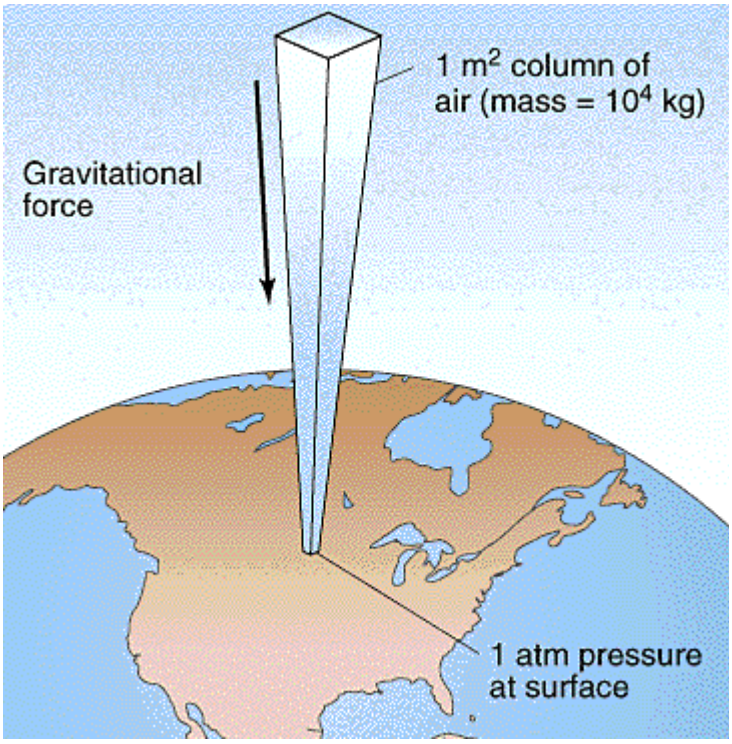
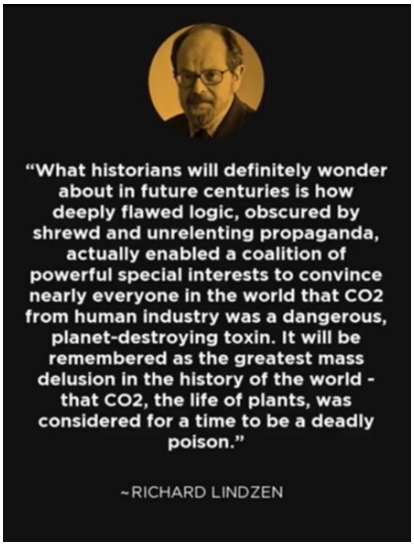


The Real Physics of Climate Change

How the Intergovernmental Panel on Climate Change (IPCC) and the Global Scientific Community have Ignored Proven Laws of Physics since 1896 to Promote their Big Budget Climate Agenda to Spend Trillions of Dollars on Renewable Energy.

A summary of the work of Professor R Holmes, Dr. N Nikolov, Dr. K Zeller, Professor J Kleppe and Dr. D Roberts.

Do Greenhouse Gases Control the Earth's Temperature?



Steve Koonin states in his book "Unsettled": "The failure of even the latest models to warm rapidly enough in the early twentieth century suggests that it 's possible, even likely, that internal variability the natural ebbs and flows of the climate system has contributed significantly to the warming of recent decades. That the models can't reproduce the past is a big red flag it erodes confidence in their projections of future climates. In particular, it greatly complicates sorting out the relative roles of natural variability and human influences in the warming that has occurred since 1980."[1]

In other words, the vaunted models cited by the IPCC (Intergovernmental Panel on Climate Change) are not capable of predicting the well known warming of the 1930s and 40s yet Koonin and the IPCC authoritatively state: "There is no question that our emission of greenhouse gases, in particular CO2, is exerting a warming influence on the planet. Human influences on the climate have grown over the past decades and will continue to grow under all but the most radical scenarios for future emissions."[2]

So, on the one hand, the IPCC models cannot reproduce past warming events, and on the other hand, "there is no question that greenhouse gases are warming the planet". So which is it? If it's not CO2 causing warming, what is?

Debating the Greenhouse Gas Theory

Contemporary climate science and IPCC Assessment Reports do not discuss global temperature sensitivities to changes in cloud albedo, absorbed solar radiation or total surface atmospheric pressure. Consequently, no equations have been derived/proposed thus far to calculate these sensitivities. The reason for such an omission is the implicit assumption made by IPCC based on the 19th-Century Greenhouse theory (Arrhenius 1896) that the observed warming during most of the 20th Century and especially over the past 40 years was chiefly caused by an increase of industrial CO2 emissions, which are believed to trap outgoing long-wave radiation in the Earth's troposphere and reduce the rate of surface infrared cooling to Space.[3]

The genesis of the modern myth that human consumption of fossil fuels generates excess CO_2 in the atmosphere that overheat the planet was in 1961 when astronomer Carl Sagan declared that Venus, whose atmosphere is 96% CO_2, was a victim of "a runaway greenhouse gas (GHG) effect". This claim was made with virtually no scientific evidence except that the Venusian atmosphere was 96% CO_2 and very hot. Three scientists, John Tyndall (1861), Svante Arrhenius (1896), and Edward Hulbert (1931) made assumptions that CO_2 could warm more with the same solar radiation than other gases hence it was a greenhouse gas capable of warming the atmosphere more than other gases. **No warming of the earth has been attributed to atmospheric pressure and other effects.**

