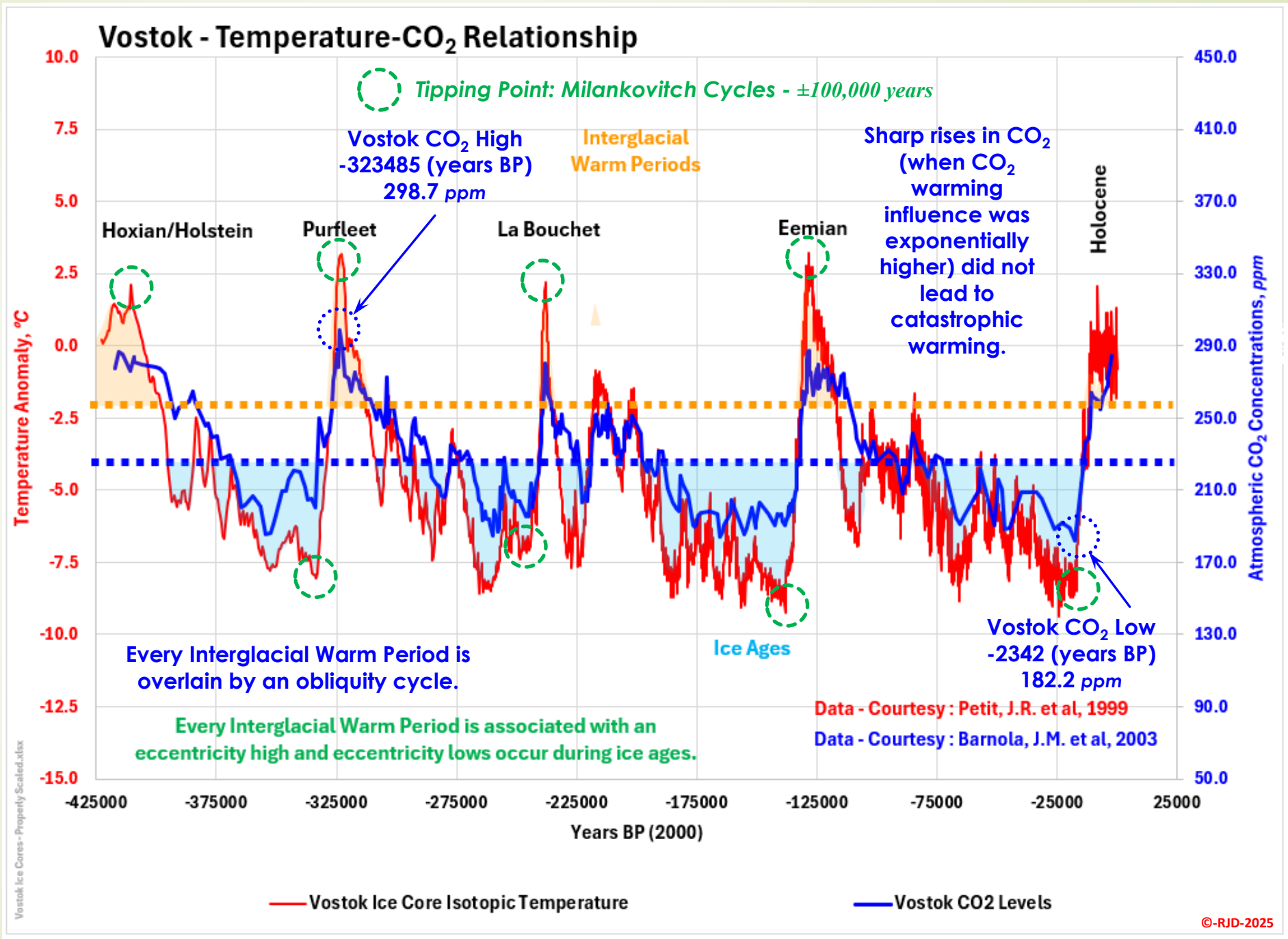
Climate Tipping Points Ice Core Data – 425,000

