

An Engineer's Critique of Global Warming 'Science'

Questioning the CAGW* theory

- * Catastrophic Anthropogenic Global Warming (global climate destruction caused by human emissions of greenhouse gasses)



By Burt Rutan July 2010

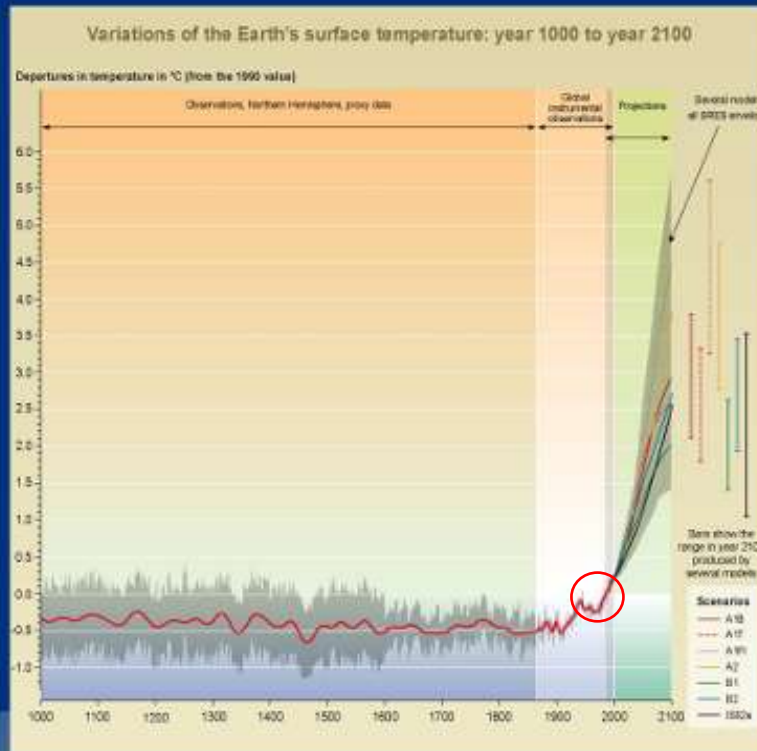
An expanded version of this presentation can be downloaded at <http://rps3.com/>
Or, Google "burt rutan climate change"

My Introduction to the Global Warming Scare

United Nations Intergovernmental Panel on Climate Change

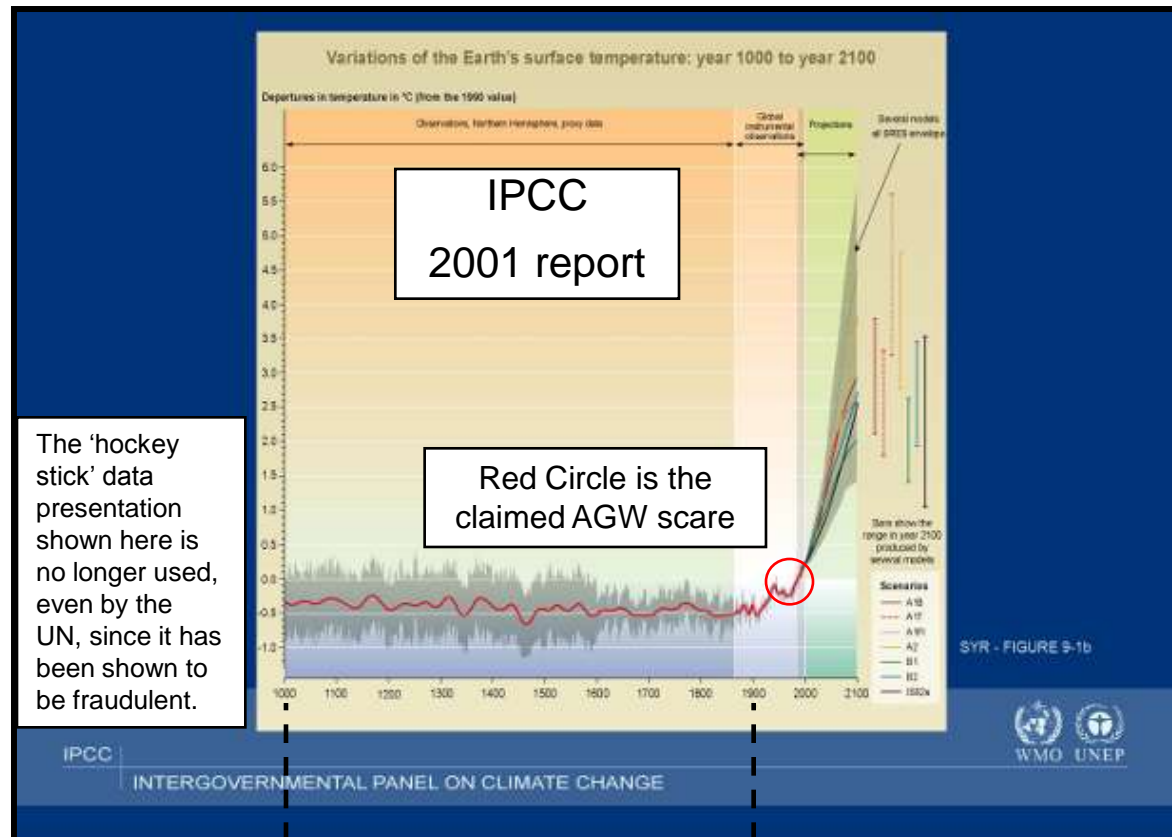
This chart includes a large number of next-century predictions - all of them showing either big problems or catastrophe in the next century; all caused by a theory of CO₂ greenhouse gas heating from human emissions (AGW).