Debates in the Stockholm Physics Society concerning the causes of the ice ages led Arrhenius to construct the first climate model of the influence of atmospheric carbon dioxide (CO2), published in The Philosophical Magazine in 1896. The general rule that emerged from the model was that if the quantity of CO2 increases or decreases in geometric progression, temperature will increase or decrease nearly in arithmetic progression. Linking the calculations of his abstract model to natural processes, Arrhenius estimated the effect of the burning of fossil fuels as a source of atmospheric CO2. He predicted that a doubling of CO2 due to fossil fuel burning alone would take 500 years and lead to temperature increases of 3 to 4°C (about 5 to 7°F). This is probably what has earned Arrhenius his present reputation as the first to have provided a model for the effect of industrial activity on global warming. [4]

But this model has never been subjected to experimental verification with real world data and is the basis for all of the climate models that the IPCC supports.

The GHG model of planetary climate has totally ignored the laws of thermodynamics and the Ideal Gas Law. We know that the temperature on earth changes about 10°C per kilometer of height. In other words, the temperature decreases 10°C for every kilometer of height above the surface so the temperature is cooler at the top of the mountain than it is at the base. The GHG theory of global warming cannot account for this well known fact of the earth's atmosphere because it ignores the compression of the atmosphere.

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1 Steve Koonin, Unsettled: What Climate Science Tells Us, What It Doesn't, and Why It Matters, page 90
2 Ibid page 75
3 Nikolov & Zeller, Exact Formulas for Estimating the Equilibrium Climate Sensitivity of Rocky Planets & Moons to Total Solar Irradiance, Absorbed Shortwave Radiation, Planetary Albedo and Surface Atmospheric Pressure, April 2022
4 https://www.britannica.com/biography/Svante-Arrhenius

Professor Robert Ian Holmes of Federation University Australia has published a ground breaking paper that shows there is little evidence of greenhouse gas warming because all atmospheric physics can be explained for planets with surface atmospheric pressures greater than 0.69 kPa (0.00681 atmosphere) by the molar mass version of the Ideal Gas law.[5] "This method requires a gas constant and the near-surface averages of only three gas parameters: the atmospheric pressure, the atmospheric density and the mean molar mass[6]."[7] Using this simple model, Holmes has calculated the surface temperature of Earth to be 288°K (15°C) and the surface temperature of Venus that has a 96% CO_2 atmosphere to be 740°K (467°C). Both values are in very high agreement with numbers measured by satellite but this simple model doesn't consider the effect of changing solar radiation due to cloud cover changes.

The Next Generation of Calculations

Holmes' simple gas law model has been expanded by Nikolov and Zeller (NZ) to include the effects of albedo[8] radiation which effects the surface temperature of the earth. NZ started by creating a model of a rocky planet that has no atmosphere to derive the basic equation to calculate the surface temperature due to solar radiation.

This model was then used to develop a model that includes the pressure effects of the atmosphere and the albedo effects of the atmosphere.[9]

"While analyzing NASA planetary data, NZ (2017) discovered that the long-term (baseline) global surface temperature of rocky planets and moons (Tsb, °K) is mainly a function of two variables: Total Solar Irradiance (TSI) reaching the top of the atmosphere and the mean atmospheric pressure at the surface." **In other words, the GHG effect is not important in the regulation of the earth's surface temperature.**

"A key new insight from the NZ model is that the climate system is not solely driven by radiation, which is a form of diabatic (external) heating, but it is also controlled by an adiabatic enhancement of the absorbed solar energy (internal heating) due to air pressure. Adiabatic heating is a standard thermodynamic phenomenon in compressible fluids such as gases. The Greenhouse theory of climate change exclusively focuses on radiative forcing and positive radiative feedback, and does not consider the adiabatic warming effect of atmospheric pressure on a planet's surface."

