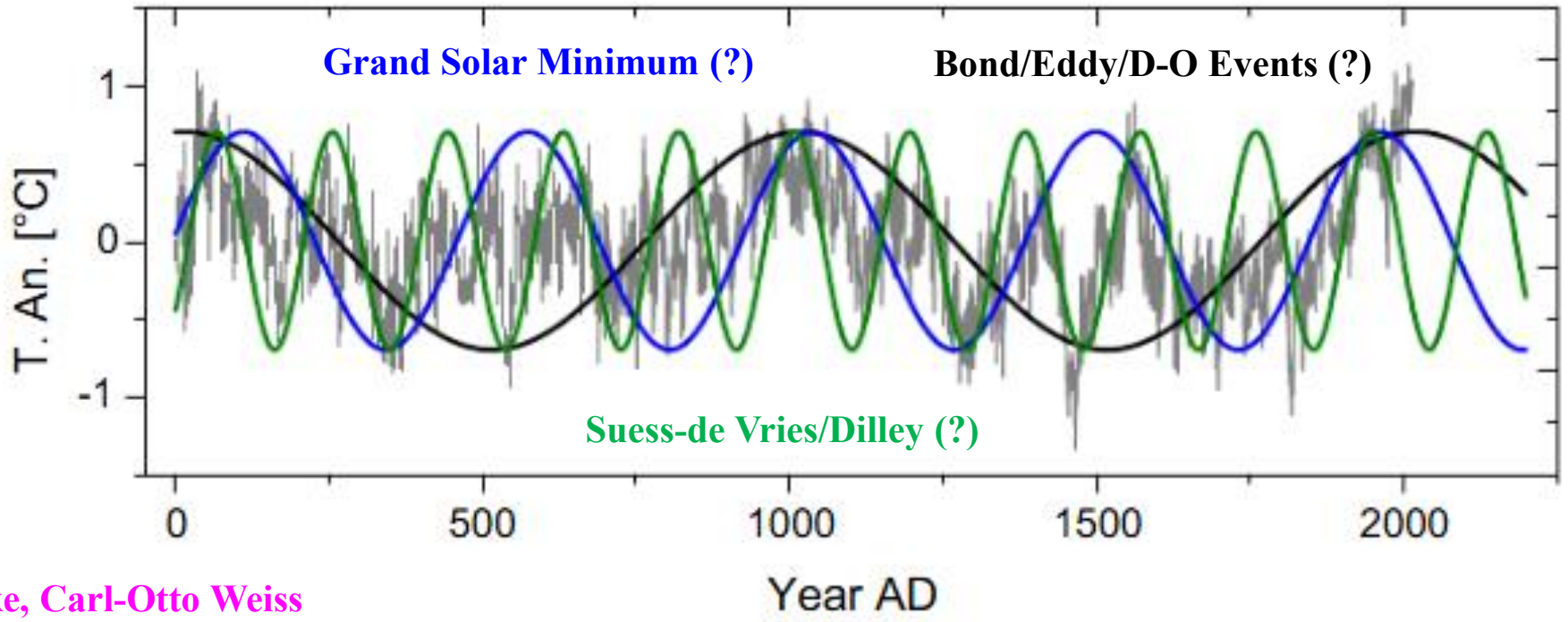
Consolidated Sinusoidal Temperature Reconstruction

Global Temperature Anomaly
G7 Consolidation
31-Year Average - G7 Consolidation
Sinusoidal Consolidation (≈60, 188, 463, and 1,003-year frequencies)



Sinusoidal Curves

Global Temperature Anomaly
G7 Consolidation
Frequency – 1003 years
Frequency – 463 years
Frequency – 188 years
Frequency – 60 years
(not shown)



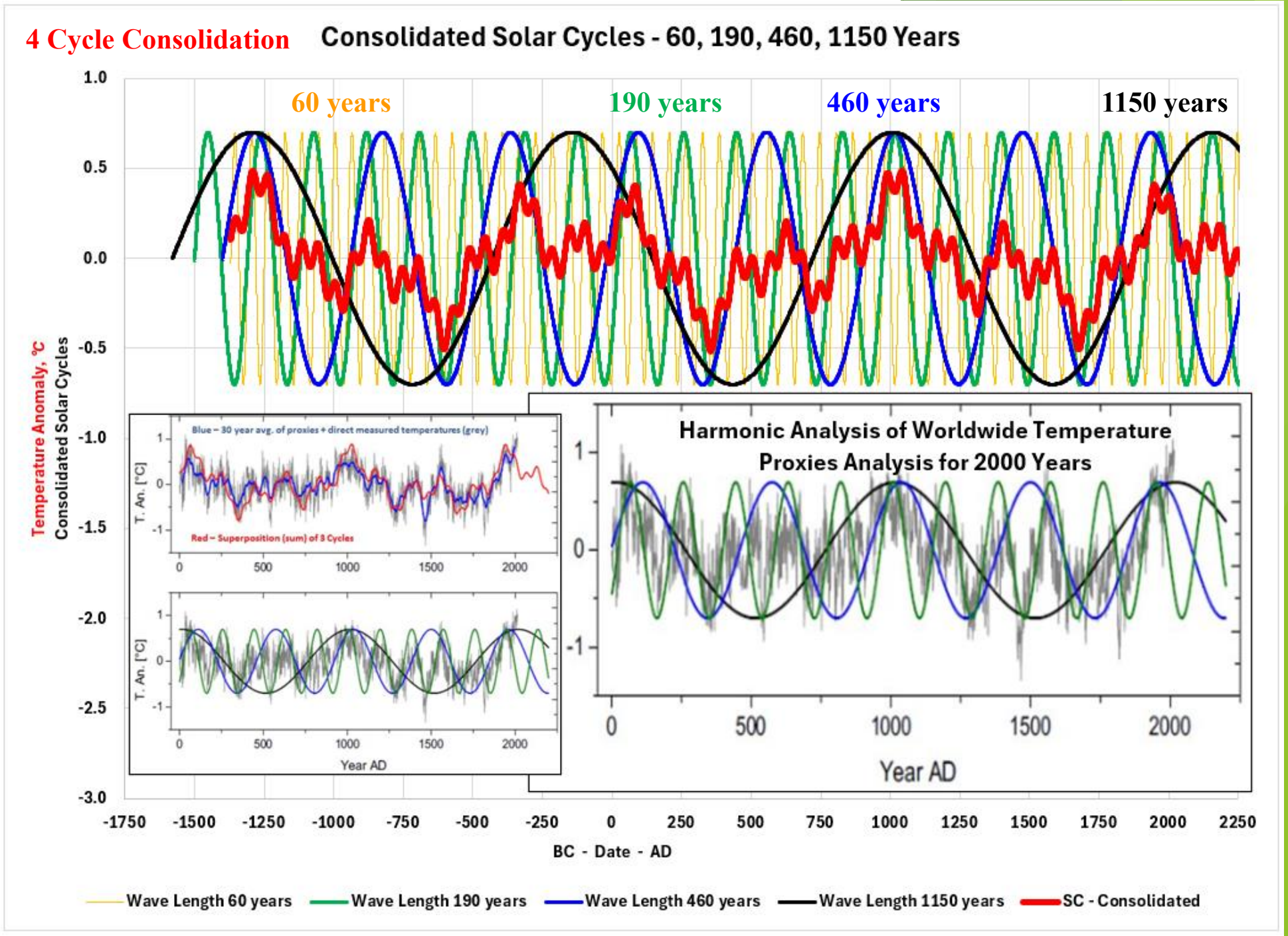
Authors: Horst-Joachim Lüdecke, Carl-Otto Weiss

Expanding the Lüdecke/Weiss Analysis back to 1750 BC

The Cycle Frequencies have been modified to fit Greenland's GISP2 Temperature dataset.

Detrended Consolidation

1750 BC to 2250 AD



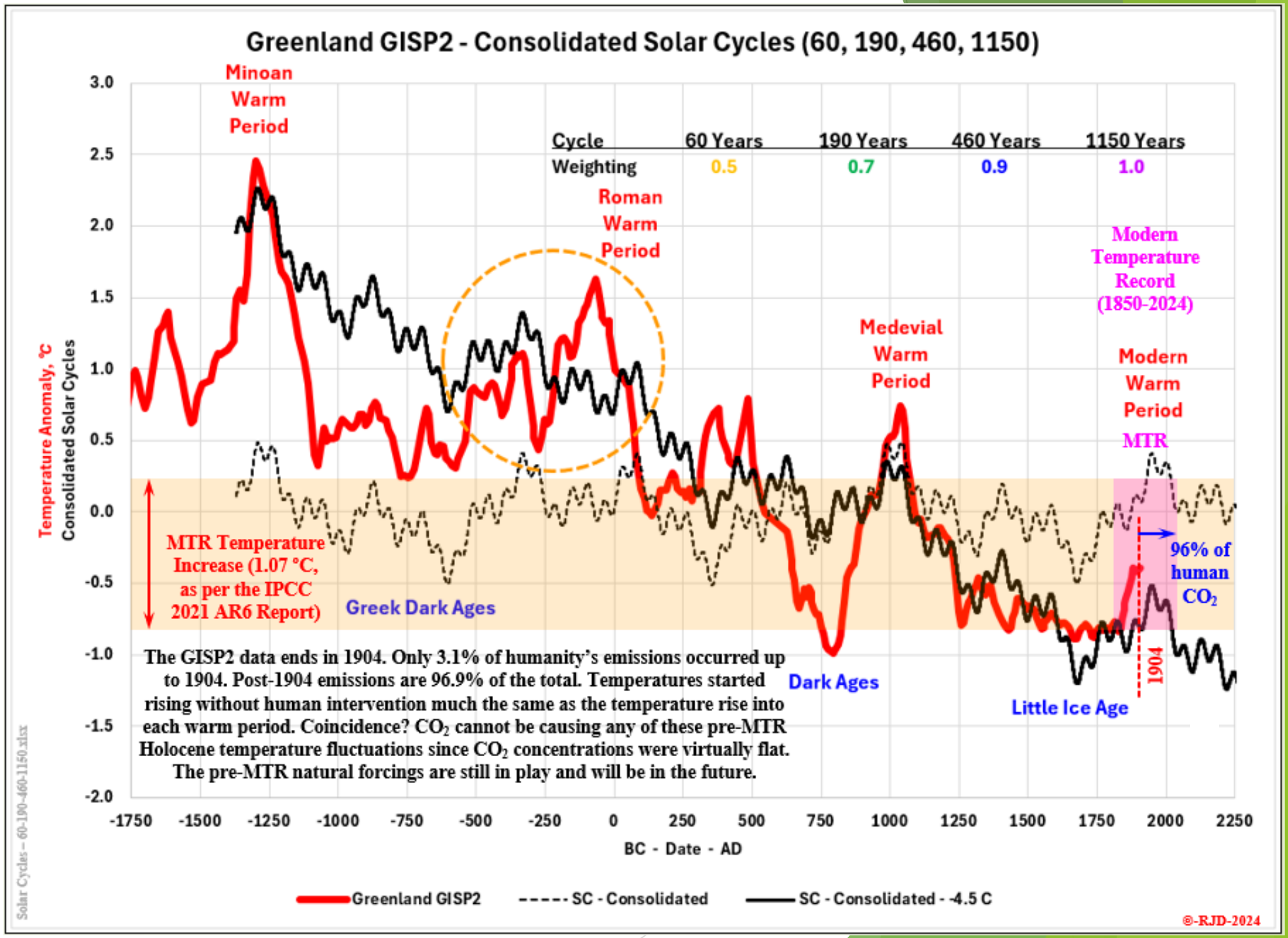
Greenland GISP2 Temperature Anomaly

Detrended Data
Dashed Line

GISP2 Trended Fit
Solid Line

Greenland GISP2 Temperature Anomaly

96% of humanity's emissions occurred post-1904. CO_2 concentrations were virtually flat pre-1850. Maybe there is more to 'Climate Change' than just CO_2!

