The Week That Was: 2022-12-31 (December 31, 2022)
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The Science and Environmental Policy Project

Best of 2022 – Excerpts

Quotes: *"A man who is certain he is right is almost sure to be wrong."*– Michael Faraday

"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less." – Marie Curie

"The only source of knowledge is experience." – Albert Einstein

"If there is something very slightly wrong in our definition of the theories, then the full mathematical rigor may convert these errors into ridiculous conclusions."—Richard Feynman

Number of the Year: +0.13 C/decade

THIS WEEK:
By Ken Haapala, President, Science and Environmental Policy Project (SEPP)

Scope: The following are excerpts of descriptions of some of the outstanding papers covered in TWTW during 2022. The emphasis is on physical evidence, not policy or speculation. The primary links follow the discussion.
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The Whole Globe, Atmosphere Included: In papers posted on the SEPP website, AMO physicist Howard Hayden shows that for 30 years the IPCC and its followers ignored the long-established Stefan-Boltzmann Law which is critical for understanding the radiation emitted from the surface of the earth. In its latest report, AR6 (2021) the IPCC recognizes but apparently does not understand the law. It would require an increase surface radiation of 16.5 W/m2 to reach a warming of 3°C, the IPCC estimate for a doubling of CO2. The IPCC continues to discuss "radiative forcing" as if it will be significant. Using its latest report and calculations by AMO physicists van Wijngaarden and Happer, which have been tested and validated by physical evidence, Hayden shows IPCC's "'radiative forcing' due to CO 2 doubling of 3.7 W/m2 – is a mere 2.3% nudge with a dramatic name."

Hayden also explains why the procedures (methodology) used by the IPCC and its followers is unlikely to result in an accurate understanding of the greenhouse effect. What is important to determine a warming or cooling of the globe is the energy released to space, which can be measured from the top of the atmosphere, not at the surface. The infrared energy can be measured using instruments on satellites under NASA's Clouds and the Earth's Radiant Energy System (CERES) program, which have been operating since 1999 and show no dramatic change in infrared radiation going to space, which will be required to justify a CO2-caused "climate crisis." Hayden constructs a simple formula which should be a constraint on climate model projections of increased warming from a doubling of CO2. The direct increase in the greenhouse effect is 2.3%, a temperature increase far less than glacial to interglacial warming. See links at https://www.sepp.org/science_papers.cfm?whichyear=2022

Howard Hayden followed the calculations based on atmospheric observations by William van Wijngaarden and William Happer show that the effectiveness of all five major greenhouse gases on global temperatures (water vapor, carbon dioxide, ozone, nitrous oxide, and methane) is largely exhausted, depleted, and that they do not have a major influence on global temperatures.

In a ten-part series on the Basis Planetary Heat Balance Hayden begins: [Boldface added]

"Planetary Heat Balance
There is nothing new or unique about the Planetary Heat Balance equation. What I want readers to see and understand is that the ***radiation to space I (out) depends on exactly two variables, the intensity of sunlight and the albedo.*** *Of course, I (out) can change, but only if either sunlight changes or the albedo changes.*

"Again, we are talking about equilibrium conditions. [The Earth is never in equilibrium, the issue is significant disequilibrium over time, such as decades.] *Disequilibrium can occur. If, for example, I (in) exceeds I (out), then the planet warms up until a new equilibrium is achieved. My motivation is to address the Equilibrium Climate Sensitivity (ECS), the term used by the IPCC and others for the temperature rise of the surface of the earth due to a doubling of CO2 concentration.*

"Some numbers
At 149.6 million kilometers from the sun, our planet is exposed to sunlight at about 1,366 W/m2 (give or take a little), and our albedo is 0.3, so we absorb and radiate about 239 W/m2. (Published numbers vary between 239 W/m2 and 244 W/m2).

"By contrast, the solar flux at Venus, at 108.2 million km from the sun, is a bit over 2,600 W/m2. The planet reflects 75% of that light, so that the planet absorbs and radiates about 162 W/m2. Venus, which is very hot at its surface, emits less IR to space than does the earth.

"An important Rule of Measurement
Measure the distance from your feet to the moon. Then measure the distance from your head to the moon. Now determine your height by subtraction. You might find out that you are negative 477 meters tall. ***The general rule is that whenever possible measure differences directly, rather than obtaining them by subtraction.***

"In the case of an imbalance between heat absorbed from the sun and IR [Infrared energy] *radiated to outer space, there is no direct way to measure the difference between the two numbers. The small imbalance must be obtained by subtraction of two large numbers, both subject to uncertainties. IPCC finds (in its Fifth Assessment Report, AR5) that the earth absorbs more from the sun than it emits. The amount they come up with is 0.6 plus or minus 0.4 W/m2. The uncertainty is almost as big as the quantity itself. In any case, the imbalance is a very small fraction of the 239 W/m2 absorbed and emitted.*

In a video presentation (DDP) Hayden develops the concept of Planetary Heat Balance.

