CSS-24a Is the Holocene Really A New Epoch? - Definitions

More detail? climatechangeandmusic.com

EPOCH – Britannica Definition

"epoch, unit of geological time during which a rock series is deposited. It is a subdivision of a geological period, and the word is capitalized when employed in a formal sense (e.g., Pleistocene Epoch). Additional distinctions can be made by appending relative time terms, such as early, middle, and late. The use of epoch is usually restricted to divisions of the Paleogene, Neogene, and Quaternary periods."

Holocene EPOCH - Wikipedia Definition

"The Holocene (/ˈhɒl.əˌsiːn, ˈhɒl.oʊ-, ˈhoʊ.lə-, ˈhoʊ.loʊ-/ HOL-ə-seen, HOL-oh-, HOH-lə-, HOH-loh-)[2][3] is the current geological epoch. It began approximately 11,650 cal years before present (c. 9700 BCE), after the Last Glacial Period, which concluded with the Holocene glacial retreat.[4] The Holocene and the preceding Pleistocene[5] together form the Quaternary period. The Holocene has been identified with the current warm period, known as MIS 1. It is considered by some to be an interglacial period within the Pleistocene Epoch, called the Flandrian interglacial.[6]" **Go to the link for the footnotes.**

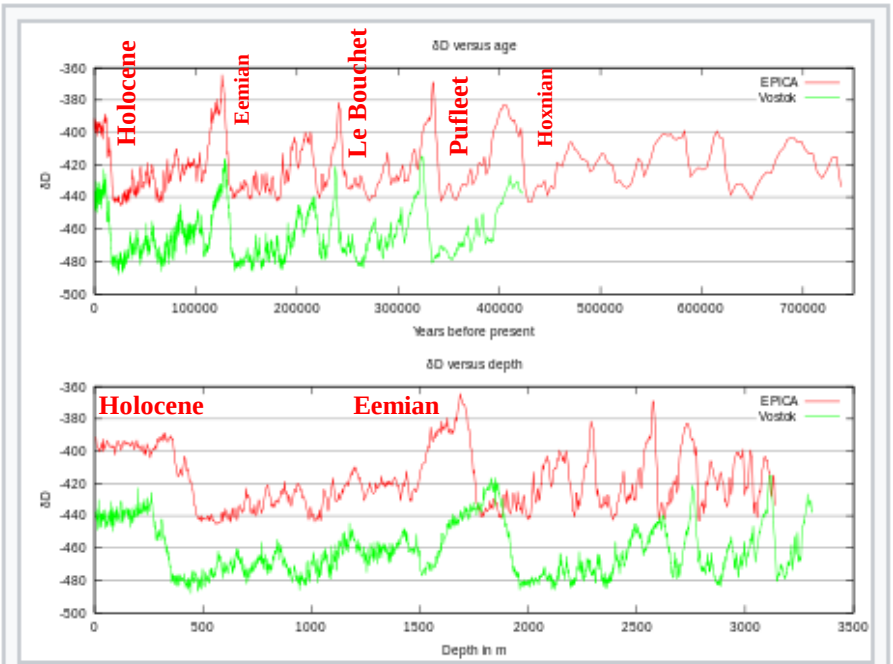
Eemian Period - Wikipedia Definition

"The Eemian (also called the last interglacial,[1] Sangamonian Stage, Ipswichian, Mikulin, Kaydaky, penultimate,[2] Valdivia or Riss-Würm) was the interglacial period which began about 130,000 years ago at the end of the Penultimate Glacial Period and ended about 115,000 years ago at the beginning of the Last Glacial Period.[3] It corresponds to Marine Isotope Stage 5e.[4] Although sometimes referred to as the "last interglacial" (in the "most recent previous" sense of "last"), it was the second-to-latest interglacial period of the current Ice Age, the most recent being the Holocene which extends to the present day (having followed the last glacial period). The prevailing Eemian climate was, on average, around 1 to 2 degrees Celsius (1.8 to 3.6 Fahrenheit) warmer than that of the Holocene.[5] During the Eemian, the proportion of CO2 in the atmosphere was about 280 parts per million.[6]" **Go to the link for the footnotes.**

EPOCH Definition

The first question you might ask is, why is the Holocene an Epoch and the Eemian, Le Bouchet, Purfleet and Hoxnian are not? Well, The argument (weak as it is) suggests that the late Holocene is different because we are now causing all the climate change.

According to National Geographic, *"Officially, the current epoch is called the Holocene, which began 11,700 years ago after the last major ice age. However, the Anthropocene Epoch is an unofficial unit of geologic time, used to describe the most recent period in Earth's history when human activity started to have a significant impact on the planet's climate and ecosystems."* In addition, *"In 2016, the Anthropocene Working Group agreed that the Anthropocene is different from the Holocene, and began in the year 1950 when the Great Acceleration, a dramatic increase in human activity affecting the planet, took off."* This CSS will delve into the rationale for labeling the Holocene an Epoch and the validity of the Anthropocene concept. Ultimately, both the Holocene Epoch and Anthropocene "Great Acceleration" are both examples of weaponizing language to push ever more aggressive Socialist agendas. Geologically, the Holocene is just another interglacial warm period in the Pleistocene Epoch.



Two ice core temperature records; the Eemian is at a depth of about 1500–1800 meters in the lower graph

The Anthropocene concept has very little to do with Geology.

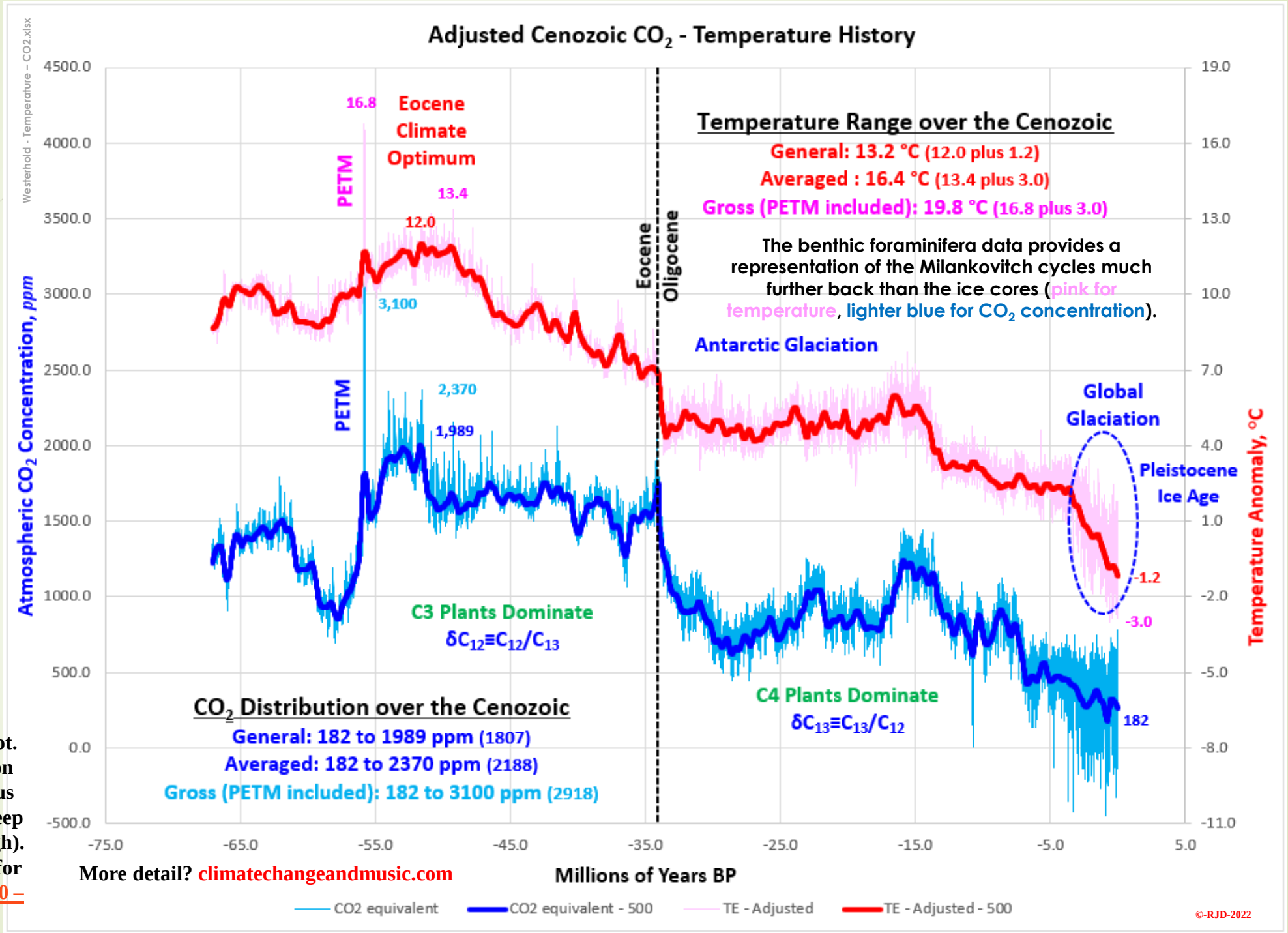
CSS-24b

Is the Holocene Really A New Epoch? - Cenozoic

This is a quick look at the bigger picture. The data presented here is from a 2020 paper, Westerhold et al's "*An astronomically dated record of Earth's climate and its predictability over the last 66 million years*". In Westerhold's words, "*Much of our understanding of Earth's past climate comes from the measurement of oxygen and carbon isotope variations in deep-sea benthic foraminifera*". The first few slides focus on the benthic foraminifera data before transitioning to the more familiar ice core data.

Greenland Homogenized Temperatures

The Pleistocene Epoch (Ice Age) is highlighted on the right side of the plot. The inflection point around 3.4 million years ago denotes the Panama Isthmus closure (which propelled us into the deep ice ages we now regularly cycle through). There is much more to the Cenozoic (for those that are interested) in my CSS-10 – A Ride through the Cenozoic post.