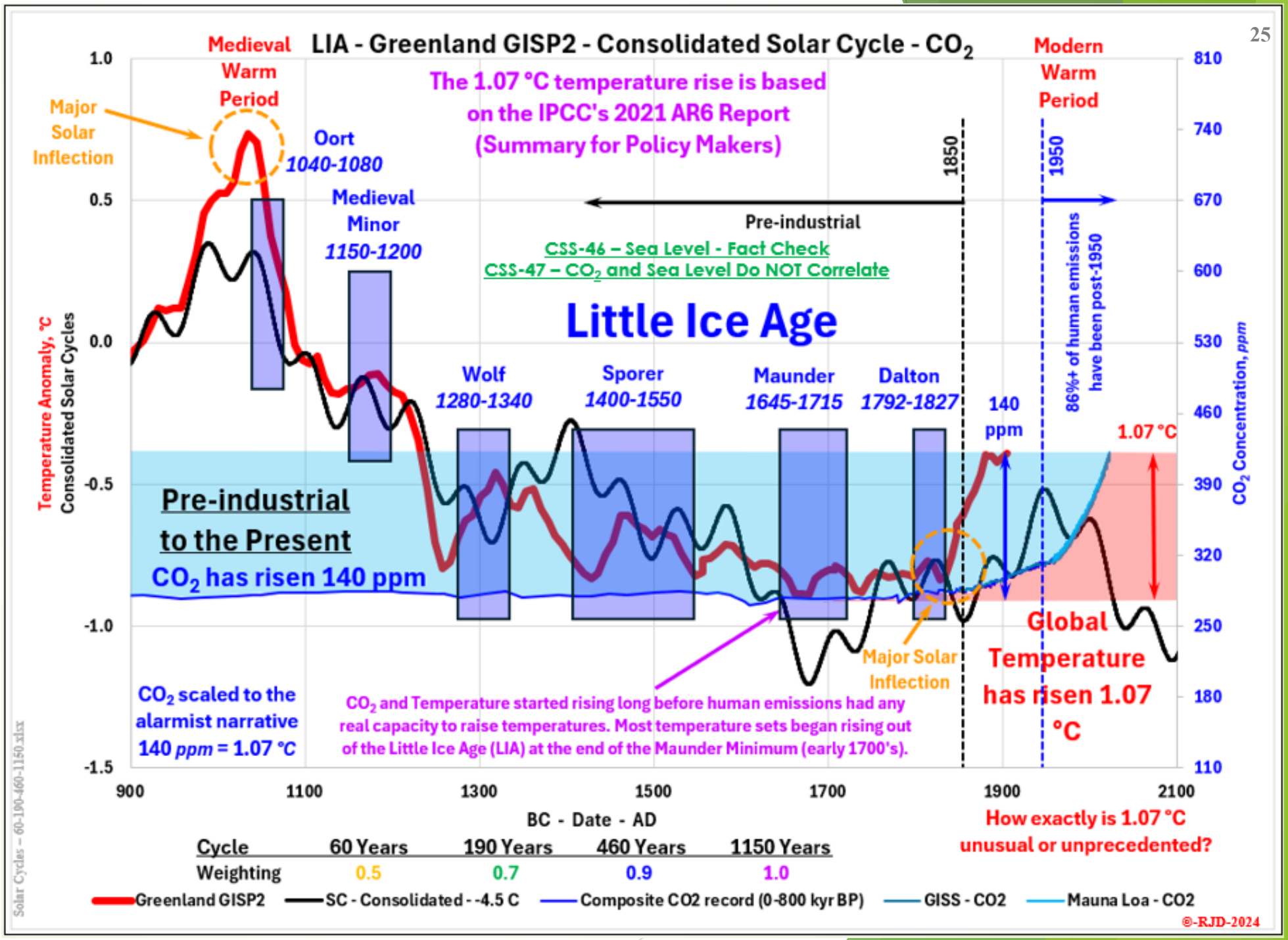


Focusing in on the last 1100+ years

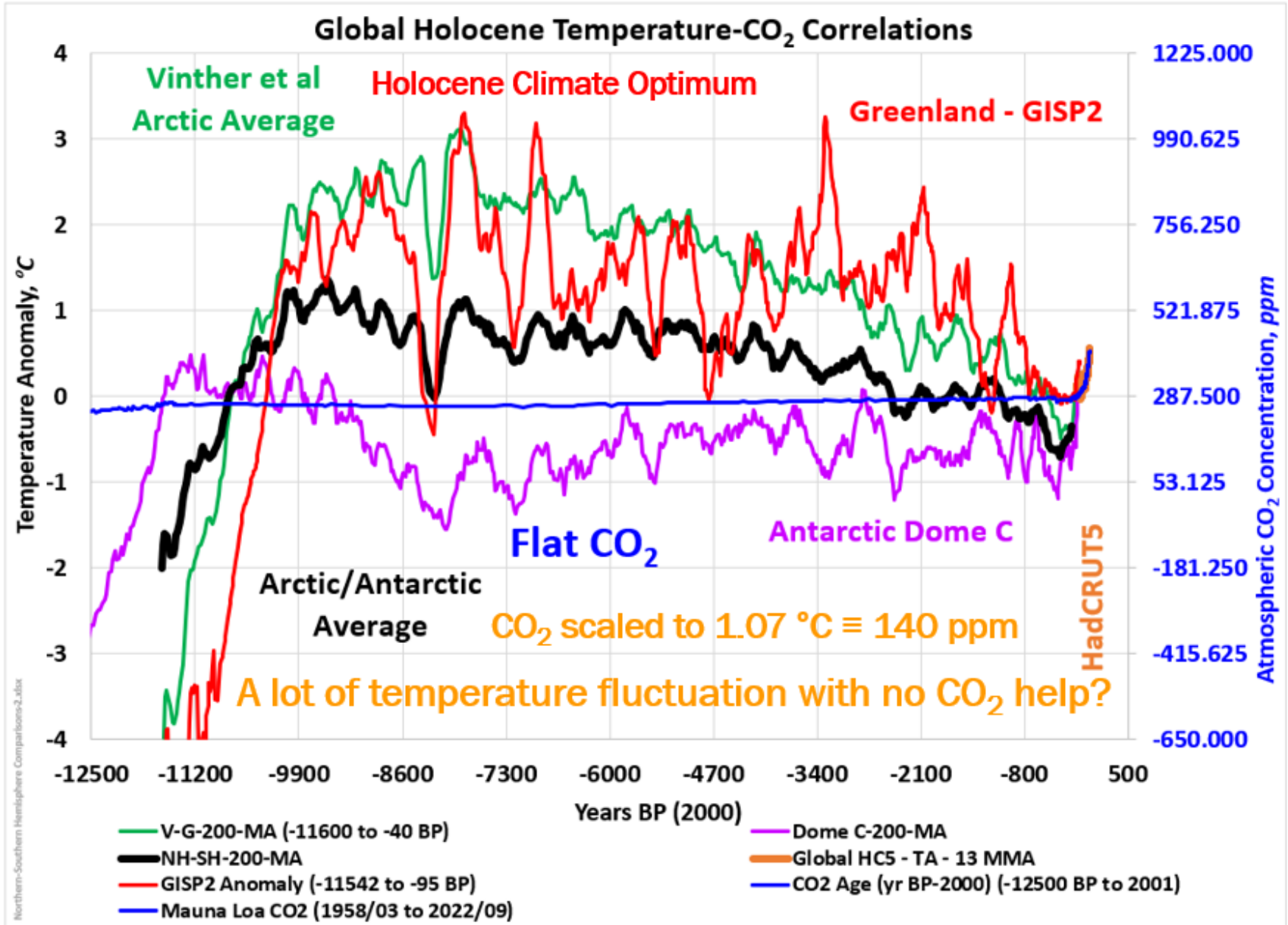
Temperature Increase since the pre-industrial era: 1.07 °C (from the IPCC's 2021 AR6 Report). Temperatures rose before CO_2 Concentrations,

CO_2 has increased 140 ppm over the same period. Pre-1850 CO_2 was essentially flat. How do temperatures change when CO_2 is flat?

The sinusoidal model matches the GISP2 proxy data very well, even recreating the Maunder Minimum in the depths of the multiple solar minimums that produced the LIA.



CO_2 IS NOT CONTROLLING HOLOCENE TEMPERATURES



Temperatures fluctuate significantly over the pre-Modern Temperature Record (MTR, 1850 to the present) despite a virtually flat CO_2 concentration.

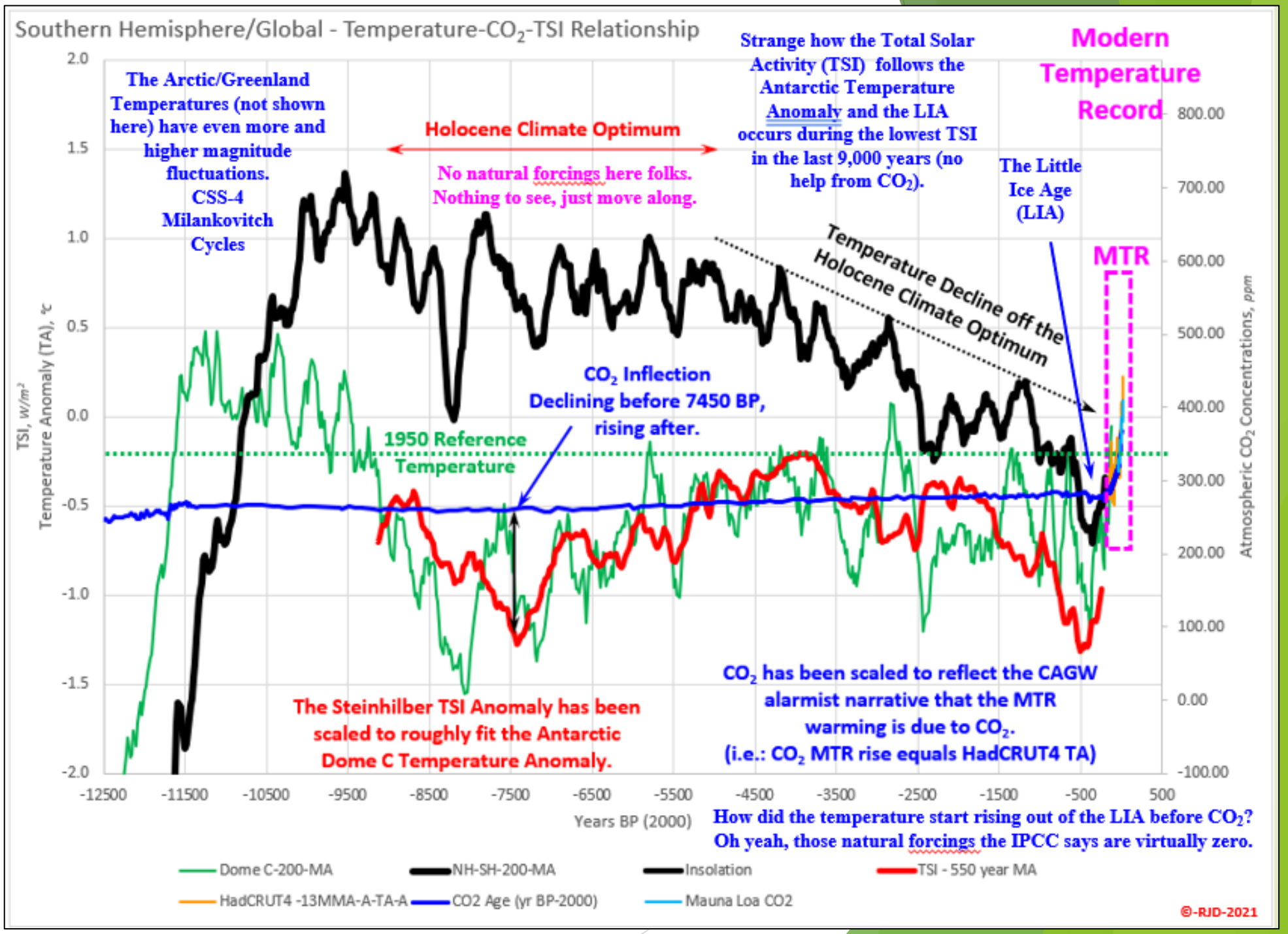
Those fluctuations are due to natural forcings (solar directly and/or indirectly) that have not stopped acting on our planet just because the alarmists have decreed it so.

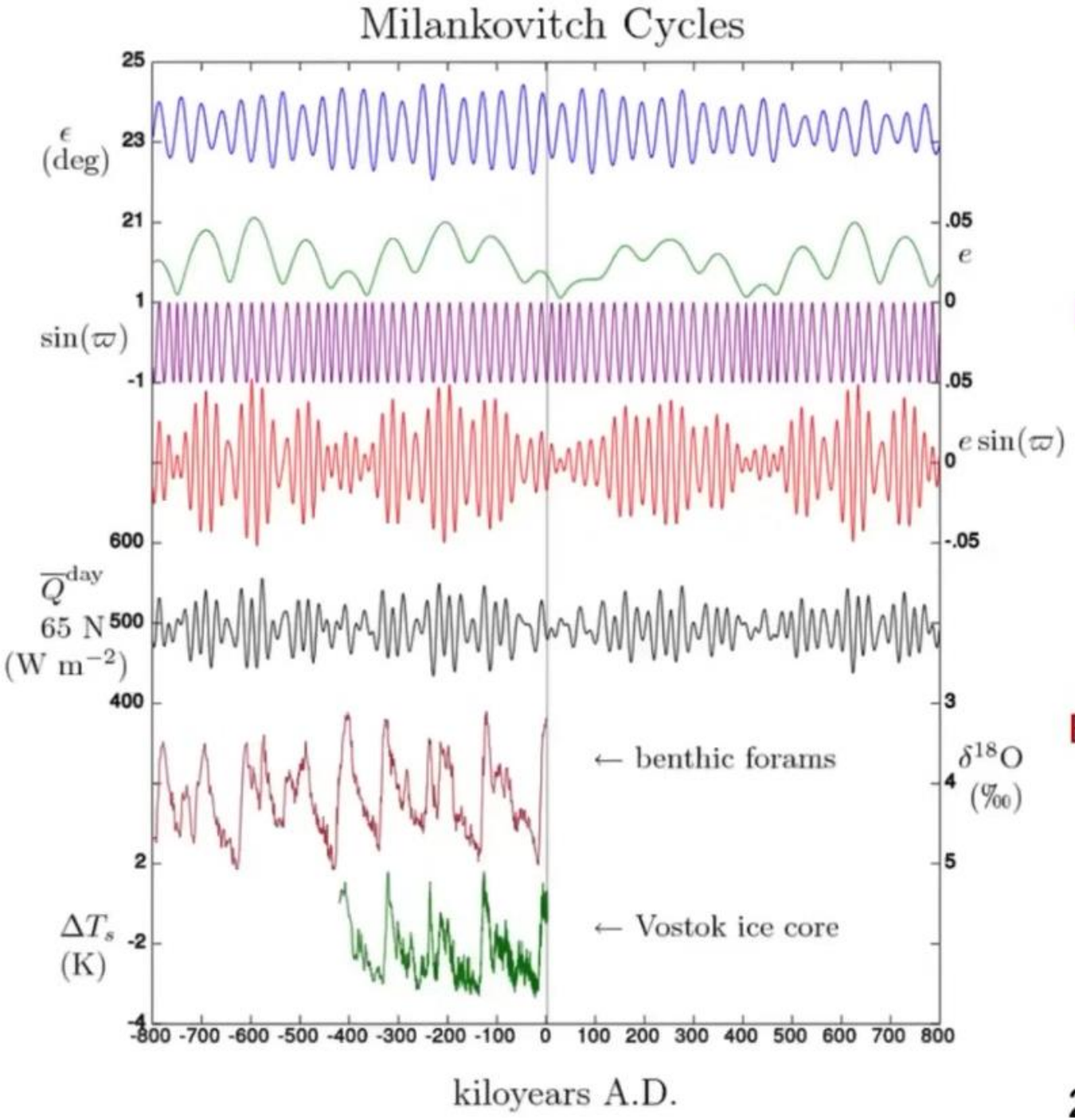
Those natural forcings are set to take temperatures significantly colder!

Steinhilber 2012 Total Solar Irradiance (TSI) correlates well with Antarctic temperatures.

The Northern (predominantly land mass) and Southern hemispheres (predominantly ocean) respond differently to solar inputs.

Global atmospheric CO_2 concentrations over the Holocene generally fell as temperatures rose and vice versa.





Obliquity (axial tilt) (ε).

±41,000 years

Eccentricity (e). **±100,000 years**

Longitude of perihelion (sin(ϖ)).

Precession index (e sin(ϖ)),

±23,000 years

daily-averaged insolation at the top of the atmosphere at 65 N lat

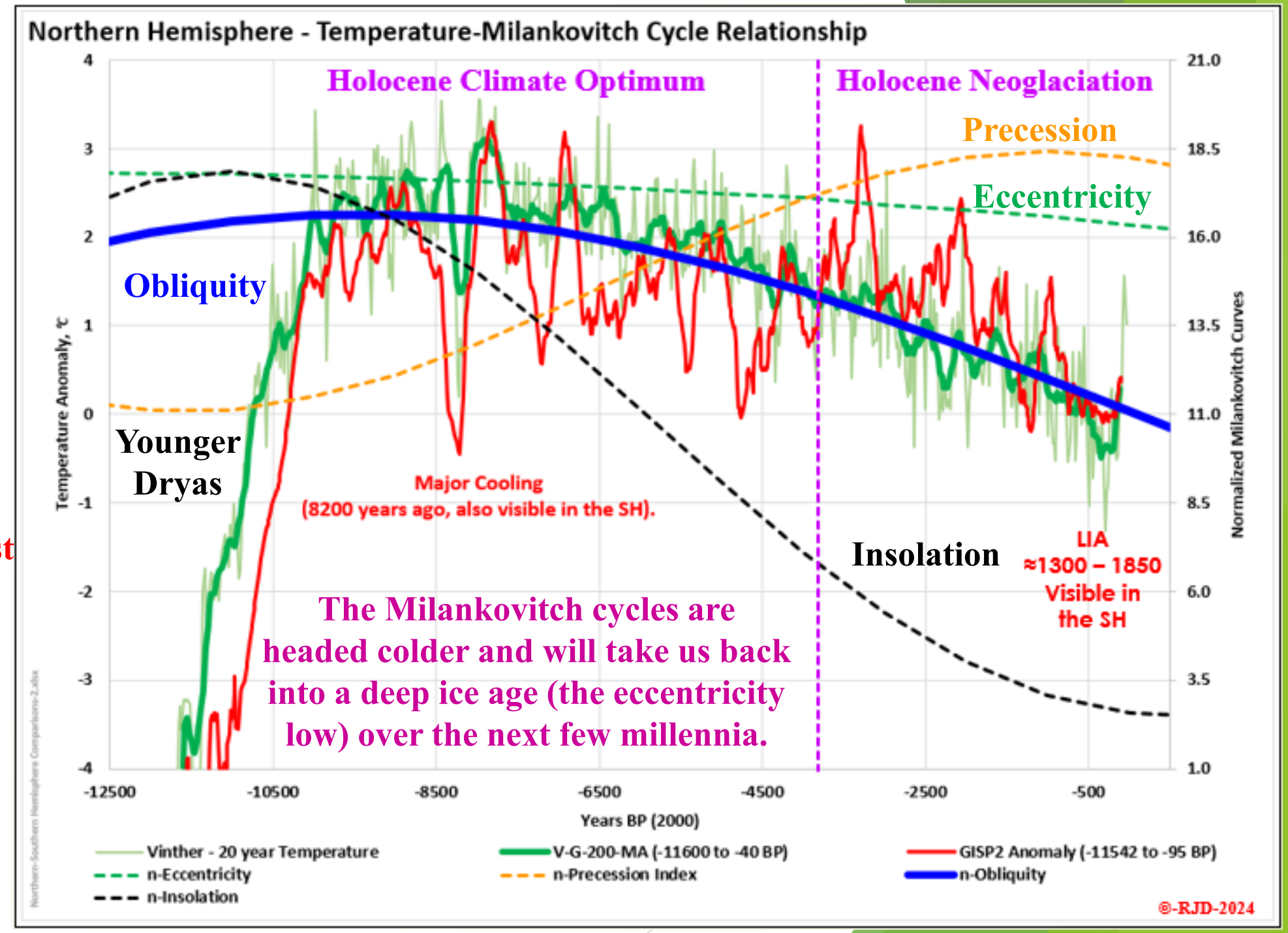
Earth's movements:

- 1.1 Orbital shape (eccentricity)
  - 1.1.1 Effect on temperature
  - 1.1.2 Effect on lengths of seasons
- 1.2 Axial tilt (obliquity)
- 1.3 Axial precession
- 1.4 Apsidal precession
- 1.5 Orbital inclination

The Milankovitch Cycles and Northern Hemisphere Temperatures

The Obliquity is dominating NH temperatures, which peaked during the Holocene Climate Optimum and has been dropping over the Neoglacial period (the last several thousand years).

The SH responded more to the Insolation (the consolidated Milankovitch cycles) and the Precession (visible in the Antarctic data).

