

A Quick Summary of Why There is Absolutely No Problem with Carbon dioxide

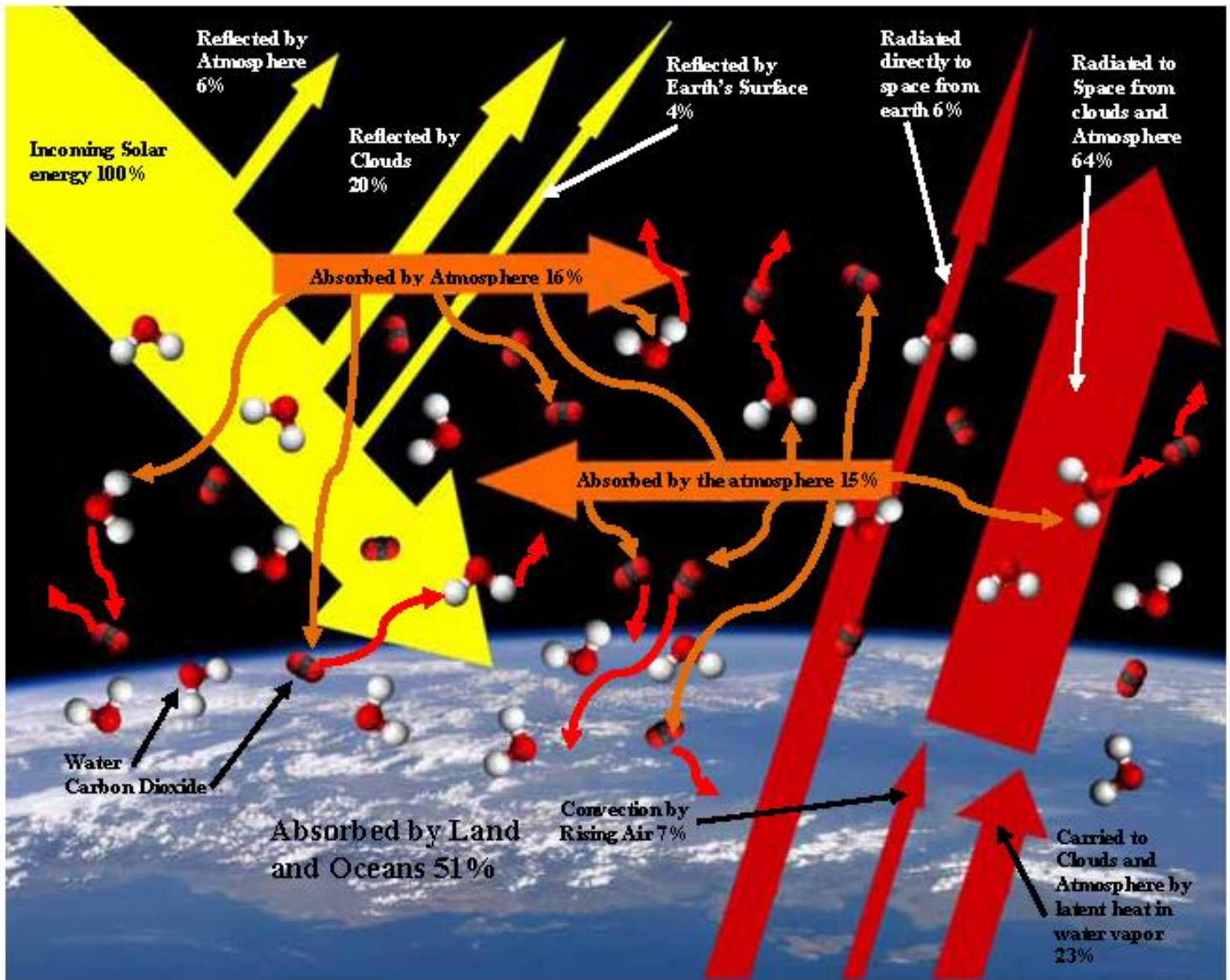
In university in the early 60's, I had physics, chemistry, geography, climate, statistics, and calculus a good mix for studying climate change much later. There were no desktop computers and everything was on punch cards so we used slide rules in college. Later at General Electric, we used teletype terminals to write programs on punched paper tapes running on main frames somewhere else. And later, after the IBM PC came out, I got the model AT and was using MS-DOS running Lotus spreadsheets and AmiPro for word processing later on the buggy Windows 3.11 and I even did programing. Some of my work was in building models and analyzing data with statistics so looking at climate change was something relatively easy for me to do.

