Climate Limits A Focus on Temperature

by Bernie McCune A CASF Presentation October 16, 2021

The Major Issues

- Temperature and warming especially from human causes seem to be the key issues in the ongoing climate "debate"
- Actual temperature measurements and their accuracy are not often considered
- Modeled rise in temperature in the future is a very controversial point that is generally never fully explored in climate discussions
- Actual data versus model predictions is a major point of contention
- Uncertainty and range of error in the actual data is generally ignored*

* Alan Longhurst wrote a book on it -"Doubt and Certainty in Climate Science"



than actual 1 Sigma values discussed in the next few slides

"What if" Game

- Modeler's "what if" predictions for the next 100 years, in some extreme cases, show an 8° C temperature increase from a 1970 global temperature baseline (4° C is their "likely" number)
- Looking at the previous slide, using past natural cycles as a guide, a prediction of only a 0.2° C increase in temperature is likely over a 150 year period (1880 to 2030)
- What if models using CO₂ forcing do not accurately indicate the true climate limits that might be expected in the future?

An in depth discussion of these temperature issues

 In 2018, I gave detailed presentation that deals with errors & uncertainties & can be found on the CASF website here:

http://casf.me/systematic-temperature-error-in-the-climate-change-disscussion/

- The presentation covers ocean and atmospheric temperature measurements and deals with instrumentation accuracy that affects these measurement records over the years
- The anthropogenic climate change community (including the scientists) have mostly ignored these concepts

The limits to climate modeling

 Another CASF presentation done in 2017 showed some of the problems of climate modeling, also highlighted some models by skeptics:

http://casf.me/climate-models-developed-by-skeptics/

- Some of the skeptical models though relatively simple may prove to have much better predictive capabilities
- Which is clearly not the case for almost all of the IPCC CMIP Models (Climate Model Inter-comparison Project)
- CMIP model hindcasting is poor but their forecasting during the past 25 years has been horrible

The CMIP Record Climate Model Inter-comparison Project



John Robson - Trouble in the Tropical Troposphere

https://www.youtube.com/watch?v=n6VM41-v2gg

Proxy Tree Ring Data



https://link.springer.com/article/10.1007/s10584-020-02772-9

Though this is proxy data from the Sangre de Cristo mountains (NM), there are many other sources of solid temperature data around. See the next slide for recent data

UAH Satellite Data

Recent satellite era data showing a modest +/- 0.3° C variation



Willie Soon N. Hemisphere Temperature anomaly vs. solar irradiance



Figure 2. Soon, et al.'s Northern Hemisphere rural-only temperature record (in blue) versus TSI (in red). Source: (Soon, Connolly, & Connolly, 2015).

Limits to Argo Data

- Although global oceans are being monitored to an increased level in surface area and depth as compared to the last century and early this century, 4000 floats are still a tiny drop in a very large bucket that are the global oceans
- See my earlier two presentations on the wonder (and limitations) of Argo data and instrumentation here:

Part 1 in Dec 2014

https://casf.me/wp-content/uploads/2021/07/Argo-System-Dec2014.pdf

Part 2 in March 2015

https://casf.me/wp-content/uploads/2021/07/Argo-System-Pt2-March-2015-PDF.pdf

Movie of Argo Data 2005 to 2012

https://wattsupwiththat.files.wordpress.com/2014/02/argo_surf_temp_2005_2012.gif? resize=480%2C480

Ocean Temperature Limits

- What are some climate temperature limits and variations?
- Surface ocean temperatures are known drivers of atmospheric temperatures that together drive long term climate temperature averages
- Deeper ocean circulation patterns that slowly drive regional ocean temperatures have 1000 year effects (Bond cycles)
- Argo can give us some interesting average surface and near surface temperature values (limits) and deep probes indicate what very deep temps might be

Expected Ocean Temperatures

- Very deep ocean temperatures are slightly below freezing while surface temperature upper limits are about 30° C with extremes to around 35° C in very limited areas for very short durations
- Average global ocean surface temperatures range from 15° C to 17° C (over time)
- Average global ocean temperature 0-200m is roughly found to be 3.6° C (0-50m is 20° C) so reported temperatures at depths below 200m that claim 4° C, are likely bogus. I would estimate them to be much lower than 2° C by volume

A recent one day Ocean Surface Temperature snapshot



°C 0 1 3 5 7 9 11 13 15 17 19 21 24 27 30 35 °F 32 34 37 41 45 48 52 55 59 62 66 70 75 80 86 95

The map above is updated daily and shows the ocean water temperature as recorded on 9th Jul 2021

Atmospheric Temperature Limits

- Some of the world wide high temperature records are from 55 to 60° C (these are no where near average temps even in the hot regions)
- Some of the world-wide low temperature records are about -120° C (generally polar regions but Siberia is similar)
- Global over-all average atmospheric temperature at the surface has been calculated to be about 14° C

Temperature Ranges and Effects

- See the next slide for a graph of Cimarron, NM for the annual range of temperature for about 120 years
- Chinese data reconstructed over the past 5000 years show that cooling trends lead to social unrest
- The Bond cycle (every 1000 years) indicates that warming trends cause civilizations to flourish
- Humans have easily adapted to very large diurnal ranges found in most places in the world
- The specific values of these temperatures are sometime controversial but not many climate scientists want to even try to characterize them



