Climate Alarm:
Why almost every aspect of this narrative is wrong.

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Remarks concerning propaganda:

Propaganda is effective. Even an opponent of Net Zero (Michael Lind) feels obligated to declare the following despite having no scientific basis for his claim:
“None of the analysis that follows is grounded in what is often attacked as “climate change denial.” Let it be stipulated that greenhouse gas emissions by modern industrial civilization are indeed causing the atmosphere to grow warmer, with some regions suffering and others benefiting as a result. Let it be stipulated that reducing the effects of those changes as quickly as possible should be a priority of U.S. energy policy.”

Joseph Goebbels famously claimed that a big enough lie, repeated endlessly, becomes ‘truth.’ ‘Repetition’ got most of the attention, but ‘big enough lie’ was perhaps more important. In the case of ‘climate,’ by making everything a lie, it caused critics to attack details while allowing the overall narrative to survive.

Let’s begin at the beginning. What is ‘climate’?

The current narrative claims that climate is the global average of temperature deviations from 30-year means. It further claims that this number is controlled by a single factor: CO_2.

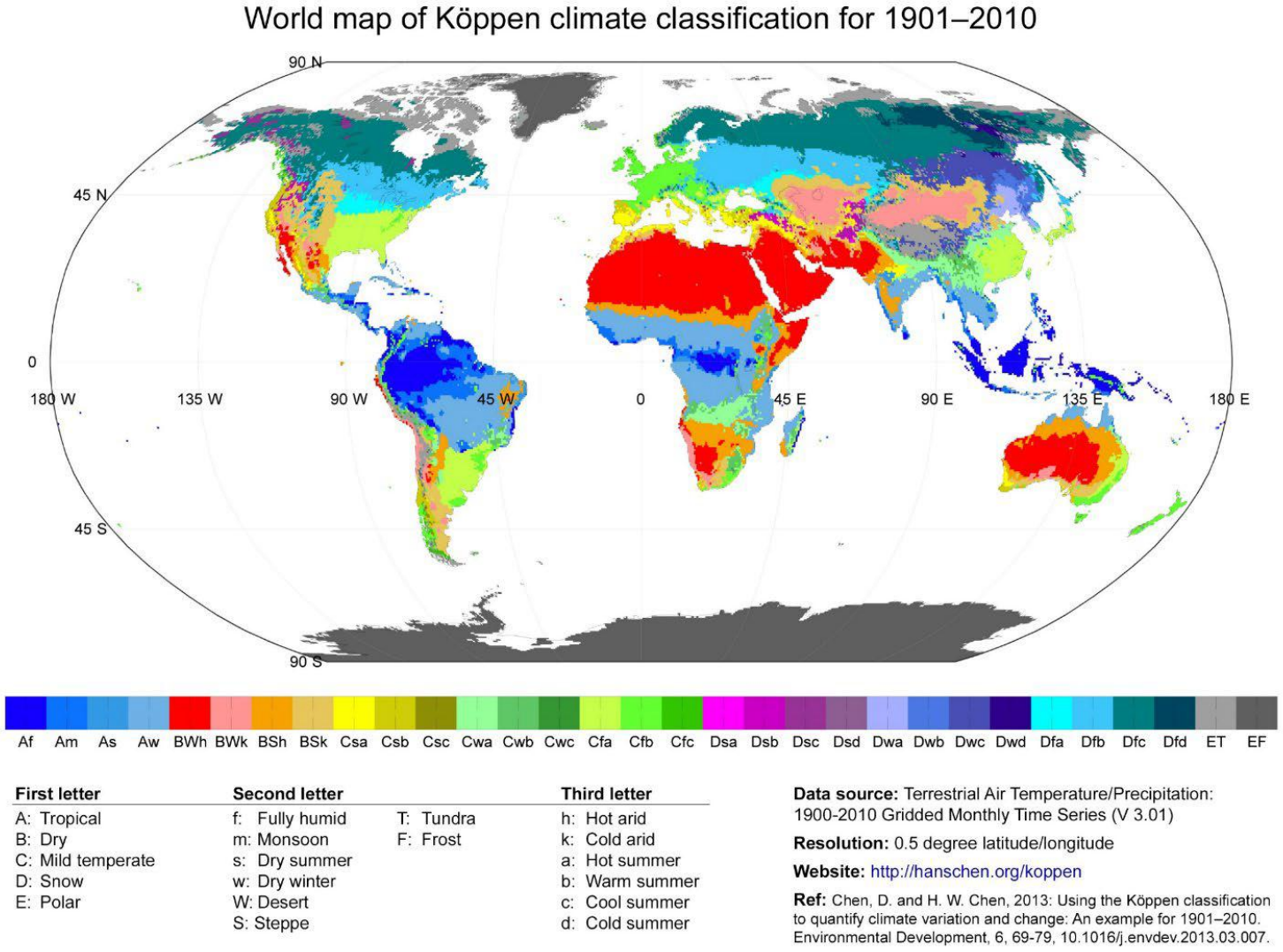
None of this makes any sense at all.

The WMO does define climate as the behavior of 30-year means. This rather arbitrary definition is simply meant to distinguish ‘climate’ from weather. For obvious reasons, it makes no claim for globality.

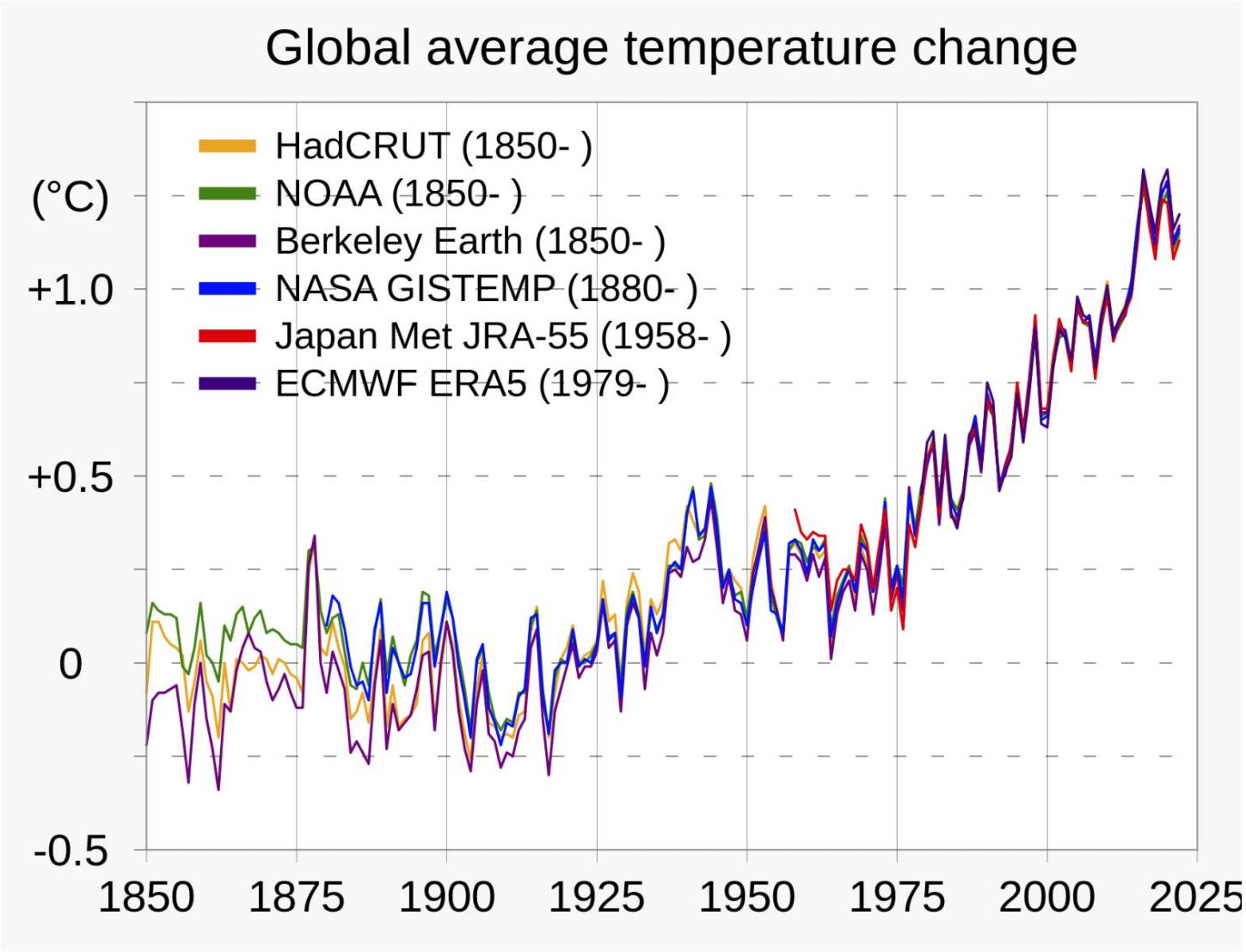
Koppen-Geiger classification.