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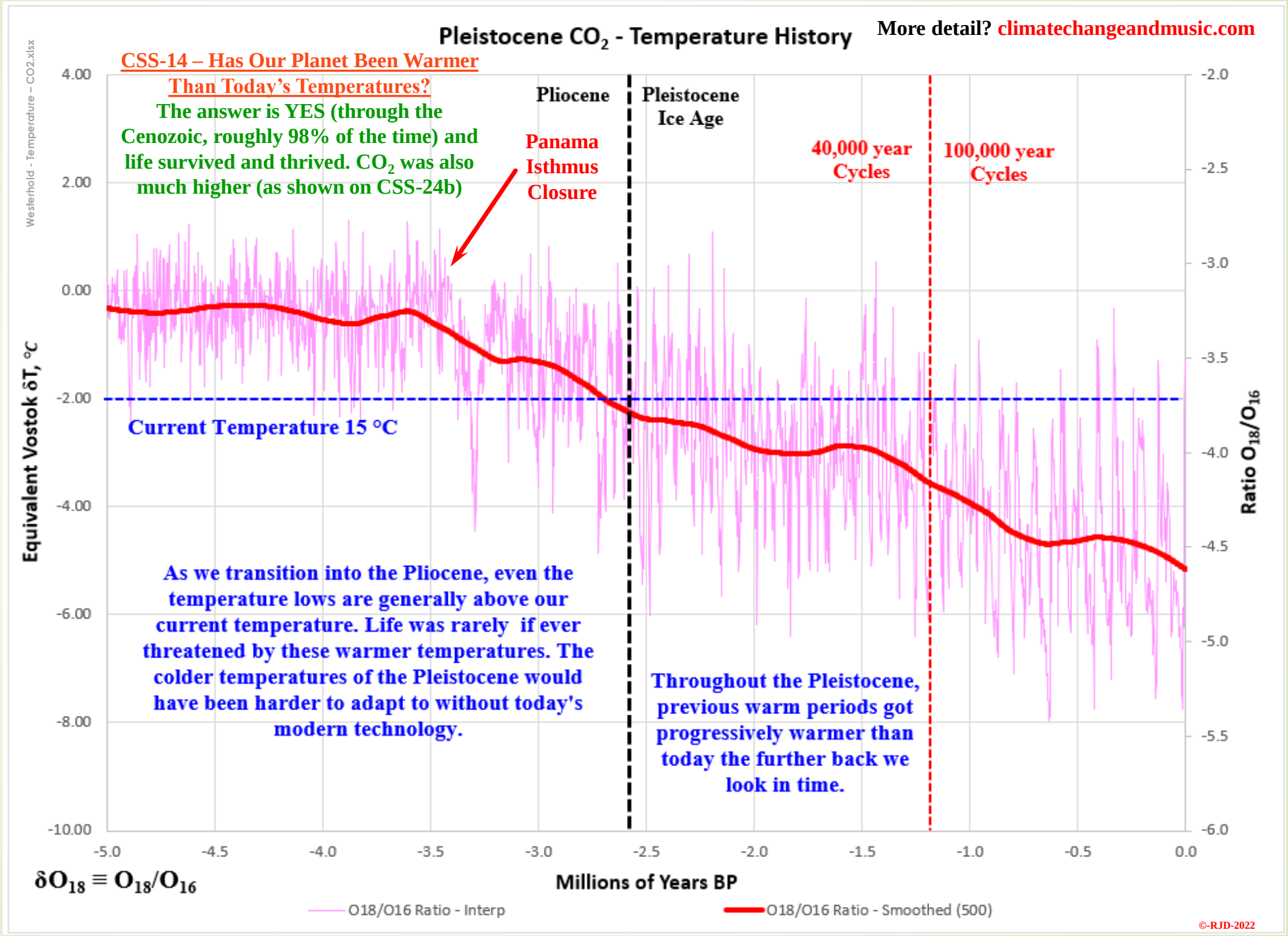
CSS-24c

Is the Holocene Really A New Epoch? – Pliocene/Pleistocene Epochs

This plot focuses on the last two Epochs prior to the Holocene (the Pliocene (5.333 million years ago to 2.58 Million years ago) and the Pleistocene (2.58 million years ago to 11,700 years ago)). Assuming, of course, that the Holocene is a new epoch. But is it? On this scale, the Holocene certainly appears to be inconsequential. The Panama Isthmus closed towards the end of the Pliocene, sending us in to a cycle of long, deep ice ages and short interglacial warm periods.

Pliocene Pleistocene Epochs

The Epoch boundary appears to be set at the point where the cycle durations settled in at 40,000 years through the first half of the Pleistocene, then transitioned to the current 100,000-year cycles. The cycles are roughly 90% deep ice age, 10% interglacial warm periods. We are fortunate to be living through a relatively short period of warmth in the very cold Pleistocene Epoch.

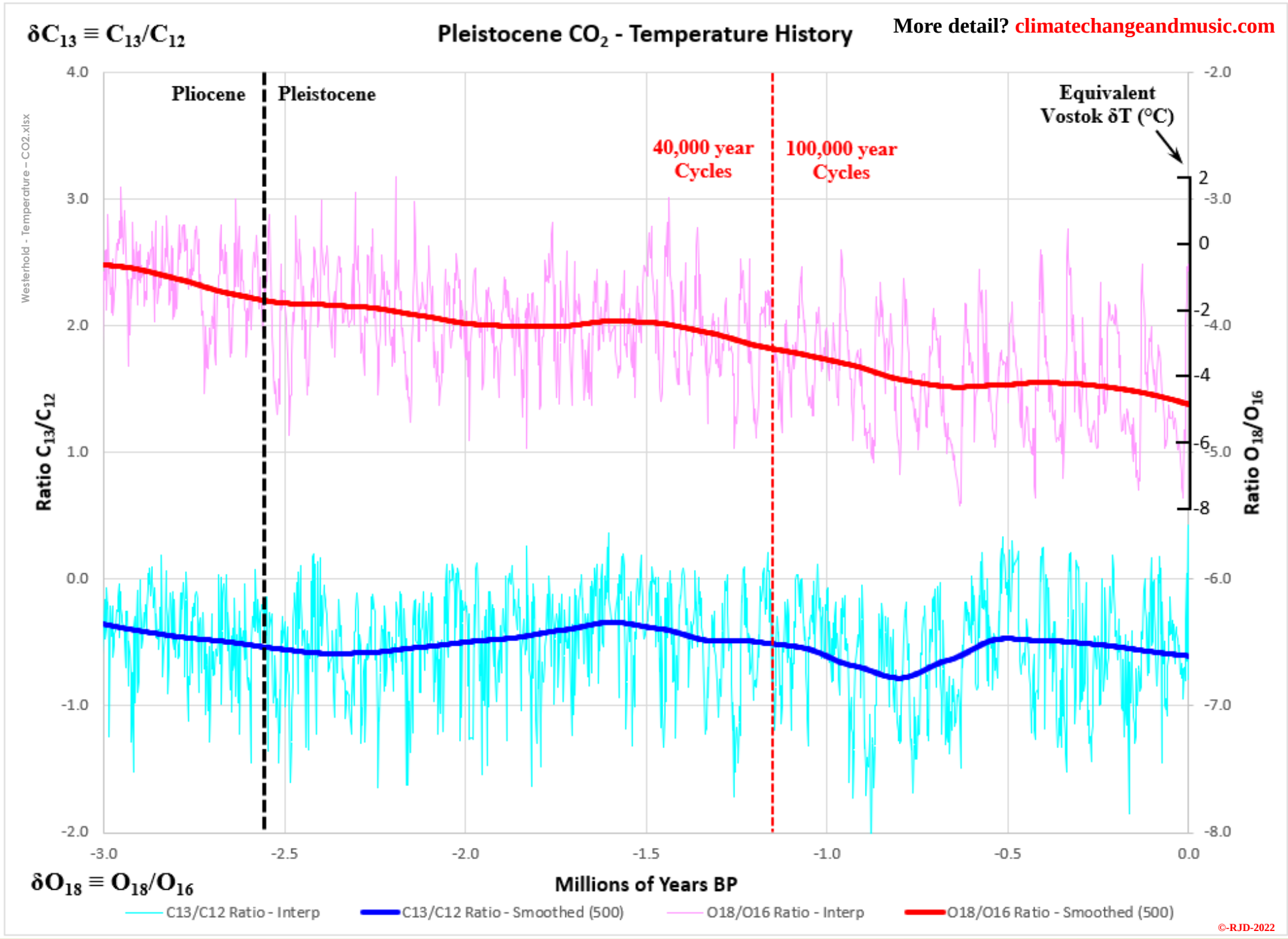


GSM – Grand Solar Minimum. The real "Climate Change" existential threat is right around the corner. Do the Research!

Is the Holocene Really A New Epoch? – Pleistocene Epoch

This plot focuses on the Pleistocene Epoch and adds in the carbon isotope ratio data (a proxy for CO_2 concentrations). The oxygen isotope ratio data (a proxy for temperatures) has been correlated with equivalent temperatures. No major revelations over the previous slide. The cycles are spread out a bit more, but the Holocene is still inconsequential. Just for reference the Pliocene lasted 2.75 million years. The Pleistocene lasted 2.57 million years (more likely 2.58 million years and counting). Calling the Holocene, a new epoch may be a little premature. But to be fair, we do need to zero in on shorter time scales to analyze the Holocene (11,700 years and counting) in more detail. That analysis is forthcoming. The idea that the Anthropocene Epoch (supposedly beginning in 1950) is a geological period is also a tough concept to swallow. More discussion later.

Pleistocene Epoch

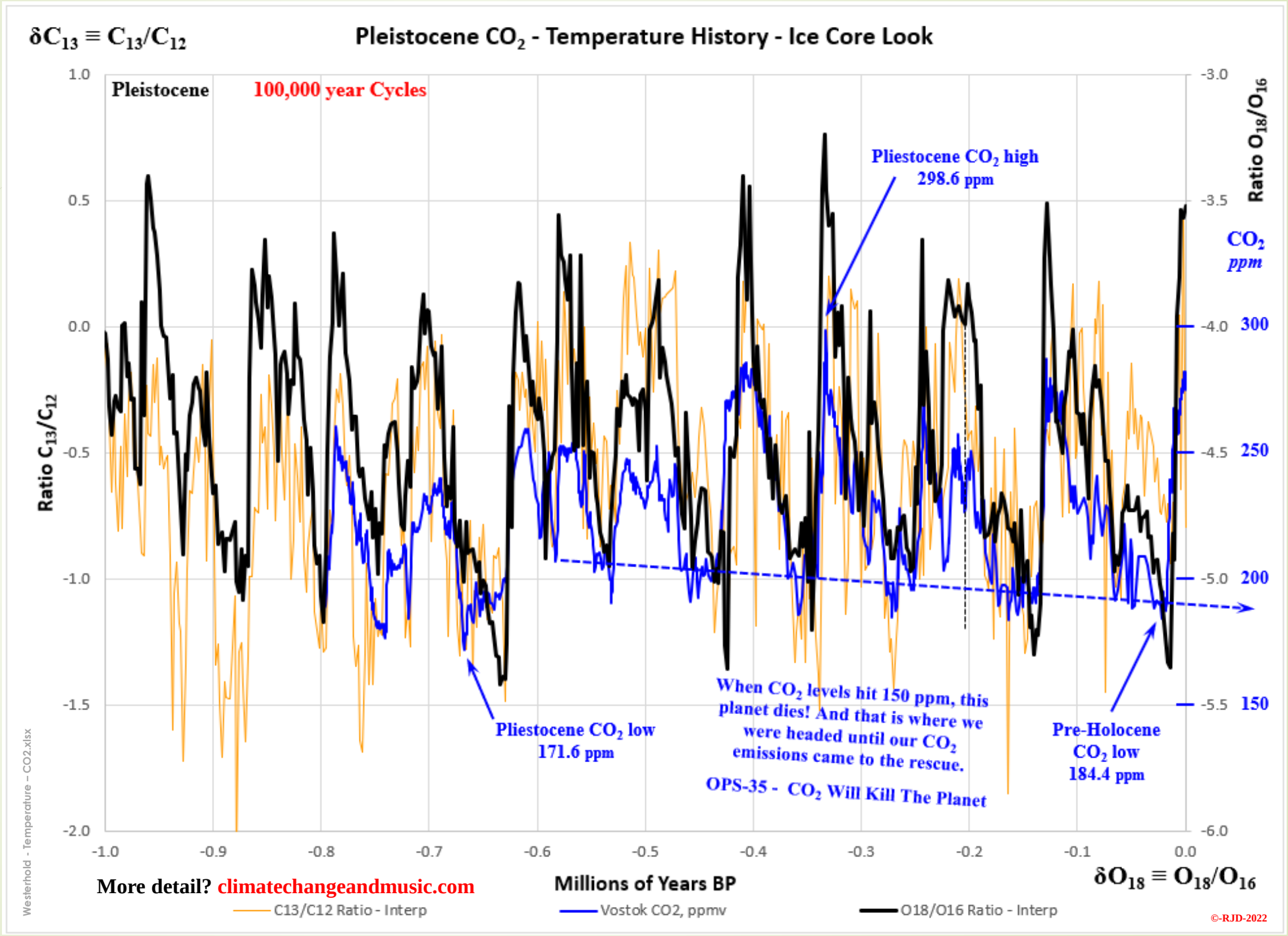


Is the Holocene Really A New Epoch? – Benthic Foraminifera and Ice Cores

The next focus is the late Pleistocene. The ice age cycles over the last million years are roughly 100,000 years in duration and correlate (not surprisingly) well with the ice core data. The Vostok CO_2 data is plotted here (Blue Curve), but the Vostok temperature data would also correlate well. We are starting to see some definition on the Holocene, but I still do not see any distinguishing parameters that would set the Holocene apart from any of the other interglacial warm periods that came before.