The All CO_2, All the Time alarmist narrative regularly refers to the coming tipping points that will thrust is into an unavoidable catastrophic temperature rise. Those references are just unnecessary fearmongering! There are many tipping point examples in the historical data, and they have little to do with CO_2 emissions. The ice core data has many tipping points (only a few major events are highlighted here). CO_2 is not producing these tipping points. CO_2 is simply responding to global temperature change. As the oceans warm, CO_2 is released. As the oceans cool CO_2 is absorbed. Over this period, CO_2 fluctuated between 182.2 ppm (in the Last Glacial Maximum (LGM), pre-Holocene) and 298.7 ppm (during the warmer Purfleet interglacial warm period). The primary climate driver over this period is the Milankovitch cycles (eccentricity, obliquity, precession and insolation). Orbital geometry through solar system gravitational interactions determines whether the planet is in a deep ice age or an interglacial warm period. Obliquity (a ±41,000-year cycle) drives most of the major tipping points shown here.

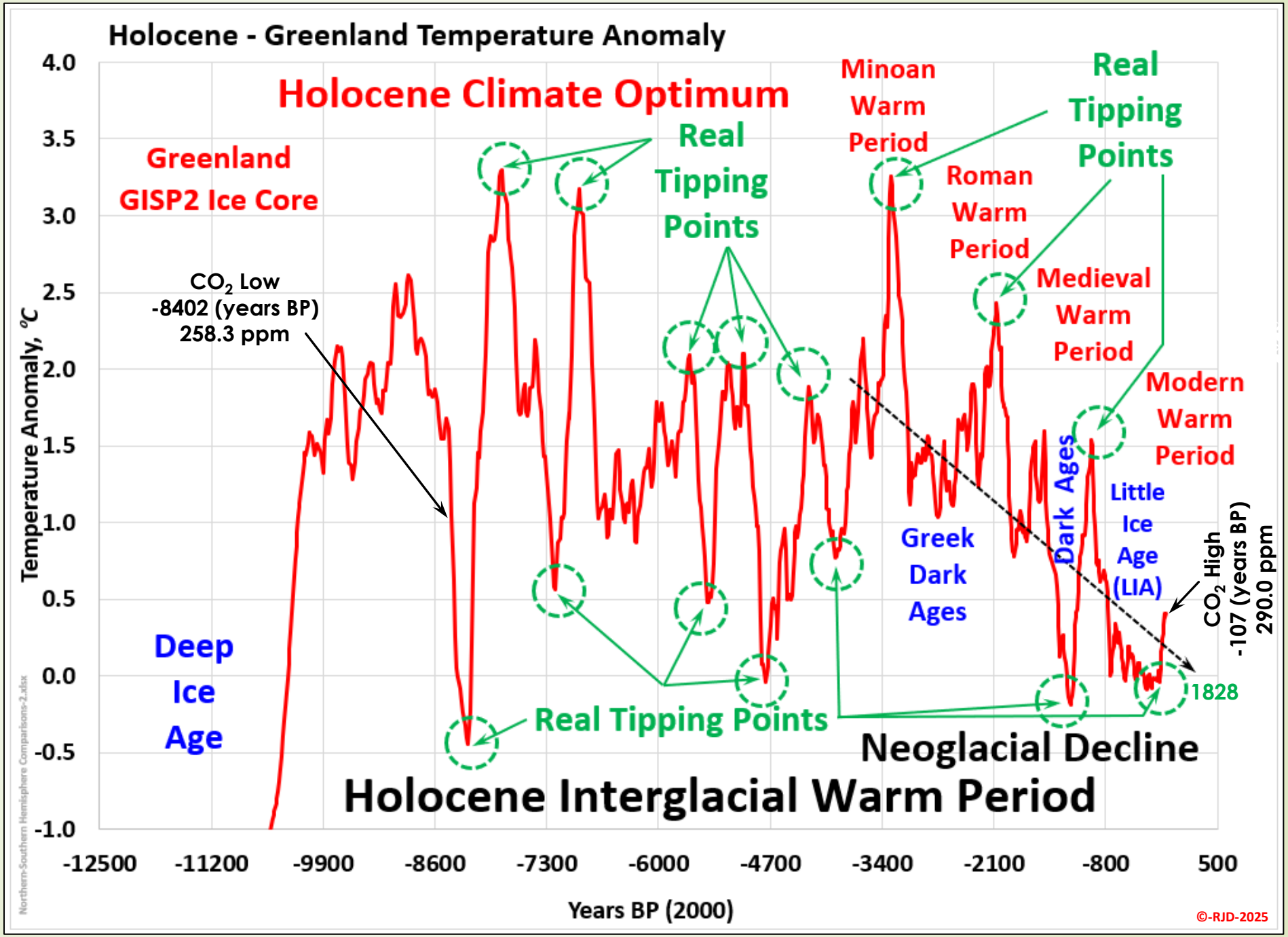
Tipping Points Ice Core Data 425,000 years