Physics the IPCC Ignores - But the climate cannot
Howard Hayden, PhD speaks at the 40th Annual Meeting of Doctors for Disaster Preparedness, on August 15, 2022., Sep 18, 2022

https://rumble.com/v1kipll-physics-the-ipcc-ignores-but-the-climate-cannot.html

[TWTW comment: Global climate modelers are stuck in chaos theory when attempting to expand their weather models to predict climate change from greenhouse gases. [The problem will be explained more fully later in January 2023 with a review of Tim Palmer's ***The Primacy of Doubt****.] The beauty of Hayden's approach is that it avoids the problems of chaos theory and gives a means of estimating planetary warming from greenhouse gases without excessive complications. The modern instruments on satellites and on the surface can measure the incoming radiation that reaches the surface, calculate the outgoing radiation leaving the surface, and measure outgoing radiation to space (from the top of the atmosphere). (These are huge numbers and small disparities are insignificant.) This approach is used in astronomy and similar fields. There is no reason apparent that it should not apply to Earth.]*
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Simplified Explanation of False Statistics in Attribution of Extreme Weather Events to Carbon Dioxide: Econometrician Ross McKitrick reviewed a study by Allen and Tett (1999, referred to AT99) and found that the study fails to meet the conditions of the Gauss-Markov theorem for making reliable assessments of probability. McKitrick's paper was published in the same journal that published AT99.

"Also, and more generally, if major errors in AT99 went unnoticed for so long, it calls into question how much confidence we can have in the various other methodologies that have been developed in climate journals in subsequent years. Having worked on paleoclimate reconstruction methods, trend estimation and comparisons methods, and now on optimal fingerprinting, comparing climate journals to stats or econometrics journals I find that climate journals seem to rely on referees who don't know how to ask the right questions when confronted with a novel statistical method. *My discussion of the introduction of the RC* [Residual Consistency] *test contrasts what AT99 did with what you'd expect to see in a statistics or econometrics journal."* [Boldface added]

Simply, the statistics used in these studies are not BLUE – Best, Linear, Unbiased, Efficient (close to true value), estimates. One has no idea how good or poor they are. The same issues apply to Fractional Attribution of Risk and Optimal Fingerprinting.

An Introductory-Level Explanation of my Critique of AT99
By Ross McKitrick, His Blog, August 25, 2021
https://www.rossmckitrick.com/uploads/4/8/0/8/4808045/at99.backgrounder.pdf

The April 9 TWTW discusses McKitrick extending this false attribution to another technical: Total Least Squares (TLS)
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Manufacturing Evidence to Order: For several years Steve McIntyre has warned readers of Climate Audit that an effort has been underway to produce spotty marine data over the past two thousand years and declare it compelling.

McIntyre traced that the assertions that temperatures have been stable up to the industrial revolution come from a set of studies by an international paleoclimatology group based in Bern, Switzerland, known as PAGES 2k (**PA**st **G**lobal Chang**ES** with 2k referring to the past two thousand years). The data itself are maintained by NOAA in Boulder. The most devastating criticism is the deliberate omission of high-resolution, well-established proxy studies of alkenone

deposits (produced by marine algae). These deposits include those in limestone beds and date back millions of years. McIntyre writes:

"But most of all, given that the 60-30S latband [latitude band] *is almost entirely (~96%) ocean, it seems bizarre that PAGES 2019 did not use any ocean core proxies, especially since there are physical formulas for estimating SST* [Sea Surface Temperatures] *from alkenone or Mg/Ca measurements. Any conversion of tree ring widths to temperature in deg C is the result of ad hoc statistical fitting, not a universal formula. Alkenone values have been measured all over the modern ocean and nicely fit known ocean temperatures. In addition, alkenone values for ocean cores going back to deeper time (even to the Miocene) give a consistent and reproducible narrative. So, there's a lot to like about them as a candidate for a "good" proxy.*

In the series of posts on his website, McIntyre extends the coverage of the deficiencies in the PAGES2k data to cover marine data from 60° South Latitude to 30° North Latitude. This is about 68% earth's surface (not separating oceans from land). McIntyre finds no 1850-year period with roughly stable temperatures from the beginning of the Christian era to the beginning of the industrial era. The deficiencies in these data prompted Donald Rapp, author of **Assessing Climate Change: Temperatures, Solar Radiation and Heat Balance** (in its third edition) to post a comment on McIntyre's website on November 1 discussing a theory of the Climategate hack and the problems with proxy data used by the IPCC:

*"...**What does matter is that as of 2009, it is clear that the climate science tribe was strongly biased in favor of alarmism and built their arguments around dubious data and worse manipulation of the data, complete with cherry picking some and hiding others, while at the same time using their influence to squelch alternative views and punish those not in the tribe. It became clear that the whole science of proxies for past climate was rife with fake news. Any proxy requires a standardization period when the model can be compared to data. Then, extrapolation to previous eras requires justification by showing that other variables were comparable during the extrapolated period to those during the standardization period."***
[Boldface added]

A Theory of the Hack
By Stephen McIntyre, Climate Audit, Nov 1, 2021
https://climateaudit.org/2021/11/01/a-theory-of-the-hack/
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False Precision: Roy Spencer writes: [Boldface added]

*"As a preface, I will admit, given the lack of evidence to the contrary, I still provisionally side with the view that warming has been **mostly** human-caused (and this says nothing about whether the level of human-caused warming is in any way alarming)."* [Boldface are italics in original.]