In point of fact, the Earth has dozens of different climate regimes. This is shown in the Köppen climate classification for the period 1901-2010. Each of these represents different interactions with their environments. Are we really supposed to think that each of these regimes responds in lock-step with the global mean temperature anomaly?

In reality, there is little correlation between local 30 year means and the global average anomalies.



Here is what we are told defines ‘climate’.



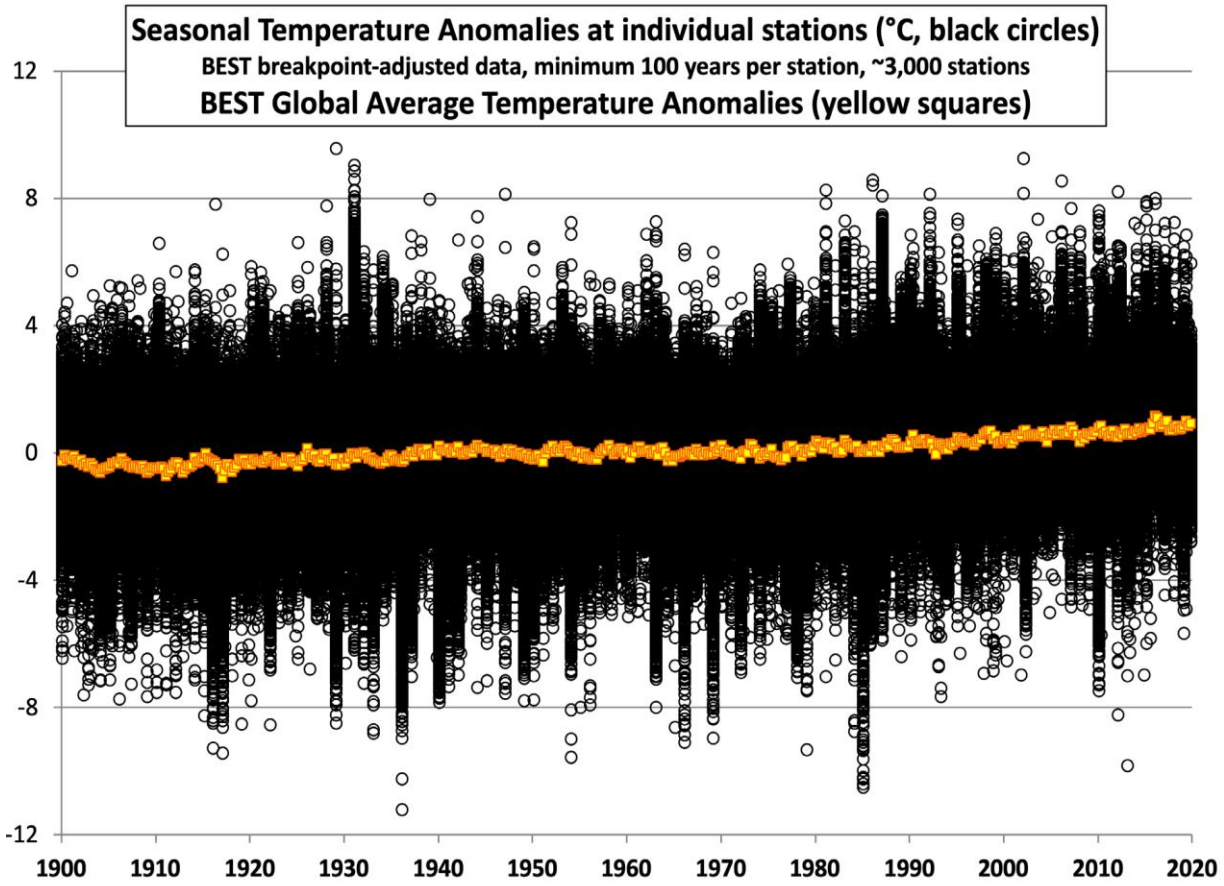
Global average temperature anomaly.

Note the vertical scale. The temperature change ranges from about 0°C to 1°C.

Note that we are not looking at ‘average temperature’. Averaging temperature at Mt. Everest and at the Dead Sea makes no sense. Instead, we average what is called the temperature anomaly (or change). We average the deviations from a 30-year mean. The figure shows an increase of a bit more than 1^{o}C over 175 years. We are told by international bureaucrats that when this reaches 1.5^{o}C, we are doomed. In all fairness, even the science report of the UN’s IPCC (i.e., the WG1 report) and the US National Assessments never make this claim. The political claims are simply meant to frighten the public into compliance with absurd policies. It remains a puzzle to me why the public should be frightened of a warming that is much smaller than the temperature change we normally experience between breakfast and lunch.

I suspect that ordinary people intuitively realize this, but the educated elite, accustomed as they are to pleasing their professors, have learned to rationalize anything.

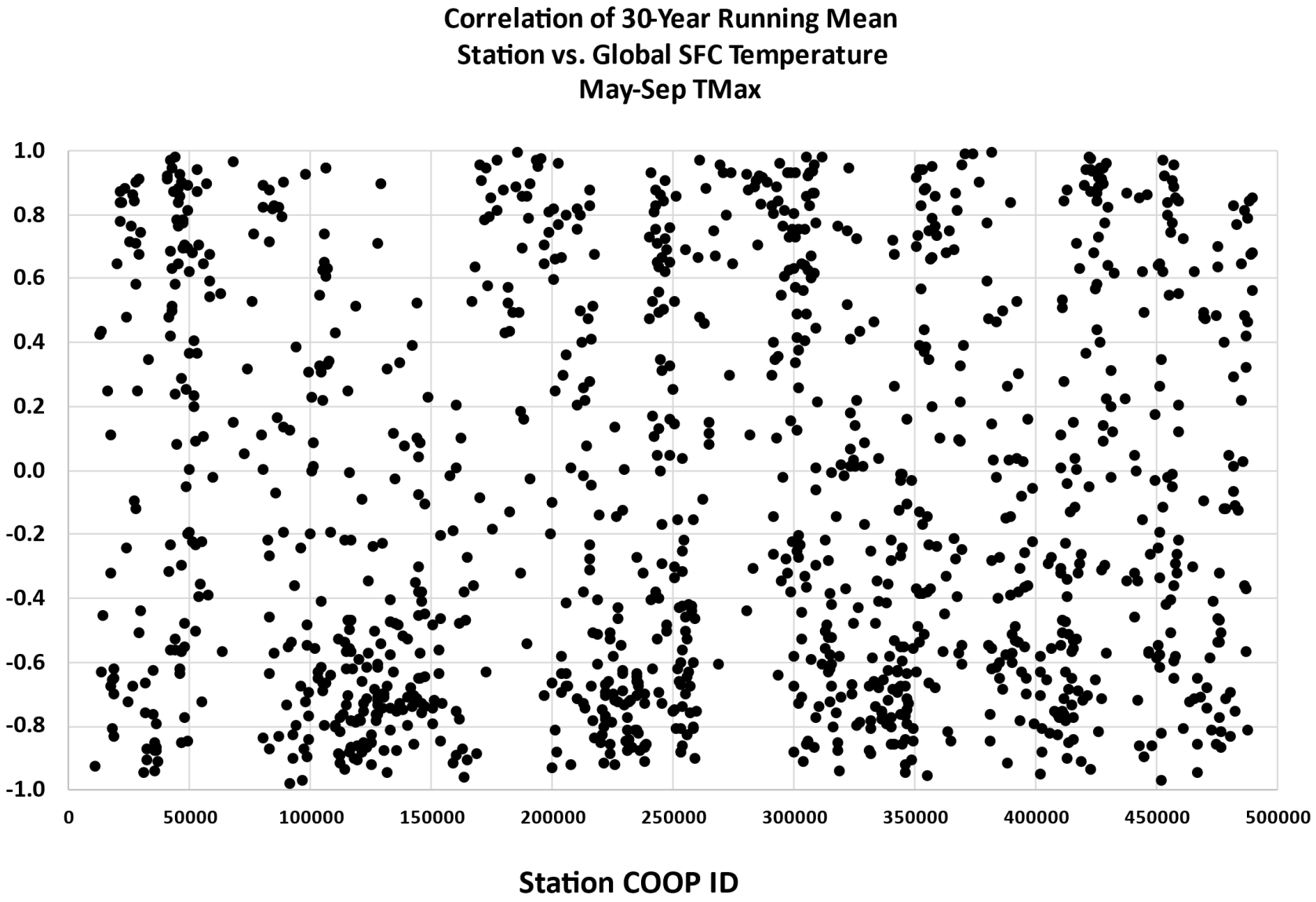
My puzzlement becomes clearer when one includes the data points in the previous figure. This was first noted by Stanley Grotch and updated by me and John Christy (https://co2coalition.org/wp-content/uploads/2021/08/Global-Mean-Temp-Anomalies12.08.20.pdf).