Climate Tipping Points Holocene

This slide focuses in on the Holocene interglacial warm period. The Holocene Climate Optimum corresponds to the Obliquity high, the Neoglacial temperature decline corresponds to the Obliquity decline taking us down into the next deep ice age. That tipping point is not that far into the future and will have nothing to do with CO2. The temperature fluctuates significantly over this period despite only minor changes in CO2 (258.3 to 290.0 ppm). CO2 has nothing to do with the tipping points over this period. Natural forcings (primarily solar (directly and indirectly)) are driving these temperature fluctuations (and the many tipping points). The most recent tipping point occurred in 1828. CO_2 concentrations had not yet started rising and human influence is primarily post-1950 (since 87%+ of humanity's emissions are post-1950). Note, the Greenland GISP2 data set does not represent global temperatures, but they do provide an important indicator for changes in the climate dynamics on our planet. There will very likely be a tipping point that takes us into another Little Ice Age. Will that be the tipping point into a deep ice age?

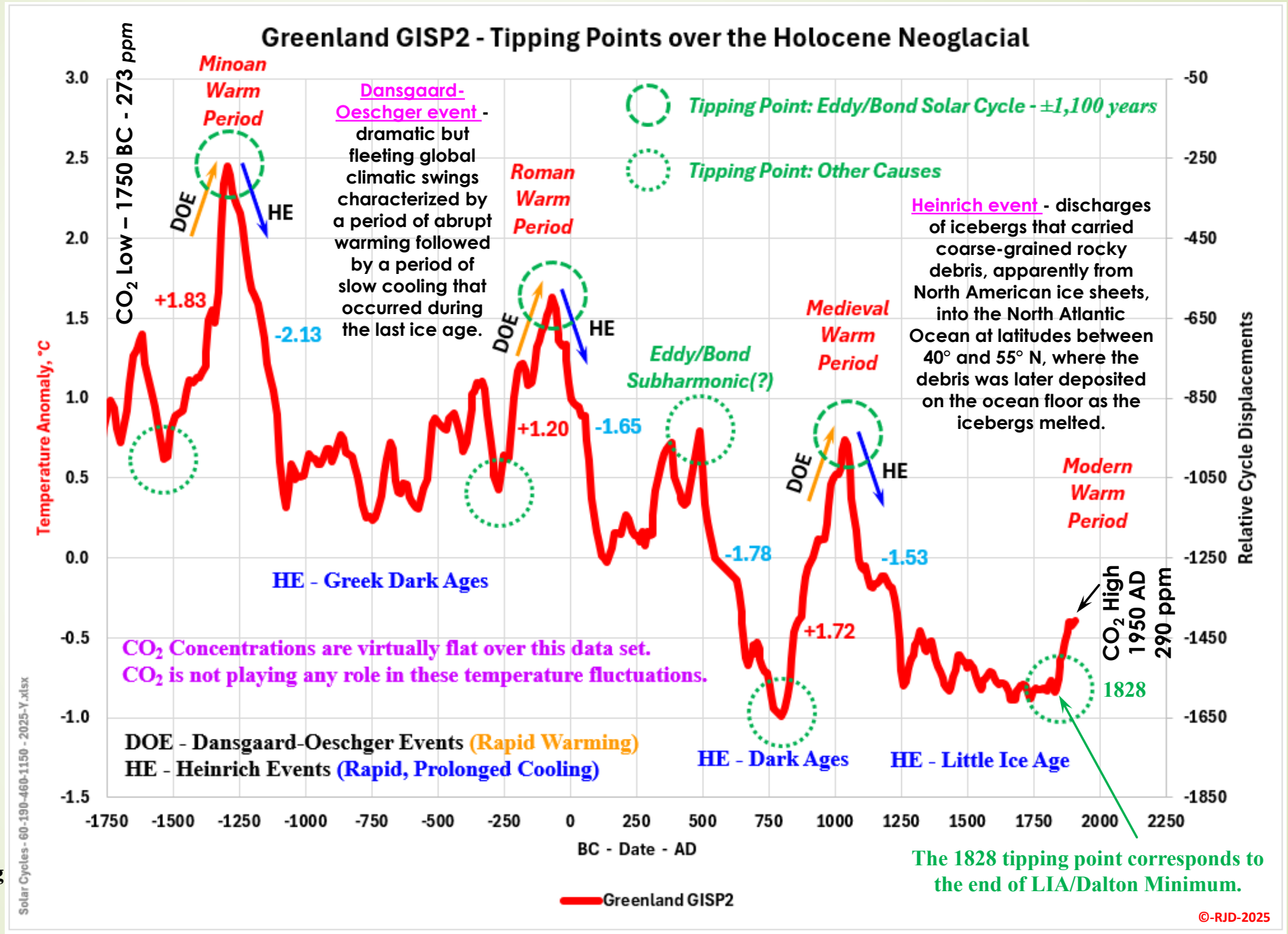
Tipping Points GISP2 Ice Core Holocene



Climate Tipping Points Holocene Neoglacial

This chart focuses in on the Neoglacial cooling over the last few thousand years of the Holocene interglacial warm period. Cooling that has virtually nothing to do with CO2 (which increased just ±13 ppm over this period). Temperatures over this period have declined significantly despite that very minor rise in CO2. The three major tipping points shown here line up with the highs of the Eddy/Bond solar cycle. Temperatures (with no help from CO2) rise quickly (a Dansgaard-Oeschger event) followed by a sharp decline (the tipping point that takes the planet into prolonged cooling periods like the Little Ice and Dark Ages). The DO events are very likely solar related events. The Heinrich events are likely a direct result of the DO heating events and solar activity. The heating leads to additional iceberg intrusions into the North Atlantic leading to ocean cooling. There is also the impending release of the colder, fresh water currently stored in the Beaufort Gyre. The Heinrich and/or Beaufort Gyre events have the potential to disrupt the Atlantic Meridional Overturning Circulation (AMOC), regardless whether it is currently slowing down or speeding up.