I got into climate change narrative after 9/11 when it was global warming and there were dire predictions from Al Gore that in 10 years, all the ice would be melted and the planet would be flooded because of increasing levels of carbon dioxide in the atmosphere and all the polar bears would be dead. Which actually didn't make a lot of sense because, the CO₂ levels were so low geologically, that it was hard to see how there was any kind of a problem? And further a lot more CO₂ in the atmosphere would have been a good thing the plants love it as it's their main source of food.

The first question that arises is what determines the Temperature of the planet? It's both simple and very complex at the same time; with the interaction of three main classes of variables. But keep in mind, there really is no one global temperature it's an abstract number that is calculated through software and as with all software garbage in garbage out.

Number one; and obviously, "all" the energy that allows life on the planet to exist comes from the sun. The mean distance to the sun is 93 million miles, but it varies because of the earth's elliptical orbit around the sun. Further, the energy that comes from the sun is also a variable on a 22 year cycle (7 times Pi). The second variable is the orbital parameter of the Earth, which is a very complex subject in itself; with the shortest cycle being around 10,000 years. Because of that, it changes the temperature range of the seasons making winters colder and summers hotter. We are actually moving away from a more stable period to one where the difference between summer and winter in the northern hemisphere will be larger 5,000 years from now. The variation in the suns output from the 22 year cycle, is a key factor in the short term effects on the climate of the planet.

Number two; we have what happens in the earth's atmosphere. When determining what the global temperature is the first thing we need to do is determine what the temperature of the planet is, only considering the radiation from the sun and nothing else to form the base. At the distance, we are from the sun and if there was no global, warming the planet would not be livable. The average temperature would be -18.79 degrees Celsius or -1.82 degrees Fahrenheit Now, I'm going to be using rounded numbers not the exact ones, for simplicity throughout this paper. The image on the next page was created to show the complexity of the thermal energy transactions in the atmosphere Throughout this discussion keep in mind that "all" the energy that come to the earth from the sun must also leave the planet by radiating out into space; with a small delay account for the heat held by the water in the atmosphere. The actual heat energy in the CO₂ is negligible.



Number three; the base global temperature of the planet is determined by what is called the black body temperature of the planet, which gives us that base to work from. The important fact is the temperature is the fourth power of the radiation coming in. Meaning small changes in the output of the sun can make big changes in global temperatures. The equation for determining that temperature is called the Stefan-Boltzmann equation developed independently by Boltzmann in 1884 and by Stefan in 1879. The black body temperature of the Earth (with no atmosphere) and the Moon are the same at -19 degrees C since they are both the same distance from the sun. The earth is warmer than that "only" because of the water in the atmosphere. The specific heat (SH) is a number that tells us how much heat an item will hold. The Specific Heat (SH) of water is very high and holds a lot of heat. The Specific Heat (SH) of CO₂ is very low and holds only a tiny bit of heat. However, it will transfer some of that heat to the water in the atmosphere. The SH of water vapor is 4.2, the SH of water as a gas is 1.9 and the SH of CO₂ is .655 all these values are in J/(kgK) Water is 2.50% of the atmosphere and CO₂ is .04%. Obviously, water is the main driver of temperature not CO₂.

Going strictly by the orbital parameters of the earth the base temperature of the planet is -19 degrees C +/- 2 degrees C, or -2 degrees F +/- 3.6 degrees. According to the latest from NASA/NOAA the current temperature of the planet is just under 15 degrees C or 59 degrees F. the difference between the Black Body temperature and the actual temperature is the total “greenhouse” effect which is around 34 degrees C and 61 degrees F (the difference between 15 C and -19 C is 34 C), which does include the small contribution from CO₂.