Spencer explains why he thinks human causation is mostly a statement of faith. He continues:

"ALL temperature change in any system is due to an imbalance between the rates of energy gain and energy lost. In the case of the climate system, it is believed the Earth each year absorbs a global average of about 240 Watts per sq. meter of solar energy and emits about the same amount of infrared energy back to outer space.

"If we are to believe the last ~15 years of Argo float measurements of the ocean (to 2000 m depth), there has been a slight warming equivalent to an imbalance of 1 Watt per sq. meter, suggesting a very slight imbalance in those energy flows.

One watt per sq. meter.

"That tiny imbalance can be compared to the 5 to 10 Watt per sq. meter uncertainty in the ~240 Watt per sq. meter average flows in and out of the climate system. We do not know those flows that accurately. Our satellite measurement systems do not have that level of absolute accuracy."

Global energy balance diagrams (which you have seen) have the numbers massaged, on the basic assumption that all the imbalance is due to humans.

"I repeat: NONE of the natural, global-average energy flows in the climate system are known to better than about 5-10 Watts per sq. meter…compared to the ocean warming-based imbalance of 1 Watt per sq. meter.

"What this means is that recent warming could be mostly natural…and we would never know it.

*"**But climate scientists simply assume that the climate system has been in perfect, long-term harmonious balance, if not for humans.** This is a pervasive, quasi-religious assumption of the Earth science community for as long as I can remember.*

"But this position is largely an anthropocentric statement of faith.

"That doesn't make it wrong. It's just…uncertain.

"Unfortunately, that uncertainty is never conveyed to the public or to policymakers."

Why Blaming Recent Warming on Humans is Largely a Matter of Faith
By Roy Spencer, His Blog, Mar 3, 2022
http://www.drroyspencer.com/2022/03/why-recent-warming-blamed-on-humans-is-largely-a-matter-of-faith/
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The Closure Problem: Professor emeritus of Mathematics and Physics Christopher Essex states that unfortunately, and critically important, is that the IPCC does not present any clear scientific facts that greenhouse gases produce their claimed warming. Even worse, the IPCC cannot rationalize their draconian predicted impacts of climate change based on anything except highly suspect climate models, which are so limited and flawed that they cannot produce any predictions that match existing factual results, let alone credible future warming predictions. These deficiencies stem from fundamentally faulty mathematics and are illustrated by the recent efforts of the UN IPCC to change their global climate modeling, thus undermining their own earlier work and predictions. **This creates a situation where nothing the IPCC has projected is credible if it ever was.**

Correspondingly, in modeling if a system has more unknowns than independent, defining equations there is no unique solution. Games can be played, but these can include imaginary numbers and similar constructions that do not give a realistic solution. Furthermore, if a modeling

system does not have a unique solution, one cannot disprove it using the same system. But one can show that it is inconsistent with reality.

During the winter months, meteorologist Joe Bastardi of WeatherBELL Analytics has repeatedly noted that numerical weather models do not pick up cold waves. In this sense, they are not suitable for forecasting the weather.

Fittingly, Essex begins his essay "Can Computer Models Predict Climate?" with a discussion that the temperature of the surface of the Earth can hit low temperatures comparable to the low temperatures of the surface of Mars due to cold waves in the Earth's atmosphere. Decades of climate modeling have been focused on the warming effect of greenhouse gases and yet have missed the reality of the atmosphere. The modelers deal with an imaginary atmosphere and ignore testing their models against the real one.

Starting with his section "Feynman, Experiment and Climate Models" Essex writes:

"'Model' is used in a peculiar manner in the climate field. In other fields, models are usually formulated so that they can be found false in the face of evidence. From fundamental physics (the Standard Model) to star formation, a model is meant to be put to the test, no matter how meritorious.