Temperature anomalies at individual stations as well as the mean.

We see that the data points are spread pretty densely over a range of about 16C – over an order of magnitude greater than the range of the mean. The change in the first figure looks big simply because the data points are left out and the scale is expanded by a factor of about 10.

Note that at any given time, almost as many stations are cooling as are warming.

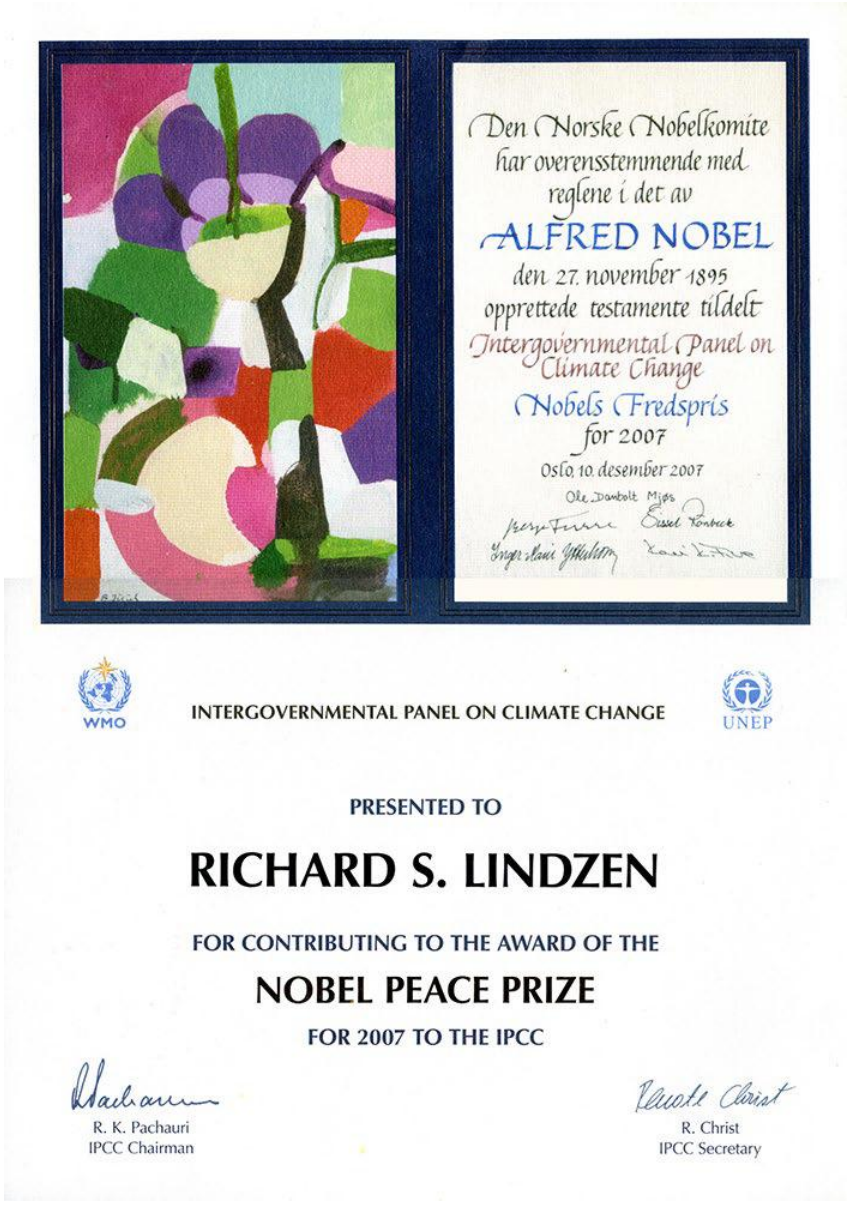

Correlation of 30-Year Running Mean
Station vs. Global SFC Temperature
May-Sep TMax
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
0
50000
100000
150000
200000
250000
300000
350000
400000
450000
500000
Station COOP ID

The insistence on globality leads to some bizarre absurdities. The attempted elimination of the medieval warm period is an example.

Hubert Lamb, founder of the Climate Department at the University of East Anglia, using numerous historical records, demonstrated that there were several centuries of unusual warmth in medieval Europe.
This greatly upset proponents of man-made warming in the early days of climate alarm. They wanted to insist that the current warming was unprecedented. The word went out that one had to get rid of the medieval warm period. The approach taken by a few groups was to present alleged evidence that there was no peak in global mean temperature. It was argued that the warmth was confined to Europe and was cancelled by cooling elsewhere. Somehow, several centuries of anomalous warmth in Europe and anomalous cooling elsewhere was no longer to be regarded as climate change.

The most notorious attempt to eliminate the Medieval warm period was Michael Mann's hockey stick. Using tree rings on a couple of handfuls of bristle cone pines with mysterious variations in weighting, he produced a hockey stick picture of global temperature which showed no warming until the recent warming – thus suggesting that the current warming, while small, was unprecedented. Steven McIntyre found that Mann's methodology would yield a hockey stick even with an input of random numbers. Two investigative panels, one from the National Academy of Science, the other from the US Congress, concluded that Mann's methodology could not extend to the medieval period. Nonetheless, Mann has received numerous awards, and most recently he was elected to the National Academy where his supporters lied about the previously mentioned reports.

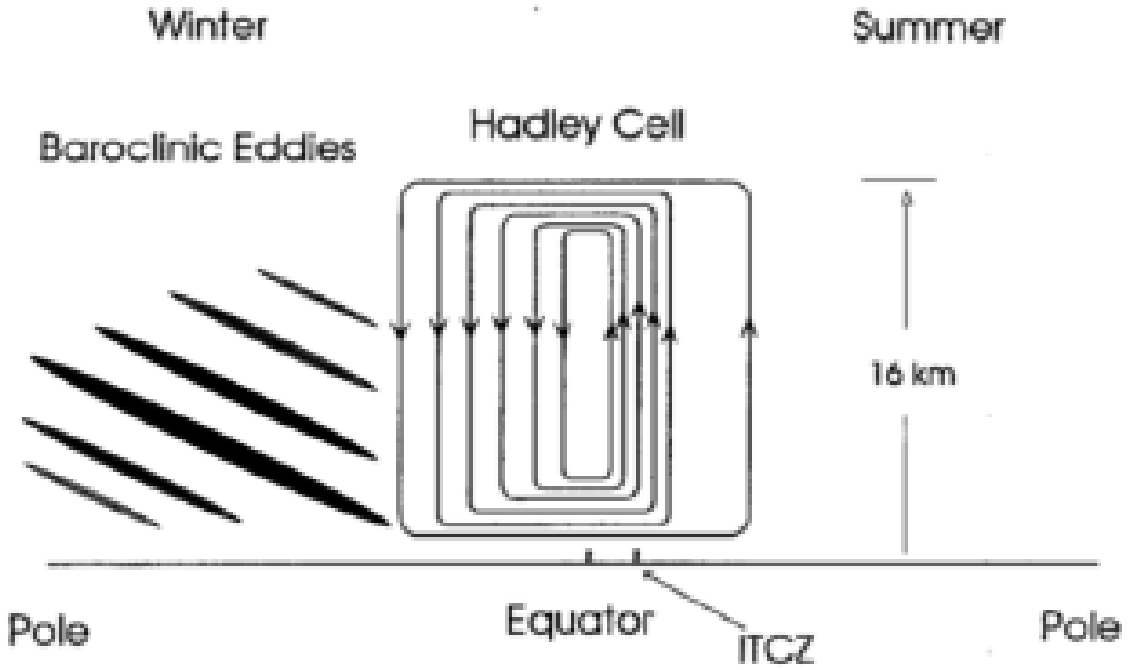
All of us who participated in the 3rd IPCC assessment received the following certificate.