Benthic Foraminifera & Ice Cores

Going forward, the discussion will flip to the ice core data. As an aside, the interesting CO_2 trajectory on this time scale is the decline in deep ice age CO_2 levels. Every deep ice age has had lower CO_2 levels. In a few million years, this planet would have become lifeless without the life-giving CO_2 injection we just provided.



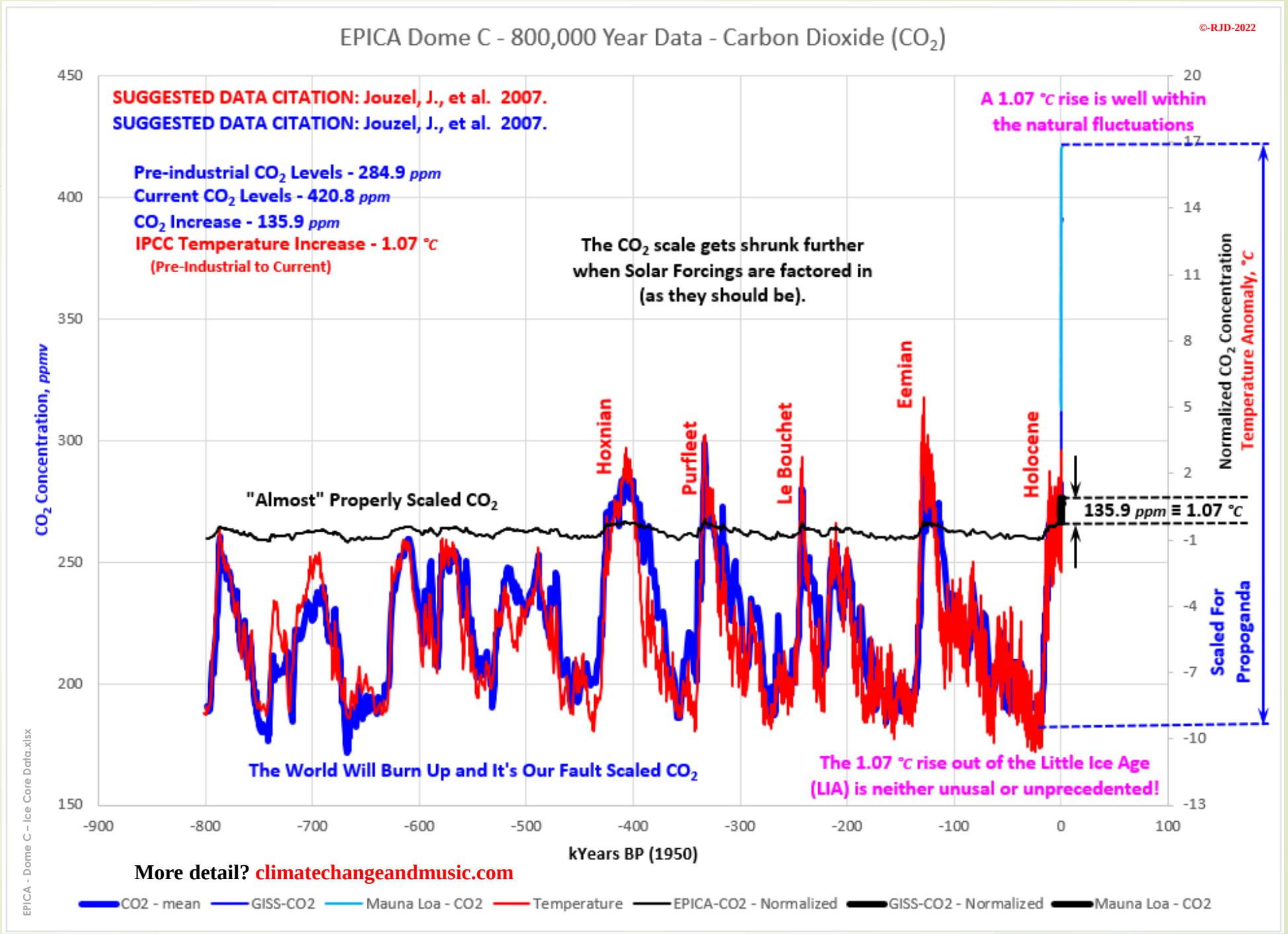
CSS-24f

Is the Holocene Really A New Epoch? – EPICA Dome C – Ice Core Data

This ice core data covers the last 800,000 years of temperature and atmospheric CO_2 data. There are two CO_2 curves (exactly the same data). The blue curve accentuates the atmospheric CO_2 increase but does not represent the CAGW virtual reality (135.9 ppm is equivalent to a 1.07 °C temperature rise), let alone reality. The interglacial warm period temperatures and CO_2 are laid right on top of one another. They correlate very well but temperature is driving CO_2 levels.

EPICA Dome C - Ice Core Data

The proper scaling (135 ppm ≡ 1.07 °C) is represented by the black line. The next slides will zoom in further but the folly of the Holocene being a new Epoch should be coming much clearer. Temperatures will drop soon (on a geological time frame) as they have done in every preceding ice age cycle for millions of years (ending both the unnecessary Holocene and Anthropocene "Epochs").



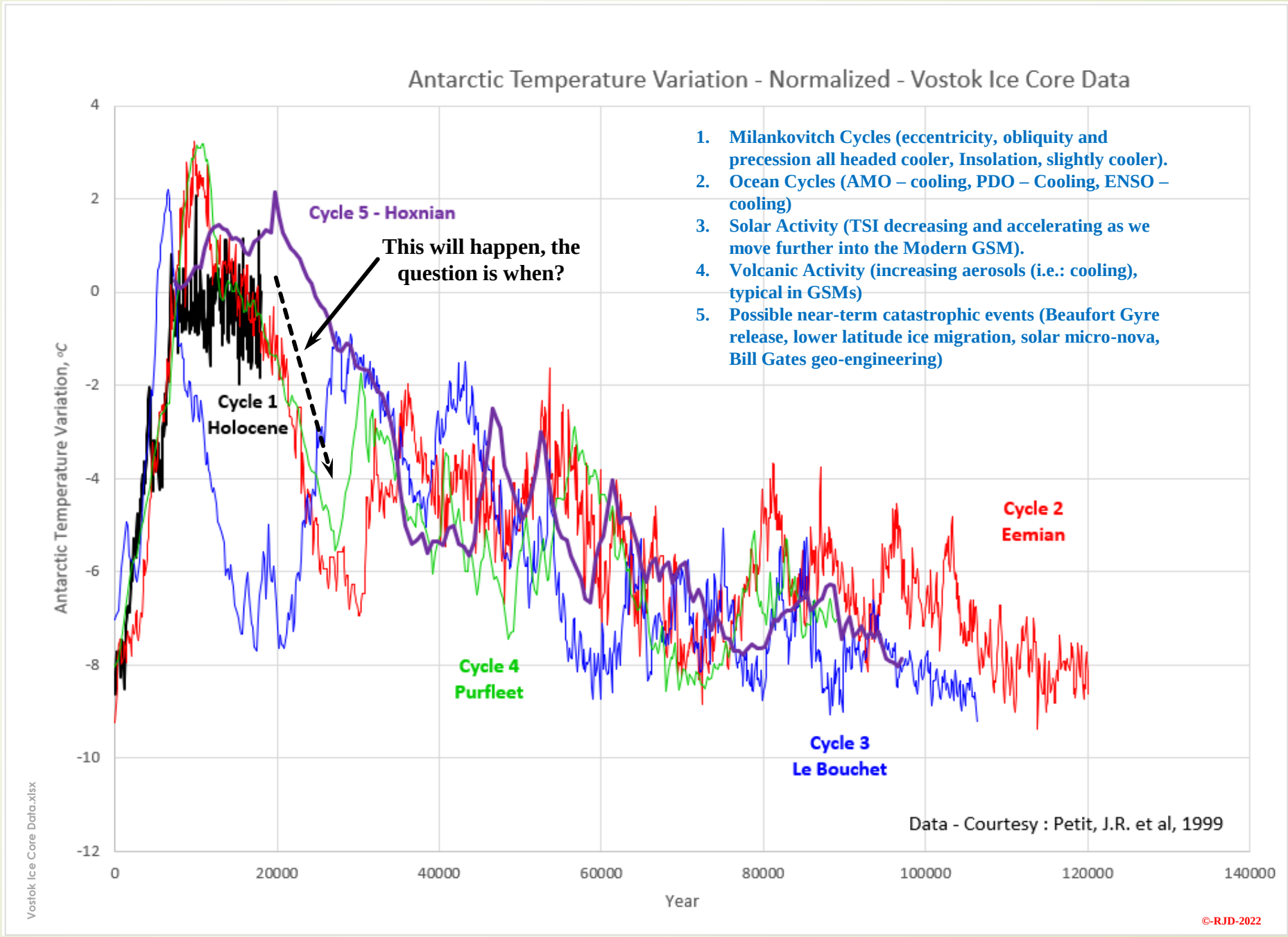
More detail? climatechangeandmusic.com

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

Is the Holocene Really A New Epoch? – Vostok Ice Cores – Normalized Interglacials

The previous data was from EPICA – Dome C Ice Core Data. The data plotted on this slide comes from the Vostok Ice Core data. This analysis produces the same results regardless of which data set is used. The Holocene is no different than any other interglacial warm period. As we progress through the Milankovitch cycles, the temperatures will drop (despite rising CO_2 levels). More Milankovitch cycle data will be provided in the upcoming slides. Once the temperatures start dropping from the Interglacial highs, they drop precipitously. Are we poised to take that drop? I certainly hope not, but there are a lot of downward pressures on global temperatures all manifesting themselves now and over the next few decades (summarized to the right). That precipitous drop will happen. Will this be the Grand Solar Minimum (GSM) that pushes us over the cliff? Global temperatures have been dropping since late 2015. Antarctic temperatures have been dropping for the last 40 years (last winter was the Coldest EVER).