Is there something an engineer can do to solve this problem?

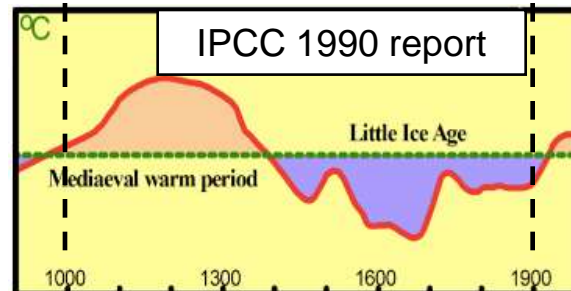


Red Circle is the claimed CAGW score

What Happened between 1990 and 2001?



The 'hockey stick' data presentation shown here is no longer used, even by the UN, since it has been shown to be fraudulent.



Current temperature

An Engineering look at Man-Caused Global Warming

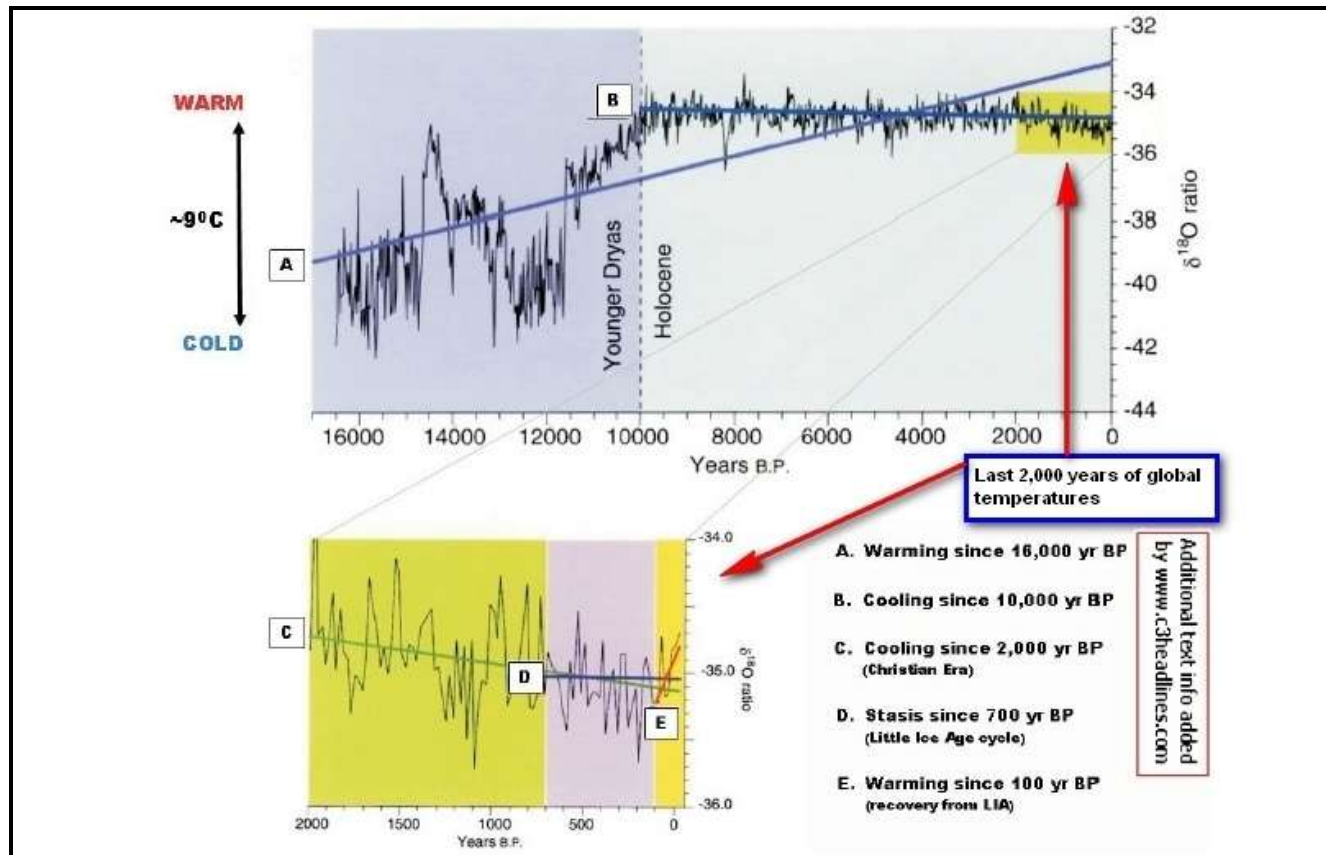
- Not a Climatologist's analysis - a view from a flight test engineer who has spent 45 years doing data analysis/interpretation/presentation.
- A focus on how the scientific community has handled the 'global warming due to fossil fuel burning' theory.
- A review of the climate data, then a study on how the results are selected, presented and promoted.
- The focus is on an Engineering Approach – where data are critical and there are consequences for being wrong; not the Scientist approach – where a theory is the product and it can be right or wrong without repercussions.