We were warned that this did not mean that we had been awarded Nobel Peace Prizes, but, for a while, Mann listed himself as a Nobel Prize winner.

However, remember what is truly bizarre about Mann's work is not the statistics, but that it assumes that several centuries of anomalous warmth in Europe and, presumably several centuries of anomalous coolness elsewhere, did not constitute climate change.

On time scales of a millenium or less, almost all known climate fluctuations are local and extratropical. Poleward of 30 degrees, radiative imbalance is not a significant causal factor. What then causes local climate change? Here it is important to recognize that the Earth's surface is never in equilibrium with space because a large part of this surface is ocean and ocean circulations with time scales of years to millenia are constantly exchanging heat with the surface. As a number of scientists have already noted, oceans are a presumptive cause of local climate variations. Unfortunately, our understanding of the plethora of ocean circulations is still very limited although the large-scale wind driven and thermohaline circulations are pretty well understood.

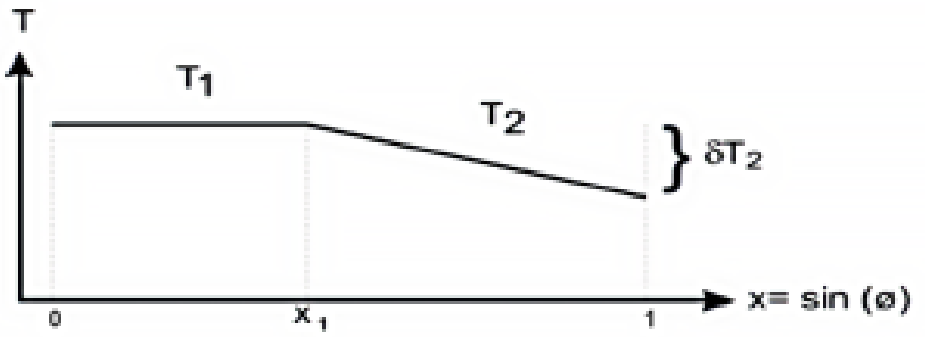


We will return to this figure later, but I show it here to illustrate the profound difference between the tropics and the extratropics. They have radically different circulation systems due to the variations in the vertical component of the Earth's rotation vector.

What about major changes that occur much more rarely than ocean circulations?

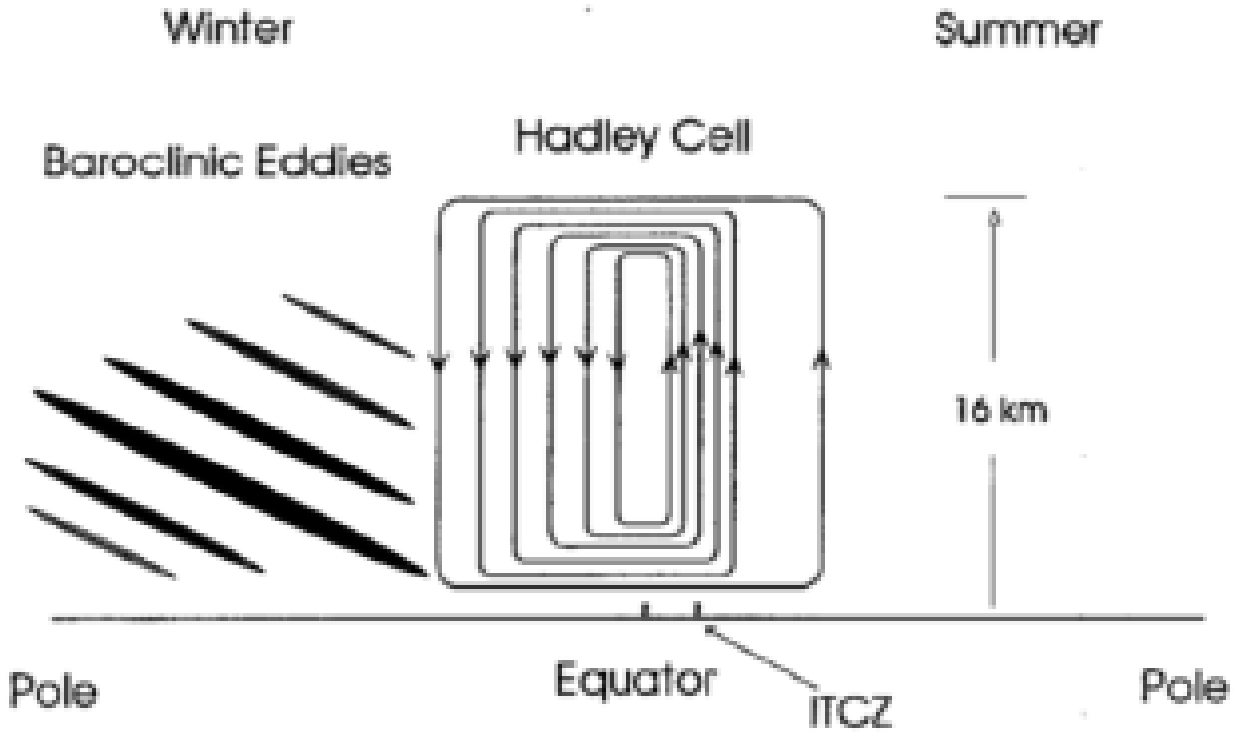
Climate sensitivity refers by convention to the warming expected from a doubling of CO_2. In the absence of feedbacks, this comes to somewhat less than 1^oC. Even with hypothesized (and dubious) positive feedbacks, it is generally reckoned to be less than 3^oC. Why has such seemingly modest warming come to be considered a massive threat. The reason, as best I can tell, is that the change in global mean temperature anomaly associated with major climate change such as the major glaciations where the change in temperature between the tropics and the poles was about 60^oC (as opposed to 40^oC today) or the warm Eocene (50 million years ago) where the temperature difference was about 20^oC, was only about 5^oC. This is explained in the following figure.

