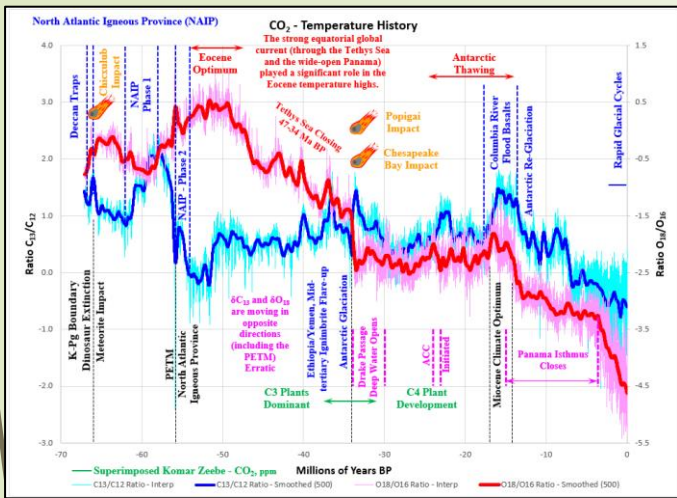


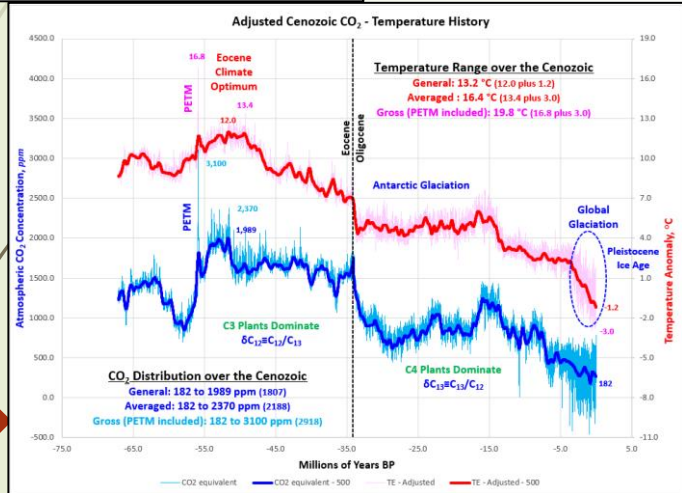
OPS-59 Cenozoic - CO₂-Temperature

More Detail: climatechangeandmusic.com



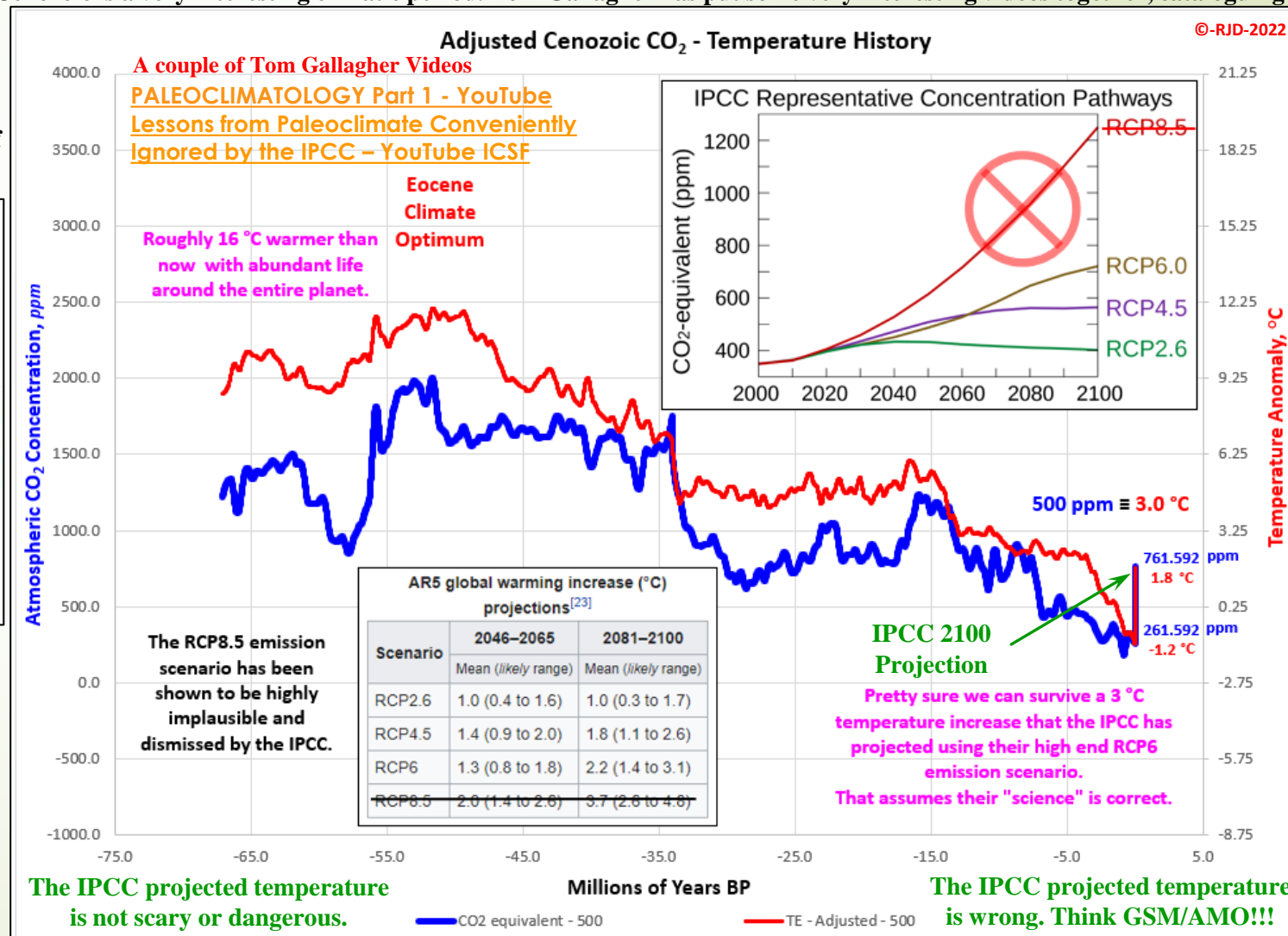
The plot to the far left shows the carbon ($\delta C_{13} \equiv C_{13}/C_{12}$) and oxygen ($\delta O_{18} \equiv O_{18}/O_{16}$) isotope data put together by Westerhold et al in 2020. Their data and analysis are laid out in their paper *"An astronomically dated record of Earth's climate and its predictability over the last 66 million years"*. This plot was prepared for my CSS-10 – A Ride through the Cenozoic post. At the time I had not attempted to convert the carbon isotope ratio ($\delta C_{13} \equiv C_{13}/C_{12}$) data to an atmospheric CO₂ concentration value. A representative depiction can be developed by simply inverting the pre-Oligocene data and calibrating that data to the known CO₂ range over the Cenozoic. The Oligocene boundary represents the general point in time where C4 plants became dominant over C3 plants. C3 and C4 plants process the carbon isotopes differently. With C3 plants the ratio is inverted relative to a CO₂ conversion. In my CSS-10 post I used the [Komar-Zeebe – Cenozoic – CO₂ Concentration](#) estimate as a general reference. The Cenozoic is a very interesting climatic period. Tom Gallagher has put some very interesting videos together, cataloguing the steady temperature decline from the global tropical temperatures of the Eocene Climate Optimum to the depths of the Pleistocene Ice Age.

The δC_{13} and δO_{18} ratios are based benthic foraminifera fossils found in ocean floor cores. These plots show the pre-Oligocene inversion to a CO₂ concentration.



Cenozoic CO₂ Temperature

The plot to the right shows the averaged data with the Global Temperature and CO₂ Concentration plotted on vertical scales that conform to the IPCC's position that we will get a roughly 3.0 °C with a 500 ppm CO₂ concentration increase from pre-industrial levels. The 500 ppm CO₂ increase will not take us to dangerous temperature levels (even if the IPCC science is correct). Is the IPCC science correct? Not according to the IPCC programmers, that self admitted that their models are running too hot. As mentioned to the right, the IPCC has also dismissed the RCP8.5 emission scenario as implausible. Roger Pielke Jr. and others have detailed the folly of the routinely used RCP8.5 emission scenario. The IPCC science is also ignoring the Grand Solar Minimum forecasted by both NASA and NOAA. Discussion (with links) of these points is included in my OPS-55 – The State of Climate Science post.



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