Tipping Points Holocene Neoglacial



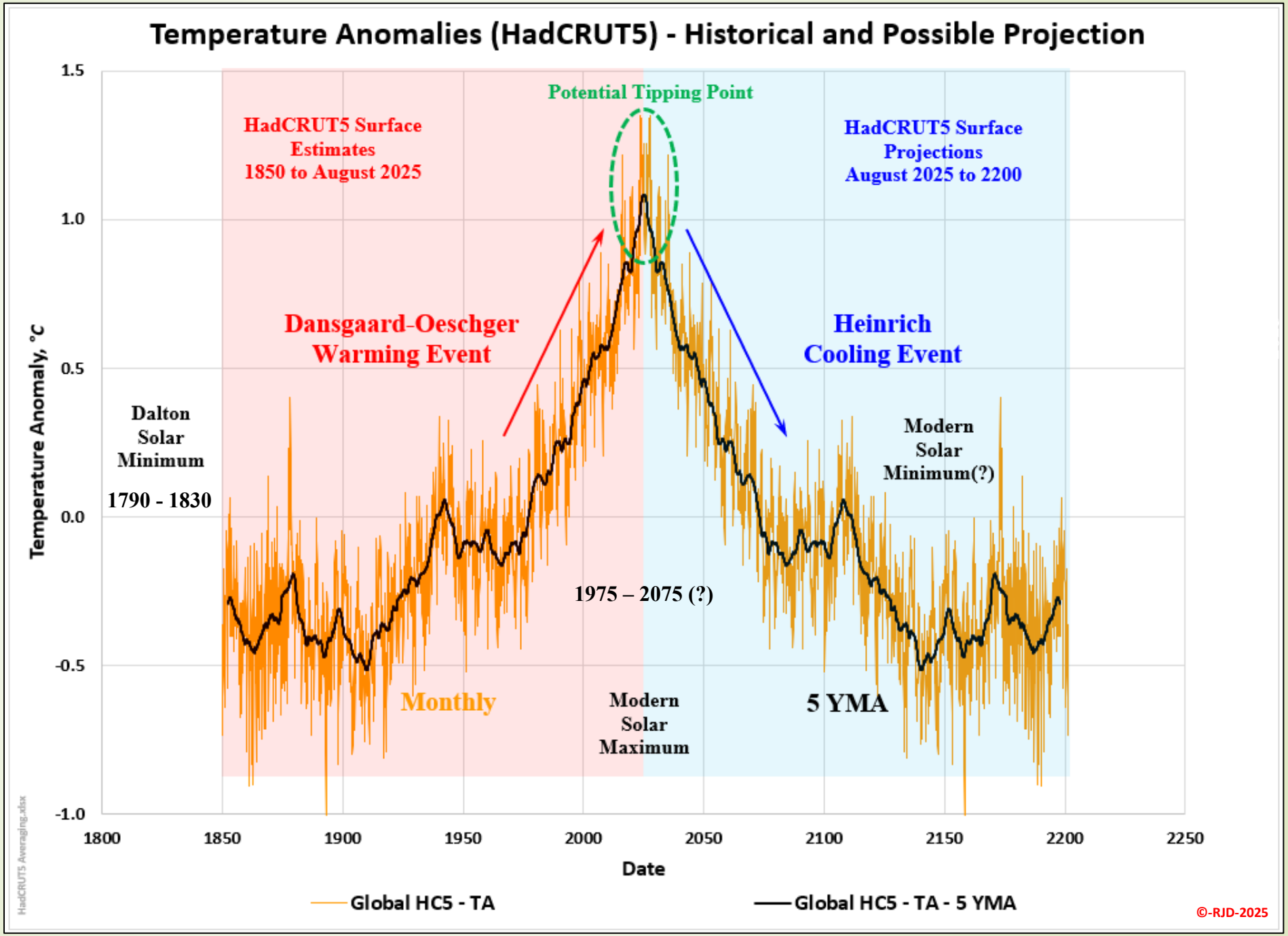
GSM – Grand Solar Minimum. You really should do the Research!

Climate Tipping Points

Modern Temperature Record

Temperatures have been rising recently (almost as if we were experiencing another Dansgaard-Oeschger event close to its scheduled time). And somehow the temperatures started rising long before CO_2 started rising and humanity had any significant emissions (87% of humanity's emissions have occurred post-1950). What comes after a DO event? The tipping point that takes us into the next Heinrich event. The timing of the tipping point is open for debate, but given that the Atlantic Multi-decadal Oscillation (AMO) is headed into its 30-year cold phase, the sun is entering its decades long Grand Solar Minimum phase and the Beaufort Gyre release is overdue, a Heinrich event is very likely a near term, future possibility. What would that Heinrich event look like? Much like the mirror image of the DO event shown to the right. The Modern Solar Maximum (based on Total Solar Irradiance Momentum (TSI_M), the 20 Year Moving Average), peaked around 1950 and has recently began declining. Forecasts vary but a Dalton to Maunder Solar Minimum scenario is very possible. Time will tell how severe the cold will get!