Vostok Ice Cores Normalized Interglacials



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

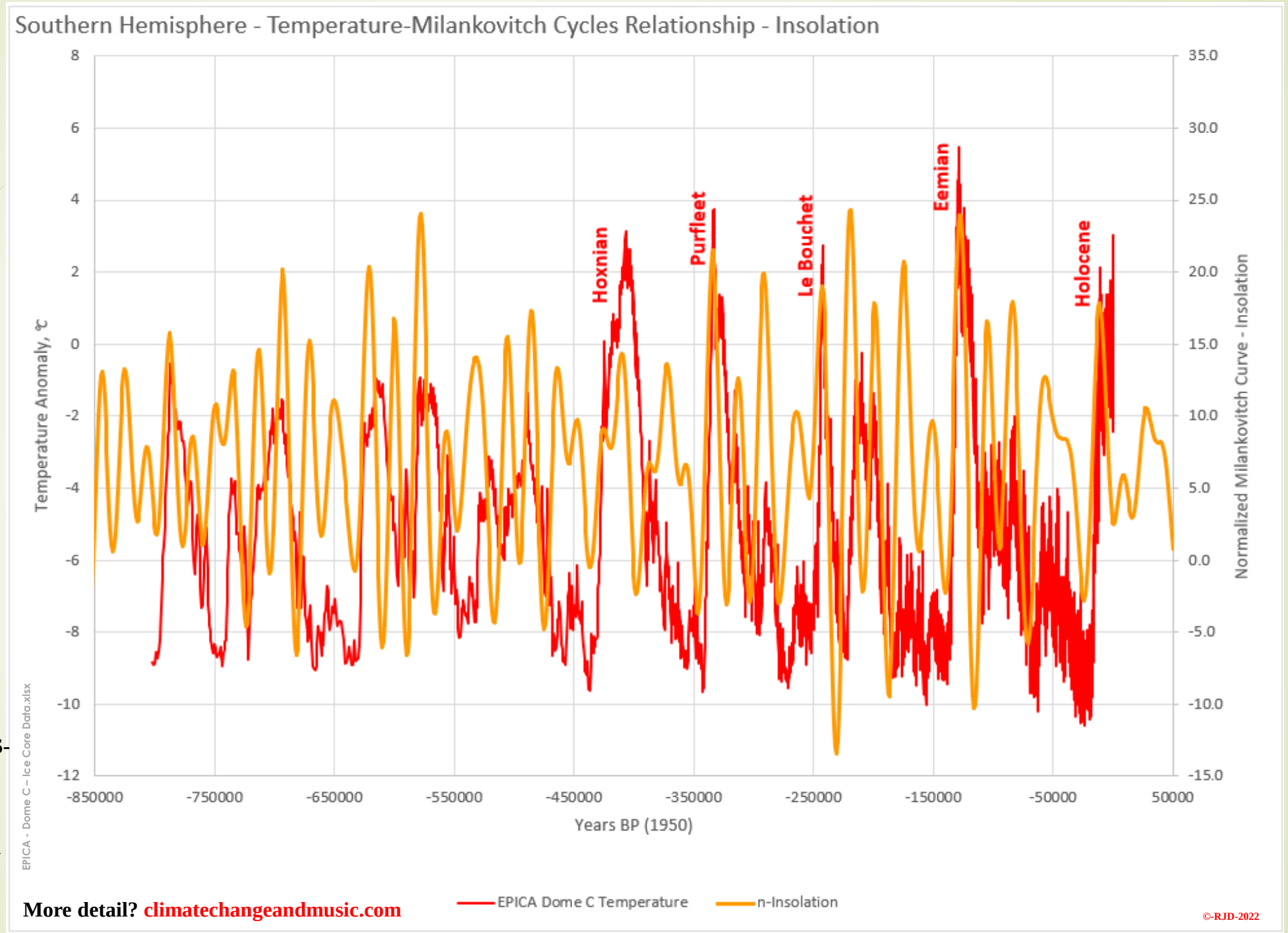
CSS-24h

Is the Holocene Really A New Epoch? – Milankovitch Cycle Insolation (800,000)

The Milankovitch Cycles are a long discussion. For more detail go to my CSS-4 – Solar Forcings – Milankovitch Cycles. This plot shows the Insolation and Temperature correlation. The Insolation is a consolidation of the three main Milankovitch cycles (Eccentricity, Obliquity and Precession). Insolation is the amount of energy that strikes the earth at 65° North. The strongest Milankvitch cycle is the Obliquity and the Eccentricity has some very interesting correlations.

Milankovitch Cycles 800,000 Year Insolation

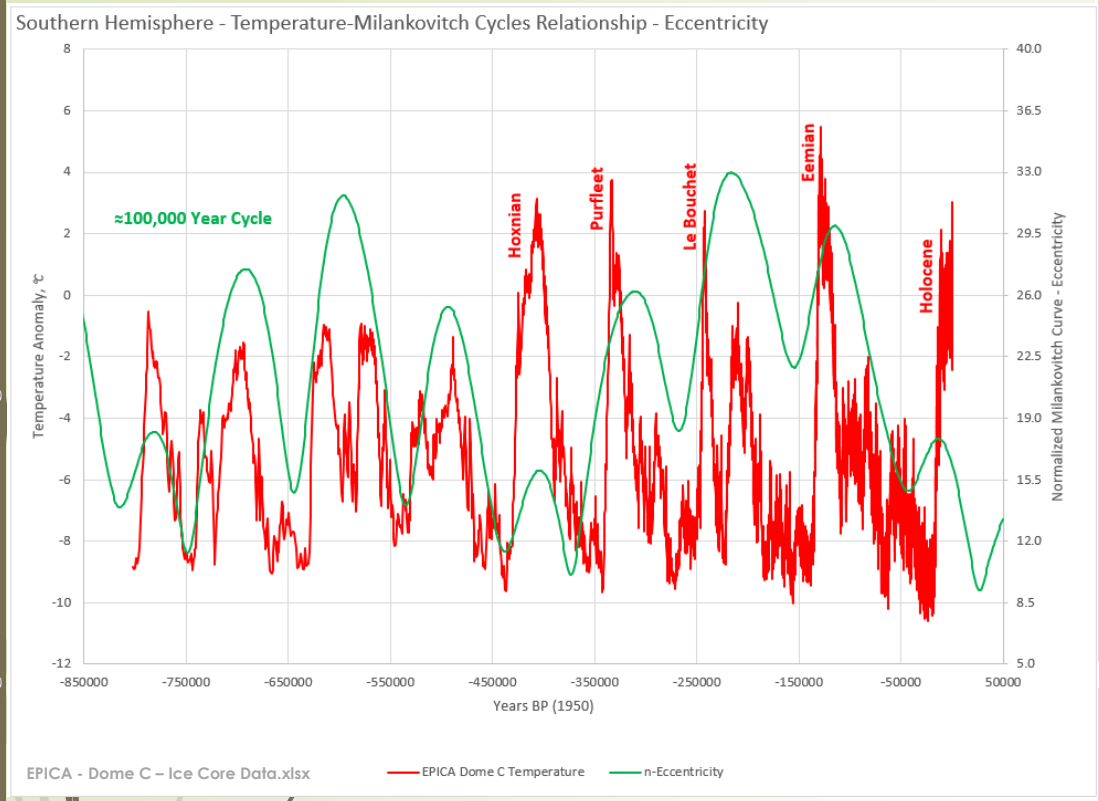
These are the long-term cycles that can be seen in the benthic foraminifera data all the way back through the Cenozoic (CSS-24b to CSS-24e). The next slides will continually focus in on shorter time scales. But again, there is little reason to suspect that the Holocene is worthy of its own Epoch. The Pleistocene Ice Age is far from over. And humanity will experience many more deep ice ages.