The difference between the Black Body temperatures to the actual temperature is **primarily** from the water in the atmosphere at 28 to 30 degrees C and maybe an additional 2 to 4 degrees C at most from the current levels of CO₂. Without getting into physics let it be known that there is a small multiplier effect from CO₂'s effect on temperature; however, most of that effect has already be realized. At the present rate of increase and assuming water stays constant at 2,500 ppm or 2.5% the most the planet's temperature could go up from CO₂ alone from the current temperature level is maybe 1.0 degrees C. The geological mean temperature of the planet is around 17 Degrees C so one more degree to 18.0 degrees C means nothing. Even 2 more degrees C only takes us to 19 degrees C the geological mean. So when we are being told by AOC that 2 more degrees means the end of the world that is crazy talk or even criminal take your pick.

Note: All the work I do is based on published data from NOAA and NASA without alteration.

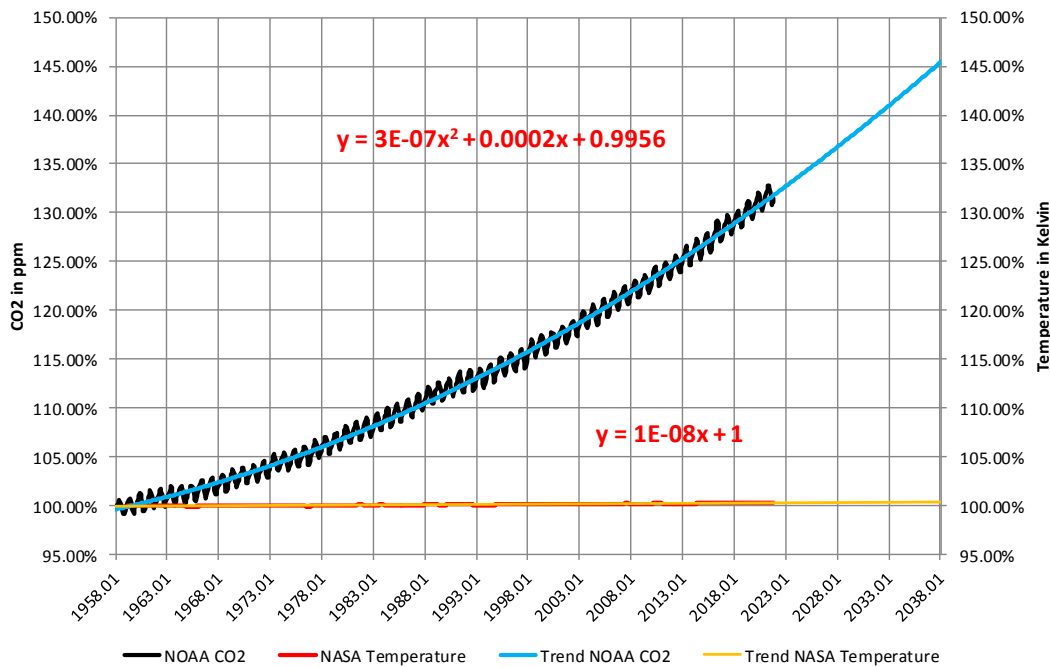
Note: in working with heat energy, we must use Kelvin not Celsius or Fahrenheit. There are solid scientific and engineering reasons why this is required.

What follows are two charts and a page from a scientific publication from a friend. The charts are based on the following logic. CO₂ was first measured scientifically starting in 1958. Temperatures had been measured back to 1850 but not converted into a “Global” temperature until after WW II. So what was done was to start in 1958 since that was the first year we had both and set that year as the base for both to determine if there was a causal relationship. Then each month from that point, a percent increase is calculated for both and that way we are comparing the changes between them on an equal basis. Therefore, if CO₂ is the cause of temperature changes we would see an obvious trend from CO₂ going up and Temperature following that.

The first Chart, Chart 8a, shows the result of that logic with the percentage changes using equal ranges on both the axis. You can see that CO₂ has gone up almost 35% from 1958 while it is hard to see any change in the temperature of the planet. You can also see that CO₂ has a seasonal pattern as the plants, mostly in the northern hemisphere, pull out of the atmosphere a lot of CO₂ in the summer when their growing. Then it goes up in the winter because the plants and trees are dormant and there is an increased use of burning fossil fuels for heating and generating electricity. This chart and the next one are using NASA monthly data from their Land Ocean Temperature Index (L-OTI) tables convert to degrees Kelvin so we can measure changes in heat content.