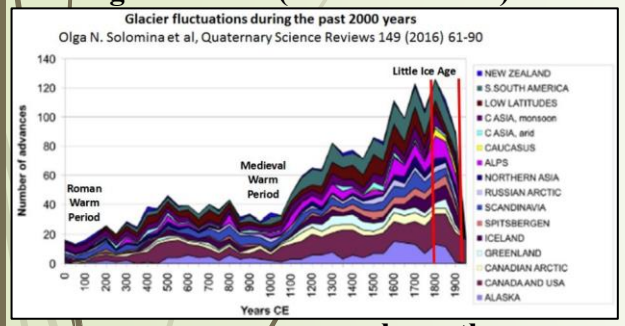
Tipping Points Modern Temperatures



Climate Tipping Points

Modern Temperature Record

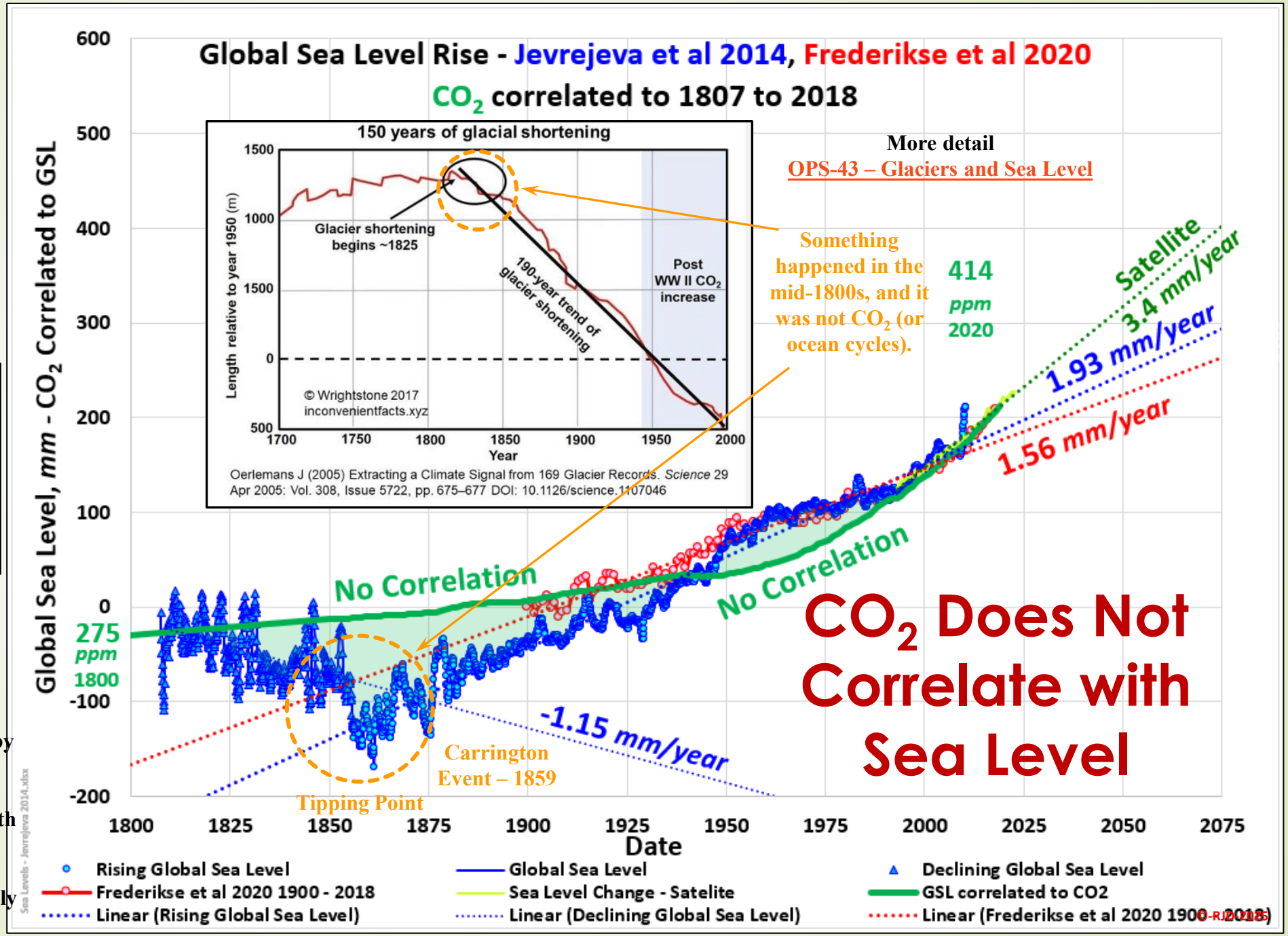
Temperatures are not the only datasets that show tipping points. For any that care to do the research, there was a very noticeable sea level inflection point in the mid-1800s. Somehow sea levels were declining in the early 1800s despite a rising CO2 concentration. CO2 is obviously not driving the pre-1960 sea levels. So, what is the driver? Well, that would be declining temperatures. The glacier data (inset and below) shows