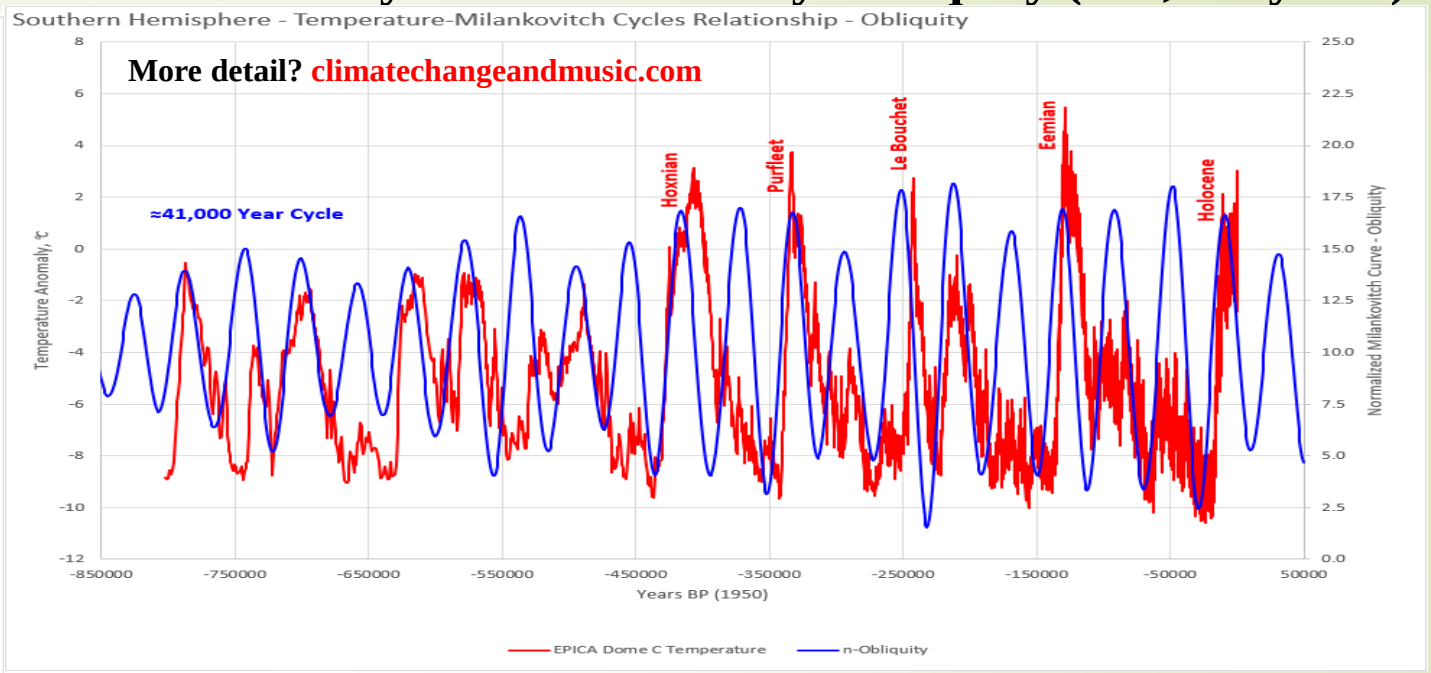


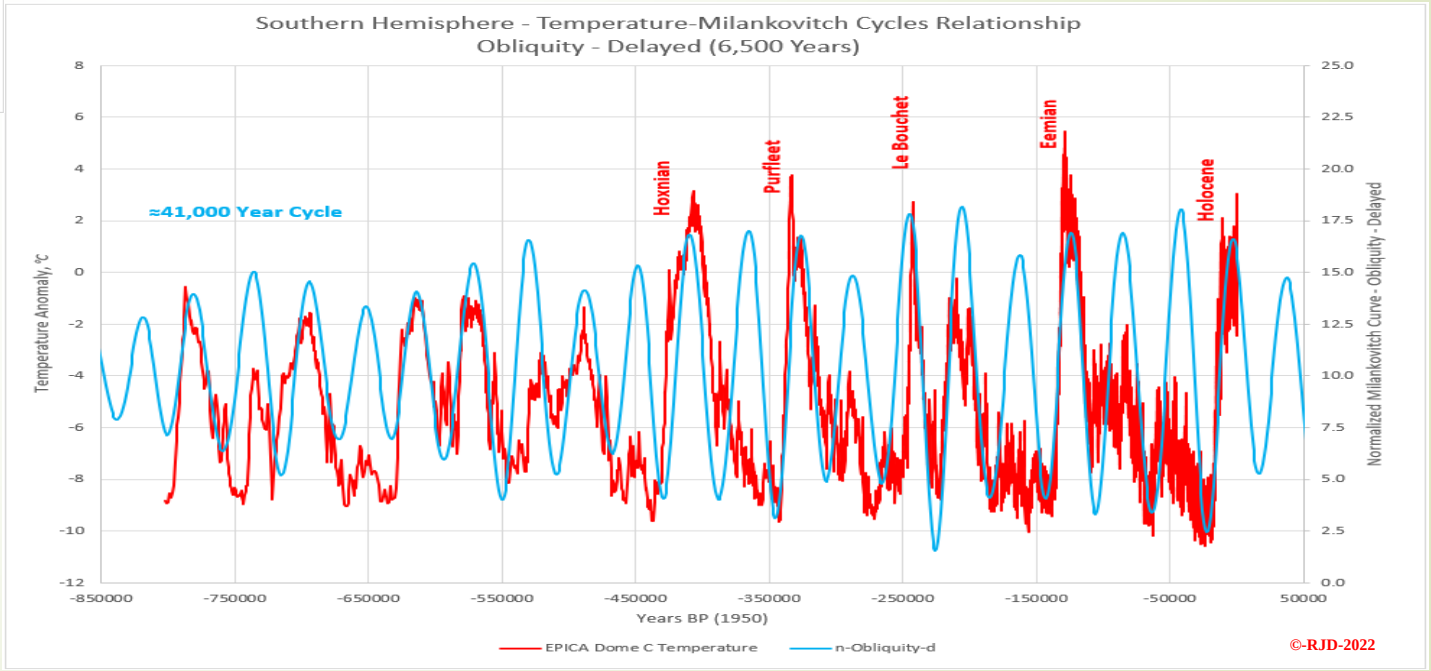
More detail? climatechangeandmusic.com

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

Is the Holocene Really A New Epoch? – Milankovitch Cycles – Eccentricity/Obliquity (800,000 years)







Milankovitch 800 Myr Obliquity Eccentricity

The two primary Milankovitch Cycles are the Obliquity and the Eccentricity. Their influence is very evident in the ice core temperature data. Just about every temperature spike or dip is associated with a high or low in the Obliquity, respectively. The Obliquity is presented twice to the right. The upper plot shows the Obliquity (as calculated). That correlation is very good. The second plot shows the Obliquity with a 6,500-year delay. That delay makes the correlation even better (for both magnitude and periodicity). The Eccentricity correlation is not as tight for the detailed temperature fluctuations. But there is a couple of interesting 100% correlations. Every interglacial warm period is associated with an Eccentricity high (100%). And every deep ice age is associated with an Eccentricity low (100%). The shorter cycle Precession is not shown on this scale but is still contributing.

CSS-24j

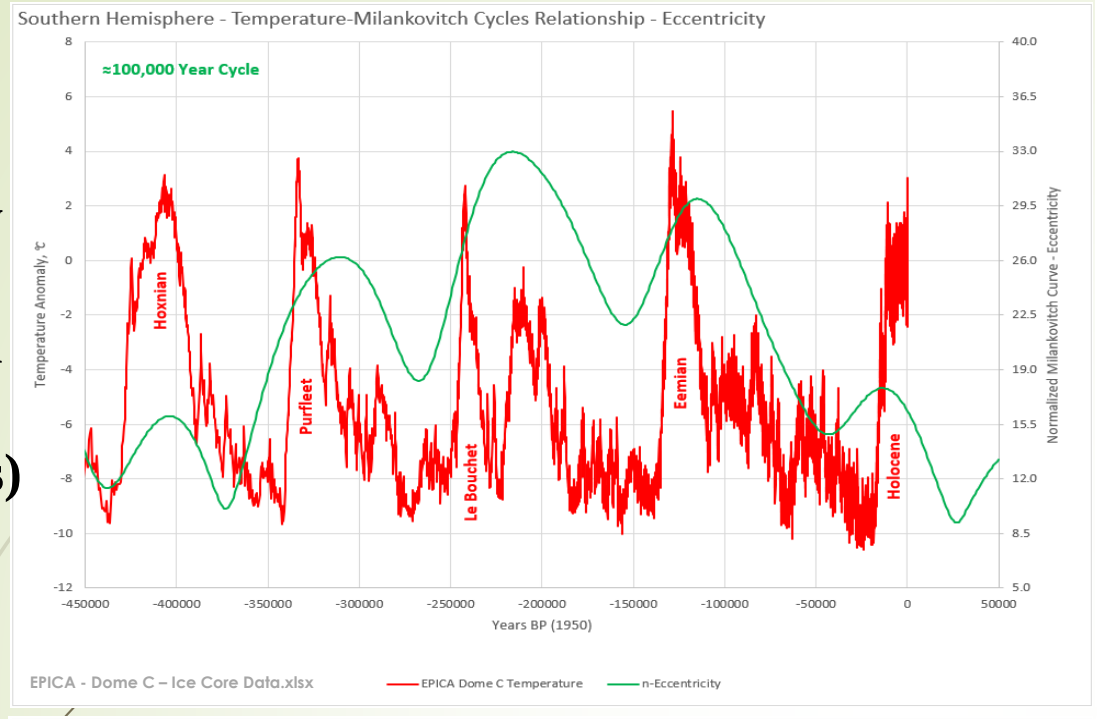
Is the Holocene Really A New Epoch? Milankovitch Cycles (450,000 years)

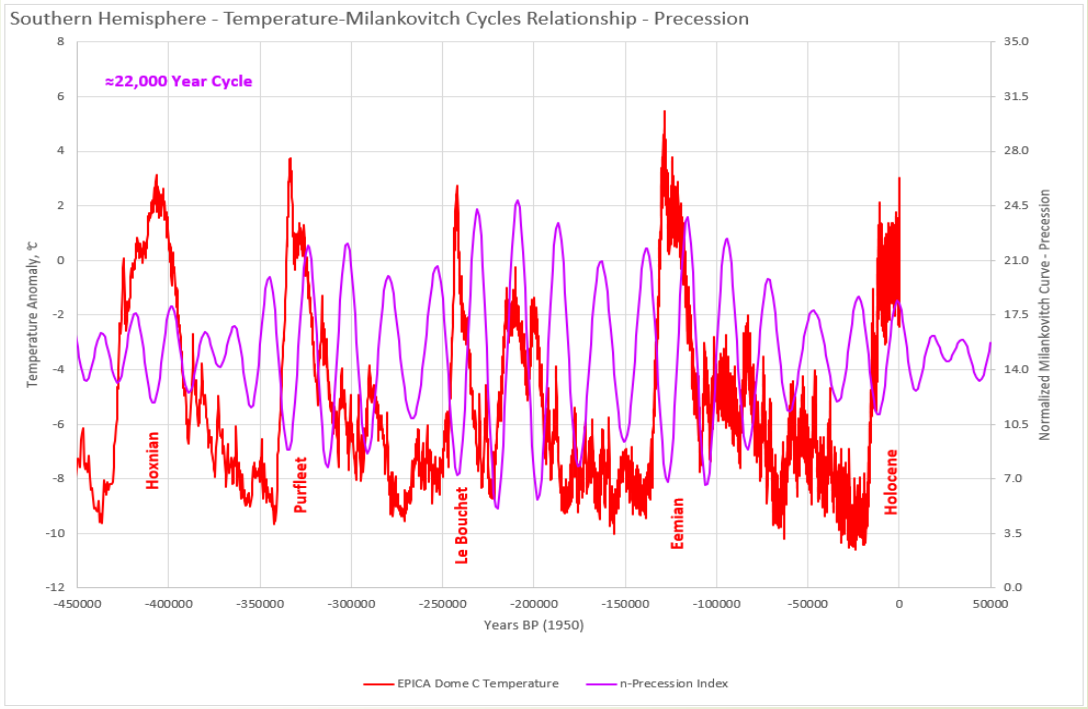
The time scale has been reduced to 450,000 years to focus on the 100,000-year cycle. No major revelations over the 800,000-year data. Delayed Obliquity shown.

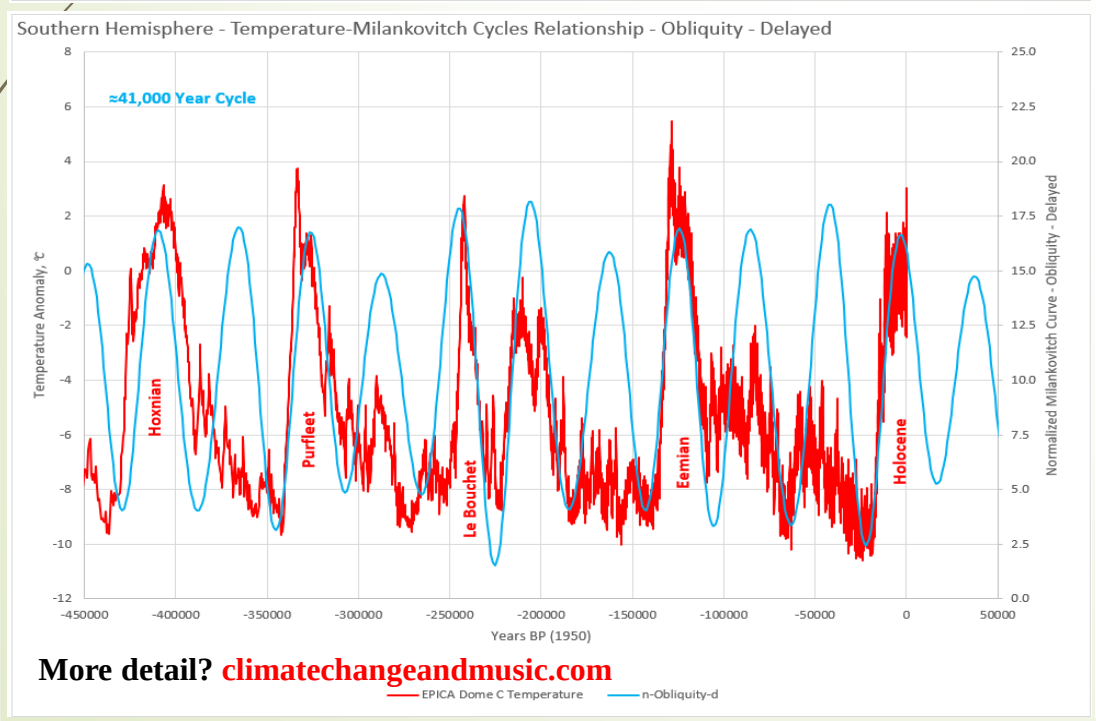
Milankovitch Cycles 450,000 Years

The Insolation also has a decent correlation. That correlation could be tightened up by using the delayed Obliquity in the Insolation calculation. An exercise for another time.