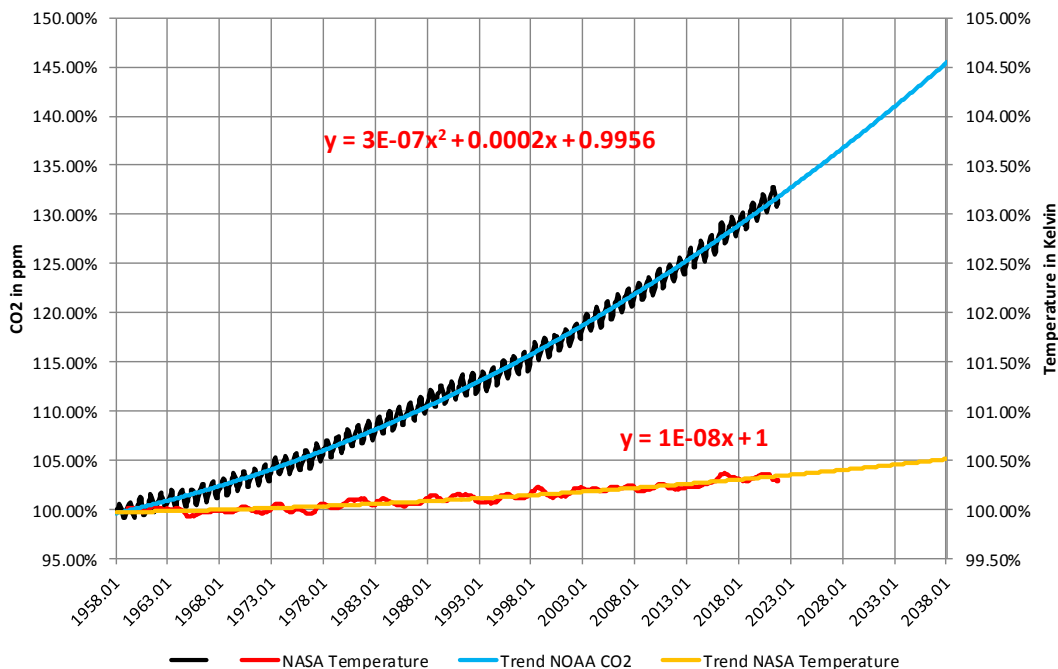
Counter to that very large increase in CO₂ there has been little to no growth in the trajectory of the temperature curve (it's almost a straight line) since this percentage growth method was first calculated in 2007. This is solid prove that there is little to no meaningful effect from Carbon Dioxide on climate. The annual seasonable change in CO₂ in the atmosphere is far greater than the total 80 year projected change of the plants temperature.

Chart 8a, CO2 and Temperature % Change from 1958



The next Chart, Chart 8, is the exact same data only the scale for the temperature was expanded. For CO₂ the left axis is from 0% to 150% and for temperature its 0% to 105% one tenth of the CO₂ value. The increase in temperature is under .4% compared to CO₂ at 35%. There are other reasons for the Temperature of the planet to be changing rather than CO₂. The mathematical projections show that by 2032 CO₂ will have gone up 145% and the temperature only .5%.

Chart 8, CO2 and Temperature % Change from 1958



What follows next is a page from a scientific paper written by W. A. Van Wijngaarden and W. Happer published on June 8, 2020 titled *Dependence of Earth's Thermal Radiation on Five Most Abundant Greenhouse Gases*.