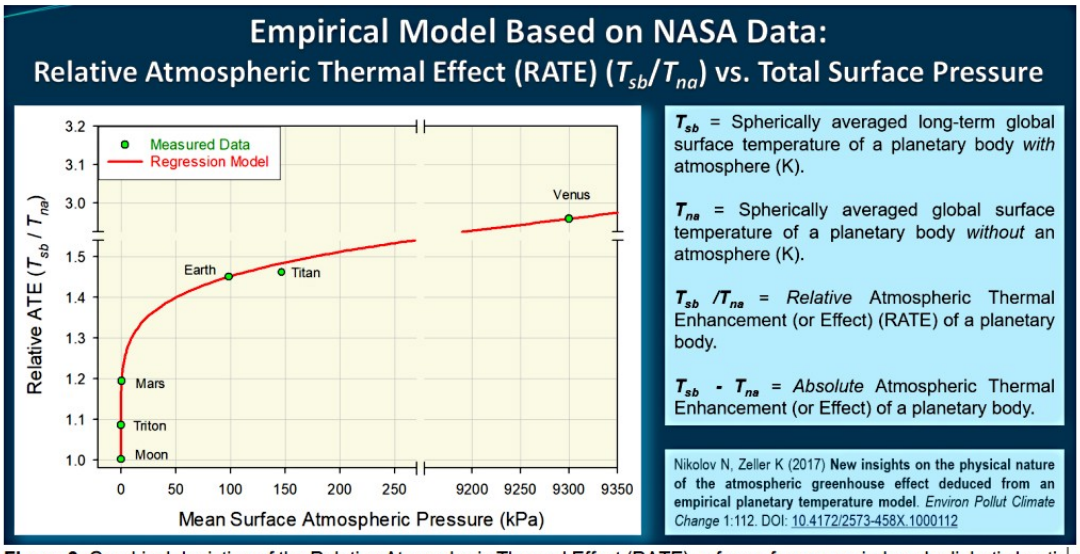

Figure 2. Graphical depiction of the Relative Atmospheric Thermal Effect (RATE), a form of pressure-induced adiabatic heating empirically described by Eq. 3.

This figure shows that the model for estimating relative Atmospheric Thermal Enhancement (ATE or warming of a spherical planet) accurately calculates the heating of planets from our moon to Venus which has a 96% CO_2 atmosphere.

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5 The **ideal gas law**, also called the **general gas equation**, is the equation of state of a hypothetical ideal gas. PV=nRT, https://en.wikipedia.org/wiki/Ideal_gas_law

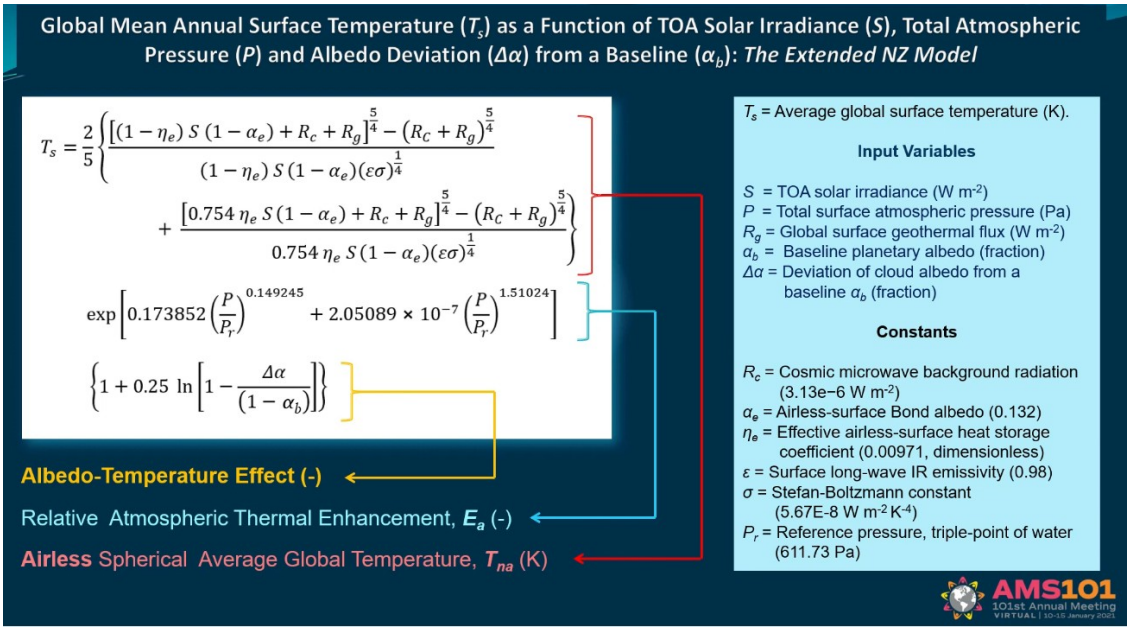
6 Mean Molar Mass is the molecular mass of the air. It's 29 gm/m^3 for the earth.

7 Robert Ian Holmes. Thermal Enhancement on Planetary Bodies and the Relevance of the Molar Mass Version of the Ideal Gas Law to the Null Hypothesis of Climate Change. Earth Sciences. Vol. 7, No. 3, 2018, pp. 107-123.