- A presentation of climate data the way an engineer would show it – present all the data, then do analysis without bias to any proposed theory.

The significance of “Statistical Significance”.

This Chart shows five “trends”, all ending at year 2000:

- A - 16,000 years, includes recovery from ice age.
- B - 10,000 years, the current “stable warm period”.
- C - 2,000 years, the Christian Era.
- D - 700 years, the Little Ice Age (LIA) cycle.
- E - 100 years, recovery from LIA.

All 5 trends except E are Statistical Significant. However, trend E is what the Alarmists focus on, to ‘prove’ the correlation with human emissions.



Data from GISP2 ice cores (after NSIDC User Services 1997 and Davis/Bohling, 2001).

Rutan Background Includes Energy Efficiency

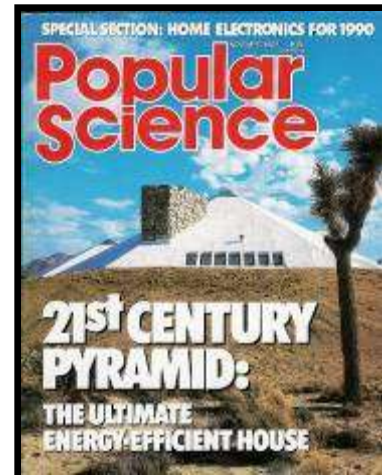
Solar Hot Water in the 70s.
Now building a 34-acre PV
solar energy farm.



My Desert Pyramid House
“Ultimate energy-efficient house” (Pop Sci Nov 1989)
Primary car was zero-emissions EV-1, 1997 to 2004.