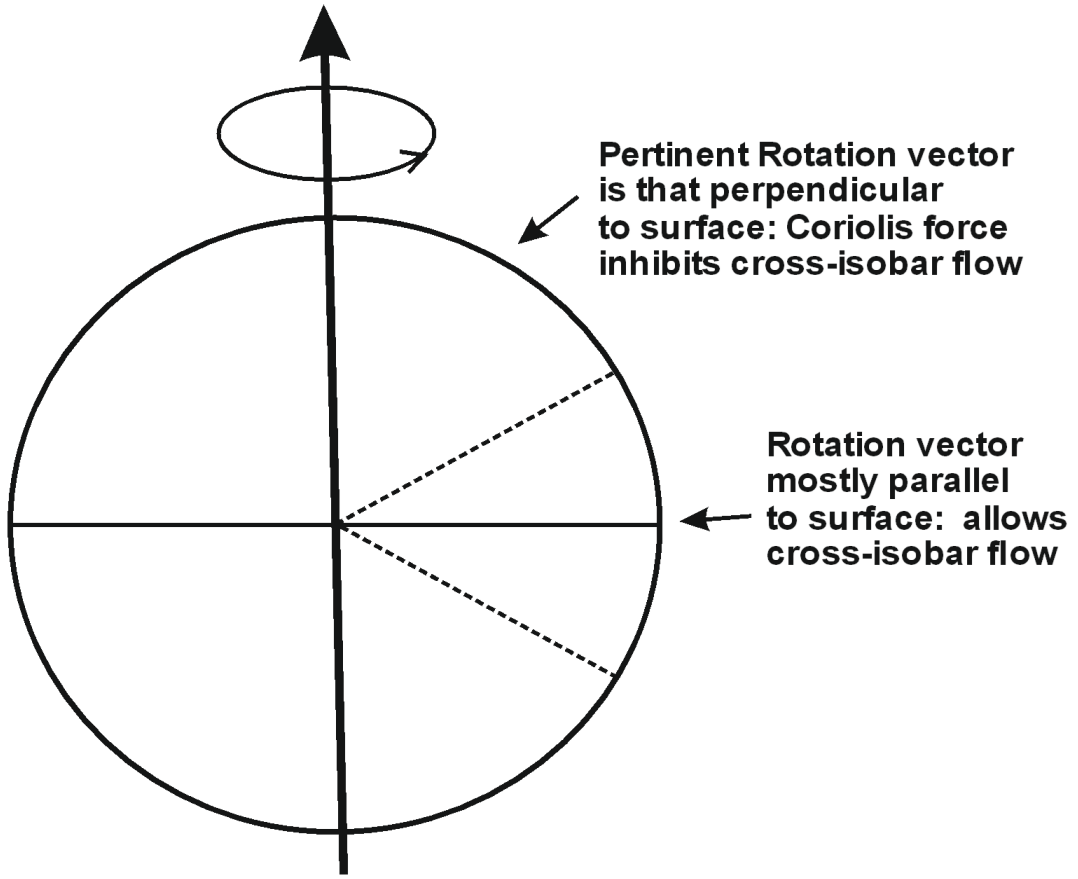
The figure on the right roughly describes the variation of surface temperature with latitude. Temperature is pretty flat in the tropics. The variation of temperature with latitude is primarily concentrated in the extratropics. Φ= latitude, x_1=0.5



$$\Delta\overline{T} = \Delta T_1 - \Delta(\delta T_2)\frac{1-x_1}{2} = \Delta T_1 - \Delta(\delta T_2)\frac{1}{4}$$

Note that major changes in the Earth's climate are primarily associated with δT_2, while the Earth's overall temperature is anchored by T_1 which seems to change little (at least for the major glaciations as well as for the Eocene). Yet, greenhouse issues are only important for T_1 rather than T_2 . The impact of δT_2 is cut by ¼ because the average change is only half of δT_2 and involves only half the earth.
Variations in T_1 are fundamental to distinguishing the climates of the different planets. It should come as no surprise that the current emphasis on greenhouse processes was introduced to the American public by James Hansen, a planetary scientist.
Note that if δT_2=0, ΔT= ΔT_1.





The reason in both cases was because the change was due primarily to the change in the tropics-to-pole temperature rather than the change in tropical temperature. It turns out that the greenhouse effect plays an important role in determining tropical temperature, but hydrodynamic heat transport determines the tropics-to-pole temperature difference. However, those arguing for climate alarm, introduce a hypothetical 'polar amplification' of tropical temperature change to account for the change in the tropics-to-pole temperature difference. It turns out to be easy to check for such a process in both data and models.

The previous picture was a schematic. The actual situation is what is shown to the right (from Sun and Lindzen, 1993 using data from Oort, 1983).

You needn't worry about this at this point. We only want to point out that the variation in temperature between the tropics and the pole is due to the dynamic heat transport rather than polar amplification. We now wish to test both the data and the models for the alleged polar amplification. The details may be found in Lindzen and Christy (2024).

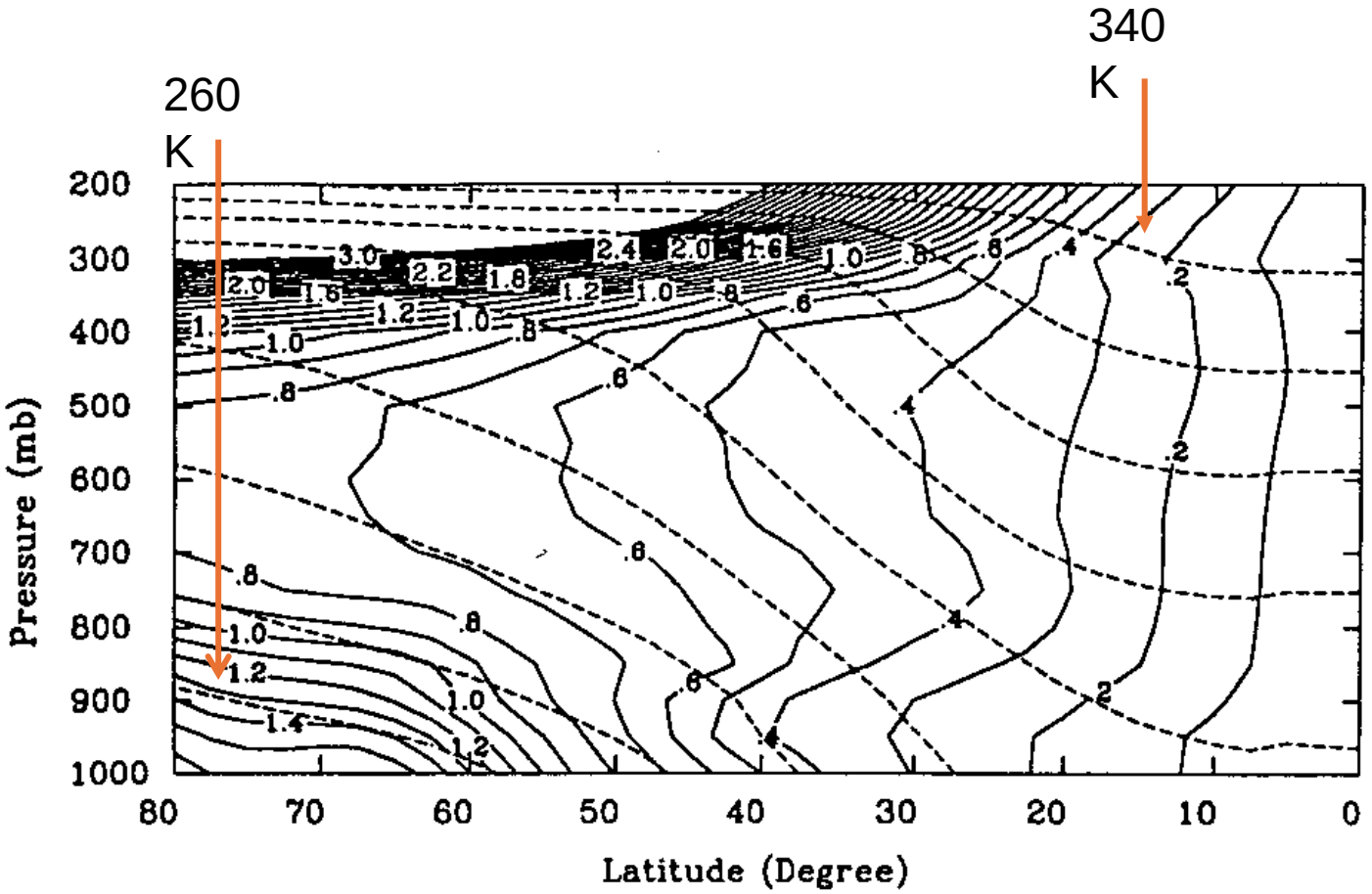
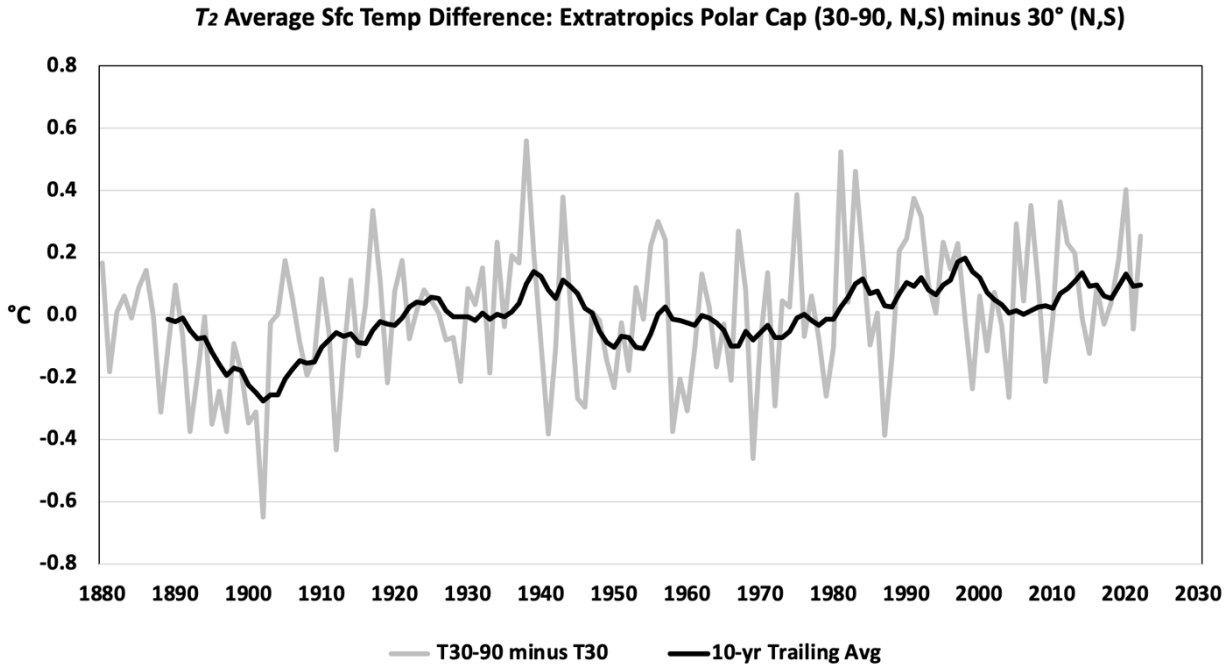