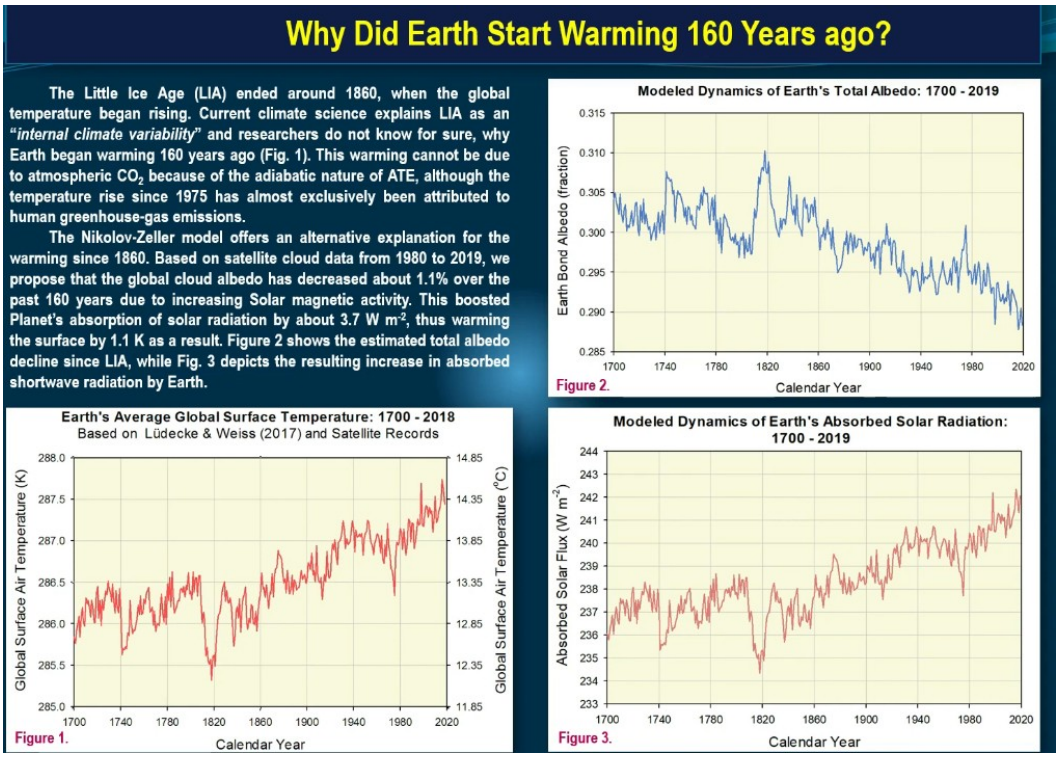
8 **Albedo** (whiteness) is the measure of the diffuse reflection of solar radiation out of the total solar radiation. https://en.wikipedia.org/wiki/Albedo

9 Nikolov & Zeller, Exact Formulas for Estimating the Equilibrium Climate Sensitivity of Rocky Planets & Moons to Total Solar Irradiance, Absorbed Shortwave Radiation, Planetary Albedo and Surface Atmospheric Pressure, April 2022

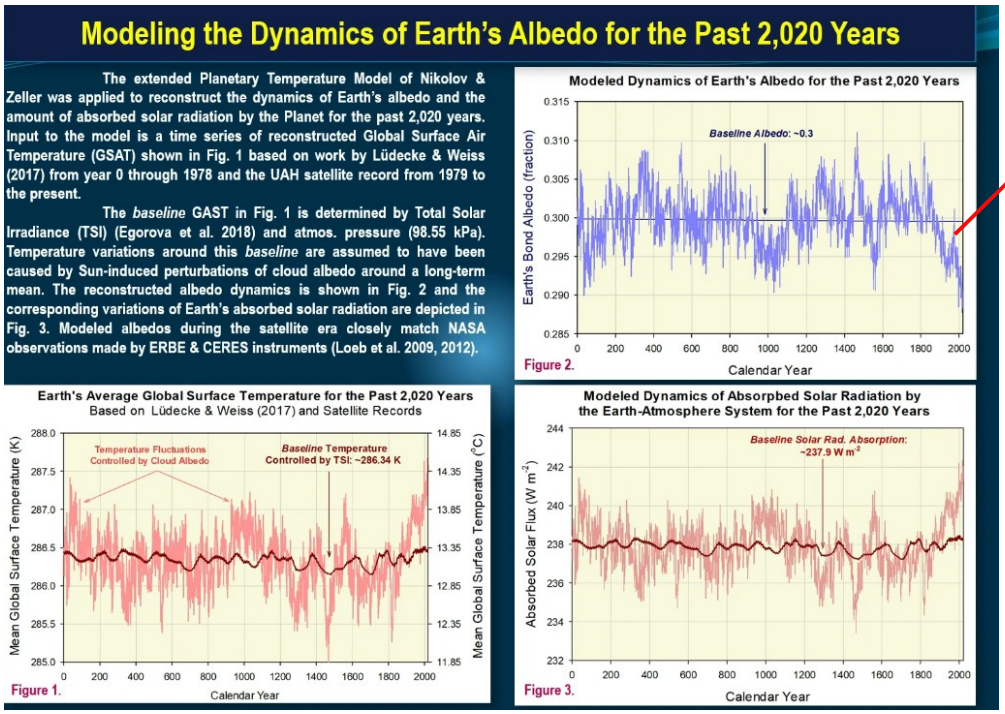
NZ's work developed this mathematical model for predicting the earth's surface base line temperature, T_{sb}:



It's not important to understand the mathematics of this formula but to understand that the temperature of the surface of a rocky planet with an atmosphere can be determined by the total surface atmospheric pressure (P), the solar radiation (S), the global surface solar radiation (Rg), the baseline albedo radiation (α_b) and the deviation of cloud albedo ($\Delta\alpha_b$) from a baseline (α_b). This means that the temperature of the earth is not primarily determined by CO2 emissions but rather a natural effect due to the gas physics of the atmosphere and solar activity.