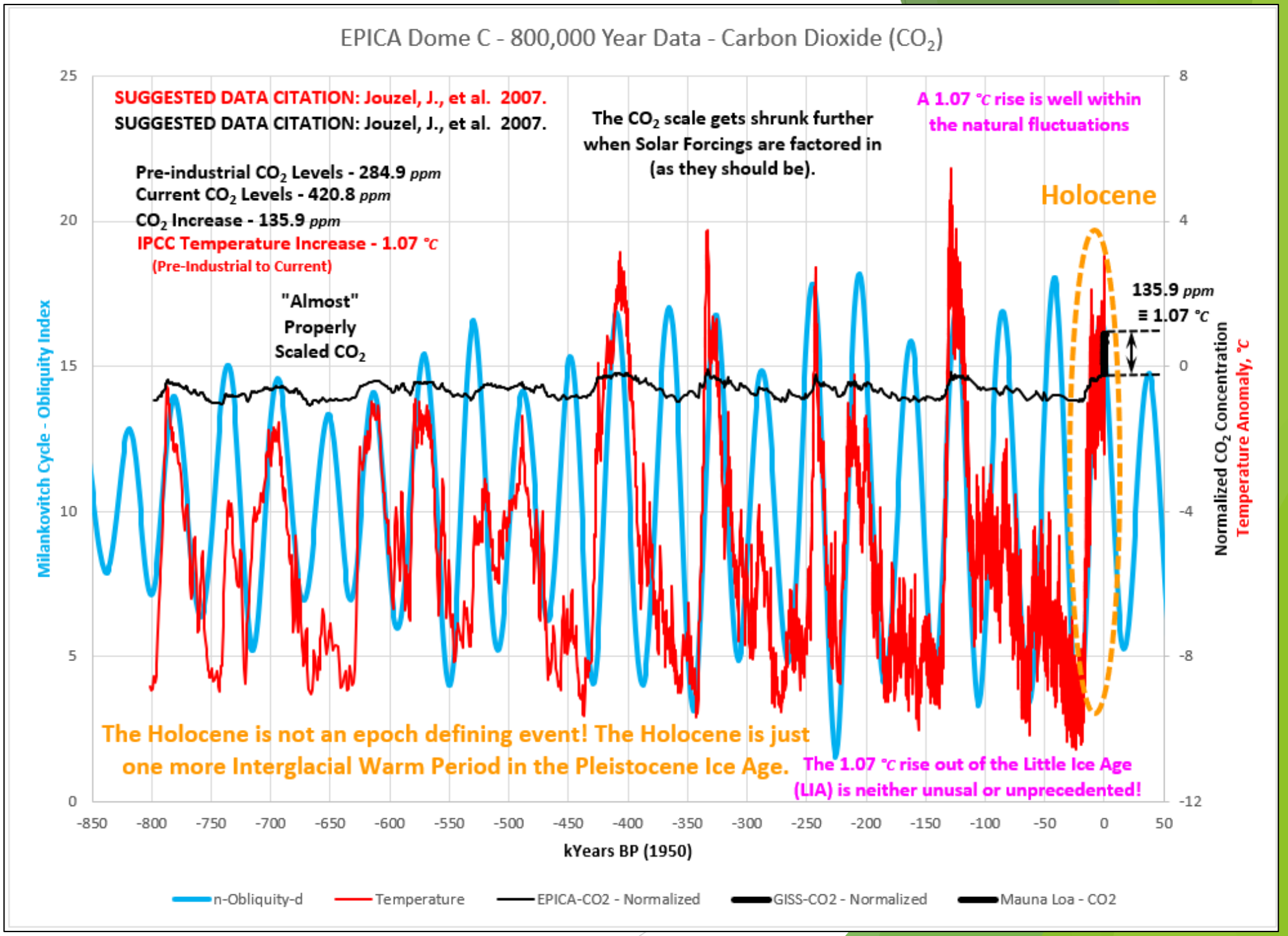


The Obliquity Cycle and Temperatures over the last 850,000 years of the Pleistocene Ice Age.

Every major interglacial warm period coincides with the Obliquity Cycle.

The Pleistocene Ice Age did not end just because the earth warmed up over the Holocene (just one more Pleistocene interglacial warm period).

The Holocene is not a new epoch, and the Anthropocene is an ideological manifestation!

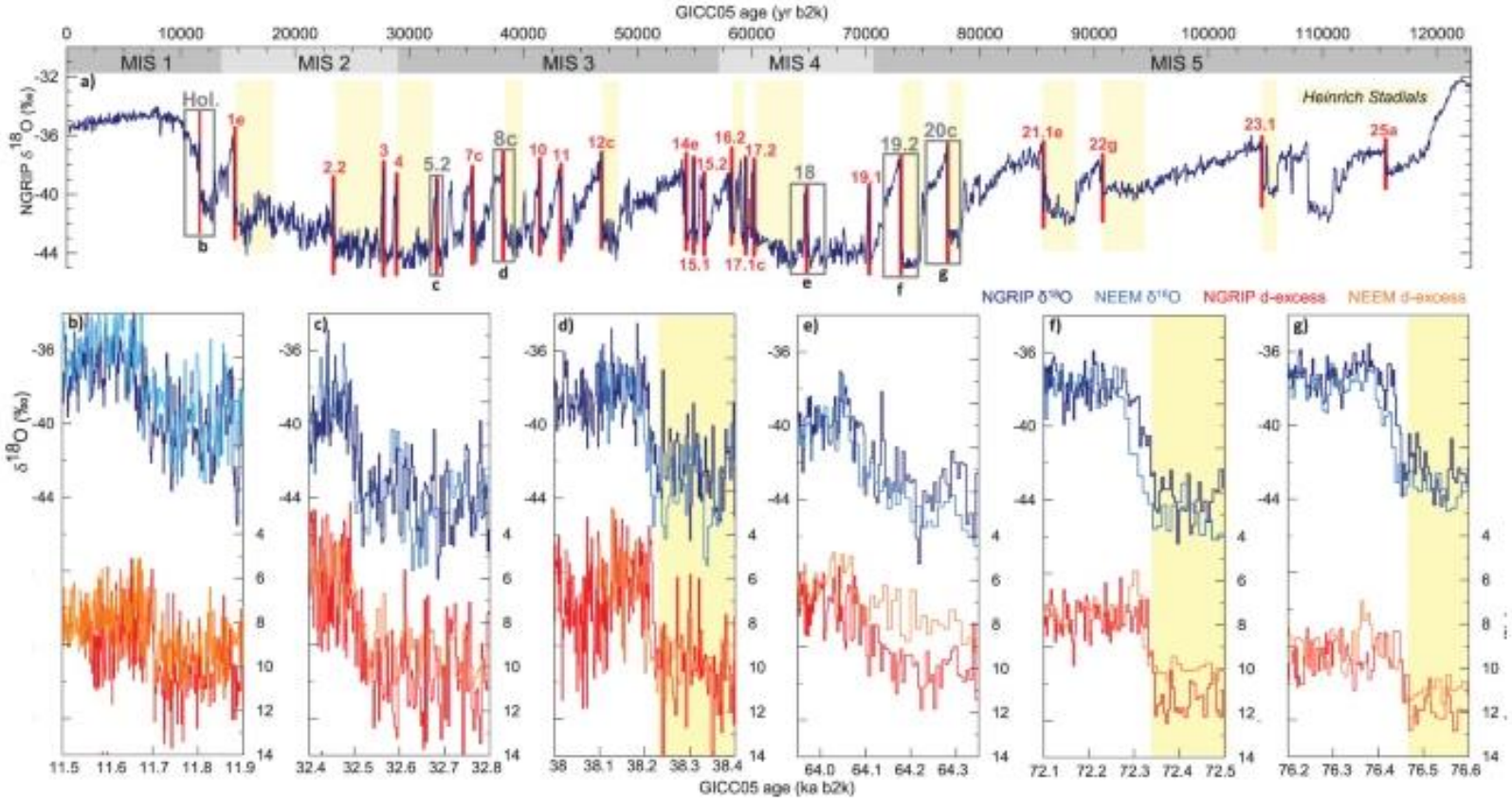


Real Climate Change Dansgaard-Oeschger (DO) Events & Heinrich Stadials

DO Events are abrupt temperature increases (warm interstadials, 5 to 10 °C) that have nothing to do with CO_2 and dwarf the minor 1.07 °C temperature rise humanity experienced over the last 170 years (a muted DO event). DO events have occurred regularly over the warm Holocene interglacial warm period. They are just more muted than when they occur during the deep ice age periods.

DO events are followed by relatively abrupt temperature declines that produce the highlighted cold Heinrich stadials shown here and in the Holocene ice core temperature data on previous slides.

Fig. 1: Abrupt climate variability recorded in Greenland water isotopic records.



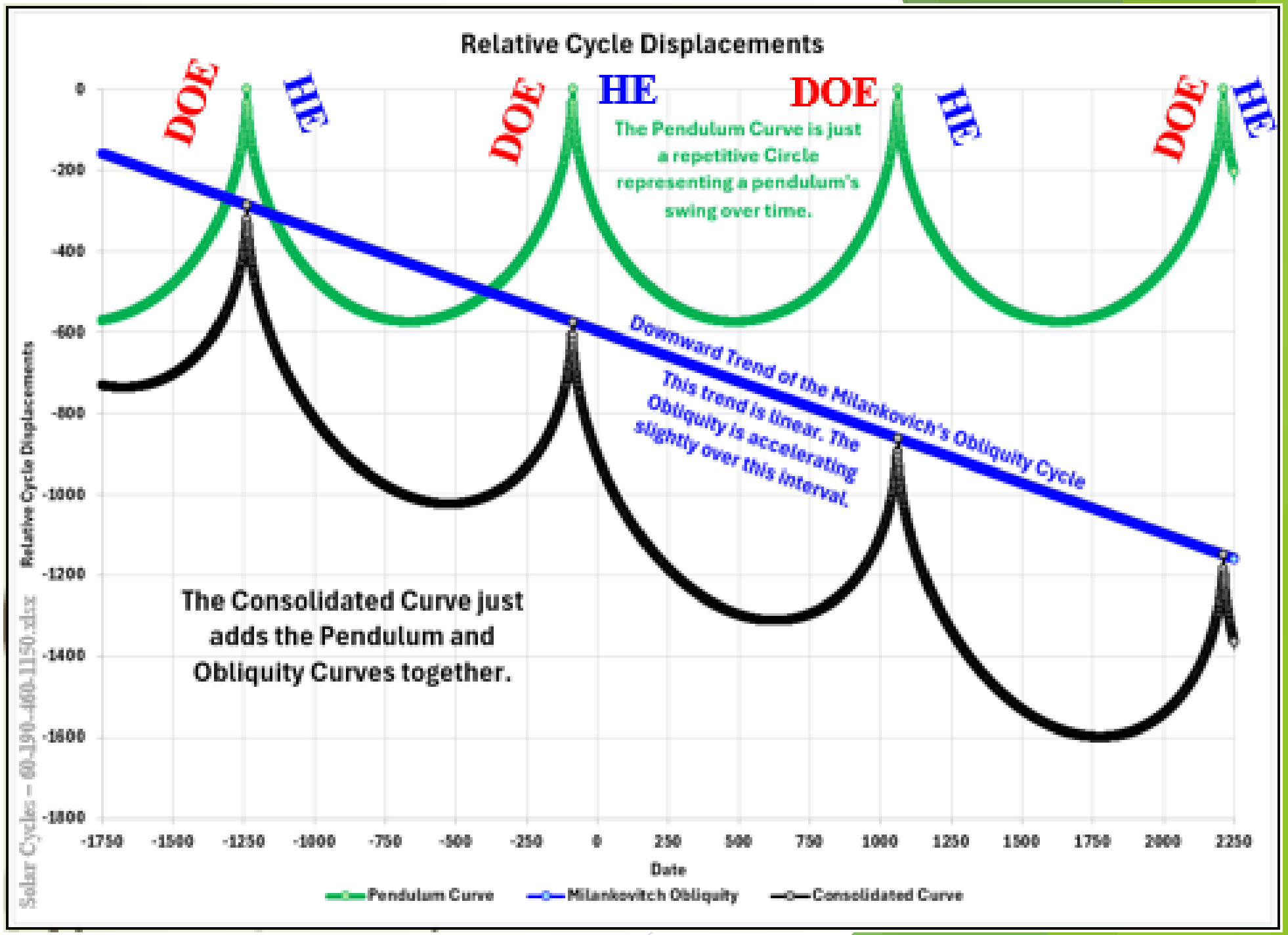
a NGRIP $\delta^{18}O$ record[5]. Studied abrupt warming transitions are highlighted with red vertical bars and Greenland Interstadials (GI) are numbered[38]. Gray boxes indicate intervals shown in (**b**–**g**), illustrating the variety of abrupt GS–GI transitions across the Last Glacial; stadials containing Heinrich events are indicated in yellow following refs. [53,85], and Marine Isotope Stages (MIS) are indicated in gray. **b**–**g** High-resolution $\delta^{18}O$ from NGRIP (dark blue) and NEEM (light blue) and d-excess from NGRIP (red) and NEEM (orange) over 400 yr time intervals centered on the Holocene abrupt onset (**b**) and the abrupt transitions into GI-5.2 (**c**), GI-8c (**d**), GI-18 (**e**), GI-19.2 (**f**), and GI-20c (**g**).

Modeling the DO and Heinrich events over the Late Holocene

The warming (DOE) and cooling (HE) in the Greenland GISP2 data presents much like a pendulum.

Natural forcings (definitely not CO_2) warm the planet. As the planet warms, the poles warm, sending more icebergs down into the mid-latitudes (reaching a tipping point and abrupt cooling).

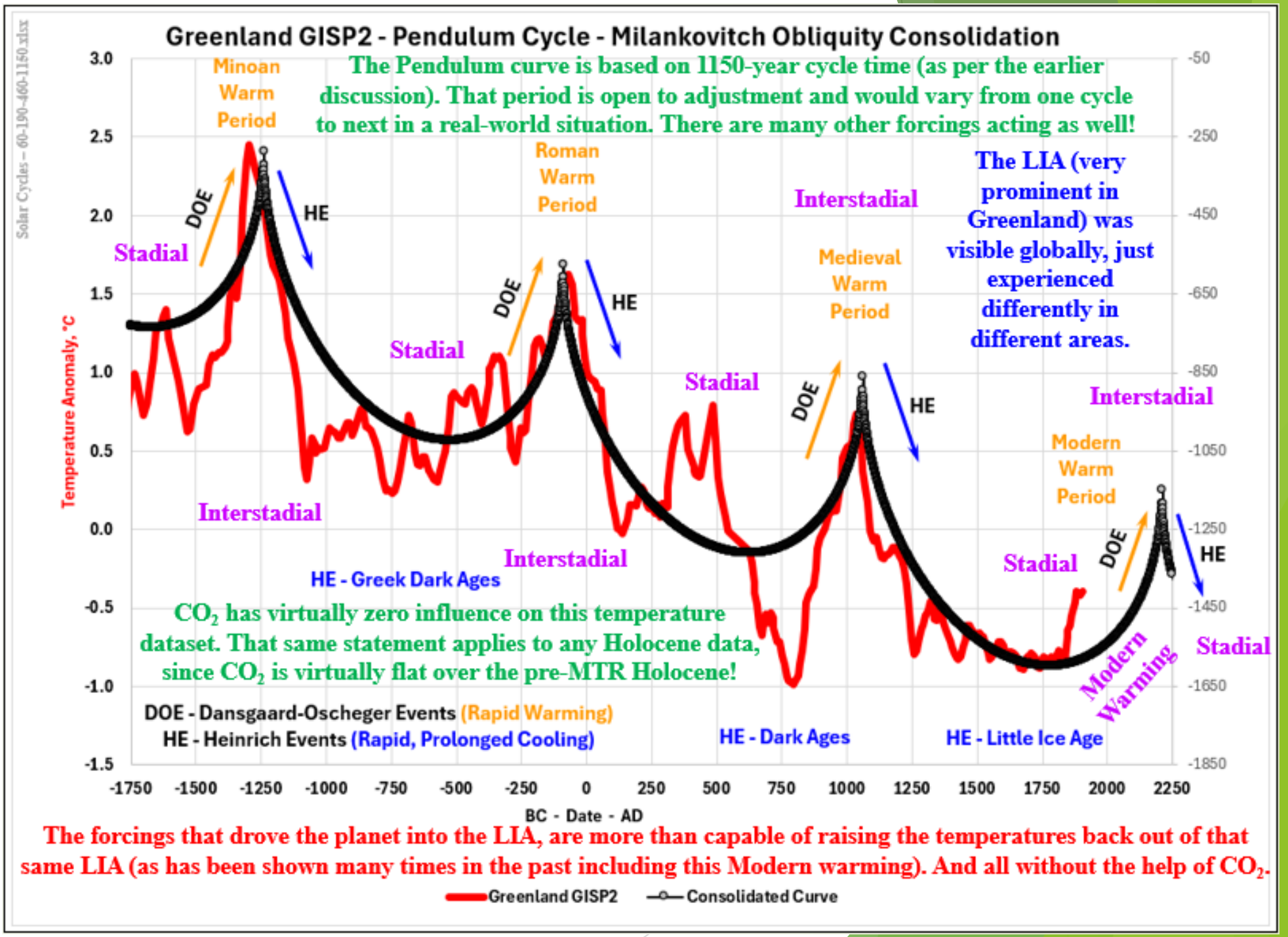
Add in the Obliquity and you get a declining Pendulum Curve.



Applying the declining Pendulum Curve to the GISP2 Temperatures

The GISP2 data matches the Pendulum Curve quite well. Just an observation not a scientific fact. There are many factors in play (including the minor CO_2 contributions).

Remember atmospheric CO_2 concentrations have virtually no effect on the GISP2 temperature data, temperatures began rising before CO_2, and 96% of humanity's emission have occurred post-GISP2 data (i.e.: not our fault).