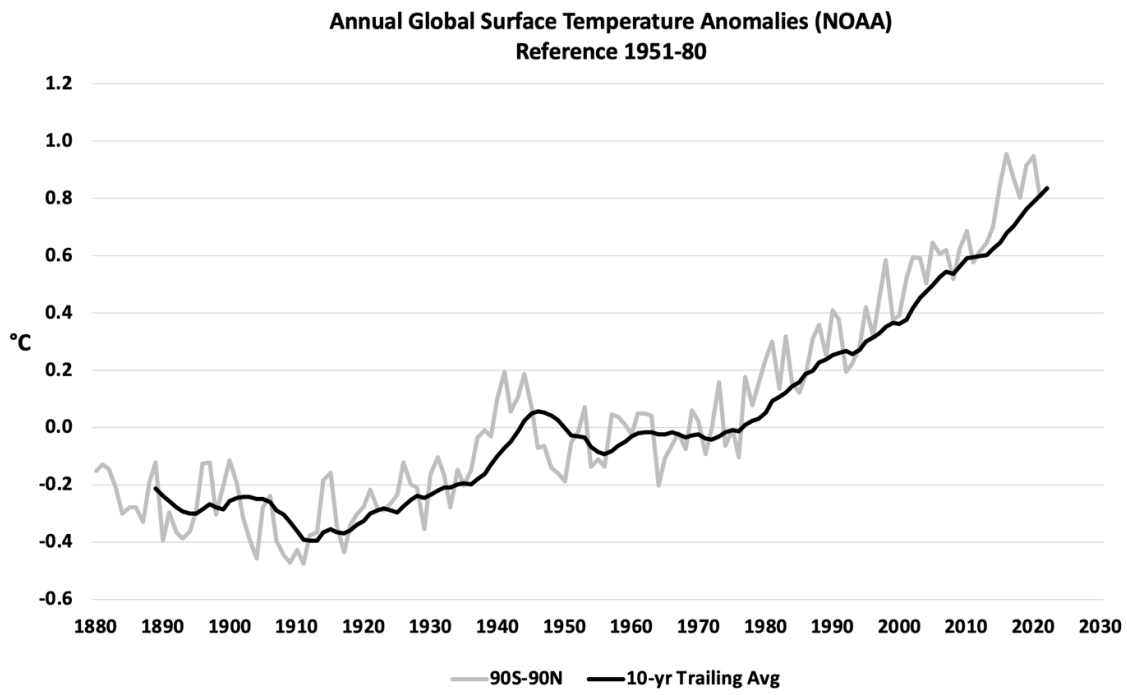
FIG. 2. Potential vorticity and potential temperature distributions in the troposphere for the winter season of the Northern Hemisphere. For clarity, isentropes are not labeled. The contours start from 260 K and end at 340 K with an even interval 10 K. Contours of PV end at 3.0 PVU. (Data source: same as in Fig. 1.)

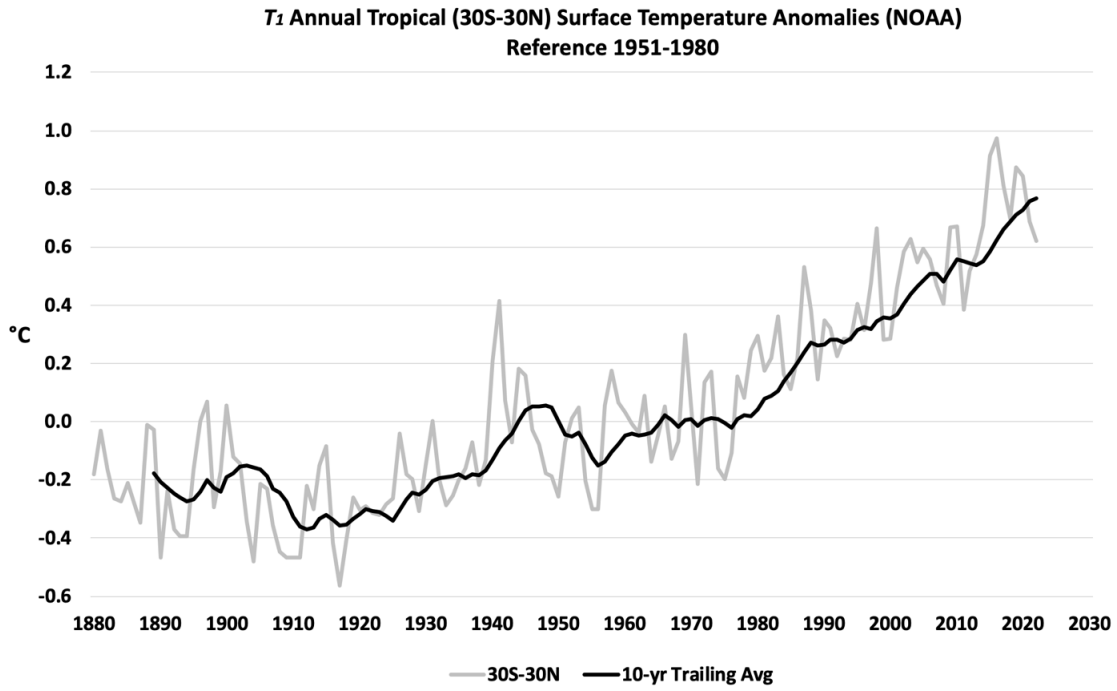


The figure on the left shows the change in the tropics-to-pole temperature difference (δT_2). The observed change is insignificant.

Consistent with this, the change in both tropical and global temperature anomaly are essentially the same.

There is no evidence of polar amplification.





Summary

1. Major climate change involves profound change in tropics-to-pole temperature difference.

2. This leads to relatively small changes in global mean temperature because it only involves half the earth, and the average change is only half of δT_2.

3. Changes in tropic-to-pole temperature difference are almost totally due to extratrpopical processes like the instabilities responsible for weather systems or snow/ice cover.