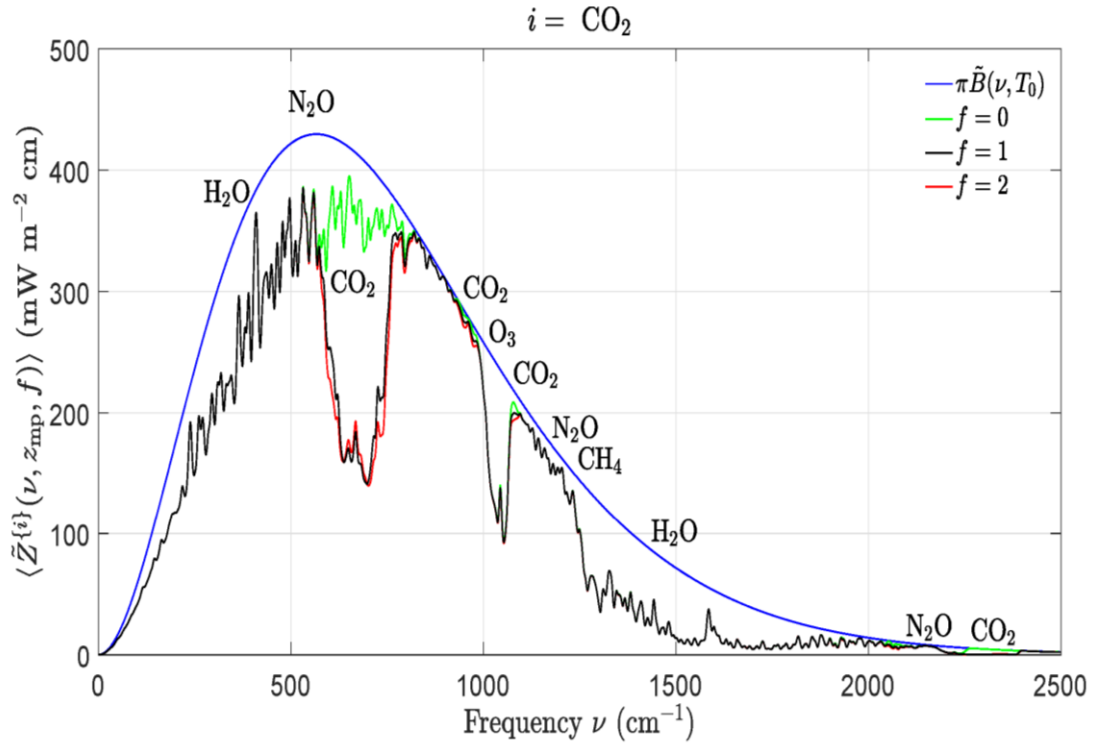


Figure 4: Effects of changing concentrations of carbon dioxide, CO_2 on the filtered spectral flux $\langle \tilde{Z}^{\{i\}}(\nu, z_{\text{mp}}, f) \rangle$ of (44) at the mesopause altitude, $z_{\text{mp}} = 86$ km. The width of the filter (43) was $\Delta\nu = 3 \text{ cm}^{-1}$. The smooth blue line is the spectral flux, $\tilde{Z} = \pi \tilde{B}(\nu, T_0)$ from a surface at the temperature $T_0 = 288.7 \text{ K}$ for a transparent atmosphere with no greenhouse gases. The green line is $\langle \tilde{Z}^{\{i\}}(\nu, z_{\text{mp}}, 0) \rangle$ with the CO_2 removed but with all the other greenhouse gases at their standard concentrations. The black line is $\langle \tilde{Z}^{\{i\}}(\nu, z_{\text{mp}}, 1) \rangle$ with all greenhouse gases at their standard concentrations. The red line is $\langle \tilde{Z}^{\{i\}}(\nu, z_{\text{mp}}, 2) \rangle$ for twice the standard concentration of CO_2 but with all the other greenhouse gases at their standard concentrations. Doubling the standard concentration of CO_2 (from 400 to 800 ppm) would cause a forcing increase (the area between the black and red lines) of $\Delta F^{\{i\}} = 3.0 \text{ W m}^{-2}$, as shown in Table 2.

The effects on radiative transfer of changing the column density of the i th greenhouse gas to some multiple f of the standard value, $\hat{N}_{\text{sd}}^{\{i\}}$, can be displayed with filtered spectral fluxes

$$\langle \tilde{Z}^{\{i\}}(\nu, z, f) \rangle = \langle \tilde{Z}(\nu, z, \hat{N}_{\text{sd}}^{\{1\}}, \dots, \hat{N}_{\text{sd}}^{\{i-1\}}, f \hat{N}_{\text{sd}}^{\{i\}}, \hat{N}_{\text{sd}}^{\{i+1\}}, \dots, \hat{N}_{\text{sd}}^{\{n\}}) \rangle. \quad (44)$$