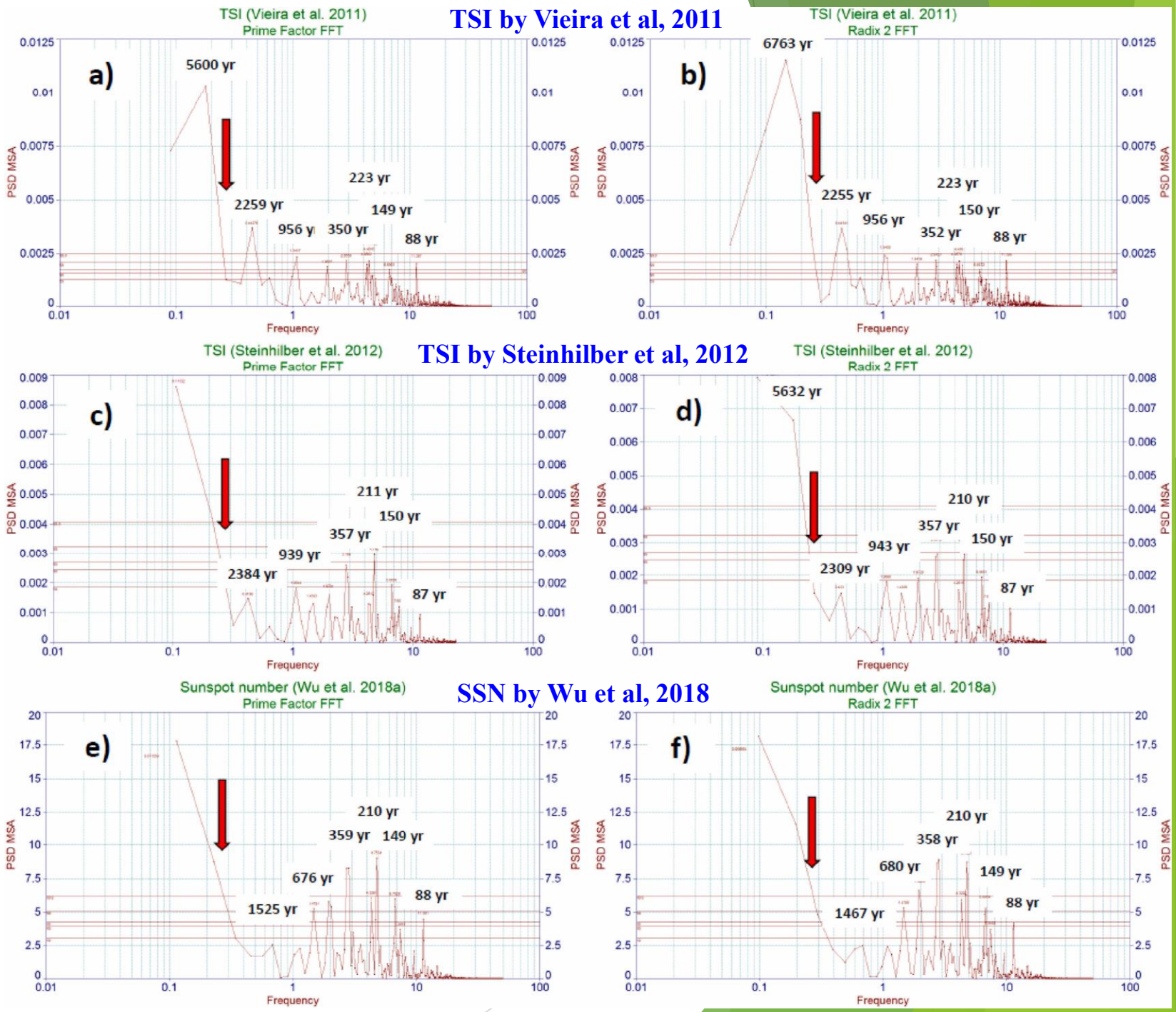


Quantitative impact of astronomical and sun-related cycles on the Pleistocene climate system from Antarctica records

Multiple Fourier Spectrum Analysis highlighting many of the solar cycles. Gleissberg (88 years), Suess-de Vries/Dilley (210 years), Grand Solar Minimum (350 – 400 years), Bond/Eddy/Dansgaard-Oeschger (1,000 years), Hallstatt/Bray/Zharkova (2,400 years), Heinrich (±6,000 years)

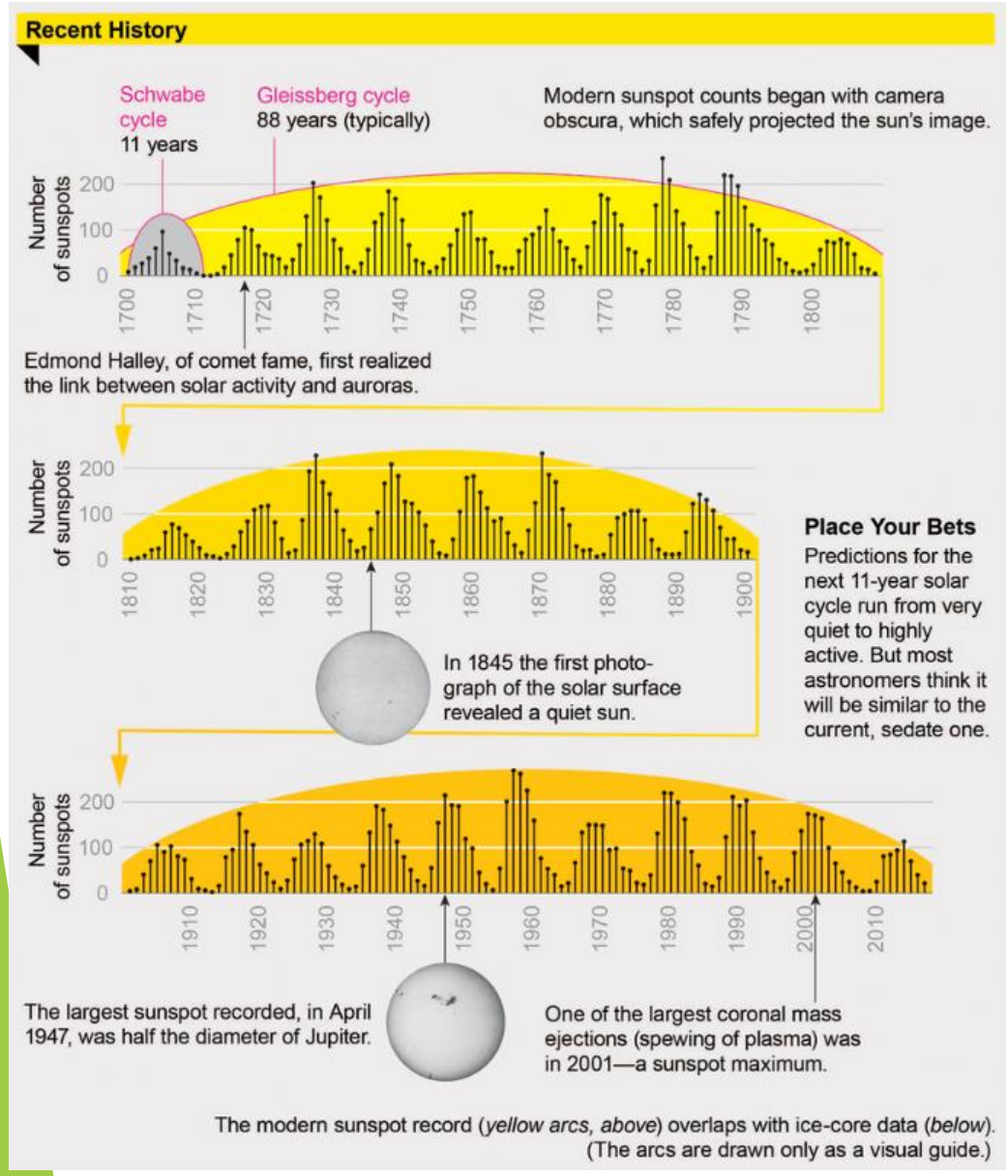
I do not currently have a name/mechanism for the 150-year spike?

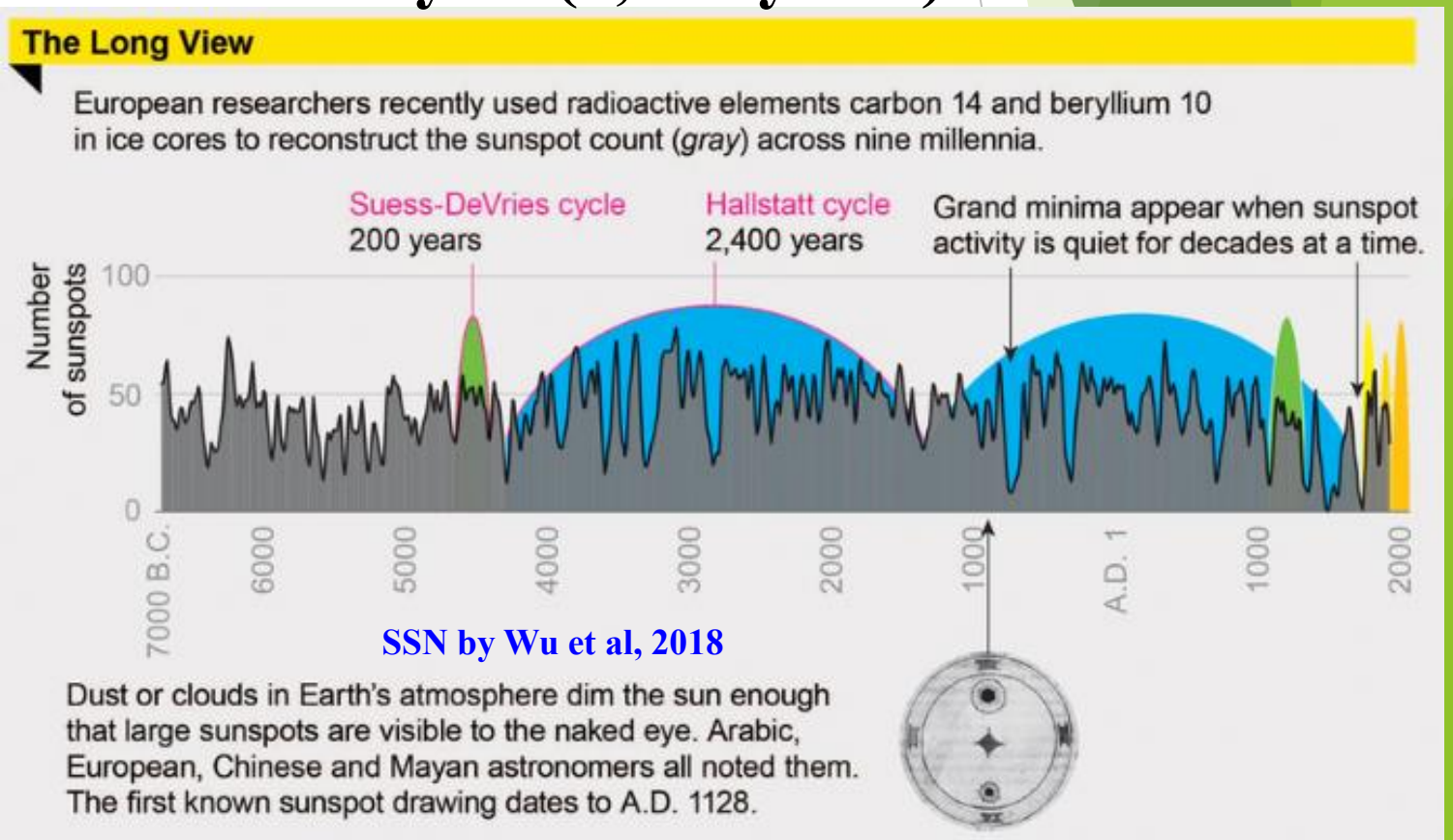
https://www.sciencedirect.com/science/article/pii/S2666033421000162



Solar Cycle Visuals

Schwabe Cycle (11 years)
Hale Cycle (22 years)
Gleissberg Cycle (88 years)
Suess-deVries Cycle (200 years)
Hallstatt Cycle (2,400 years)

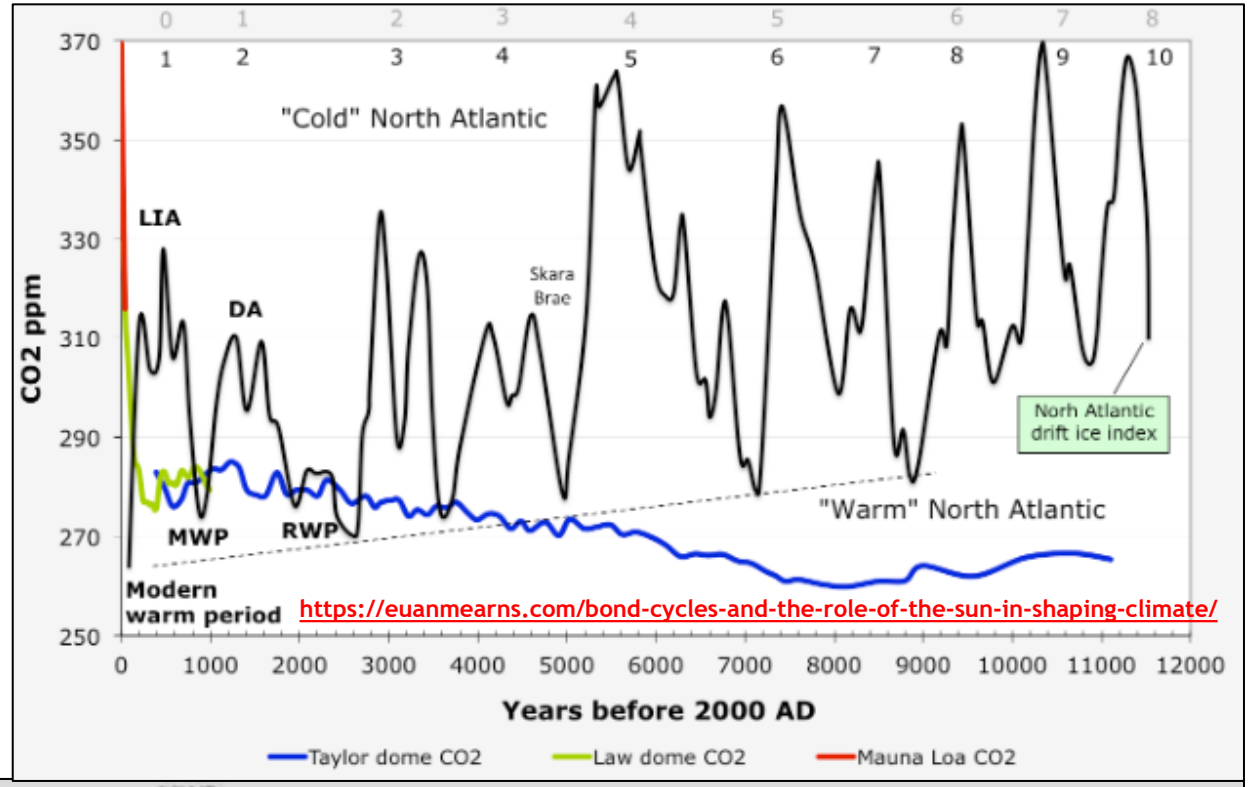


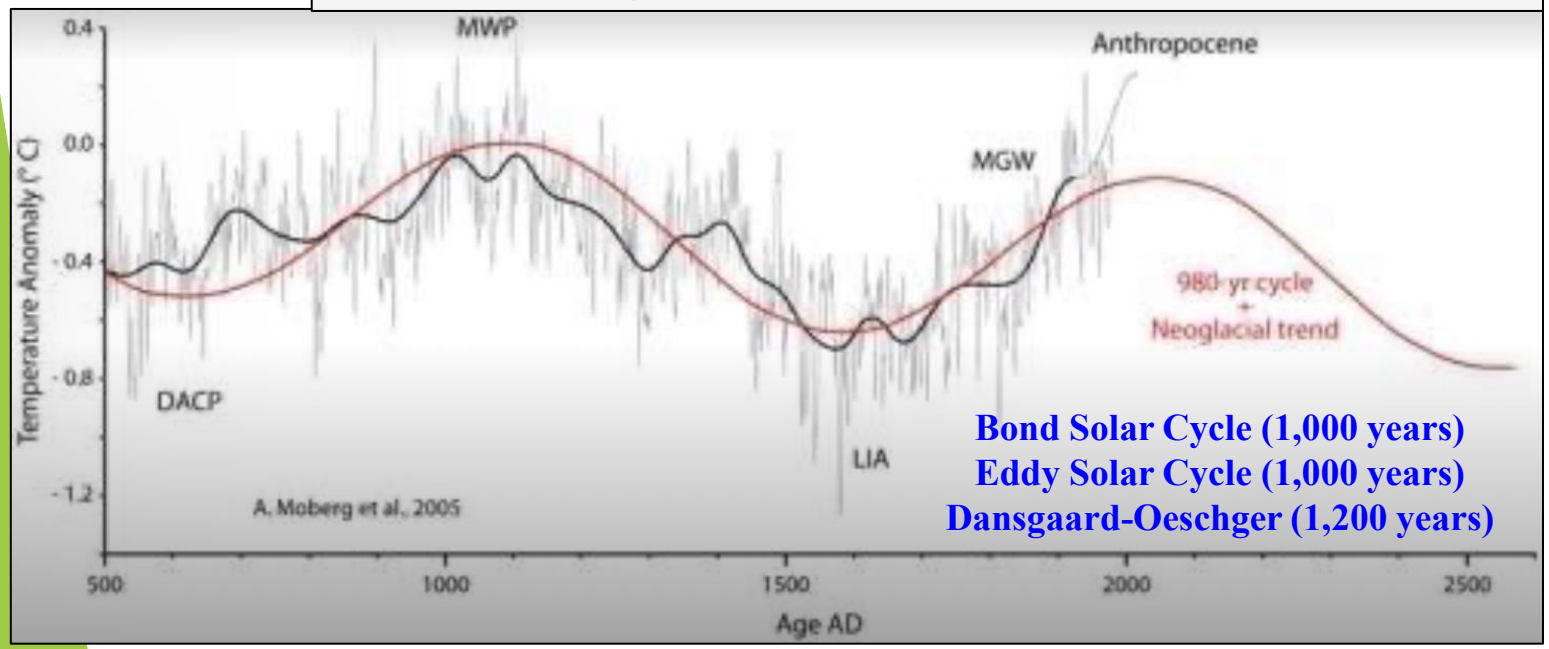


[The Sunspot Cycle Is More Intricate Than Previously Thought | Scientific American](https://www.scientificamerican.com/article/the-sunspot-cycle-is-more-intricate-than-previously-thought/)