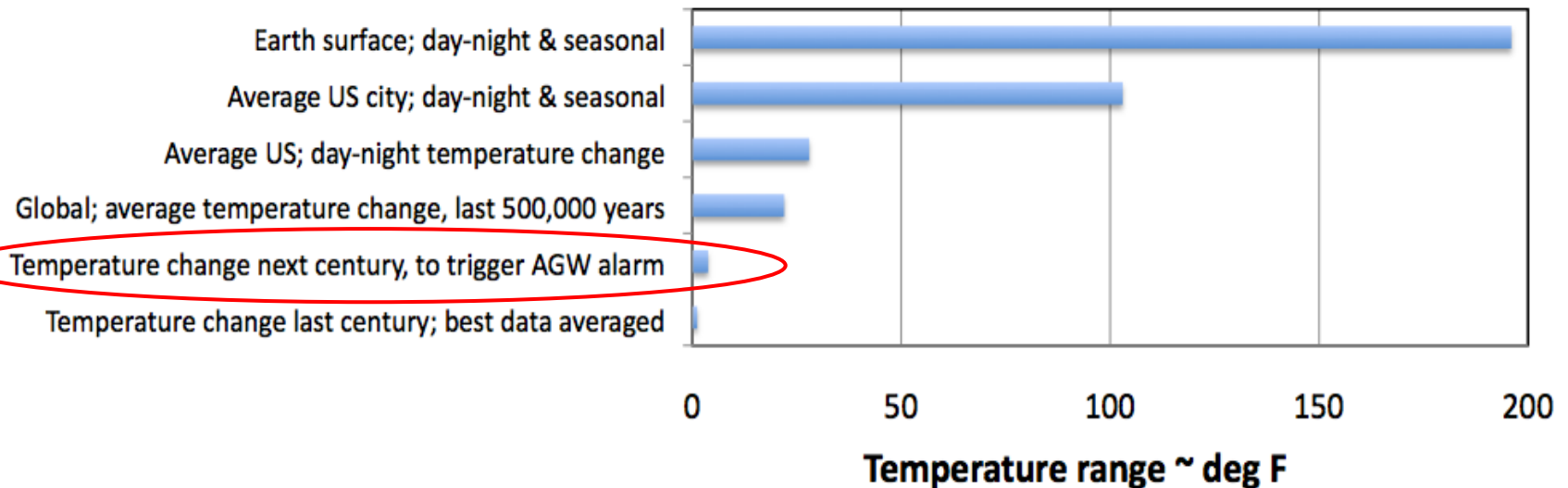
Loss of my EV-1 Electric car in 2004.
General Motors crushed them all



The Challenge is Massive for the Alarmist

To track and to forecast miniscule global-average temperature changes.

The Challenge - look at large variance data to predict a small variance for next century



The temperature trend is so slight that, were the global average **temperature change** which has taken place during the 20th and 21st centuries were to occur in an ordinary room, most of the people in the room would be **unaware** of it. The CO₂ % in this room will increase more during this talk than the atmospheric CO₂ % did in the last 100 years.

The CAGW call to action (for a Carbon-constrained world).
Requires these 5 issues to be true.
This report studies these five, in order.

1. Recent human burning of fossil fuels suddenly and dangerously increased CO₂ beyond previous levels.
2. Human CO₂ emissions causes greenhouse warming.
3. Dangerous, sudden global warming occurred the last 50 years.
4. The current Temperature is too Hot & further warming is Bad.
5. It is more difficult to adapt to climate changes than to attempt to control them.