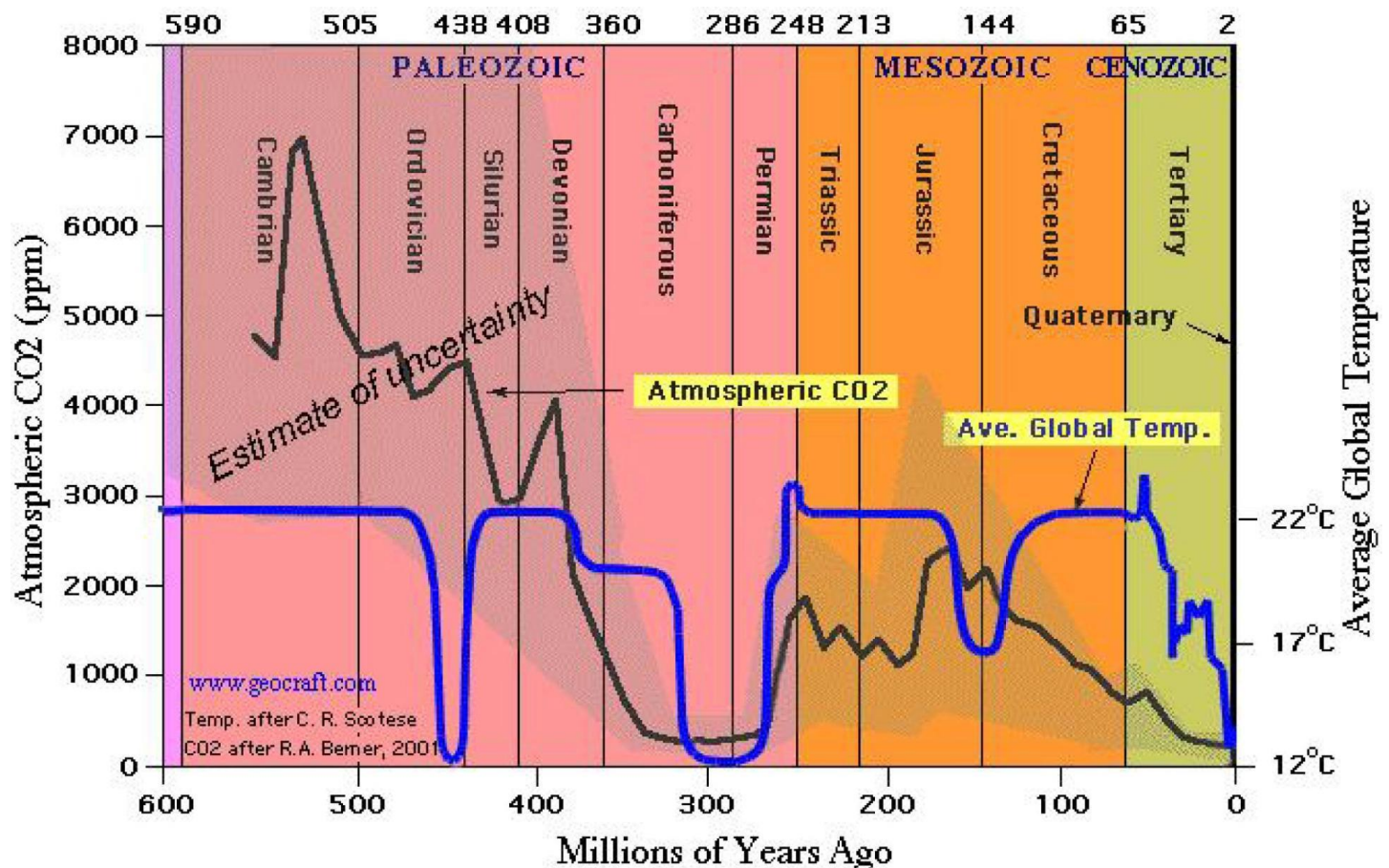
Figs. 4 and 5 show how varying the concentrations of CO_2 and CH_4 affect the filtered spectral fluxes at the mesopause altitude, $z_{\text{mp}} = 86$ km. Expanded views of the differences between the flux for standard and doubled concentrations of greenhouse gases are shown in Fig. 6, where we display

$$\langle \Delta \tilde{F}^{\{i\}}(z_{\text{mp}}, 2) \rangle = \langle \tilde{Z}^{\{i\}}(\nu, z_{\text{mp}}, 1) \rangle - \langle \tilde{Z}^{\{i\}}(\nu, z_{\text{mp}}, 2) \rangle. \quad (45)$$