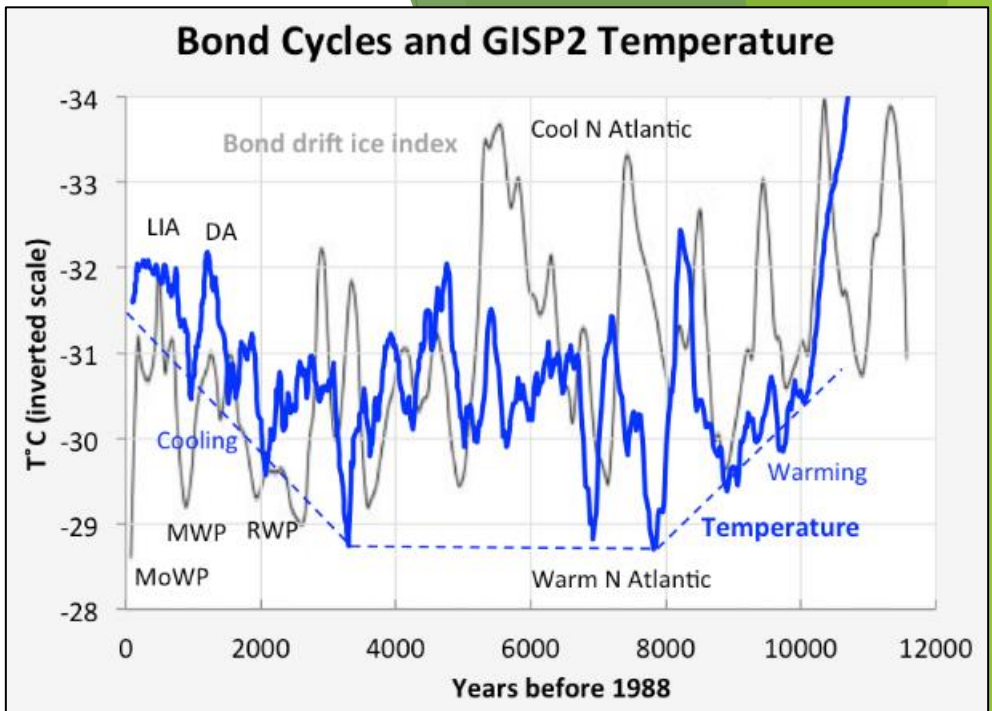
Bond Cycles and the Role of The Sun in Shaping Climate

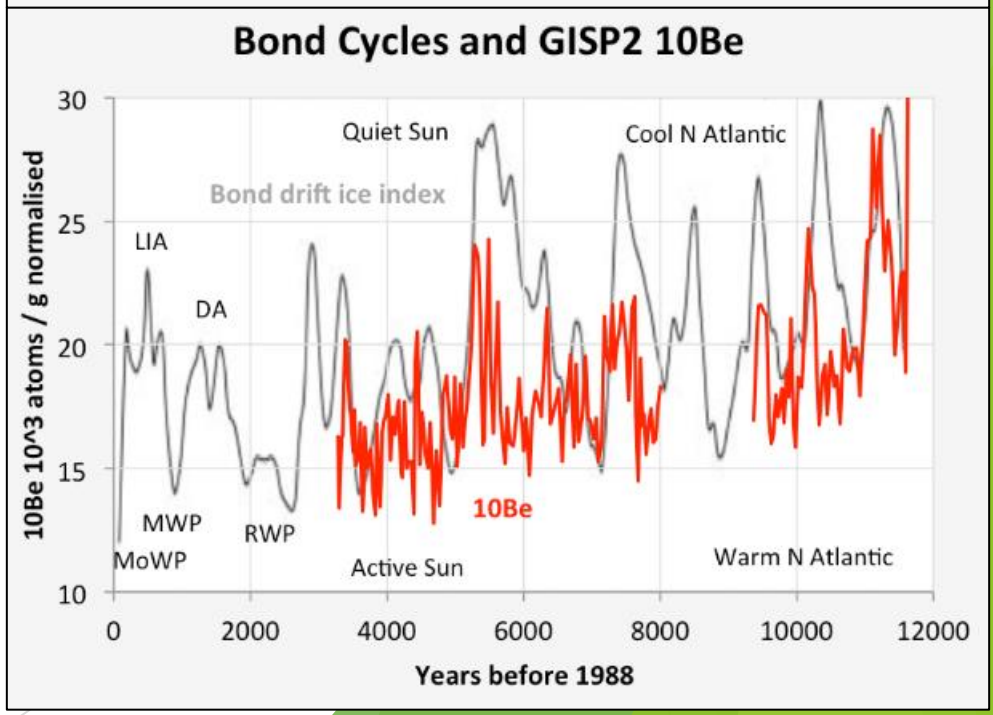
Bond
Eddy
Dansgaard-Oeschger
(±1,000 years)





Bond Solar Cycle (1,000 years)
Eddy Solar Cycle (1,000 years)
Dansgaard-Oeschger (1,200 years)



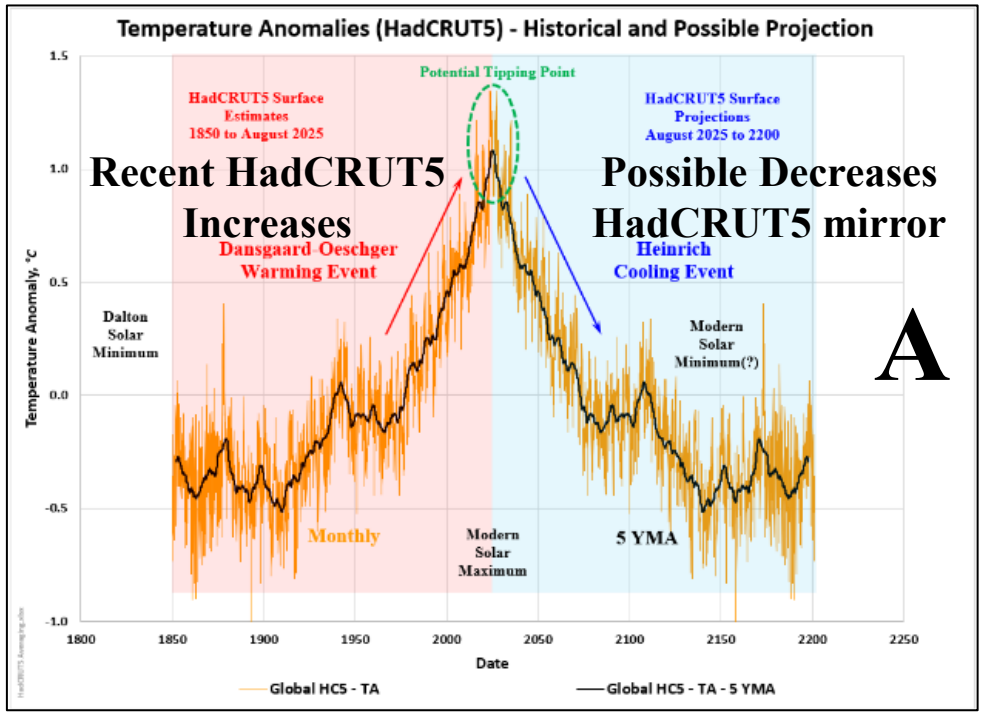


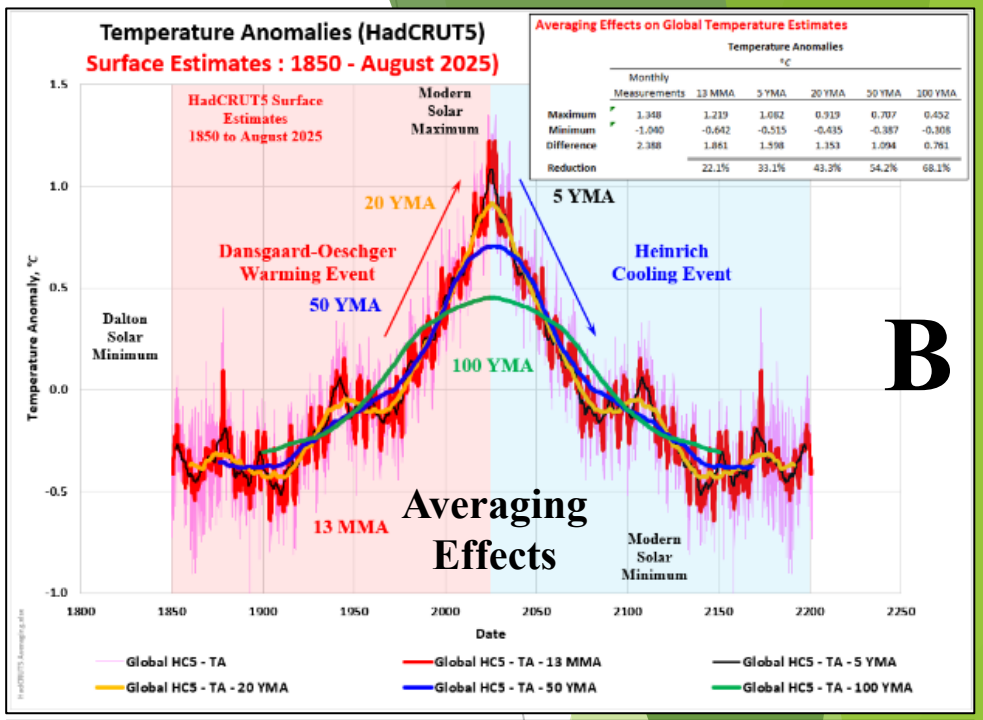
Climate Tipping Points

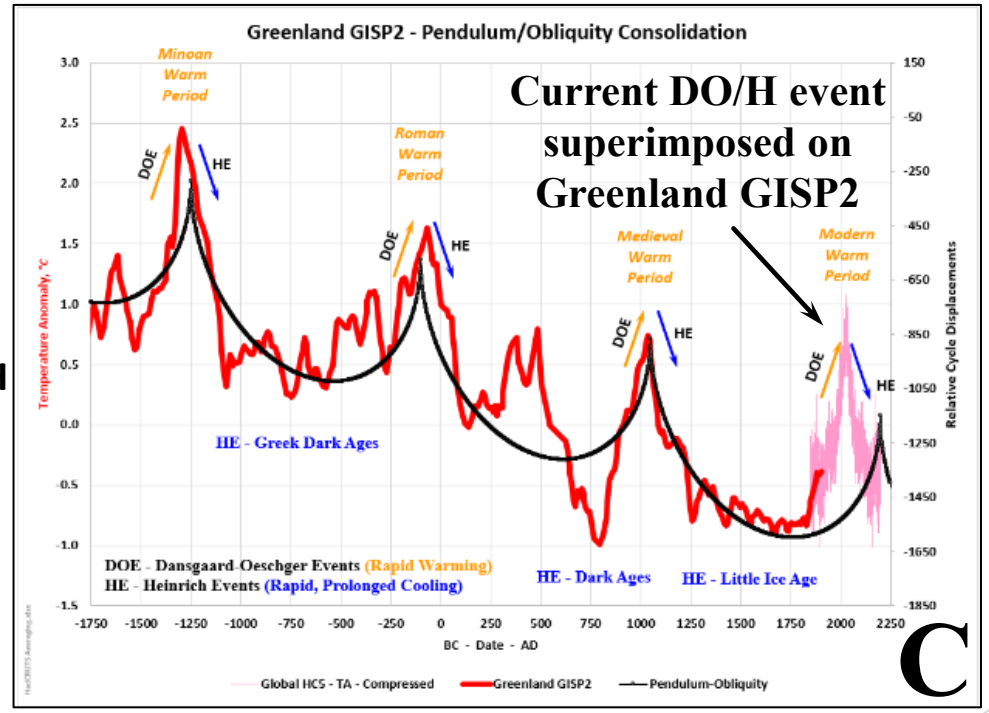
We are nearing a dangerous tipping point as we approach the peak of the current Dansgaard-Oeschgar/Heinrich event (a little ahead of schedule). The problem will not be warming; the problem will be the cold.

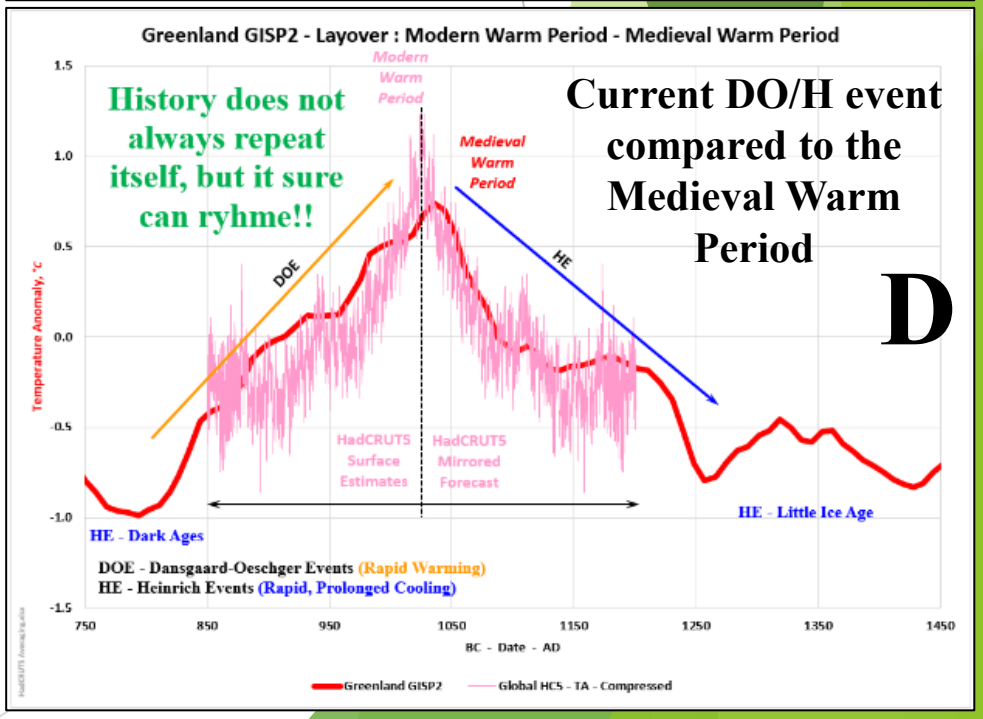
A. Historical/Forecasted DO/H event.
B. Averaging Effects.
C. DO/H event superimposed on Greenland GISP2.
D. Current DO/H event compared to the last DO/H event (i.e.: the Medieval Warm Period).