"Climate models do not have this character. No observation from Nature can cause them to be replaced by some new form of model. Instead, climate models are seen by some as the implementation of perfect established classical physics expressed on oracular [prophesying] *computers, and as* ***such must be regarded as fully understood and beyond falsification. In terms of normal science, this is fantasy.***

"If a climate model disagrees with data, in principle the sub-grid-scale (more below) of ad hoc climate models can be adjusted to make it agree. Fortunately, good model builders resist the temptation to overdo such tuning. ***However, they may do things inadvertently like tune models to be more like each other than like the atmosphere and oceans.****"*

"Extreme Computing in Search of Climate

"Extreme conditions can compromise any computer calculation, despite popular faith otherwise. Sharp transitions on boundaries, extreme gradients, and extremes in density are examples. There are also extremes that are often overlooked, e.g., ***an extreme of time****. Direct computation of the meteorological physics for long timescales is an extreme in time.* ***Integrations of classical physics on computers for climatological timescales are unique and unprecedented.*** *Like other forms of extreme computation, there are consequences."* [Boldface added]

The modelers have achieved a completely imaginary atmosphere which they falsely claim is based on first principles. Essex goes through other efforts to define Climate in a way useful for numerical models and shows that the efforts have failed. He concludes:

"A physical definition for climate remains scientifically elusive because it represents a deep problem that neither elegant theories nor brute force computations have succeeded in getting a foothold on. Without that definition, the question posed by the title cannot be answered.

Can Computer Models Predict Climate?
Guest post by Christopher Essex, Emeritus Professor of Mathematics and Physics, University of Western Ontario., Big Picture News, Apr 13, 2022
https://nofrakkingconsensus.com/2022/04/13/can-computer-models-predict-climate/
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Beware of Cooling: Earth Scientist Tom Gallagher begins his presentation of changing climate showing what Ireland and the Northern Hemisphere were like 19,000 years ago. Most of Canada was covered with ice. So was Ireland, and much of northern Europe. Gallagher emphasizes his focus is on Climate Change (not weather!), climate change is driven by variations in incoming solar energy described by Milankovitch as well as other cycles.

To understand changing climate, we need to understand energy storage and accumulation including the mechanisms and lag times. Often these are missing from climate studies. Gallagher goes into energy transport including ocean currents and how continental drift influences ocean currents. Many papers by climate scientists looking at the history of climate ignore the importance of changes in ocean currents.

Rather than limiting his research to the past 150 years or so, Gallagher goes back to about the time dinosaurs became extinct, about 67 million years ago. He relies on data, (physical evidence, from proxies, fossils, including differences in isotopes of atoms) not theory. His data are the earth's climate history encased in rock and ice as well as sediments in the oceans. He believes that by learning the past we can know more about the present, and are better equipped to forecast the future, but cannot do so with great certainty.

He goes through a graph of temperature and atmospheric CO2 over the Earth's history to show that there is no correlation over time. Al Gore was wrong in his movie. He shows that sea levels tend to be influenced by glacial periods; more ice means lower sea level.

Over the past 50-60 million years there has been a temperature variation of about 18 ºC (32 ºF). We are now in a brief, quite steady warm period during an Era of pulsating glaciation. Southern glaciation (Eastern Antarctica) began about 34 million years ago. About 15 million years ago the western Antarctic ice sheet began. The northern ice cap (Greenland) began around 3 million years ago.

By 3.3 million years ago, the seaway through Panama closed and the seaway in Indonesia narrowed, **terminating the Equatorial Current**. These events gave us the Quaternary Period beginning with the Pleistocene Epoch which immediately preceded the current, warm Holocene Epoch. In the Quaternary Period the Earth's oceans were forced into a North-South pattern, the North and South ice caps and ice sheets expanded. **The equatorial heat transport of the oceans no longer moderated the Milankovitch Cycles**, and they began to cause large 100,000 and 41,000-year glacial cycles with drastic 10-degree C swings in temperatures. [Boldface added]

The default climate condition during the Pleistocene is: Glacial, Cold and Dusty. During periods of glaciation in what are now the great bread baskets of civilization, the Great Plains, the plains of Europe, and Asia, became barren and subject to great dust storms. These storms created huge loess-covered areas. Accumulating dust on ice sheets brought the end of glaciation periods.

Gallagher explains that his data sources include a new source of proxy data that became available in September 2020. His data sources have high sample density and accuracy and exceptionally

long time series analysis isotopes of Oxygen 18 and Carbon 13 in microscopic plankton. He cites a 67-million-year record of temperature and CO2 concentration using isotopic analysis of Benthic Forams from sea sediment cores (Westerhold – Science, Sep 11, 2020).

Gallagher goes on to explain we are living in a neoglacial, not the peak of the Holocene which ended about 8000 years ago. Humanity thrives in warm times, suffers in cold times. The Holocene had several abrupt warming periods of 1.5 to 3 degrees C and based on ice core graphics; the rates of temperature rise are like one another. Older Holocene warming rates were much faster than now.

The primary influencers of climate are still here: Solar Cycle; Oceanic Currents; Oceanic Oscillations; and Regional Oceanic Energy. Further the beryllium isotope, Be10, correlates well with sunspot activity, and since 1830s the solar signal is stronger, bringing the Earth out of the Little Ice Age.