This is a 38 page work with significant ramifications to the validity of the IPCC climate change narrative. The bottom line to this scientific study is that there is NO DANGER to additional CO_2 in the earth's atmosphere. Any warming that might be caused by CO_2 has for the most part already been accounted for. Page 13 from that report shown above, clearly shows that the sun's radiation

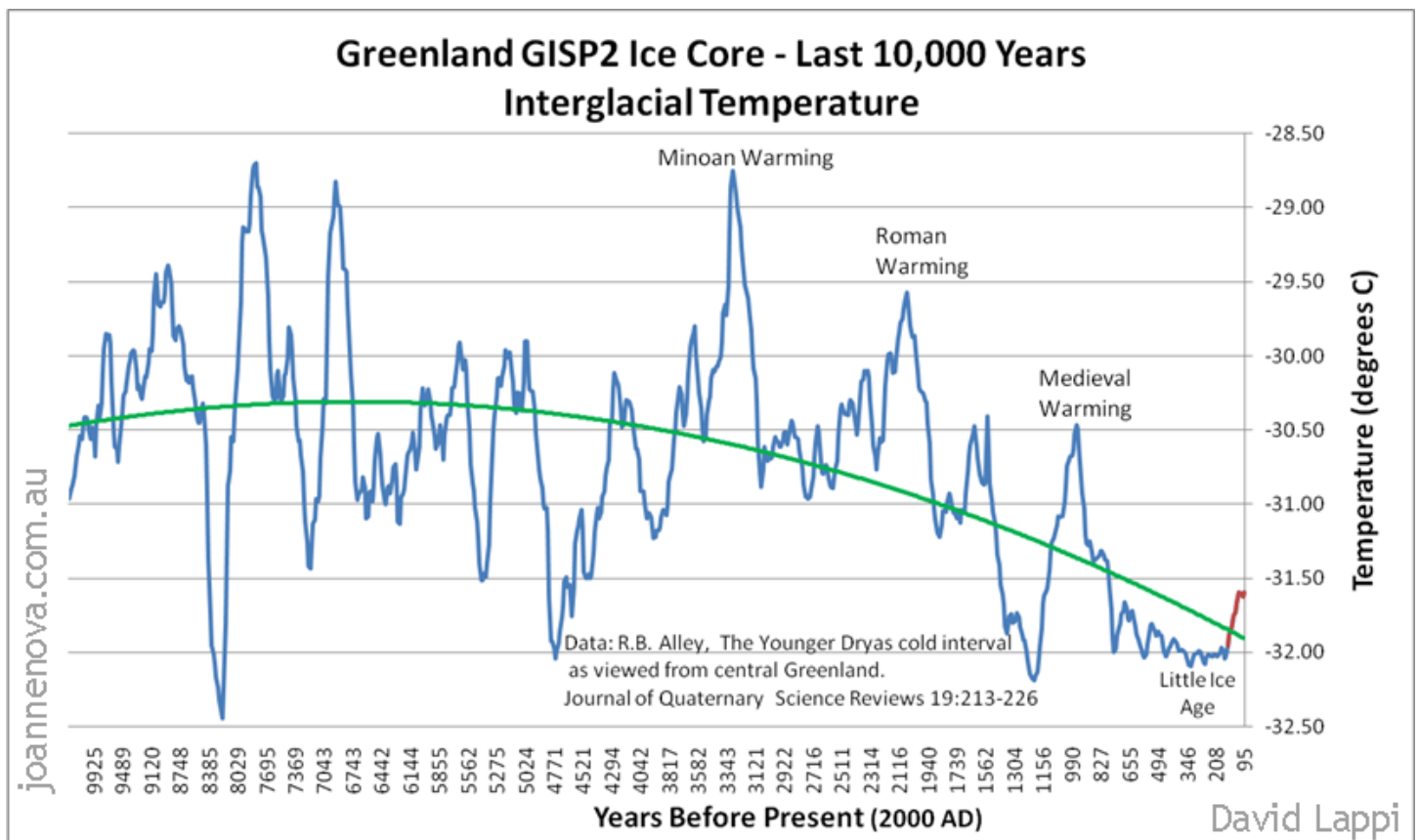
absorption bands for CO₂ are now saturated and there will be little to no additional effect. The **green line** is no CO₂ the back line is the current level of CO₂ and the **red line** is double the current level of CO₂. As can be clearly seen the black and **red lines** are virtually identical, indicating little to no additional change in temperature from CO₂ is possible. The **blue line** is the radiation from the sun.