Tipping Points Modern Temperatures

shows the same temperature response (with a more muted tipping point).

What happened in the mid-1800s? Solar activity became picked up (likely kicked off by the 1859 Carrington event). Post-1850, Sea Levels began to rise linearly with minor accelerations and decelerations associated with the warming and cooling ocean cycles (primarily the AMO). Glacier shortening is also linear with minor cycling. A new TP (likely delayed) will follow the upcoming MTR TP



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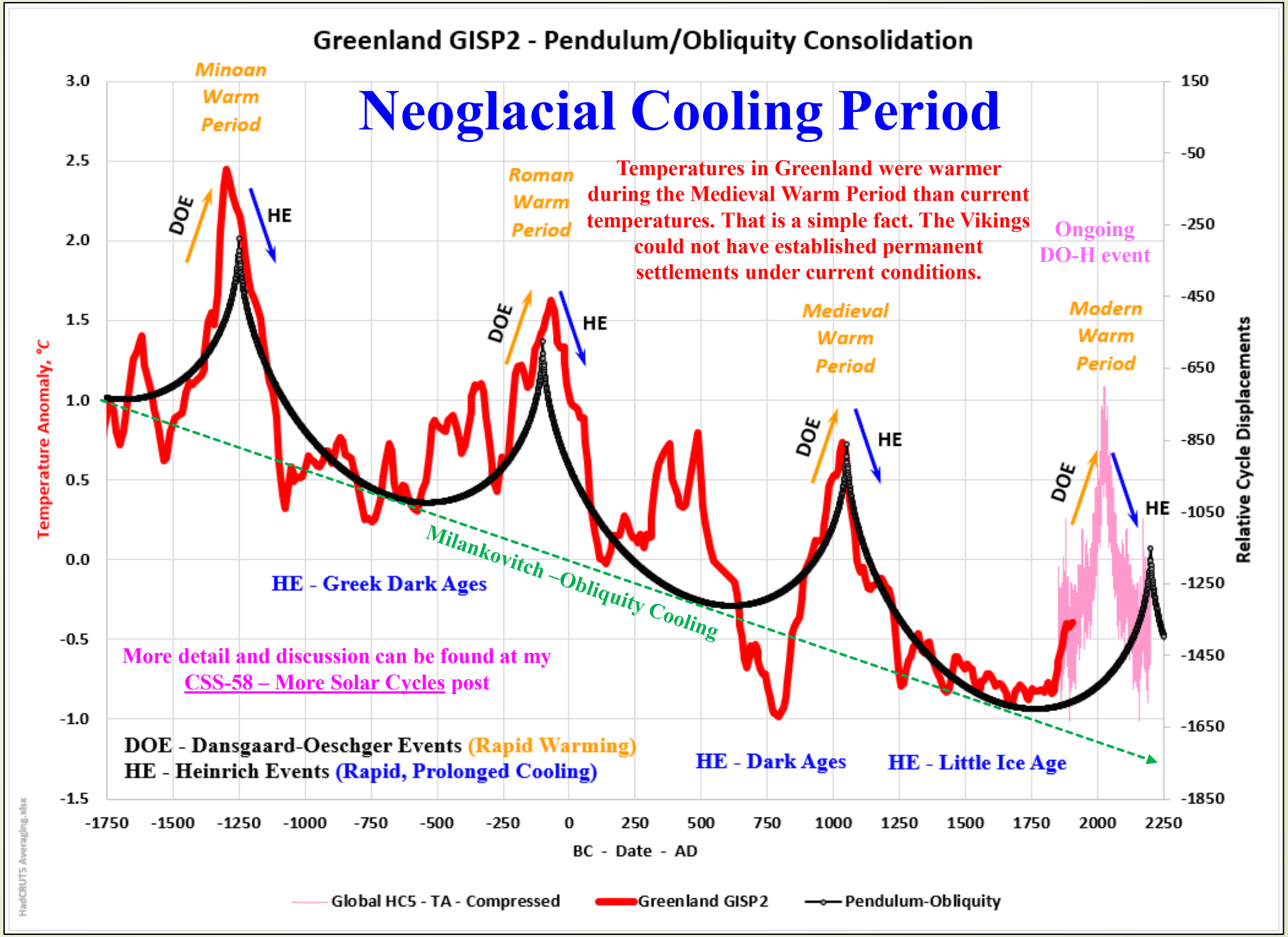
Climate Tipping Points Neoglacial - MTR