Note that the model shows decreasing albedo Figure 2 which increases absorbed solar radiation as shown in Figure 3. **This is what has driven global warming over the last 160 years not fossil fuel burning.**

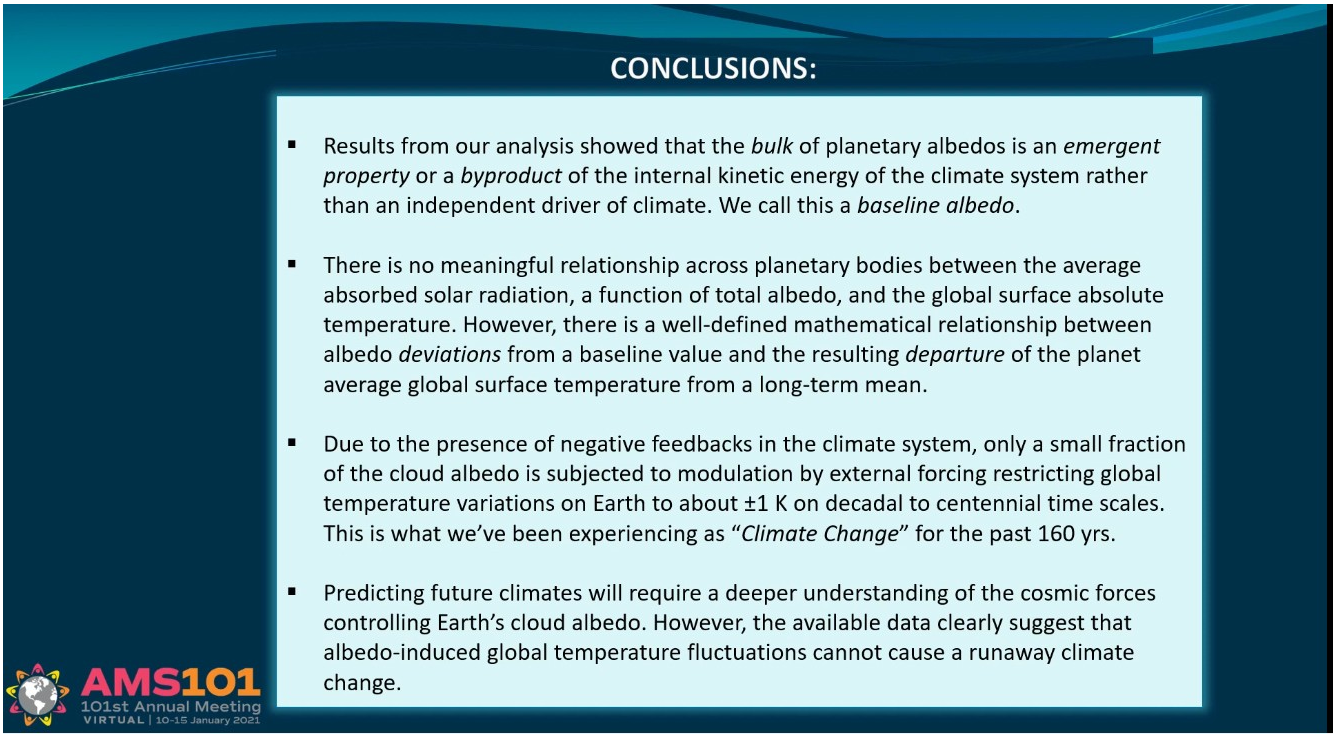


Note that the model predicts a decrease in albedo in modern times (more solar radiation absorbed by earth). The warming at the beginning of the industrial revolution, 1800, is **NOT** due to greenhouse gas from fossil fuel burning but due to the change in the albedo of the earth system (brightening of the clouds) probably due to solar activity. "However, a plethora of studies published during the past 15 years have shown through both satellite and surface observations that the absorption of solar radiation by the Earth-atmosphere system has increased significantly since 1982 due to a decreased cloud cover/albedo, a phenomenon often referred to as "global brightening".[10]

Greenhouse Hypothesis vs. NZ Climate Concept:
Principle Differences

Greenhouse Hypothesis	New NZ Climate Concept
The overall thermal effect of Earth's atmosphere is about **33° C**	The overall thermal effect of Earth's atmosphere is about **90° C**
The atmosphere warms Earth's surface by impeding the loss of radiant heat to Space through absorption and re-emission of outgoing *long-wave terrestrial radiation* by trace greenhouse gases.	The atmosphere warms Earth's surface *adiabatically* through the *force of air pressure*, which *enhances* the energy received from the Sun in a way analogous to compression heating (Earth's surface is under a constant gas compression!).
Earth's global temperature is *sensitive* to changes in atmospheric concentrations of trace greenhouse gases. Thus, human-induced carbon emissions can affect climate.	Earth's global temperature is *independent* of atmospheric composition. Non-condensing trace gases do not have a measurable impact on climate. Thus, the sensitivity of the climate system to human-induced carbon emissions is essentially *zero*.
CO_2 is the *control knob* of Earth's climate on virtually all time scales, i.e. from decades to millions of years.	Earth's climate is controlled by *different forces* on different time scales: • Sun-induced changes of *global cloud cover/albedo* through Birkeland electric currents and magnetic modulation of the galactic cosmic ray flux are responsible for the observed *decadal to centennial* fluctuations of climate; • Changes of *total atmospheric mass* and *surface air pressure* drive climate dynamics on time scales of *thousands to millions of years*.