Lessons from Paleoclimate Conveniently Ignored by the IPCC
By Thomas P Gallagher & Roger C Palmer, ICSF and CLINTEL, Apr 21, 2022 [H/t Jo Nova]
https://www.youtube.com/watch?v=pj-Iu1i317E
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Big 5 Natural Causes: Ecologist Jim Steele is producing a series of videos, with transcripts, describing "The Big 5 Natural Causes of Climate Change." Part 1 is on Varying Atlantic Water Transport. Part II is on Jet Streams and Extreme Weather. Part III is on the influence of ENSO (El Niño Southern Oscillation) on earth's temperatures, including the Arctic. Part IV is on Landscape Changes which are very important to increasing surface temperatures but largely unrelated to changing greenhouse gases (a major problem with IPCC reports). Part V asserts that Clouds [are] the Moderators of Warming and Extreme Heat.

The Big 5 Natural Causes of Global Warming- Part 1: Varying Atlantic Water Transport
By Jim Steele, WUWT, Apr 25, 2022, First video:
https://wattsupwiththat.com/2022/04/25/the-big-5-natural-causes-of-global-warming-part-1-varying-atlantic-water-transport/
Text: https://perhapsallnatural.blogspot.com/2022/04/the-big-5-natural-causes-of-global.html
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IPCC Reports Are Not Science: In arguing against the proposed SEC rules, the main points Professors Happer and Lindzen make are:

I. RELIABLE SCIENTIFIC THEORIES COME FROM VALIDATING THEORETICAL PREDICTIONS WITH OBSERVATIONS, NOT CONSENSUS, PEER REVIEW, GOVERNMENT OPINION OR MANIPULATED DATA"

"II. SCIENCE DEMONSTRATES THERE IS NO CLIMATE-RELATED RISK CAUSED BY FOSSIL FUELS AND CO2, AND THEREFORE NO RELIABLE SCIENTIFIC EVIDENCE SUPPORTING THE PROPOSED RULE"

"No government has the right to decide on the truth of scientific principles."

The two IPCC rules are:

IPCC SPM Rule No.1: All Summaries for Policymakers (SPMs) Are Approved Line by Line by Member Governments"

"Since governments control the SPMs, the SPMs are merely government opinions. Therefore, they have no value as reliable scientific evidence.

What about the thousands of pages in the IPCC reports? A second IPCC rule requires that everything in an IPCC published report must be consistent with what the governments agree to in the SPMs about CO2 and fossil fuels. Any drafts the independent scientists write are rewritten as necessary to be consistent with the SPM.

IPCC Reports Rule No. 2: Government SPMs Override Any Inconsistent Conclusions Scientists Write for IPCC Reports

They go into details about how the IPCC manipulates its reports and conclude:

"Thus, in our opinion, science demonstrates that there is no climate emergency and no climate related risk caused by fossil fuels and CO2. Therefore, there is no reliable scientific evidence that supports the SEC proposed rule.

Further, contrary to what is commonly reported, CO2 is essential to life on earth. Without CO2, there would be no photosynthesis, and thus no plant food and not enough oxygen to breathe.

Moreover, without fossil fuels there will be no reliable, low-cost energy worldwide and less CO2 for photosynthesis making food. Eliminating fossil fuels and reducing CO2 emissions will be disastrous for the United States and the rest of the world, especially for lower-income people."

Comment and Declaration on the SEC's Proposed Rule "The Enhancement and Standardization of Climate-Related Disclosures for Investors," File No. S7-10-22, 87 Fed. Reg. 21334 (April 11,2022)
By William Happer and Richard Lindzen, CO2 Coalition, June 17, 2022
https://co2coalition.org/wp-content/uploads/2022/06/Happer-Lindzen-SEC-6-17-22.pdf
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As Bad As Ever: Earlier reports by Anthony Watts et al. on the poor siting of surface stations designed to provide reliable records of weather resulted in thoughtful essays and experiments. Watts assembled a team that conducted another survey using photographic evidence to note improvements. Among the Conclusions and Recommendations of the new report was:

"It is important to note Watts and his fellow authors found a slight warming trend when examining temperature data from unperturbed stations, which cleaved closely to the findings of the University of Alabama-Huntsville's satellite-derived temperature record. This warming trend, however, is approximately half the claimed rate of increase promoted by many in the climate science community." Air-surface temperatures should not be used for climate modeling or for a basis for policy.