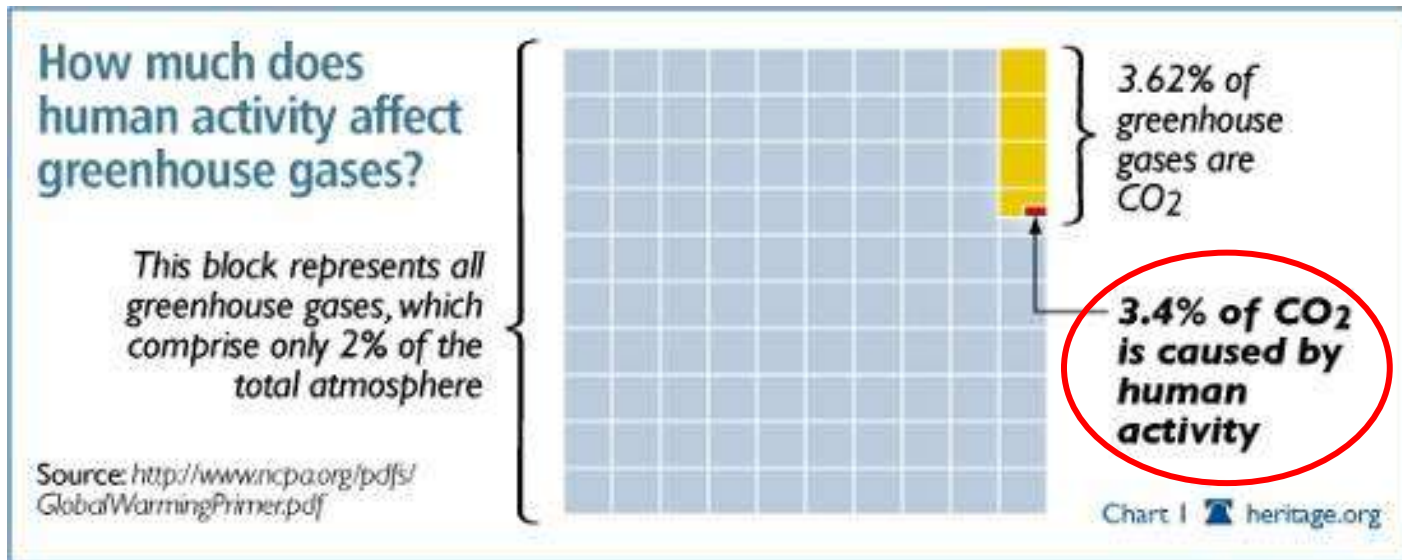
First, let's address #1. Has our use of fossil fuels caused sudden, dangerous, unprecedented CO₂ increase?

The Challenge is Massive for the Alarmist - to prove his CAGW theory

He must convince us that CO₂ is a pollutant. But calling it a pollutant is an uninformed joke. CO₂, along with oxygen and water is essential for all life.

Look at a leaf, a grain, a flower. Half of what you see was made from CO₂. Recent rising CO₂ has resulted in 15 to 30% more crop yields and large increases in forest growth.

However, human Emissions of CO₂ are Tiny.

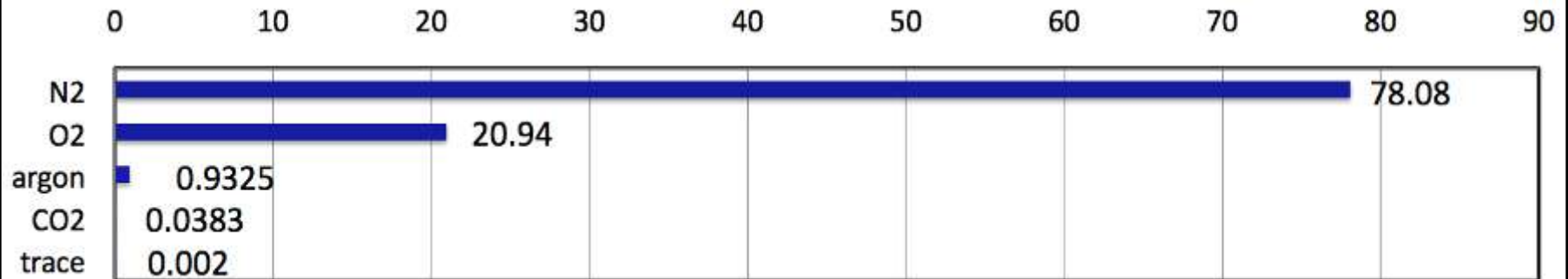


The Massive Alarmist's Challenge

Carbon Dioxide content is very small, invisible on a bar chart.
Greenhouse gas effects of Human Emissions are also miniscule