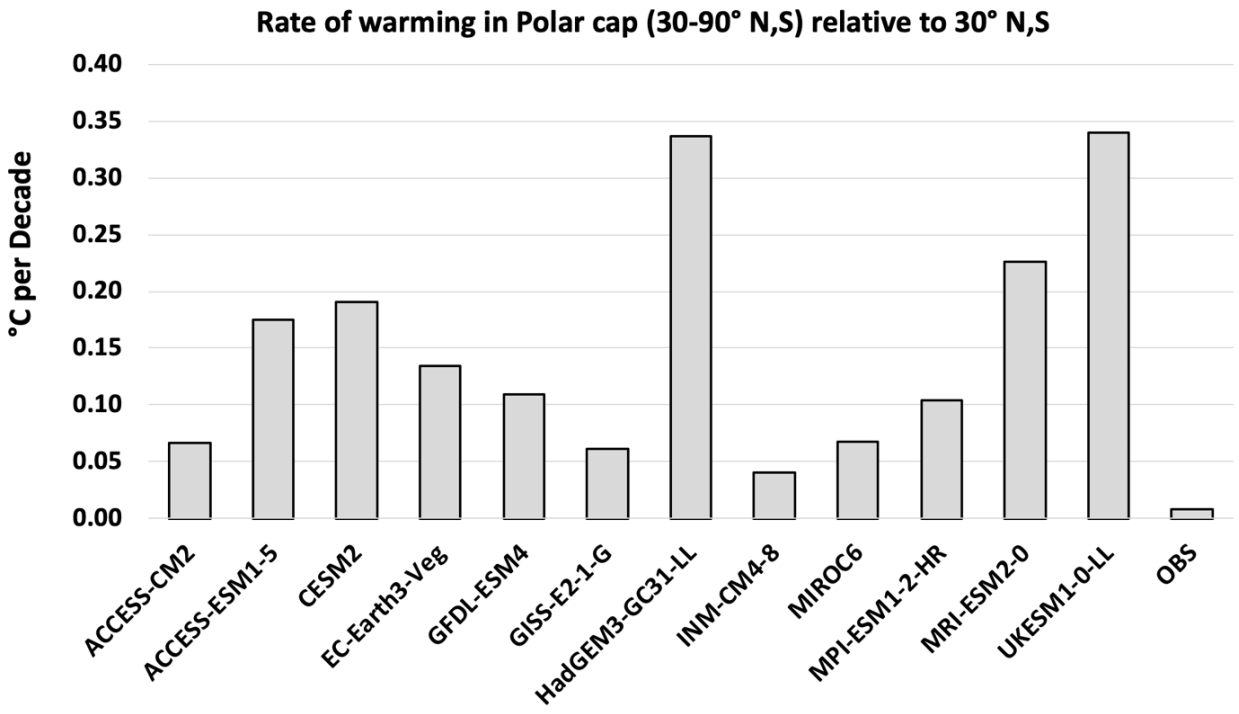
4. Climate alarm assumes, contrary to item 3, that polar temperature change is simply an amplification of changes in tropical temperature.

5. The observations show that warming since the 19th Century involves essentially no polar amplification.

6. This means that small changes in tropical temperature are associated with small temperature changes everywhere.

7. The fact that IPCC models display significant changes in tropics-to-pole temperature difference contrary to data simply means that the models are wrong.

The following compares results from data with those from IPCC models.



Model ID	Run ID	Source	Equilibrium Climate Sensitivity °C	Polar cap minus 30°Lat gradient trend °C/decade	Tropics (20S-20°N) Tropospheric Trend 79-22 °C/decade
ACCESS-CM2	r1i1p1f1	Australia	4.8	+0.06	+0.32
ACCESS-ESM1-5	r1i1p1f1	Australia	4.0	+0.17	+0.36
CESM2	r1i1p1f1	United States NCAR	5.2	+0.19	+0.27
EC-Earth3-Veg	r1i1p1f1	European Community	4.3	+0.14	+0.33
GFDL-ESM4	r1i1p1f1	United States NOAA	2.7	+0.11	+0.31
GISS-E2-1-G	r1i1p3f1	United States NASA	2.7	+0.16	+0.27
HadGEM3-GC31-LL	r1i1p1f3	United Kingdom	5.6	+0.34	+0.43
INM-CM4-8	r1i1p1f1	Russia	1.8	+0.04	+0.25
MIROC6	r1i1p1f1	Japan	2.6	+0.07	+0.18
MPI-ESM1-2-HR	r1i1p1f1	Germany	3.0	+0.10	+0.25
MRI-ESM2-0	r1i1p1f1	Japan	3.1	+0.23	+0.21
UKESM1-0-LL	r1i1p1f1	United Kingdom	5.4	+0.34	+0.39
Observations				**+0.01**	**+0.13**

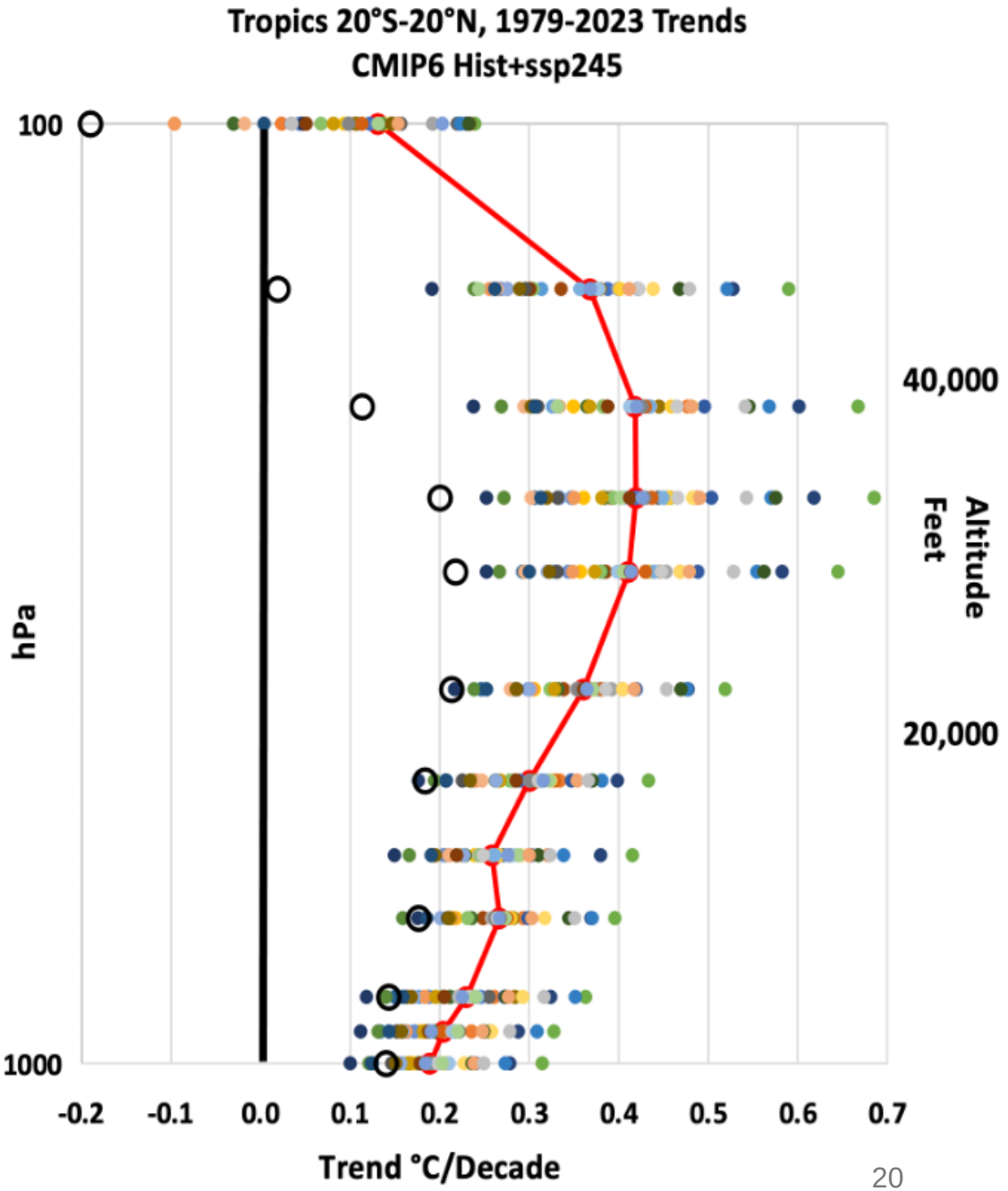
It turns out that the IPCC models show not only ‘polar amplification’ that is not significantly present in the data, but also show excessive tropical warming relative to the data. The variations among the different models, suggests substantial uncertainty as to the reliability of the models.