A Temperature Discussion

- It seems clear to me at this point in the process that only the models are showing a several degree increase in global average temperature for the next 100 years
- There has been very little increase in the recent global average temperature and that increase is mostly in the noise of temperature instrument error
- All of the temperature charts that I have shown in this presentation to this point indicate that there could be a cooling period occurring at this time
- If it really is happening we might see only about an overall warming trend for the past 100 years of 0.3° C or less

One from Tony Heller July 16, 1901





Heller USHCN 1895-2020



USCRN from the start

A very rural view of US Temperatures

Contiguous U.S. Average Temperature Anomaly



Limits of CO₂ warming

- What little effect that CO₂ (especially human emissions of CO₂) has on this warming cannot even be seen in the measurements we have been making for the past 40 years (some of those measurements seem to be showing natural outgassing of CO₂ from the global oceans)
- The dramatic annual atmospheric CO₂ swings seem to be driven mostly by ocean warming (upswing) and the global land and ocean plant uptake of CO₂ (down)
- Increasing atmospheric CO₂ from all sources has caused a significant "greening" of the planet

Satellite and Ground Temperature Measurements

- Many decades of monthly and annual average temperatures values show patterns of natural climate effects
- Some of these effects are direct Solar effects, El Nino and La Nina patterns, PDO and AMO index effects, etc.
- Models showing CO₂ heating effects cannot be found in the actual data
- In fact most of the so-called long term warming of 0.8° C to 1° C in the global oceans and atmosphere over many of the past decades are lost in the noise of instrument error and large short term natural temperature swings

The failed CO₂ concept of ECS

See Lindzen's latest paper "The Imaginary Climate Crisis"

- Concentration of atmospheric CO₂ and its radiative effects continue to influence climate science as a warming effect when there is little to support it in the real temperature measurements
- See two presentation that discuss the science here:

https://casf.me/category/equilibrium-climate-sensitivity/

https://casf.me/wp-content/uploads/2020/10/Physics-Vs-Model-CO2-Pres-PDF-1.pdf

Bob Endlich's detailed El Nino/ La Nina Study

• See his very extensive look here:

https://casf.me/el-nino-and-la-nina-controls-rainfall-anddrought-in-western-usa/

- The patterns seen in all of this data are decidedly natural and can be traced back 100s of years, well before humans and extensive fossil fuel use had much effect
- There is a natural warming increase and THEN a atmospheric CO₂ increase mostly derived from the oceans (as explained by Henry's Law)

Space Weather & Short Term Cycles

- Long Term Solar, Planetary and Moon effects on the climate are sometimes referred to as Space Weather
- Galactic positions of the earth driving the ice ages, as well as short term lunar and solar cycles add to the complications of climate effects
- Solar heating of the ocean surfaces and wind patterns affect 60 year cycles of the Pacific Decadal Oscillation (PDO) which is an index of El Nino/La Nina frequency during each PDO 60 year cycle
- Atlantic Multi-decadal Oscillation (AMO) is a similar north Atlantic index of SST found there over 60 year periods



None of the natural or even small human effects reach temperature extremes for long.

Even the Ice Age temperatures have limits

PDO and AMO-NM and the Western US

Major modes of decadal scale internal variability



Natural Drivers to Climate

- Temperature cycles and drivers of the surface oceans such as El Nino, La Nina, PDO, AMO and circulation patterns are natural
- Temperature and Drought conditions in the earth's mostly lower atmosphere clearly seen in NM (and globally in east-west patterns and in north-south patterns)
- 60 year AMO Temperature and PDO drought cycles
- Short 5 to 7 year temperature cycles

PDO in New Mexico

Aligned with EB Dam Water Volume and Jornada Range Precip



100 years of PDO and drought

Cimarron NM annual average temperature over about 100 recent years fluctuated about 6° F max. A typical summer/ winter range might be from 80° F to 20° F (60° F range)



Cimarron Avg Temperature

Years

Dinurnal swings might sometimes be 20° to 30° F. With these very large short term swings, temperature increases in the 0.8° to 2°C for a long term warming climate (next 100 years) seem quite modest and decidedly not extreme.



El Paso Annual Mean Temp







Petr Chylek's Polar SeeSaw 11&17YrAvg Vertical Axis dT(K) Temp Anomaly N = Arctic S = Antarctica



A Couple of Common Sense Graphics

Temperature Changes People Know How To Handle



The thickness of the black line represents the total change in global mean anomaly over the past 120

The Cost of Societal Problems, 1900-2050, and Climate Change, 2015-2100, as a Percentage Global GDP



Source: 'How Much Have Global Problems Cost the World?' by Bjorn Lomborg, Cambridge University Press

Conclusions

- Global temperature limits are naturally controlled with almost no effects from CO₂
- Those limits during the Interglacial we are now in are relatively comfortable to humans
- Humans deal with very large temperature swings on a daily basis
- Global warming over the past few decades and for the next few decades is and will be modest
- Beware of climate models that predict otherwise

One More Thought Provoking Graphic

Climate Change's Effect on Malnutrition Deaths in Millions, 1990-2050

Without Climate Change

With Climate Change

8 million per year



One Last Thought

All the findings that blame global warming for their existence such as extreme weather, more of and more extreme hurricanes, tornadoes, droughts, heat waves, obesity, contagion . . . on and on . . .

. . . . are not based on scientific evidence . . .

. . . so be very skeptical of all that nonsense!