New Surface Stations Report Released – It's 'worse than we thought'
By Anthony Watts, WUWT, July 27, 2022
Text: https://wattsupwiththat.com/2022/07/27/new-surface-stations-report-released-its-worse-than-we-thought/

Video: https://wattsupwiththat.com/2022/07/29/live-corrupted-climate-stations/
Link to report: **Corrupted Climate Stations: The Official U.S. Surface Temperature Record Remains Fatally Flawed**
By Anthony Watts, et al. The Heartland Institute, 2022
https://www.heartland.org/_template-assets/documents/publications/2022_Surface_Station_Report.pdf
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More Water Vapor: The eruption of Tonga-Hunga may be the greatest disturbance of the atmosphere since the Krakatoa eruption of 1883, greater than disturbances caused by testing nuclear weapons. The plain language summary of the paper states:

"Using measurements from the Microwave Limb Sounder on NASA's Aura satellite, we estimate that the excess water vapor is equivalent to around 10% of the amount of water vapor typically residing in the stratosphere. Unlike previous strong eruptions, this event may not cool the surface, but rather it could potentially warm the surface due to the excess water vapor."

The stratosphere is above the tropopause where most water freezes out. It is characterized by temperature layers, with temperatures increasing with altitude. Will NASA's climate modelers include this disturbance in their calculations?

Tonga Eruption Blasted Unprecedented Amount of Water Into Stratosphere
By Staff, NASA Jet Propulsion Laboratory, Aug 2, 2022 [H/t WUWT]
https://www.jpl.nasa.gov/news/tonga-eruption-blasted-unprecedented-amount-of-water-into-stratosphere
Link to paper: **The Hunga Tonga-Hunga Ha'apai Hydration of the Stratosphere**
By L. Millán, et al, Geophysical Research Letters, July 16, 2022
https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2022GL099381
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Natural Plasticity: For simplicity, natural plasticity can be described as how plants and animals adapt to changing environment. CO2 Science has numerous articles on this. Jo Nova gives two good examples. One is the ability of forests to adapt to changing inter-annual temperature variability. The second is a ten-year systematic study of a coral reef in an isolated atoll in the central Pacific. Over the study period, the reef experience two significant bleaching events. The abstract states"

"The El Niño events of 2009–2010 and 2015–2016 resulted in acute thermal stress and coral bleaching was observed at both reef habitats during these events. Across 10 yr. and two bleaching events, the benthic community structure on Palmyra shows evidence of long-term stability. Communities on the RT [reef terrace, wave sheltered] *exhibited minimal change in percent cover of the dominant functional groups, while the FR* [fore reef, wave-exposed] *had greater variability and minor declines in hard coral cover. There was also spatial variation in the trajectory of each site through time. Coral cover decreased at some sites 1 yr. following both bleaching events and was replaced by different algal groups depending on the site, yet returned to pre-bleaching levels within 2 yr. Overall, our data reveal the resilience of calcifier-dominated coral reef communities on Palmyra Atoll that have persisted over the last decade despite two bleaching events, demonstrating the capacity for these reefs to recover from and/or withstand disturbances in the absence of local stressors."*

Corals and forests have survived warming and cooling for hundreds of millions of years — including times when CO2 levels were at last 10 times as high as now—and there is no reason to assume human increase in CO2 will change that ability. See links under Challenging the Orthodoxy and Changing Climate

It's almost like corals have been doing this for millions of years. 90% bleached but recovered in just two years?
By Jo Nova, Her Blog, Sep 2, 2022
https://joannenova.com.au/2022/09/its-almost-like-corals-have-been-doing-this-for-millions-of-years-90-bleached-but-recovered-in-just-two-years/
Link to paper: **Decadal stability of coral reef benthic communities on Palmyra Atoll, central Pacific, through two bleaching events**
By Adi Khen, et al. Coral Reefs, May 21, 2022
https://link.springer.com/article/10.1007/s00338-022-02271-6
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No Dangerous Warming: CLINTEL published an interview with William van Wijngaarden of York University giving further insights on the greenhouse effect, among other issues. Van Wijngaarden has authored several important papers with William Happer on the warming effects of major greenhouse gases including methane, carbon dioxide, and water vapor, the most important greenhouse gas. Their papers in 2022 are "2n-Stream Radiative Transfer" (June), employing a new method to solve the radiative transfer phenomena and "2n-Stream Conservative Scattering" (July), which uses the matrix methods of quantum mechanics to calculate the radiative transfer in clouds. This may lead to an understanding of the formation and dispersion of clouds, an important unknown in the influence of the greenhouse effect on earth's temperatures. The UN Intergovernmental Panel on Climate Change (IPCC) and its followers largely ignore spectroscopy, the branch of physics dealing with the detection of electromagnetic radiation from atoms. Thus, it is doubtful these papers will receive the attention they deserve.