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







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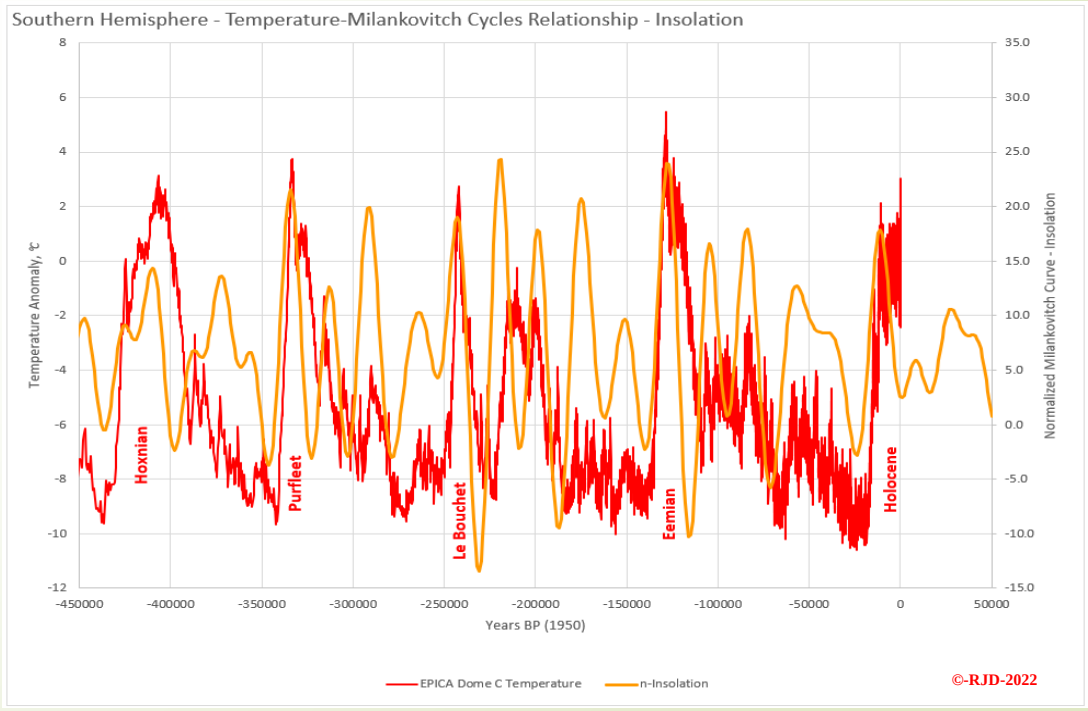


CSS-24k

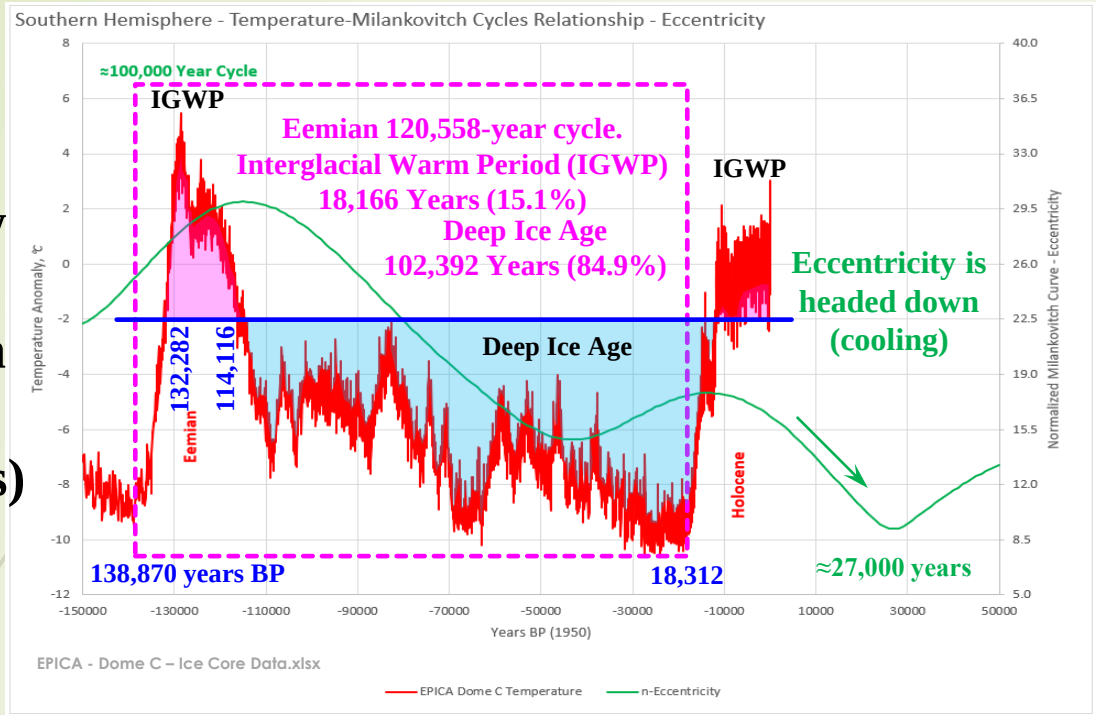
Is the Holocene Really A New Epoch? Milankovitch Cycles (150,000 years)

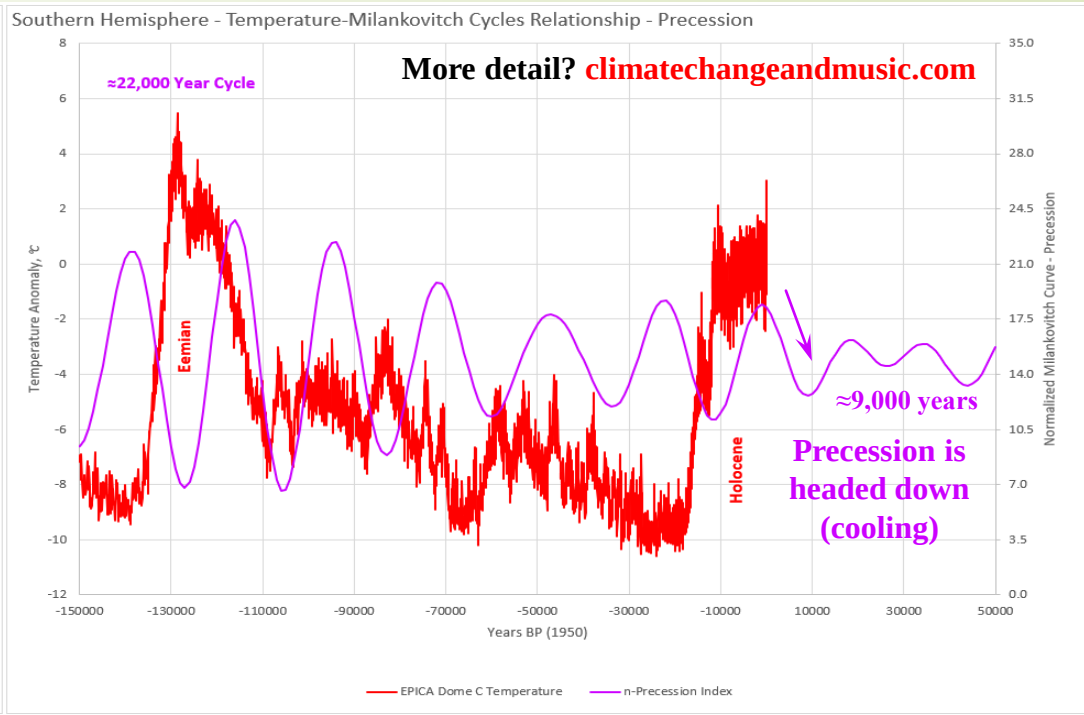
Taking the time scale down to 150,000 years shows the correlation over two interglacial warm periods (the Eemian and thankfully, our Holocene).