[10] Goode & Pallé 2007; Wild 2009; Herman et al. 2013; Stanhill et al. 2014; Hofer et al. 2017; Pfeifroth et al. 2018; Pokrovsky 2019; Delgado-Bonal et al. 2020; Dübal & Vahrenholt 2021; Yuan et al. 2021



Summary

Nikolov and Zeller have provided a robust mathematical model of the earth's climate based on measurable physical phenomena: the albedo of the earth, the atmospheric pressure, and the Total Solar Irradiance (TSI). These parameters drive the temperature of the earth, not fossil fuel generated CO_2 in the atmosphere. Unfortunately, the albedo is caused by solar activity that is not well understood so it cannot be modeled to generate future climate change predictions. Consequently, we need more research into the sun's physics not on flawed CO_2 driven IPCC models that can't even reproduce the droughts and warming of the early 20th century. More on this in the next section on precipitation.

What are the Controlling Mechanisms for Precipitation?

"What's more, as the 2017 Climate Science Special Report (CSSR) notes, there are significant regional and seasonal differences in how precipitation has changed across the country. Since 1901, the Northeast, Midwest, and Great Plains have seen increases, while parts of the Southwest and Southeast have experienced decreases. In other words, US precipitation has indeed risen a bit overall, but the fact that it varies over both years and location much more than the trend itself makes it hard to draw any solid conclusions about the relative roles of human influences and natural variability."[11]

So, the greenhouse gas theory cannot adequately model the temperature of the earth and it can't model the precipitation. Maybe there is another answer!

Various scientists have postulated that cosmic rays, solar flares and sunspot cycles have significant influence on our climate but those theories have not been proven. Until now. We now have a better understanding of the effect of the physics associated with the switching of the sun's magnetic field on our planet due to the research of Kleppe and Brothers.

Groundbreaking Work on the Sun's Influence on Earth's Climate

The story starts with Professor John Kleppe's work in 2003 studying ancient trees rooted in the bottom of Fallen Leaf Lake in the Tahoe basin. Professor Kleppe found that by studying tree ring data and carbon dating that the trees started growing in the lake in the medieval period at about the year 1,000.[12] This led to a now accepted theory that the trees rooted in the bottom of the lake grew during a drought that lasted for over 200 years. But the question remained, what caused the drought.

We now have an answer: "We have shown in several previous papers the major driving forces of winter precipitation in the Sierra are the reversal of the sun's magnetic field and a statistically independent "carrier" signal being generated by the Earth's large-scale atmospheric circulation."[13]

The solution to this problem is very complex because of the interaction between sun and earth phenomena. It's important to understand what the modulating factors are that are modifying our climate.

1. The Gleissberg Cycle – The Gleissberg Cycle (GC) is a phenomenon that modulates the sun's magnetic field. The GC has several frequency components. One of 100 years and another of about 3,222 years, the Hallstatt cycle that may be related to the motion of the planets in the solar system.
2. The Earth's large-scale atmospheric circulation driven by parameters including orbital (inclination, eccentricity, precession, obliquity, and rotational), depth of the atmosphere, and heating by the sun.
3. The reversal of the sun's magnetic field that modulates the sunspot activity with a period of about 22 years. Many people have postulated that the sunspots are the influencing factor but it is in fact the sun magnetic field reversal and the Gleissberg modulation.

These three signals combine to effectively modulate the Snow Water Equivalent (SWE) of the Sierra Nevada snow pack. In other words, the snow pack is determined by the combined effect of these three phenomena. The Gleissberg modulation is like the amplitude modulation of AM radio communications.

El Nino/La Nina Events

The research also shows how solar magnetic activity affects atmospheric circulation in the western tropical Pacific including the connections between the El Nino-Southern Oscillation (ENSO), the Walker circulation, and the resulting variability in the lower thermosphere.[14] "Researchers continue to search for the connection between the variability of the sun and that of the Earth's troposphere to the point it has become "third-rail science", (Zhai, 2017), (Leamon et al., 2018). The main problem has been the scientific community continues to attempt to directly correlate Earth's climate with the 11 and/or 22year solar cycles."[15] The Kleppe/Brothers research shows that the Gleissberg modulation has to be included in the spectral analysis to detect the effects of the 22 year sun magnetic cycle.

"The modulation of the Sea Surface Temperature (SST) by the reversal of the magnetic field of the sun comes from the modulation of the downward short wave solar radiation flux, SW↓ and the downward long wave radiation solar flux, LW↓. The SW↓ flux leads the El Nino Modoki Index (EMI) index by 1 month; and; the long wave radiation flux LW↓ also leads

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11 Steve Koonin, "Unsettled" page 133