Interview with William van Wijngaarden
By Jan van Friesland, CLINTEL.org, Accessed Sep 7, 2022
https://clintel.org/interview-with-william-van-wijngaarden/

2n-Stream Radiative Transfer
W. A. van Wijngaarden & W. Happer, Atmospheric and Oceanic Physics, June 1, 2022
https://wvanwijngaarden.info.yorku.ca/files/2022/09/Arxiv-June-1-2022.pdf?x45936
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A 3-D Problem With A 1-D Solution? Richard S. Lindzen is noted for solving complex problems, puzzles as he calls them. His comments on the complexity of "climate change" in "An assessment of the conventional global warming narrative" are noteworthy. He states:

"Although the gross inadequacy of our understanding of clouds and other factors is openly acknowledged by the IPCC, concerns over global warming are based on what is essentially the assumption that variations in water vapor, clouds, and so on act to amplify rather than oppose the impact of CO_2; in other words, they are assumed to be positive rather than negative feedbacks. ***It is on the egregiousness of these assumptions rather than on the greenhouse effect itself, that most sceptics (including myself) have focused."*** [Emphasis in original]

General Circulation Models (lately called Global Climate Models) *"do especially poorly are presenting the natural internal variability of the atmosphere and the oceans, and almost all of*

them fail to correctly anticipate changes in the commonly used measure of global temperature. Nor do they simulate past climates adequately."

The IPCC and its followers have attempted to address the multi-dimensional problem of climate change with a simple solution that is wrong – greenhouse gases. Among other issues they ignore the complexity of convection by two fluids in motion rubbing against irregular surfaces. The abstract states:

"The one-dimensional picture of the greenhouse effect and the role of carbon dioxide in this mechanism dominates current depictions of climate and global warming. We briefly review this picture. We then discuss the shortcomings of this approach in dealing with the three-dimensional climate system. One problem is determining what temperature on the real Earth corresponds to the temperature in the one-dimensional treatment. This, in turn, leads to the traditional recognition that the Earth has, in fact, many climate regimes at present. Moreover, there have been profound changes in the temperature difference between the tropics and polar regions over millennia, but at the same time the temperature of the tropical regions has remained little changed. The popular narrative assumes that small changes in the tropics are amplified at high latitudes. There is no basis for this assumption. Rather, the difference is determined by dynamic heat fluxes in the atmosphere and oceans, with the controlling flux due to baroclinic instability in the atmosphere. Changes in mean temperature are primarily due to changes in the tropic-to-pole difference, and not to changes in the greenhouse effect. The stability of tropical temperatures in the face of strongly varying heat fluxes out from those latitudes points to the existence of ***strong negative feedbacks in the radiative-convective response of the tropics****."* [Boldface added]

In a brief non-mathematical presentation, he address issues such as the popular narrative, what is the Earth's temperature? What is the Earth's climate? What determines the tropics-pole temperature difference? What produces the stability of the tropical temperature? Where does CO_2 fit in the climate? And what are the political impacts of the IPCC's absurdly simplistic approach to climate change. In the section "Where does this leave us?" Lindzen writes:

"As described in detail in Lindzen (2008, 2012), the US government committed itself to the current narrative by the early 1990s and greatly increased funding as a result. Moreover, given the size of the energy sector, ***any attempt to rebuild it, however unnecessarily and ineffectively, presents immense opportunities for huge short-term profits*** *– opportunities that are obviously tempting and strongly defended. Atop all of this, has been the constant Goebellian repetition by the media of climate alarm. And this alarm is accompanied by so-called 'solutions' that deal with something, namely decarbonisation, that is, in fact, largely irrelevant to climate change, while imposing great and pointless pain.* [Boldface added]

"It is essential – to western civilization itself – that the harm associated with this totally unwarranted alarm be ended, however difficult the task."

Nic Lewis has a thoughtful critique of Lindzen's work. However, Lindzen responds that Lewis uses a one-dimensional approach in addressing the so-called water vapor feedback.

An assessment of the conventional global warming narrative
By Richard Lindzen, Comment by Nic Lewis, GWPF, 2022 [H/t Paul Homewood]
https://www.thegwpf.org/content/uploads/2022/09/Lindzen-global-warming-narrative.pdf?mc_cid=d5f95de4d7&mc_eid=4961da7cb1

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From a Climate Modeler's Perspective: On her blog, Judith Curry reviews the book **The Primacy of Doubt** by Tim Palmer, who:

"…is a Royal Society Research Professor in the department of physics at the University of Oxford. He pioneered the development of operational ensemble weather and climate forecasting. Palmer is a Commander of the British Empire, a fellow of the Royal Society and the U.S. National Academy of Sciences, and a recipient of the Institute of Physics' Dirac Gold Medal."

Curry begins her review:

"This is a beautifully written book: eloquent while at the same time approachable, spiked with anecdotes and occasional self-deprecating humor. Some quotes from the Introduction, that give a flavor of the book, including the style of writing.

After praising the book, Curry concludes.

"JC recommendation to readers: Don't waste your time reading this book if all you are looking for is confirmation of your predilection for (or against) urgent reductions of fossil fuel emissions. Read this book if you have an intellectual curiosity about physics, chaos, uncertainty, and their applications across the sciences. This remarkable book will surely satisfy and stimulate your curiosity. Further, such understanding will lead to better understanding of how we think and make decisions. Most refreshingly for a book that is at least partly in the climate space, this book does NOT attempt to tell us what to think or which decisions to make."