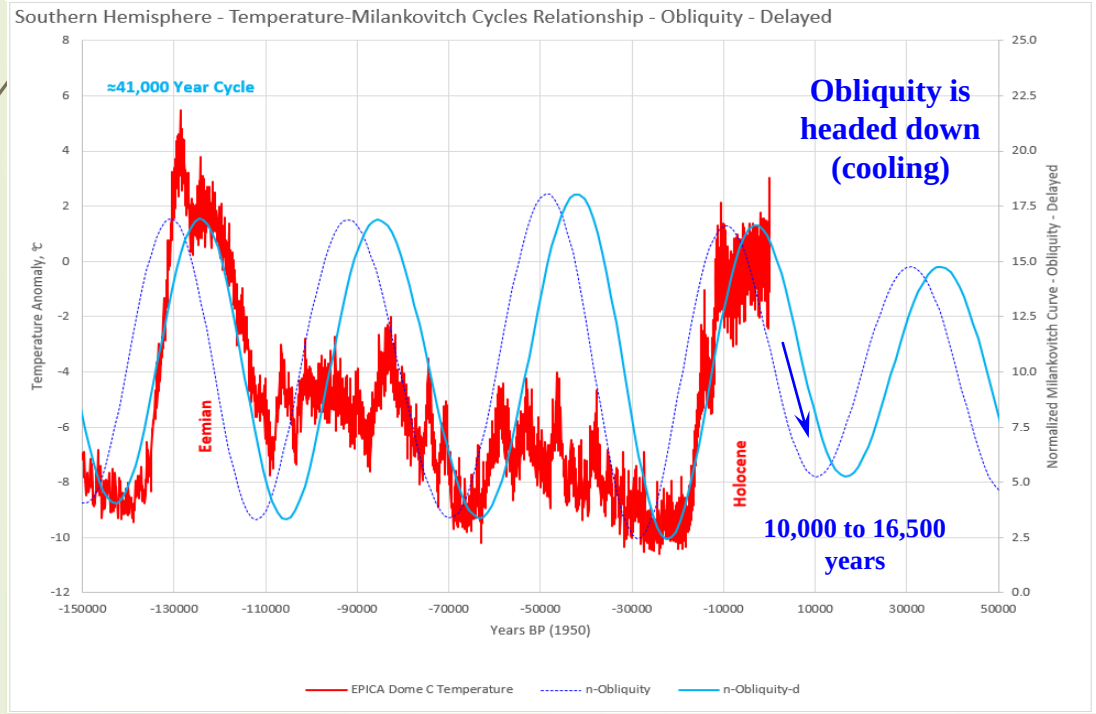
Milankovitch Cycles 150,000 Years

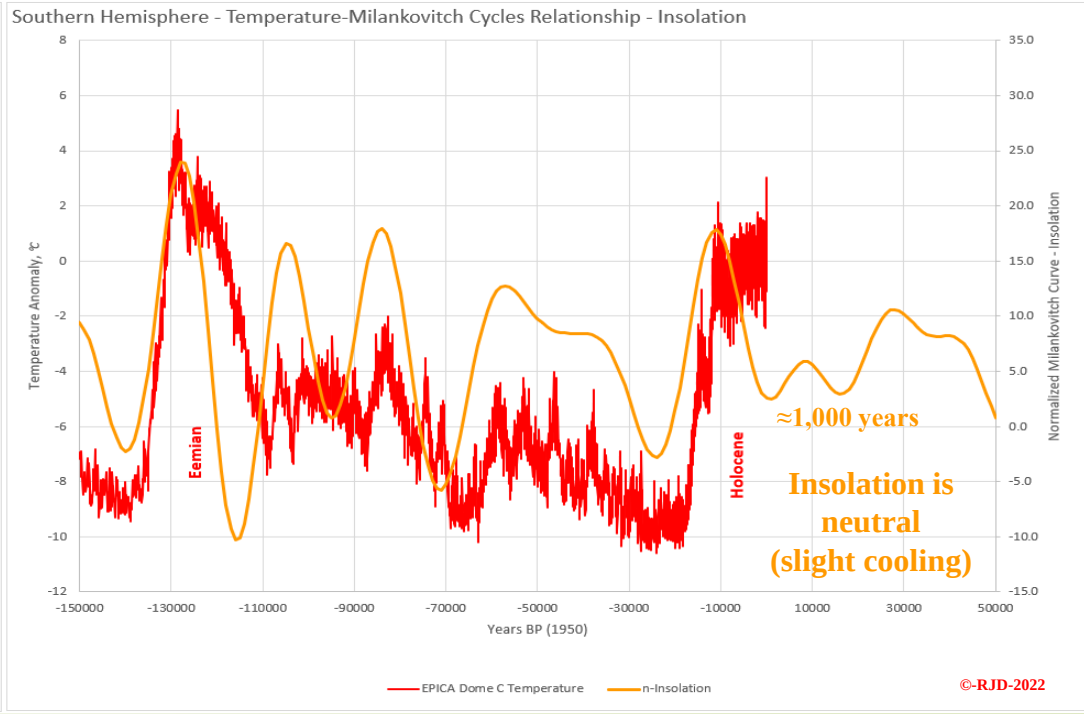
You can start to see the folly of labelling the Holocene as an Epoch. The global temperatures will drop shortly on a geological time frame and CO_2 warming cannot stop that.

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







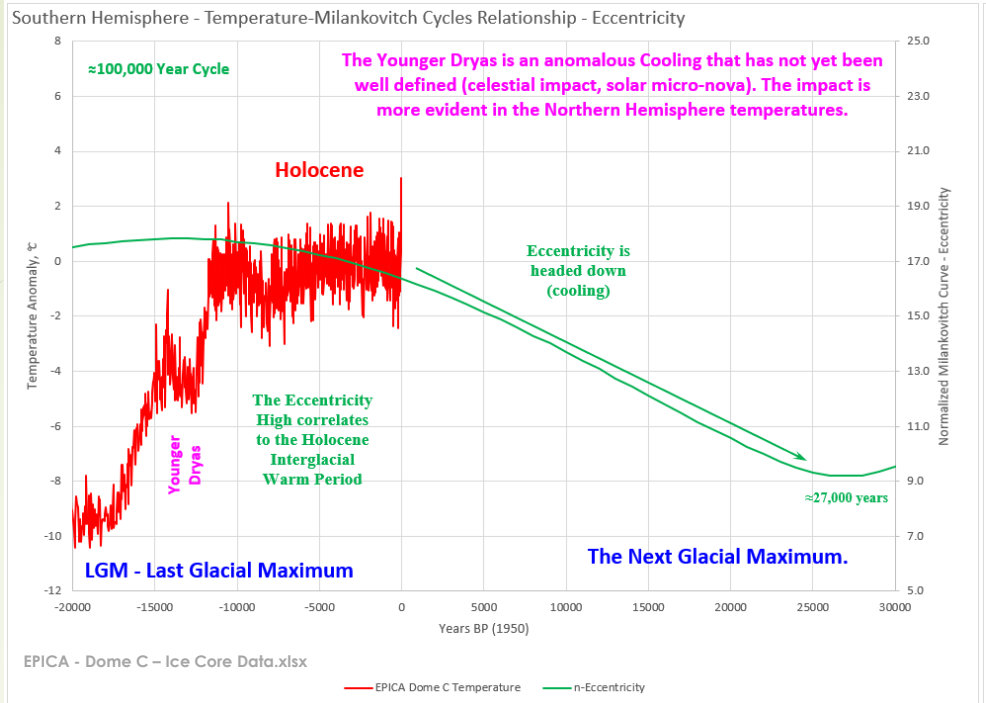


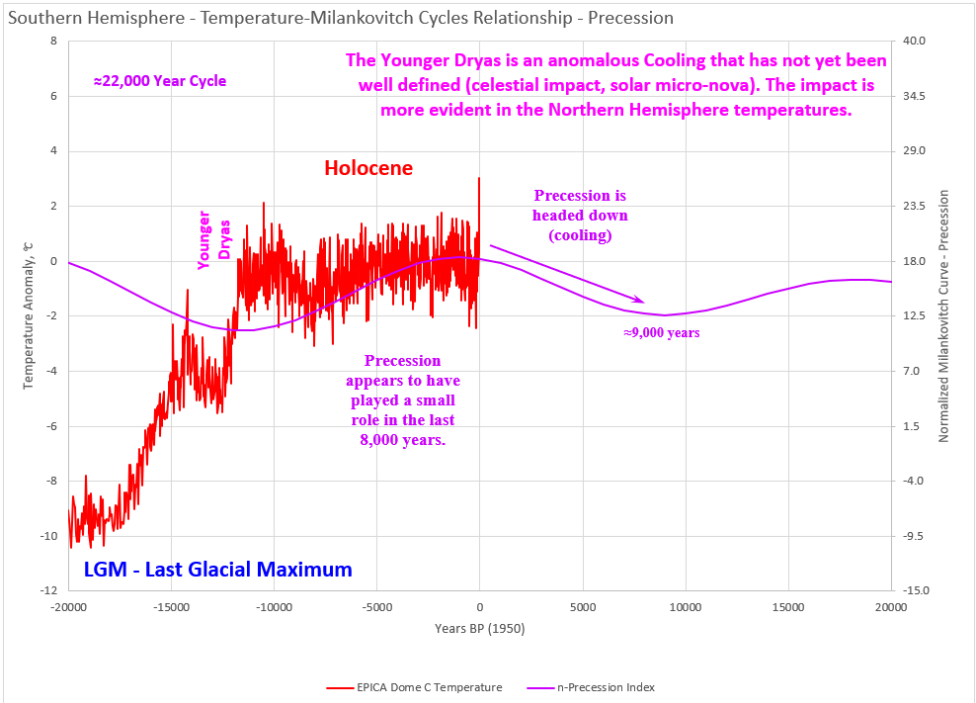
CSS-24l

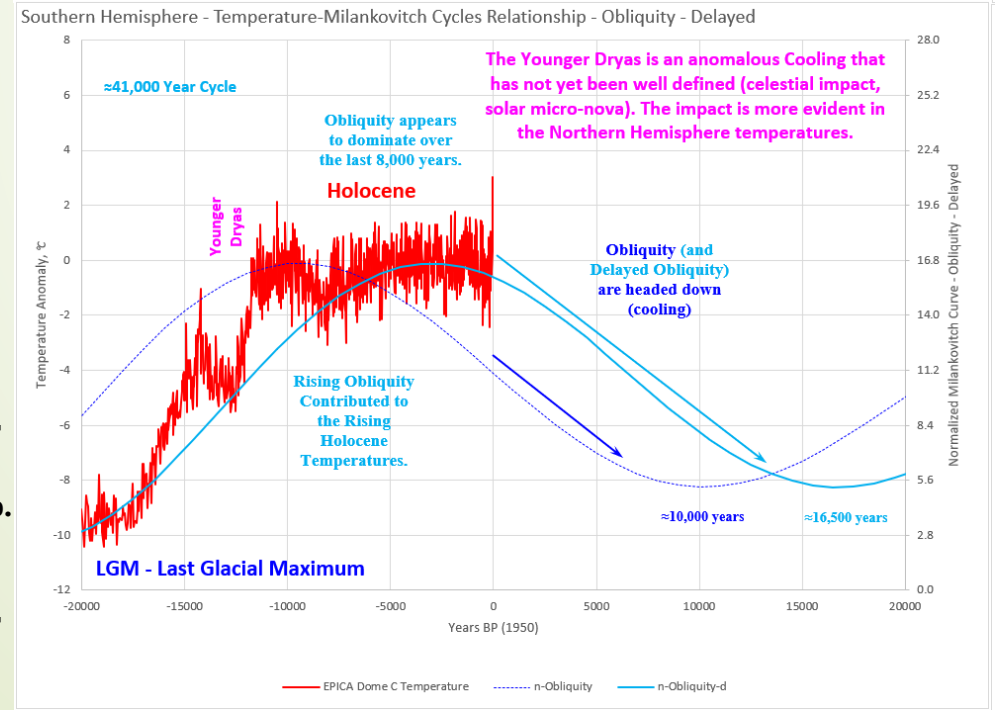
Is the Holocene Really A New Epoch? Milankovitch Cycles (20,000 years)

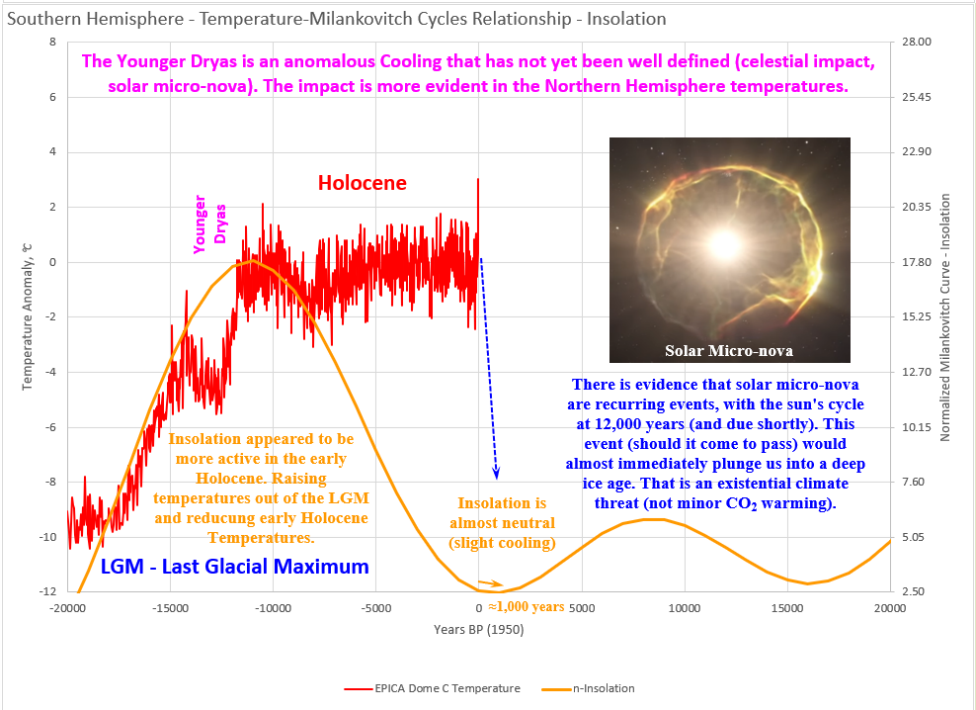
Milankovitch Cycles 20,000 Years

One more zoom, down to the Holocene Interglacial Warm Period (20,000 years BP). Eccentricity, Obliquity and Precession are all headed down (i.e.: in concert with the cooling that began around 3,500 years ago). The Insolation (bottom right) is still cooling slightly but can be considered neutral. The expected temperature trend is not that difficult to interpret. A wrinkle that could cause some real and extinction level climate change is the solar micro-nova concept. There is evidence that the sun experiences a micro-nova every 12,000 years. The last one could have been responsible for the Younger Dryas abrupt fall back into a deep ice age. That was roughly 12,000 years ago. Guess what, we are due for another one. If that scenario plays out, the minor warming CO_2 might provide or the ideological drive to reduce emissions will all be meaningless.