Bond/Eddy Dansgaard-Oeschger (±1,000 years)





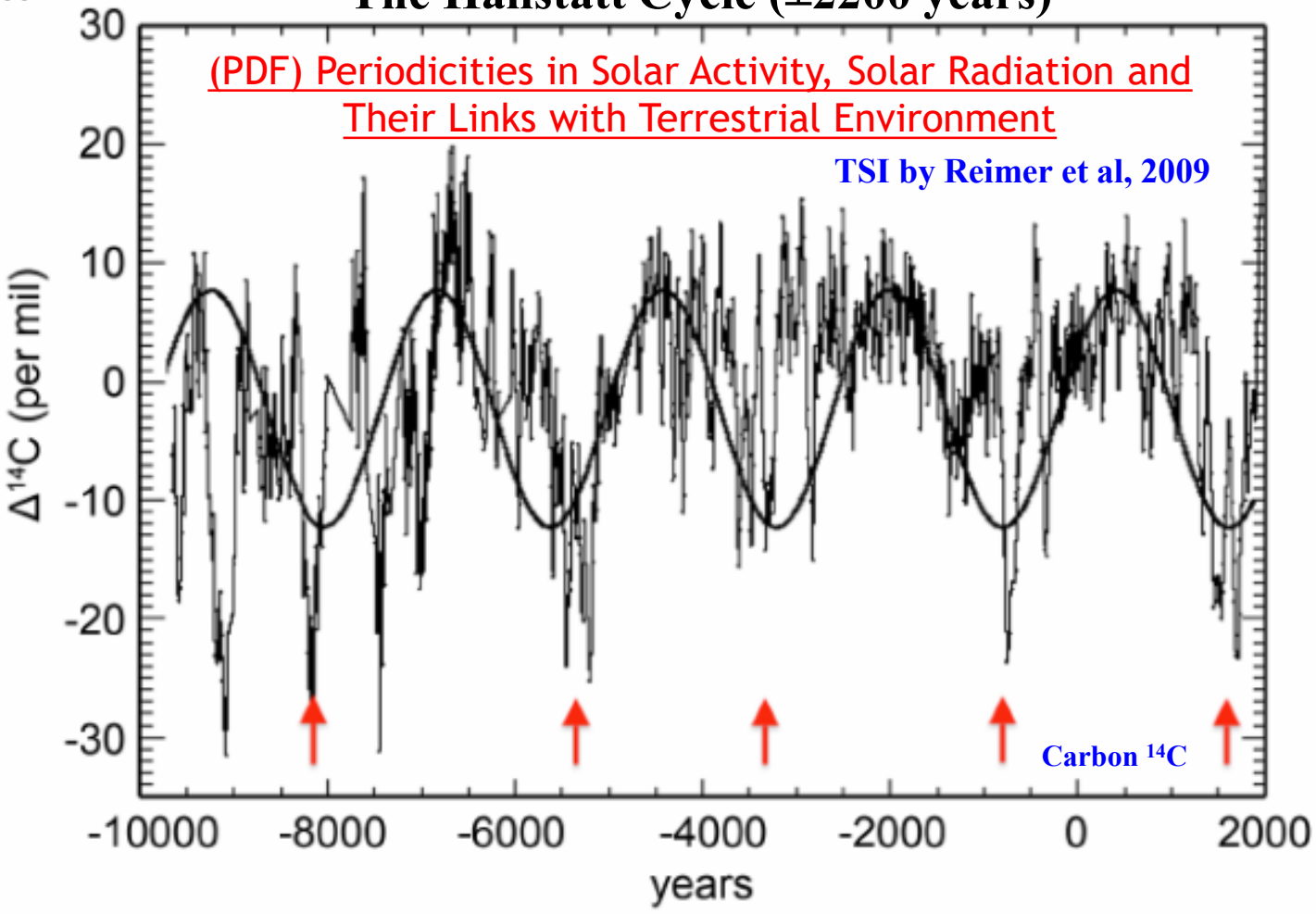


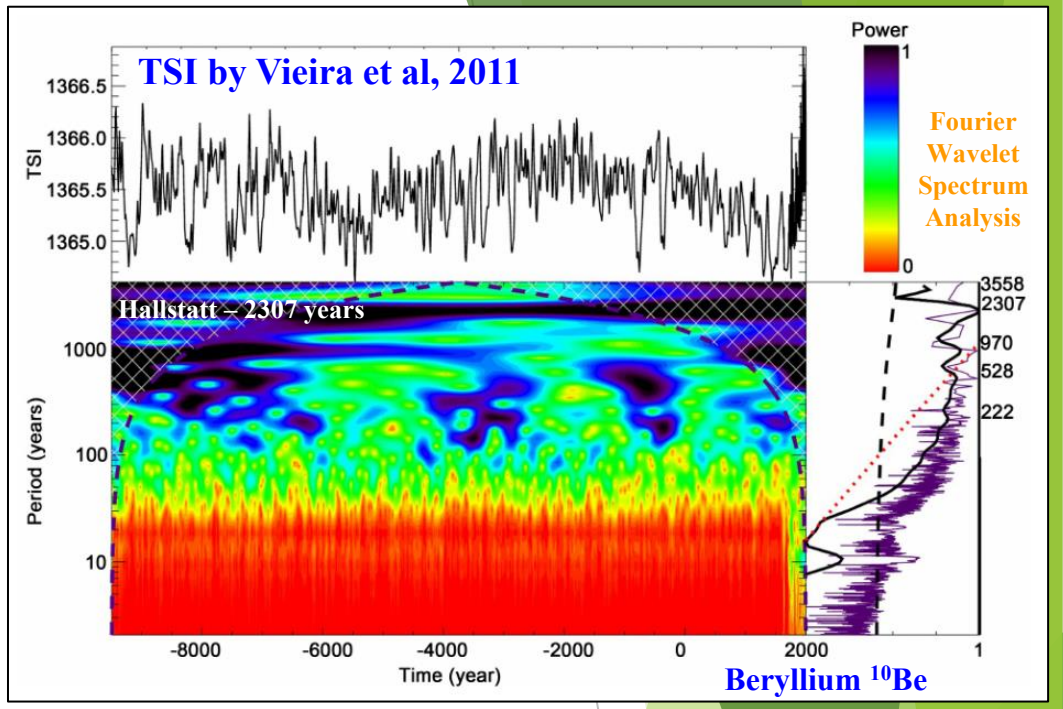


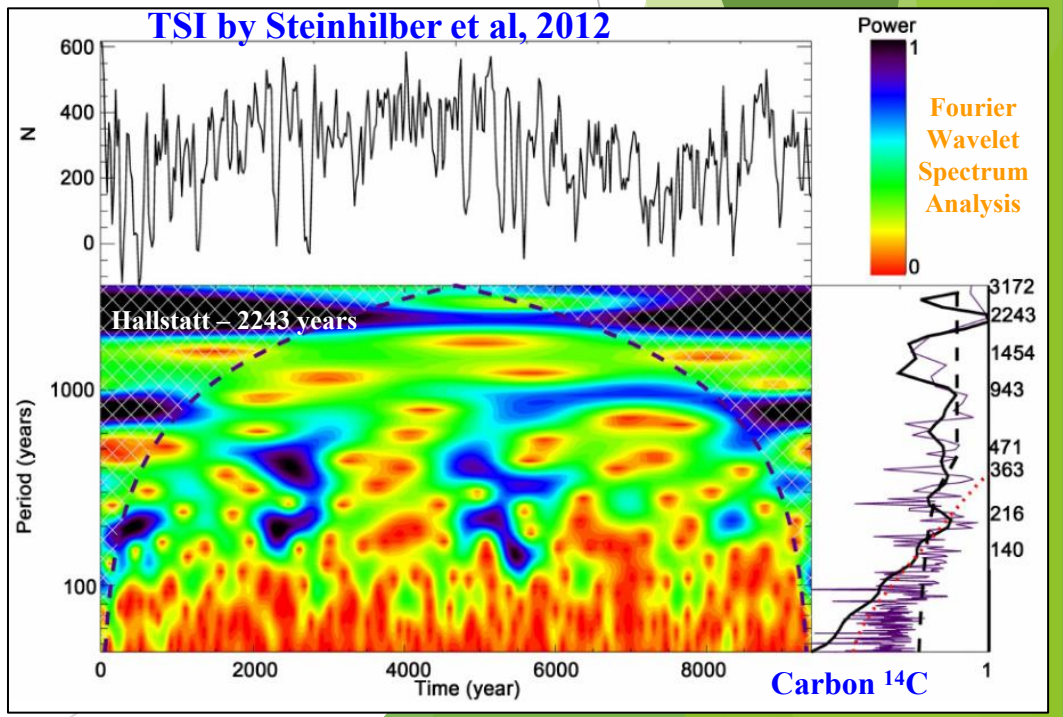
The Hallstatt Cycle (±2200 years)

(PDF) Periodicities in Solar Activity, Solar Radiation and Their Links with Terrestrial Environment

TSI by Reimer et al, 2009







Other Cycles present in this data

Schwabe – 10.7 years

de Vries – 216 years

Grand Solar Minimum – 363 years

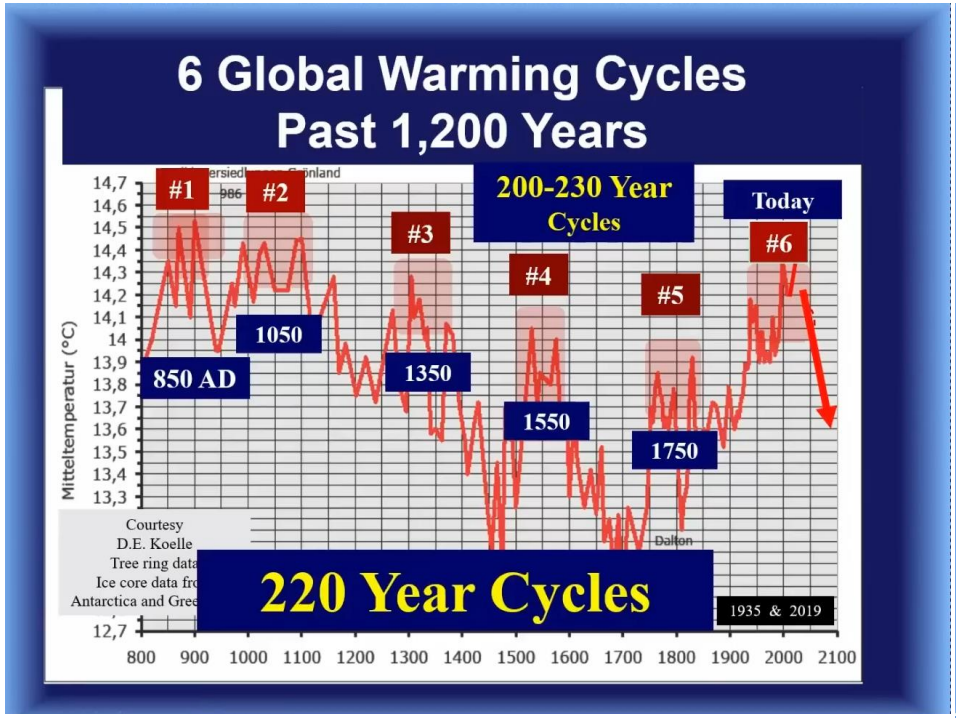
https://www.researchgate.net/publication/369627461_Periodicities_in_Solar_Activity_Solar_Radiation_and_Their_Links_with_Terrestrial_Environment - Zharkova et al 2023

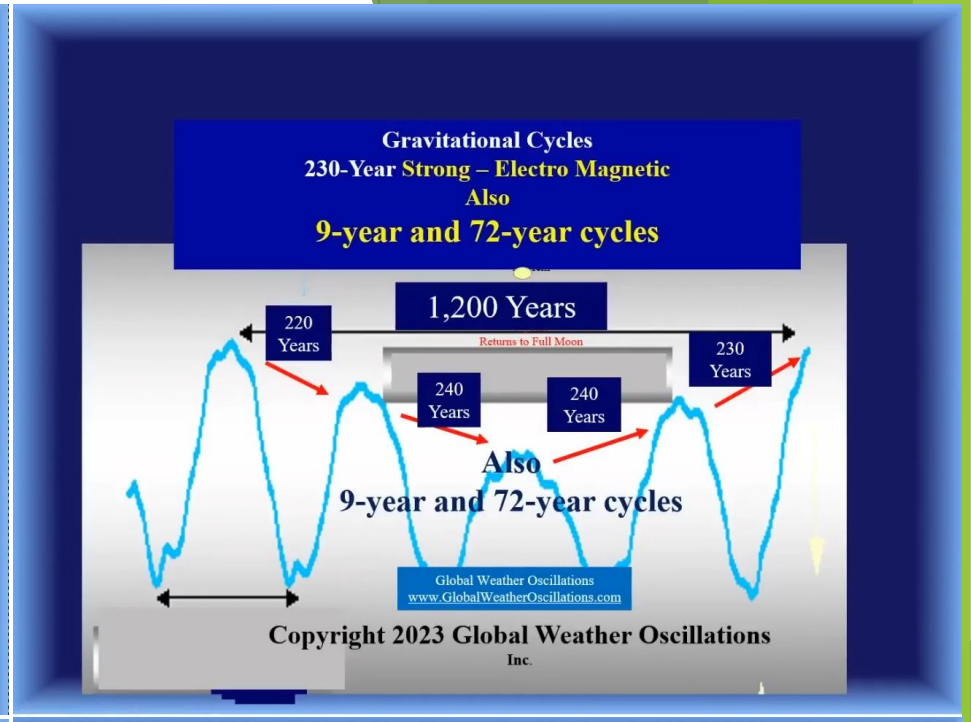
Climate Change With a Lunar Perspective?

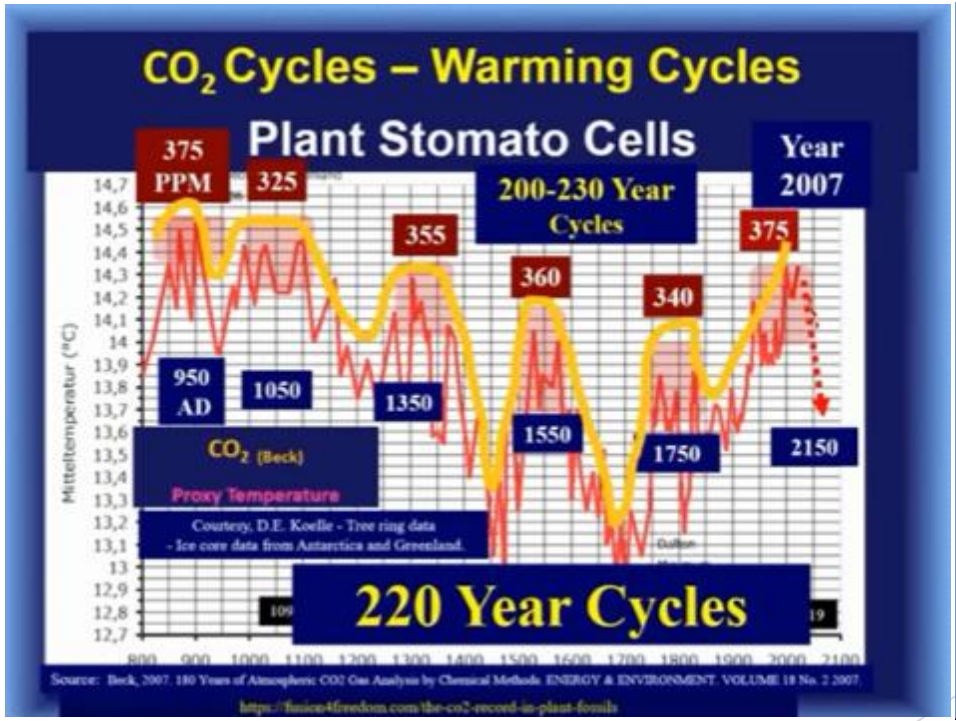
These data sets come from David Dilley's work showing a 9, 72, 220 & 1200-year cycles in temperature that matches the gravitational cycles between the earth and moon and the plant stomata CO_2 estimates.

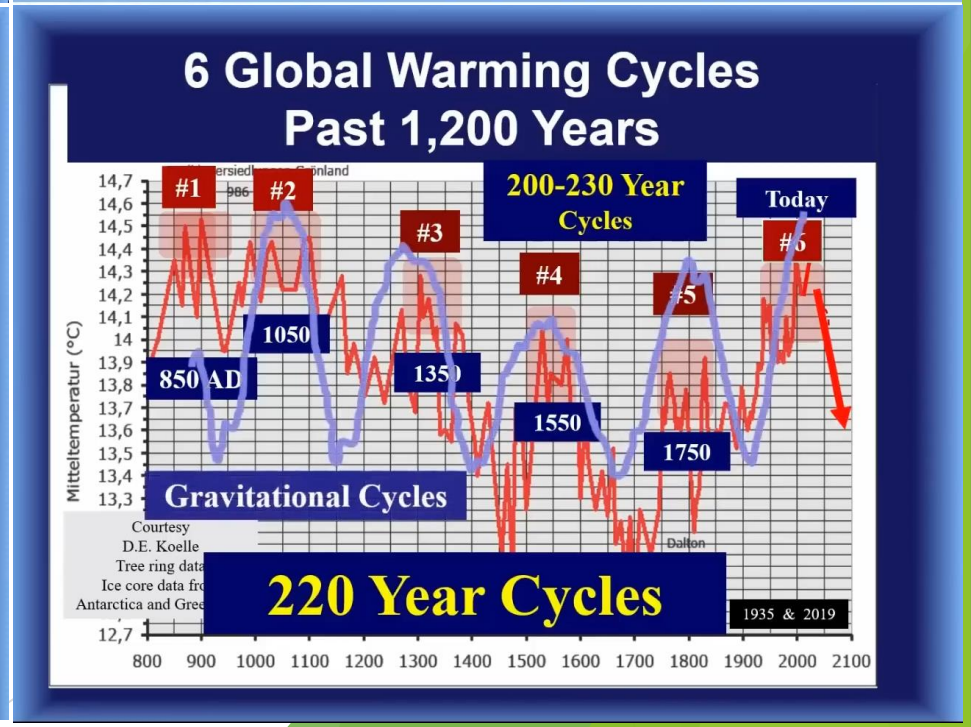
Note, this is not a mainstream view (yet)!