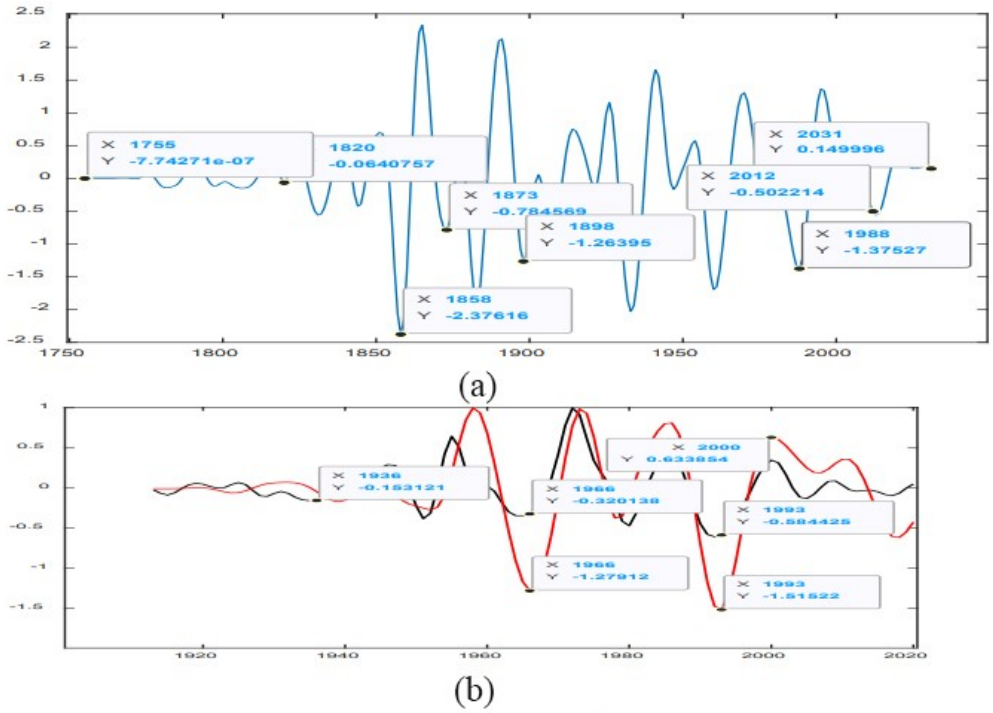
12 Kleppe, et al . 2011. Duration and severity of Medieval drought in the Lake Tahoe Basin. Quaternary Science Reviews, 30, 3269-3279

13 Kleppe, et al. 2022, Mega-drought Detection and Prediction in the Central Sierra Derived from the Reconstruction of Mt. Rose SWE Record for Water Years CE 972-CE 2031 Using the Reversal of the Sun's Magnetic Field

14 Kleppe J.A., & D. S. Brothers 2019. How the reversal of the magnetic field of the sun modulates snowfall in the Sierra Nevada Mountain range of the western United States. Proceedings 87th Western Snow Conference, 53-56.

15 Ibid page 53-56

the EMI index by 1 month. It is important to note the time series of the radiative fluxes are correlated with the time series of the El Nino and the EMI indicating both radiative flux variations have the same solar spectral peaks." [16] This important discovery shows that El Nino/La Nina events are directly related to the reversal of the sun's magnetic field thus the snow pack in the Sierra Nevada is dependent on the magnetic activity of the sun.



Estimated MRSWE (blue) 1755 to 2031 b. Actual(black) v Estimated(red) for 1913 to 2020 (R=0.7)

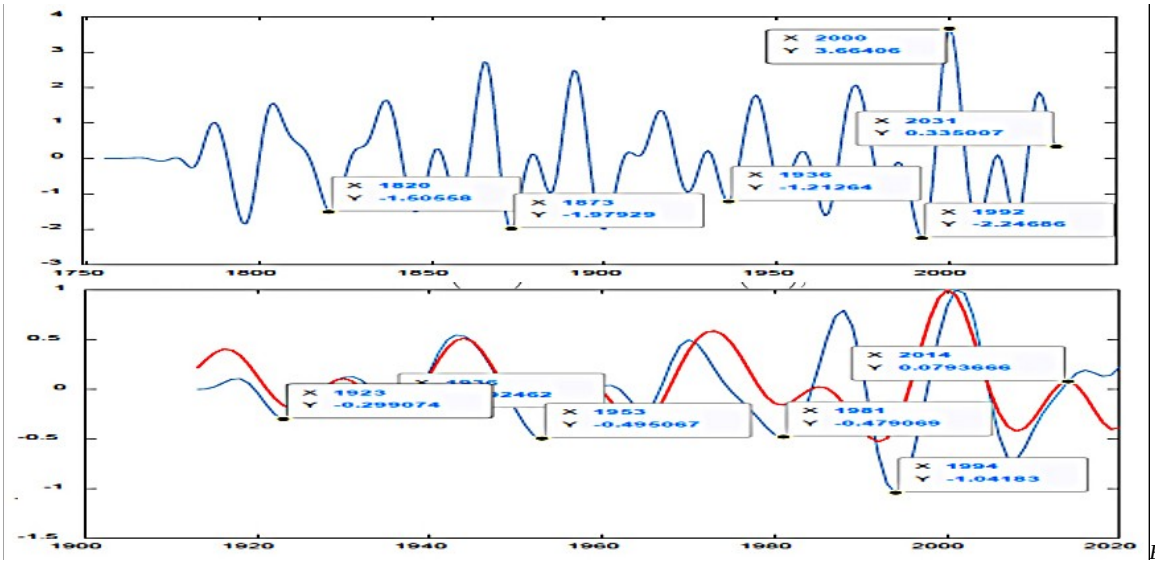


Figure 1: Figure 2:

Top: Estimated PDSI (blue) 1755-2031 with selected drought dates shown
Lower: Estimated PDSI (blue) actual PDSI (red) Correlation: 0.63

[16] Ibid 56

PDSI (Palmer Drought Severity Index) Note that the Gleissberg modulation of the sun's magnetic field model accurately detects the extreme droughts of the 1920's and 1930's. The model shows excellent correlation with R=0.63.