This next Picture is a Chart of the levels of CO₂ and temperature going back 600 million years. It also shows the estimated range in temperatures of the earth is from 12 degrees C to 22 degrees C with the mean at 17 degrees C and clearly, we are at the low end today at 15 degree C as we are still warming from the last ice age which ended over 10,000 years ago.



Because of the multiple cycles involved from: the sun, the orbit of the earth and the heat transfer on the earth from the equator to the poles there are swings in the climate with changes of a few degrees C especially in the northern hemisphere. We are actually approaching the middle of a cooling period caused by the current reduced output from the sun (22 year cycle) which started almost 20 years ago. This cold period will run for probably 15 or more years before we get any more warming in the current 1,000 year cycle that will end in the middle of the 22nd century. At that point, we will get progressively colder for around 500 years. But keep in mind that all these cycles are not fixed there is a lot of variability to the time frames.

The last chart from ice cores in Greenland shows the temperature ranges since the end of the last ice age ended 10,000 years ago. It is very clear that there are climate cycles not related to human activity or CO₂. Further, what caused all the ice that covered most of North America and Europe to melt? Where did that heat come from it certainly wasn't from any human activity. And this wasn't the first ice age and it will certainly not be the last one.



Consider this! The earth is closest to the sun in December but the axis is point away from the sun so in the northern hemisphere its winter but because we are closet to the sun it isn't as cold as it could be. Ten thousand years ago when the earth was farthest from the sun and the axis was point away from the sun. Because the northern hemisphere is mostly land and the southern hemisphere is mostly water there will still be a lot of water being evaporated especially in the pacific which will move north and come down in snow. But with the colder winters, ice will build up and as more and more ice, builds up more and more of the thermal energy will be reflected off the planet making it yet colder. The movements of the continents have for now created the perfect alignment for this to happen. And maybe that will start the next Ice age.

The point to this discussion is that there are major climate changes that have been happening ever since the planet was formed and none of these changes were from human activity including what is happening today. Also keep in mind that CO₂ is a require plant food if there was no CO₂ there would be no plants. If there were no plants, there would be no animals. And if there were no plants or animals, we would not be here. Plants need at minimum 180 ppm and during the little ice age around 1650 AD the CO₂ was getting close to that level. Fortunately, we humans were beginning to burn lots of wood and coal and that was putting CO₂ back in the atmosphere. Then some 200 years later we found oil and natural gas and that changed everything including saving the plant from a lack of CO₂ in the atmosphere. Since most plants grow, better and faster in a high CO₂ environment more CO₂ is better than less with the ideal level probably around 1,000 or more ppm.

The green movement today is actually dangerous to all life on the planet. The reason I say this as there is serious discussion about finding ways to pull out the co2 from the atmosphere today; Especially from Bill Gates. Normally this kind of insane solution for a non-existing problem would be

laughed at as the dreams of a mad man. Unfortunately, Gates, probably the richest man on the planet, has the money to experiment with ways to do changes the heat balance of the planet. His current endeavor is to seed the atmosphere with reflective particles to stop the sun light from reaching the surface of the planet. Gates is a ruthless businessman with no morals and knows nothing about science, he never graduated from college so he has limited over all knowledge which shows in his programs. Since there are natural, warm and cold cycles to the climate stopping in coming solar radiation for no good reason could easily trigger the next ice age which would wipe out civilization as we know it. Look at that previous chart from the ice cores; that little red blip at the bottom right --- Does that really look like we have a problem with being too hot?

The worst thing we can do today is stop burning fossil fuels.

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