Gravitational interactions throughout the solar system influence solar dynamics and ultimately our climate!



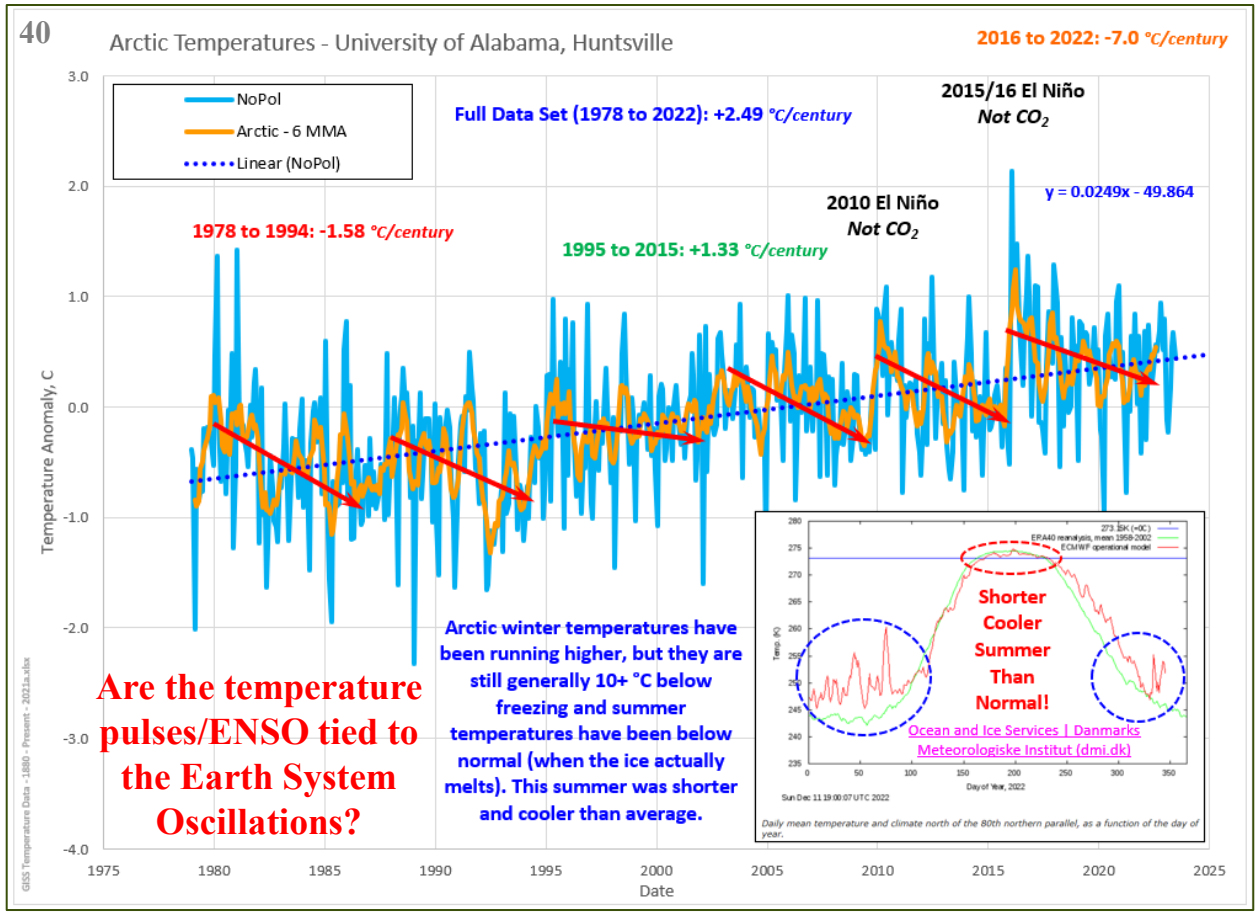


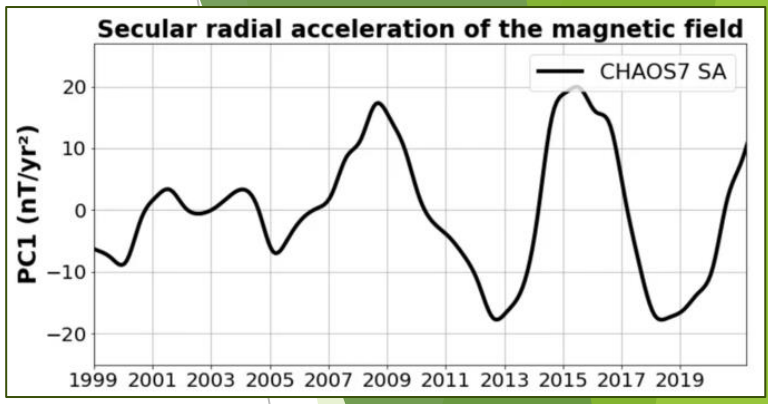


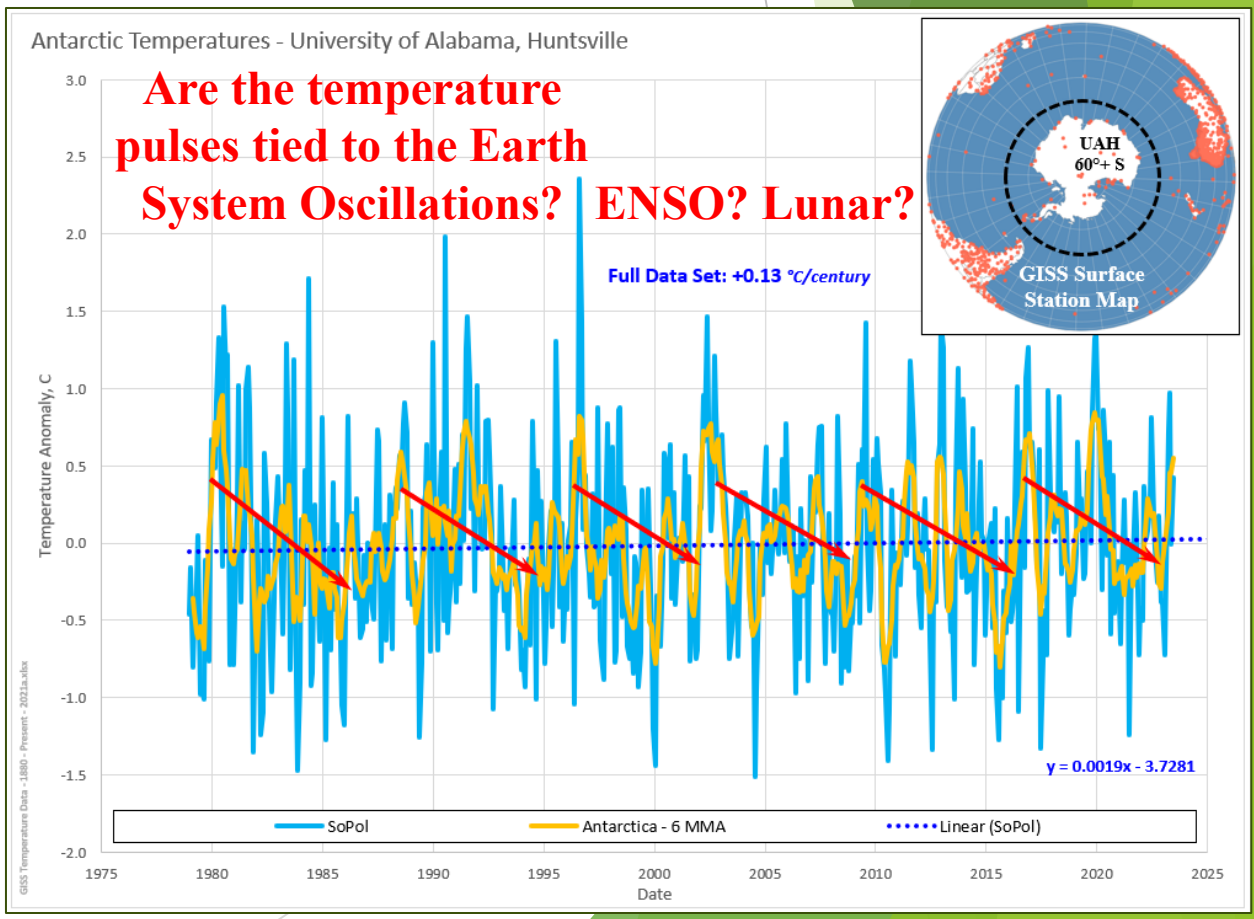


Why is the Earth System Oscillating at a 6-Year Period?

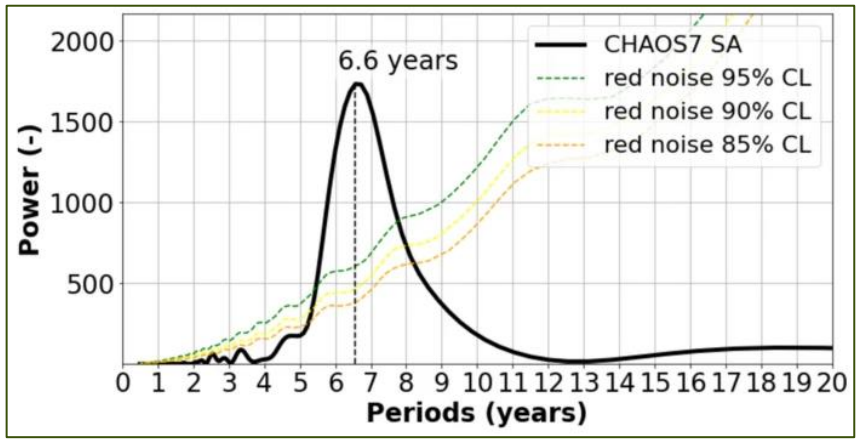
February 2025 Paper



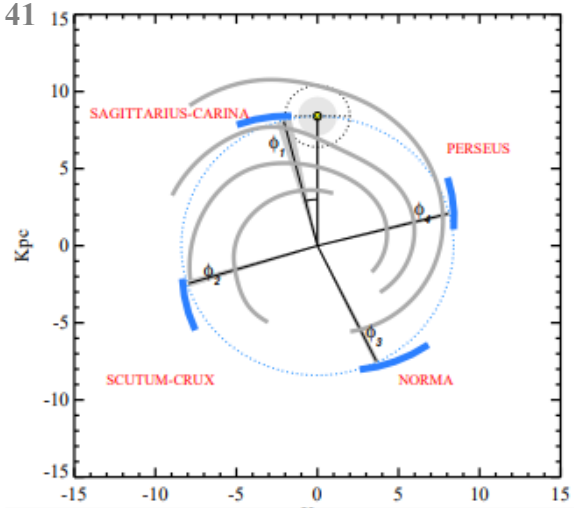




The frequency from the secular radial acceleration of the magnetic field data (top right)

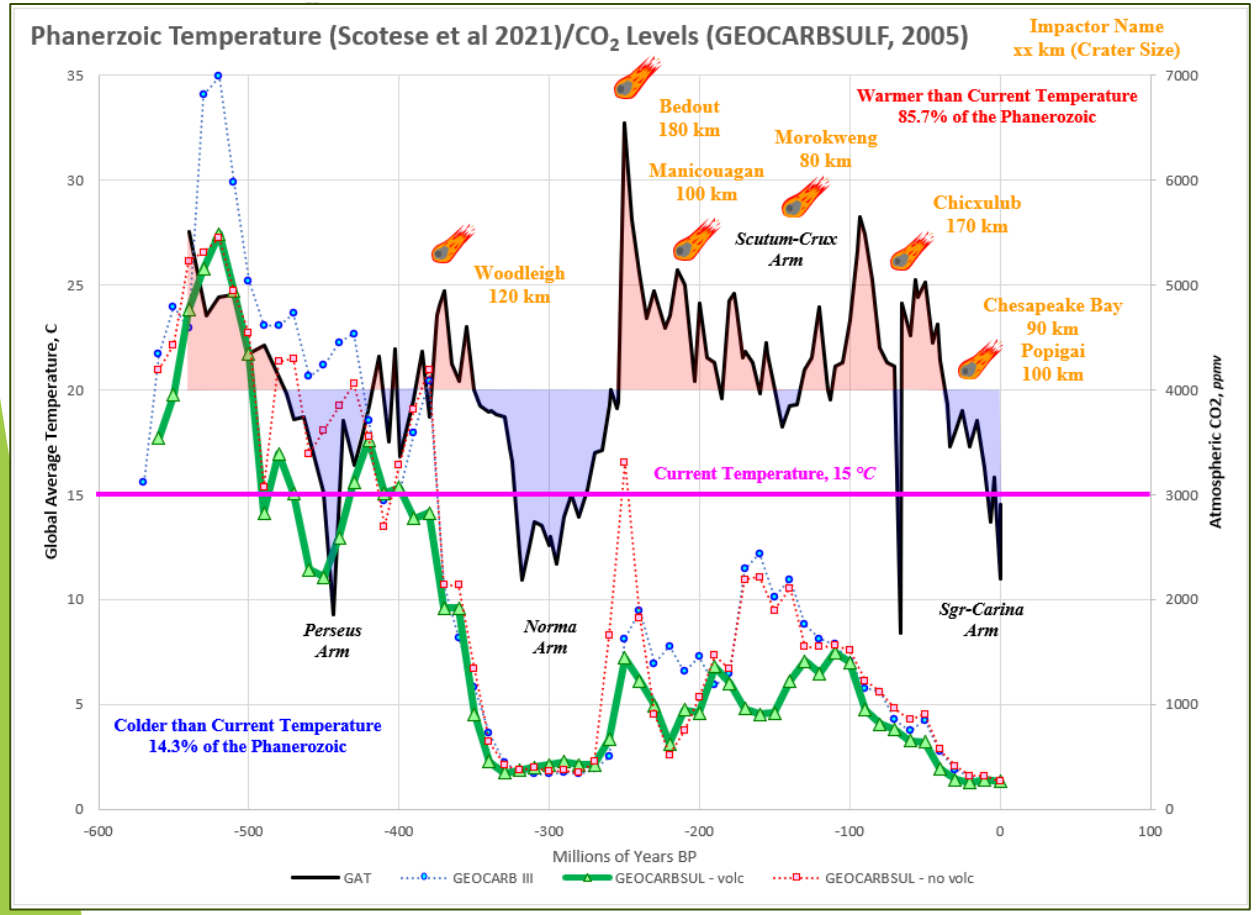


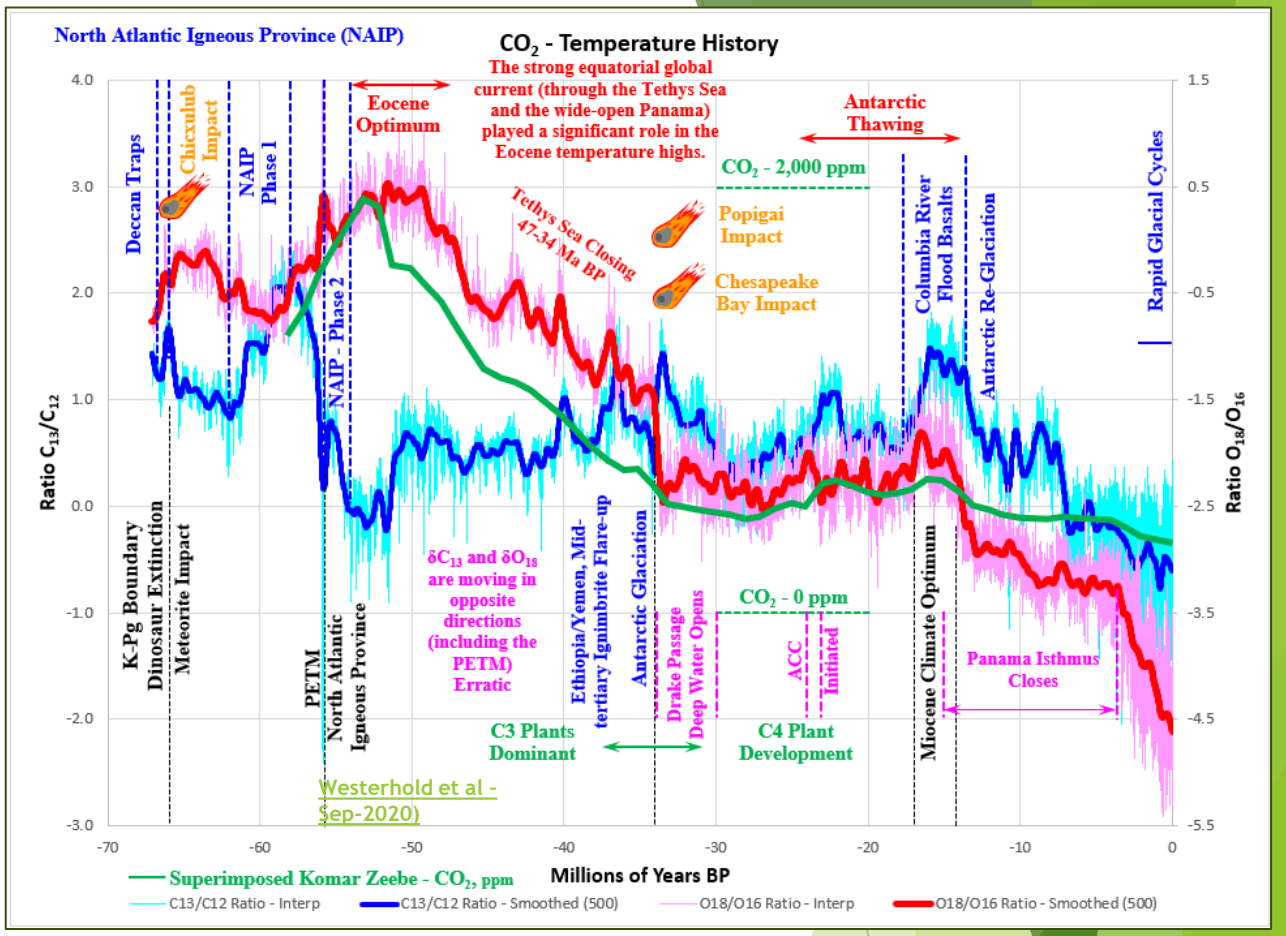
https://link.springer.com/article/10.1007/s10712-024-09874-4