What would a modern day Dansgaard-Oeschger/Heinrich event look like in Greenland? The process starts with the HadCRUT5 surface temperature dataset. The DO event. That data was adjusted to reflect the historical temperature averaging (converting a global average to the expected response in Greenland). A detailed discussion was included in my recent post (CSS-72 – Holocene Stripe Chart – Fact Check). The DO event mirror image (representative only) was then attached producing the results to the far right. The result may be a bit aggressive, given Greenland has not yet warmed up to the Viking era levels yet (very visible in the glacier advance data on the previous slide.

Tipping Points Neoglacial - MTR

The black curve is a DO/H model that combines the Obliquity cycle with a Pendulum Cycle. The modern DO event appeared early. That could be due to some unusual combination with the many other solar cycles (like the major events between the Roman and Medieval Warm Periods). The Obliquity and other Milankovitch cycles will continue to put downward pressure on the Holocene temperatures (eventually pushing us into a deep ice age).



Climate Tipping Points Medieval Warm Period

How does the current DO/H model compare to historical events. Quite well! This chart overlayed the "Modern Warm Period" on the Medieval Warm Period. The match does not cover the deepest troughs on either side of the Medieval Warm Period (i.e.: Dark Ages and the Little Ice Age (LIA)) but the temperatures were definitely lower in the pre-HadCRUT5 era (i.e. the Dalton Minimum, the last major cold of the LIA). The Central England Temperature (CET, 1659 to the present) does show a strong temperature decline into the depths of the Dalton Minimum (early 1800s), a similar profile to the pre-Medieval Warm Period Dark Ages. The post-HadCRUT5 mirror data would likely Drop further into the new "Modern Little Ice Age". Despite the much warmer sea Surface temperatures over the last two years there are colder anomalies starting to show up (as per the late August data shown here). The North Atlantic temperature anomaly is still negative but not as pronounced as the August data. Still begs the question, will circumstances lead to an AMOC collapse, and a colder climate in the near future? Is that tipping point coming?

Tipping Points Medieval vs Modern WP