However, the fact that all the models differ from the data in one direction is not without interest.

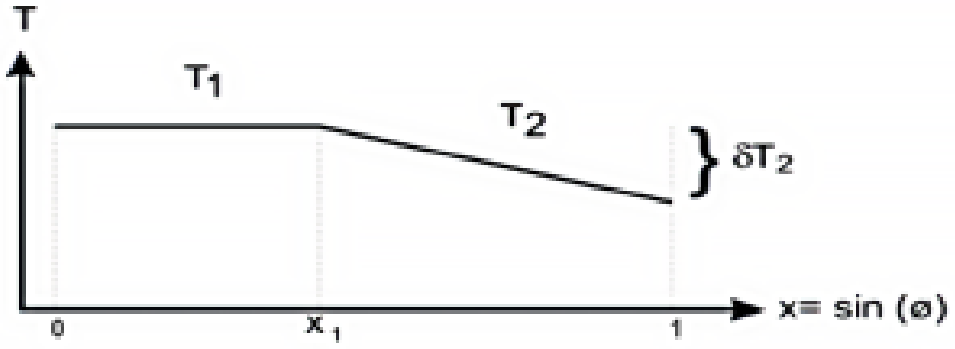
Not surprisingly, the models run ‘hot.’

The models are tuned to roughly agree with observations at the surface, but once one leaves the surface, it is clear that the models are running hot. (the colored dots are from models. The open circles are from data. The red line is the average among the models. The chart is due to my colleague, John Christy.

A member of one prominent modelling group privately admitted to me that model runs failing to show warming were simply discarded.



Without polar amplification, we only have ΔT_1 which is small even with **highly unlikely positive feedbacks**.



$$\Delta\overline{T} = \Delta T_1 - \Delta(\delta T_2)\frac{1-x_1}{2} = \Delta T_1$$

It is worth noting that the alleged positive feedbacks attracted a great deal of attention. The fact that the tropics were similar to today 2.5 billion years ago when solar output was about 30% less than it is today (something called the 'Early Faint Sun Paradox', Sagan and Mullen, 1972), strongly suggests a negative feedback (Rondanelli and Lindzen, 2010). So does the fact that the variations of meridional heat flux associated with climates between the Eocene and the Glacial maxima produce little change in tropical temperatures. In some ways, however, concern over these feedbacks was a distraction from more important problems.

Given what we now know, suggesting that climate is an existential threat is both malicious and stupid. Agreeing with such suggestions is merely stupid, but that is bad enough.

Before ending this talk, let us briefly return to real climate changes.

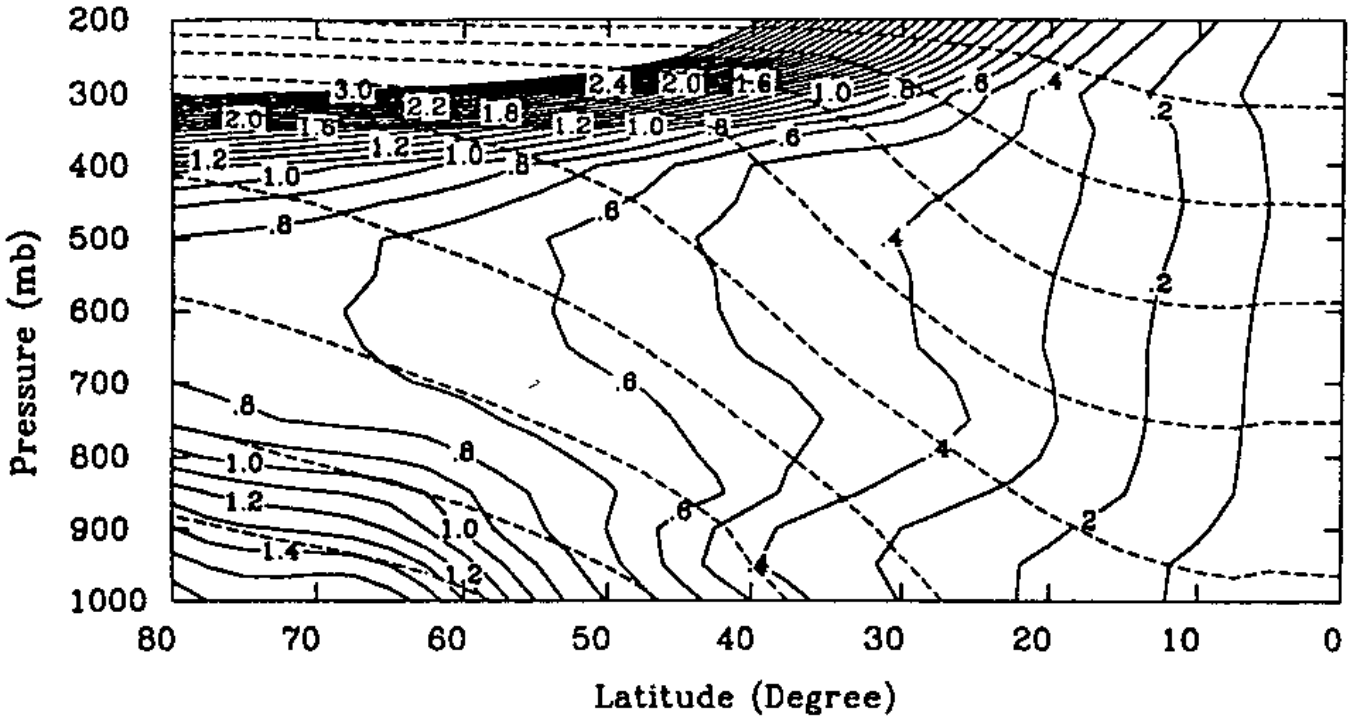


FIG. 2. Potential vorticity and potential temperature distributions in the troposphere for the winter season of the Northern Hemisphere. For clarity, isentropes are not labeled. The contours start from 260 K and end at 340 K with an even interval 10 K. Contours of PV end at 3.0 PVU. (Data source: same as in Fig. 1.)

The figure on the left shows the relatively horizontally homogeneous temperature that characterize the tropics. The extratropics are characterized by the baroclinic eddies that we associate with weather. The saturation of these eddies determines the slope of the last isentrope leaving the tropics which determines the polar tropopause where the tropics to pole temperature difference is approximately 20°C (Jansen and Ferrarri, 2013) as is currently observed (Newell et al, 1972). (By 'saturation' we mean that the eddies have brought the mean field to a state where the eddies cease to grow.) There is something peculiar going on near the surface from about 50°N to the pole. This is the arctic inversion where due to ice at the surface, temperatures are rising with altitude rather than decreasing. This causes the tropics-to-pole temperature difference at the surface to be greater than 20°C. During the Eocene, the surface temperature difference, however, does appear to be 20°C.

Milankovitch, 1941 argued that the glaciation cycles of the last 700,000 years were due to orbital variations. His work was largely conducted in the Hungarian Academy's library in Pest during WW1, and supplemented by the work of Bacsák. More recently, the CLIMAP program pointed to problems relating orbital variations in radiance at 60^{o}N in June to ice volume. However, Milankovitch's theory has been strongly supported by the work of Roe,2006, and Edvardsson et al,2002. They noted that the CLIMAP program should have considered the rate of change of ice volume rather than the ice volume itself. Thus, our understanding of the cycles of the past 700 thousand years is pretty good. However, our understanding of the preceding 3 million years or so where periodicities of 41 thousand years dominate is still lacking.

Also, why the Eocene appears to be consistent with the absence of arctic inversions, but why other periods that are presumed to be ice-free are not, remains to be understood.

There is plenty of work remaining before we have a solid understanding of climate change on the Earth, but we are at a point where we can, at least, sketch out a rational agenda. We are certainly at a point where we can stop confusing climate change on the Earth with climate differences among different planets.

Future generations will marvel at the fact that this confusion was used to justify the destruction of Western industry, demand that billions of poor remain poor, prevent the use of fertilizer thus perpetuating hunger, cause the slaughter of cattle, and numerous other displays of societal insanity.

Thank you for your attention.

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