Climate Change over the Phanerozoic Deep Ice Ages & the Sun's Position within the Milky Way Galaxy

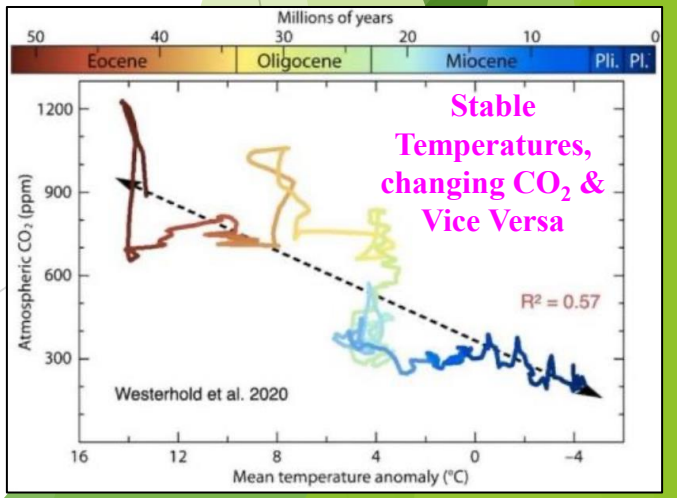
CSS-12 – Cosmic Ray Discussion





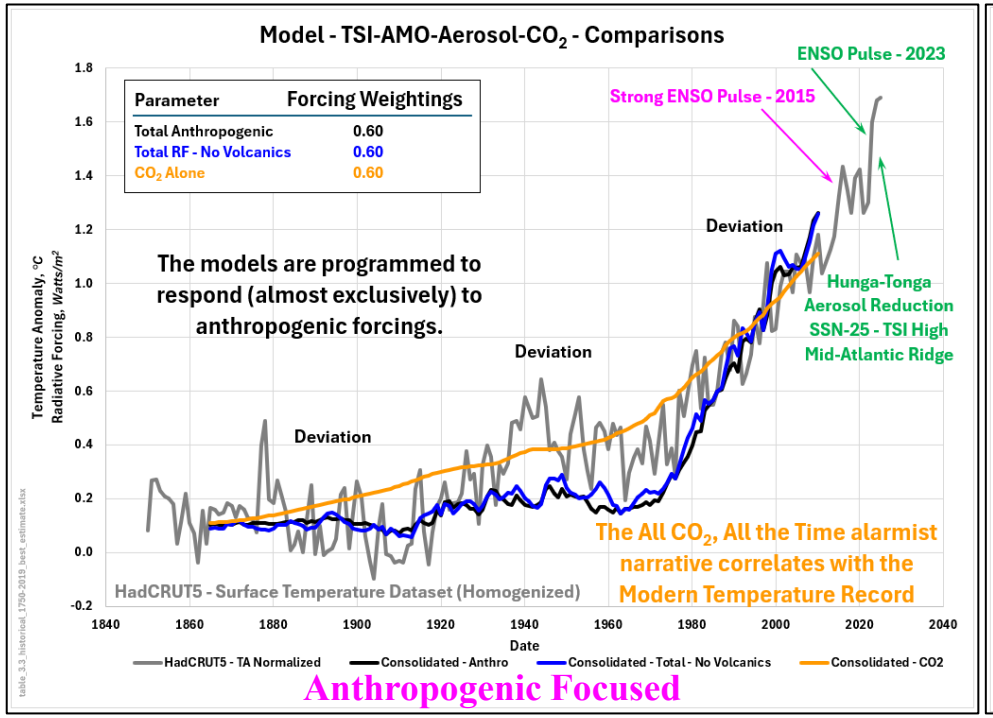
Climate Change over the Cenozoic A Mix of Plate Tectonics, Volcanics & Celestial Impacts

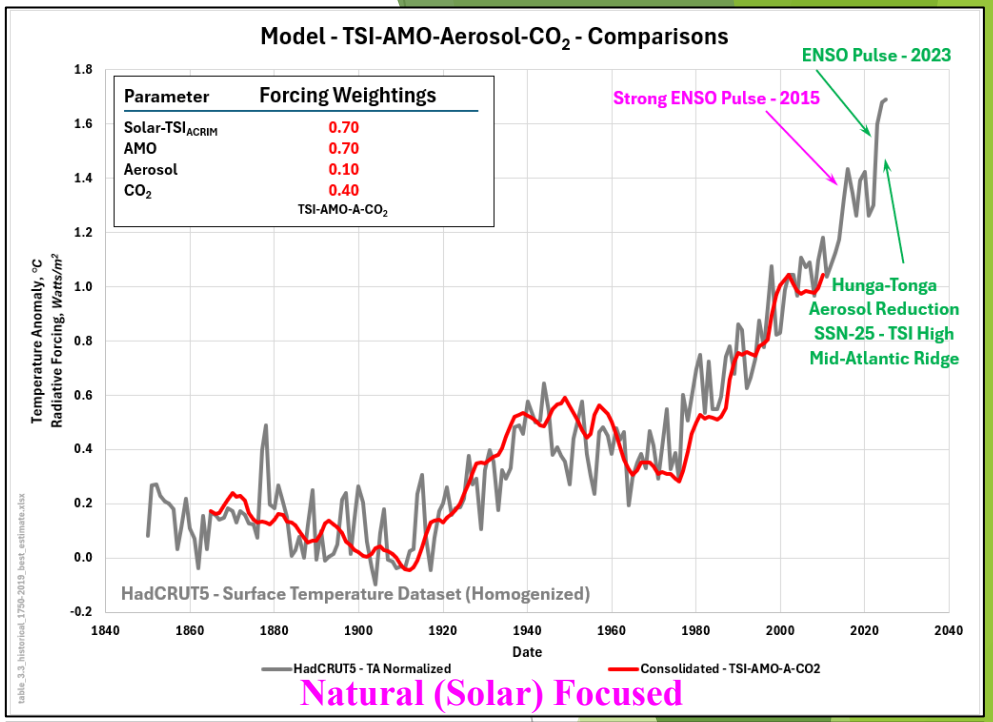
CSS-10 – A Ride Through the Cenozoic

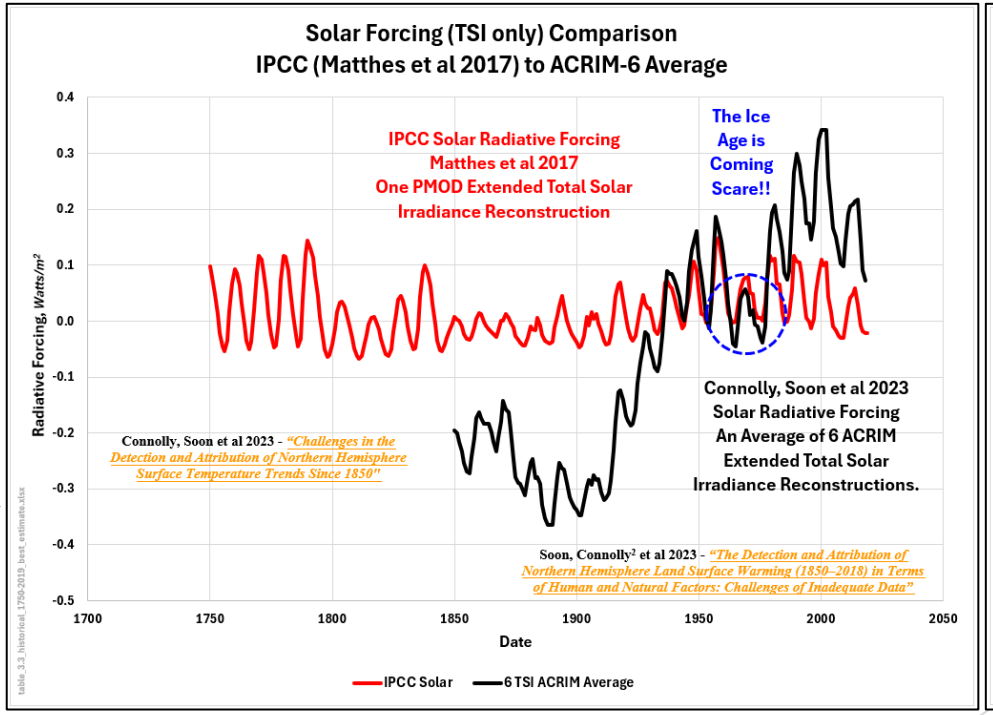


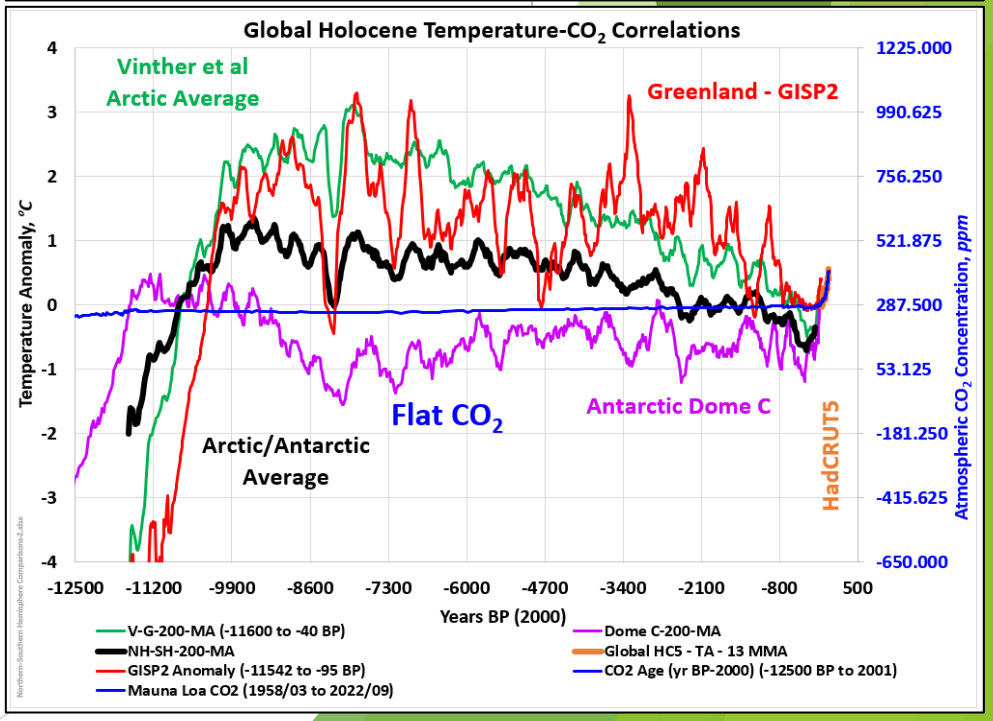
Which history match is more representative? The IPCC's Anthropogenic Focused "Best Estimates" or the Solar Focused option created by adding in the Atlantic Multi-decadal Oscillation (AMO) and replacing the IPCC's Matthes et al 2017 TSI reconstruction (PMOD, extended, one of the 40+ available) with an average of six ACRIM extended TSI reconstructions?

Can the IPCC's Anthropogenic focused model history match the pre-MTR Holocene climate? NOT A CHANCE!



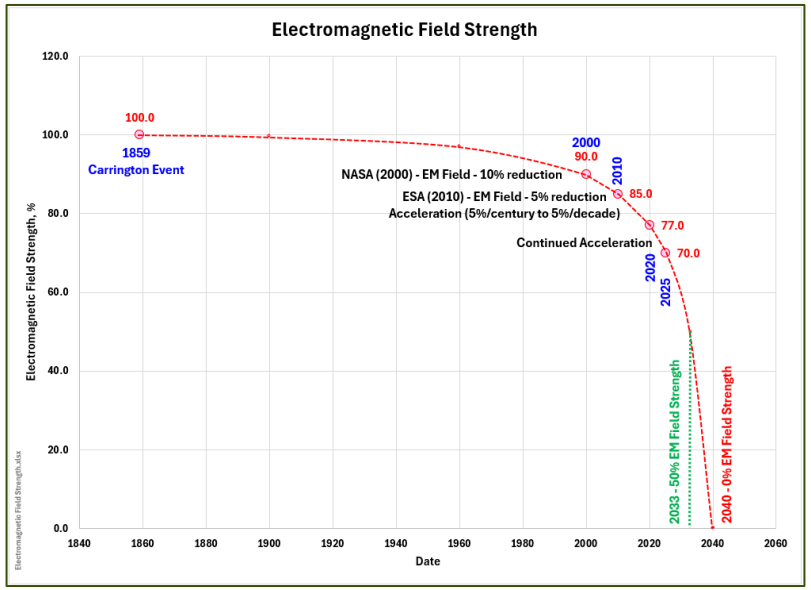


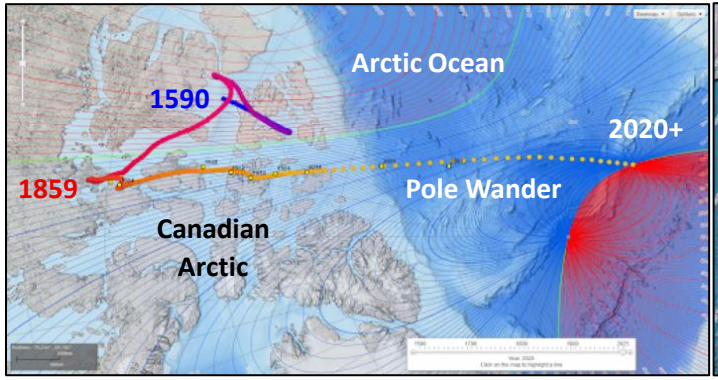


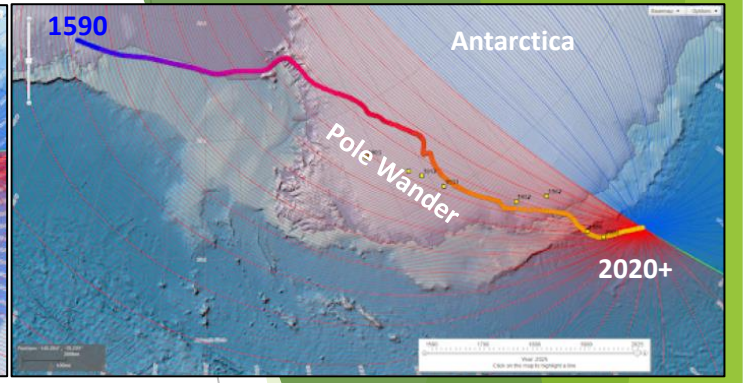


The Solar Micro-Nova Cycle ±12,000 years

The current Geomagnetic Excursion has begun and a global magnetic pole shift is near







The Earth's Electro-Magnetic Field (EMF) Strength has decreased 25 to 30% since the 1859 Carrington Event appeared to kickstart the magnetic north pole's migration across the Arctic Sea towards Russia. That EMF weakening is accelerating quickly.

The Relative Paleo-Intensity (RPI) peaked during the Maunder Minimum (1645 to 1715) and has weakened 55% since then and appears to be accelerating towards zero. Interestingly, the Holocene RPI profile (rotated 180°) correlates well with the Holocene temperatures shown here.

The Solar Micro-nova and/or the ±X1000 Solar Flares/CMEs are real existential threats! NOT CO_2!