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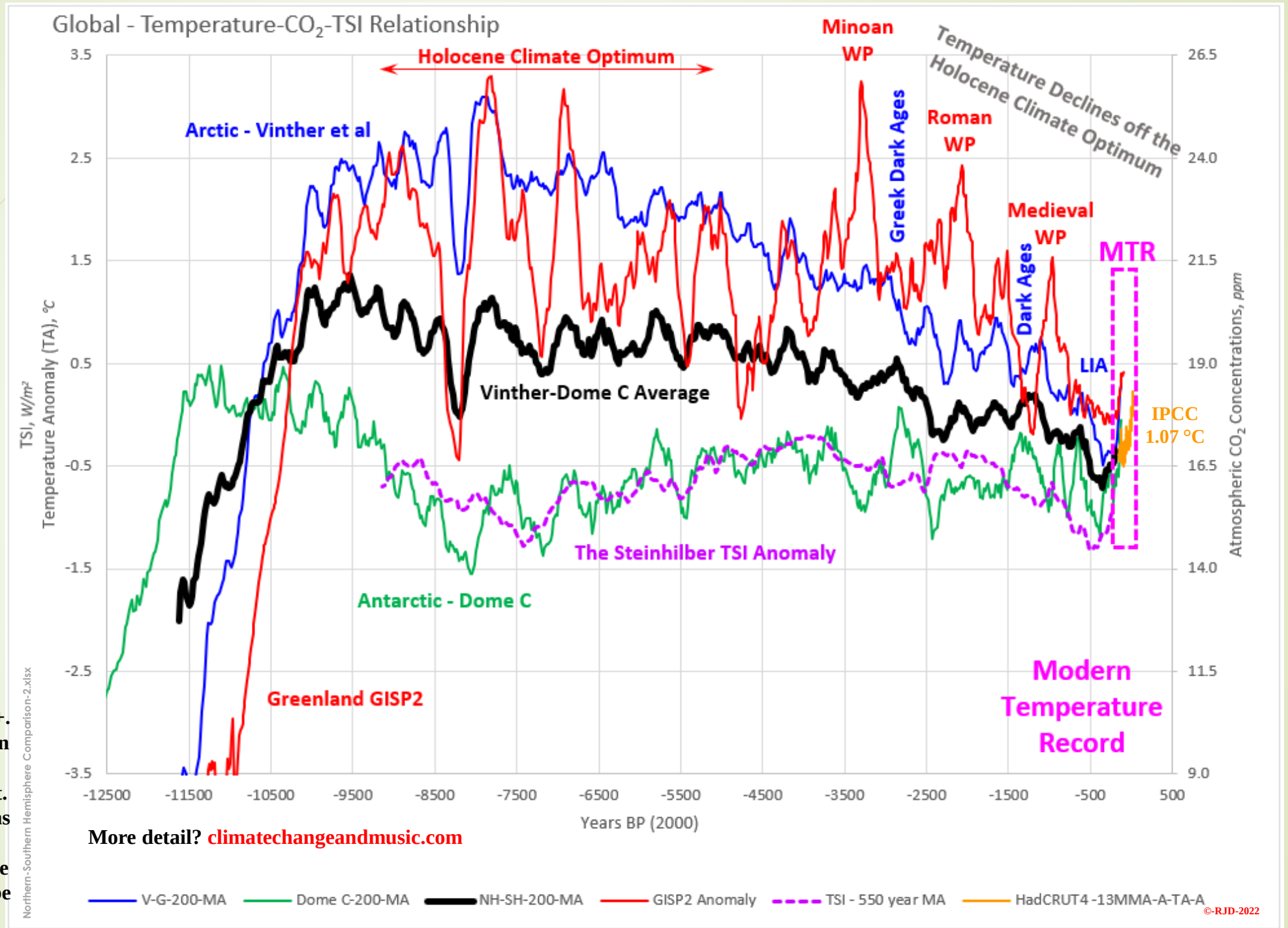
CSS-24m

Is the Holocene Really A New Epoch? Holocene Temperature/Solar Profiles

I have included this plot of Holocene temperatures just to show some variety. The Southern Hemisphere temperature data (used for most of this CSS) correlates very closely with the Steinhilber TSI Anomaly (the shape of which is likely closely related to the Milankovitch Cycles). Temperatures from around the planet have been declining for the last 3,500 Years. The Northern Hemisphere temperatures have, in general been declining for 7,500 years+. The CO_2 (properly scaled) has not been included here, but through the pre-MTR Holocene, CO_2 was virtually flat. The pre-MTR temperature fluctuations have nothing to do with CO_2. Those natural forcings (solar) were still active during the MTR and will continue to be active into the future.

Holocene Temperature 12,500 Years



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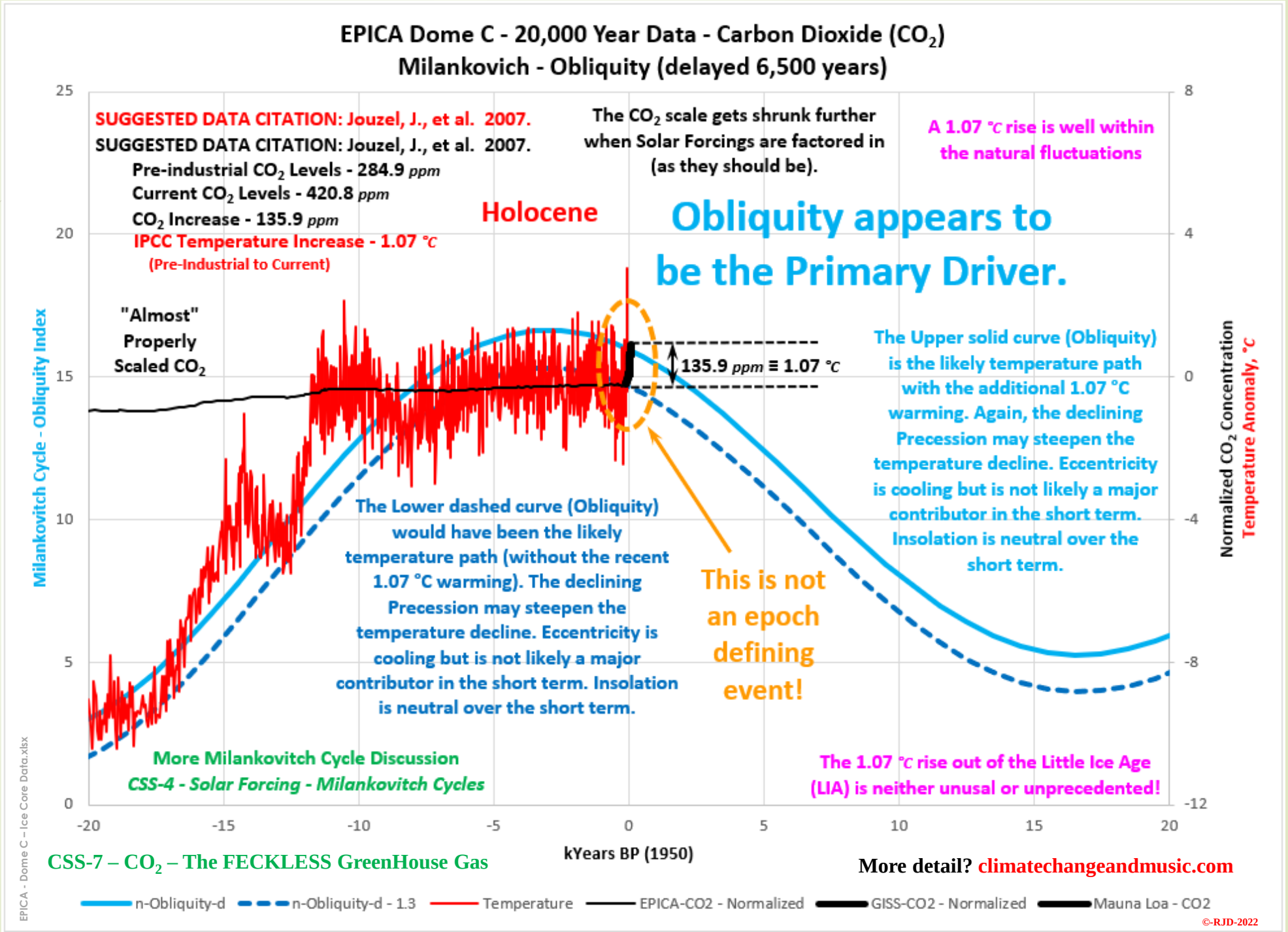
GSM – Grand Solar Minimum. The real "Climate Change" existential threat is right around the corner. Do the Research!

CSS-24n

Is the Holocene Really A New Epoch? Milankovitch Cycles Quick Forecast (20,000 years)

So, what is the most likely temperature trend expectation? We can start with the Obliquity. Global temperatures have been following the Obliquity closely for the last 800,000 years. There is no reason to expect that to change significantly going forward. But for the sake of discussion, let us assume that the CAGW alarmist narrative (135 ppm is equivalent to a temperature rise of 1.07 °C) is correct. That would adjust the Obliquity curve up by 1.07 °C. The temperatures are still headed down, just from a slightly higher level. That is the worst-case scenario. Not all the 1.07 °C is due to CO_2 and CO_2's effectiveness declines exponentially as CO_2 concentration increases. Half of that 1.07 °C increase occurred pre-1950 but 86%+ of human emissions occurred post-1950. Just saying.

Milankovitch Forecast 20,000 Years



CSS-7 – CO_2 – The FECKLESS GreenHouse Gas

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

CSS-24o

Is the Holocene Really A New Epoch? Milankovitch Cycles Quick Forecast (800,000 years)

The point of this CSS was to look at the concept of the Holocene being its own Epoch and to a lesser extent the concept of the Anthropocene. The Holocene will look just like every other Interglacial Warm Period (as shown here) and the Holocene will not be the last Interglacial. The Pleistocene Epoch has not ended and will not end until we exit the Sagittarius-Carina arm of the Milky Way Galaxy. We entered that arm around 34 million years ago (Antarctic Glaciation) and are not expected to leave the arm for many, many millions of years. Additional data and discussion on these longer-term trends can be found in my CSS-10 – A Ride Through The Cenozoic and CSS-12 – Cosmic Ray Discussion. The Anthropocene concept is nothing but a terminology play, not science!

Milankovitch Forecast 800,000 Years