The Primacy of Doubt
By Judith Curry, Climate Etc. Oct 18, 2022
https://judithcurry.com/2022/10/18/the-primacy-of-doubt/#more-29194
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Ring of Fire: Among the issues discussed are the following: One of the perplexing issues coming from satellite measurement of sea surface temperatures in the Pacific is the realization that there are two distinct types of what is called El Niño events. One type is the traditional El Niño, with a warming occurring off the coast of Peru stretching westward. It is followed by a La Niña, a cooling. These changing patterns give rise to the concept called the El Niño Southern Oscillation (ENSO), naturally occurring events which change weather worldwide. The normal phase (neutral) is La Niña. A three-month period during which the average temperature is more than 0.5°C off normal is called an El Niño if positive, a La Niña if negative.

The second type of El Niño is the Warm Pool El Niño, a warming of part of the Pacific which is not followed by a La Niña. In a lecture to the Irish Climate Science Forum (ICSF) and the Climate Intelligence Foundation (CLINTEL) Professor Wyss Yim of Hong Kong University explains the two types of El Niños are distinctly different events, with the warm pools formed by underseas (submarine) volcanoes, not changes in atmospheric and ocean weather patterns.

In addressing changing climate, often confused with changing weather patterns, Professor Wyss Yim of Hong Kong University notes that we must consider various patterns in order of importance. The first order of importance is astronomical forcing and the sun which give rise to global changes such as glacial/interglacial cycles, regional changes such as monsoons seasons and day-to-day changes such as changing temperature over a day, and during the seasons.

The second order of importance is geothermal heat/plate climatology which can change climate locally, regionally, and globally. Short term events, such as major volcanoes can change weather conditions for several years. The 1815 volcanic eruption of Mount Tambora in Indonesia, the most powerful volcano in recorded human history disrupted weather patterns and temperatures globally, resulting in a "year without a summer" in North America. It resulted in epidemic of diseases and death in Europe. It is estimated that average summer temperatures in the Northern Hemisphere cooled by 0.53 °C (0.95 °F), resulting in failed harvests and famine. This shows why cooling is more dangerous to human health than warming.

According to Yim, human induced climate change is of third order of importance. We must fully understand the first two before we can attribute change to human causes, and we do not.

Fortunately, we now have advanced instrumentation to study volcanoes we cannot see, such as the coordinated group of earth observing satellites that cross the equator northbound about 1:30 pm on the local solar time. It is called the Afternoon Constellation, the A-Train. Also, there is the ARGO ocean network of floats observing temperatures, salinity, and currents of the oceans starting this century.

Unfortunately, the ability to observe the effects of submarine (subsurface) volcanoes in the oceans gives rise to many false claims from individuals and organizations, including the IPCC, who do not understand the greenhouse effect. The infrared radiation radiated downward by greenhouse gases cannot penetrate the oceans beyond one millimeter (less than 1/16th of an inch, 0.04 inches).

Professor Yim concludes by stating that polar sea-ice changes can be explained by ocean heat waves caused by volcanic activity, rather than by CO2-caused warming.

Volcanic Eruptions, a Driver of Natural Climate Variability – ignored by IPCC
By Professor Wyss Yim, ICSF and CLINTEL, Oct 28, 2022
https://www.youtube.com/watch?v=OlTlMXR_tSw
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2022 Fredrick Seitz Award: The SEPP board unanimously accepted the recommendation of the Frederick Seitz Awards Committee headed by Will Happer and gave the 2022 award for integrity in science to Professor emeritus of Mathematics and Physics Christopher Essex. The formal presentation will be at the 15th International Conference on Climate Change organized by The Heartland Institute from February 23 to February 25 in Orlando Florida. SEPP is a co-sponsor of the event. https://climateconference.heartland.org/
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Number of the Year: +0.13 C/decade: In reporting the global temperatures trends for November 2022, Roy Spencer writes:

"The linear warming trend since January 1979 now stands at +0.13 C/decade (+0.12 C/decade over the global-averaged oceans, and +0.18 C/decade over global-averaged land)."

The changes are erratic and not linear. They include the changing greenhouse effect, volcanic aerosols in the atmosphere at the beginning of the record and increased atmospheric water vapor from submerged volcanoes that create ocean hot spots, unrelated to the El Niño Southern Oscillation (ENSO). These are causing a warming of the Arctic. So, the trend due to increasing human-caused greenhouse gases is less than what the numbers indicate.

UAH Global Temperature Update for November 2022: +0.17 deg. C
By Roy Spencer, His Blog, Dec 6, 2022
https://www.drroyspencer.com/2022/12/uah-global-temperature-update-for-november-2022-0-17-deg-c/