"It appears Earth's Water Cycle is being modulated by seawater evaporation directly related to solar activity modulated UV light. The maximum transmission of UV light in seawater occurs at the Earth's equator due to the favorable angle as the sunlight enters the seawater. The underwater trapped heat at the longer wavelengths heats the surface seawater and adds to the El Niño effect or "warm water tongue". This idea is supported by the fact the four solar activity generated periods found in the Mt Rose SWE are also found in the Sea Surface Temperature (SST) measurements."[17]

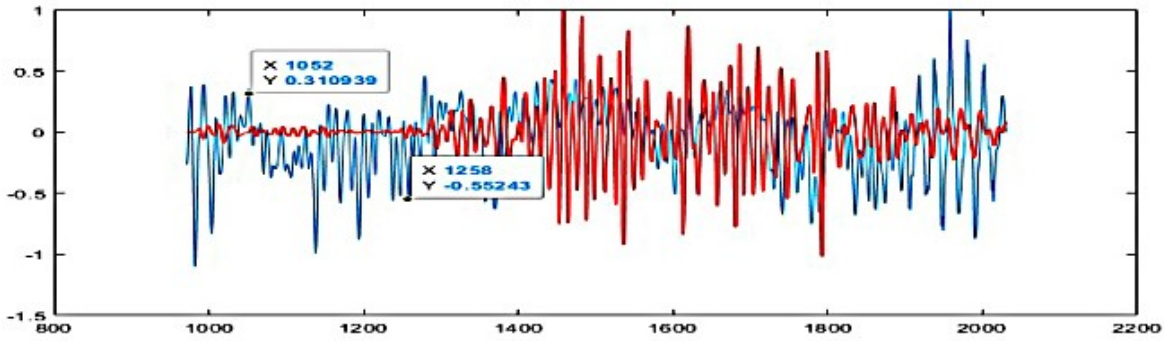


Figure 2: Figure 5 Mt. Rose SWE BCE 6675 to CE 2031 shown in (red) and solar modulation shown in (blue)

"The reconstruction of Mt. Rose SWE (red) over the period CE 972 to CE 2031, clearly shows the mega-drought reported in (Kleppe, et al ,2011). The midpoint is CE 1155. The solar modulation data from (Brehm, et al ,2021) are shown in blue."

"It is important to note the solar modulation data (blue) shown in Figure(5) is not directly correlated with the reconstructed SWE(red). One must use the amplitude modulated Kleppe/Brothers model to estimate the SWE. It is also important to note the mega drought CE(1052-1258) is not seen using the model if one ignores the Hallstatt Cycle. The mega droughts appear to occur at the peak values of the Hallstatt Cycle. These values are at the peaks of the absolute value of the demodulated Hallstatt Cycle or approximately every 1586 years. The next mega-drought in the central Sierra is therefore not expected to occur until approximately the year CE 1175+1586 = CE 2761. This should provide sufficient time for appropriate measures to be taken to help mitigate such a wide-spread natural disaster.

Short-term accurate prediction of drought using the Kleppe/Brothers model is limited by the ability to accurately predict the date of the flip of the magnetic polarity of the sun and to also have an accurate prediction of the intensity of the sun's changing magnetic field over each Solar Cycle."[18]

Over 20 years of research has been done to develop this theory and these results. It clearly shows that the sun has a very large influence on our climate in a new and novel way that has not been previously investigated. The records have been reconstructed over 1,000 years and correlated to modern times from CE 972 to CE 2031. The high correlation of the effects of the magnetic field of the sun on the precipitation record in the Sierra Nevada is better than anything that has been produced by the IPCC modeling initiative.

Conclusions

We noted that there was little correlation between the IPCC models and the warming period of the early 20th century. The Kleppe/Brothers research has shown very high correlation (R=.7) between the amplitude modulation of the sun's magnetic field by the Gleissberg Cycle, and the Mount Rose, NV snow water equivalent (MRSWE) record over water years 1913-2021.

Summary

Professor Steve Koonin has shown that there is little evidence that human produced CO_2 is influencing climate change. The research quoted in this brief has clearly shown that the sun and it's magnetic anomalies are the driving forces modulating our climate. The modern theory of complex models based on GHG theory have failed to show that excess CO_2 in the atmosphere are causing warming. They totally ignore the adiabatic compression of the earth's atmosphere and the changing albedo that are primarily responsible for our climate change.

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[17] Ibid

[18] Kleppe, et al. 2023. Mega-drought Detection and Prediction in the Central Sierra Derived from the Reconstruction of Mt. Rose SWE Record for Water Years CE 972-CE 2031 Using the Reversal of the Sun's Magnetic Field. proceedings of the AGU December 14, 2022.