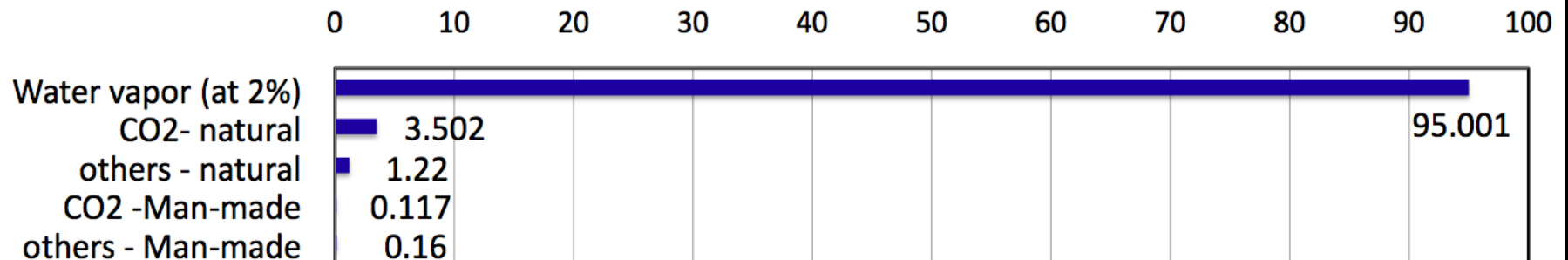
Atmosphere Makeup, without Water Vapor

Atmospheric Gas Composition by Volume ~ %



Greenhouse Gas Effects adjusted for heat retention characteristics

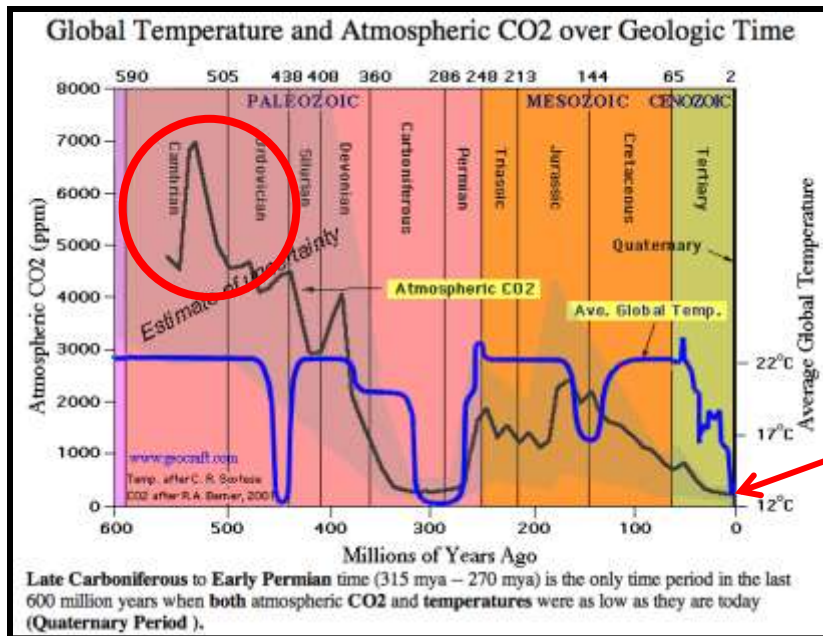
Greenhouse Gas Composition by Volume ~ %



Man's emissions of CO2 contribute only 0.117%
of the total greenhouse gas warming effect.

Looking back 600 million years

Atmospheric Carbon Dioxide was likely 18 times today's concentration, during the Cambrian period when life's diversity was at its greatest expansion (red circle). It was 4 times the current level when the dinosaurs were killed by an asteroid. The only other extended time CO₂ was low, (like today) was a period 300 million years ago.



In the big picture we are now in a **low** CO₂ period. The 20th century increase shows as an insignificant dot at this scale. There is no correlation of CO₂ and temperature anywhere on this chart.

Do we risk **runaway greenhouse warming** if our CO₂ concentration gets too high? CO₂ has been scarce the last 2 million years. Also, it has never significantly driven temperature before.

The danger is too-low atmospheric CO₂

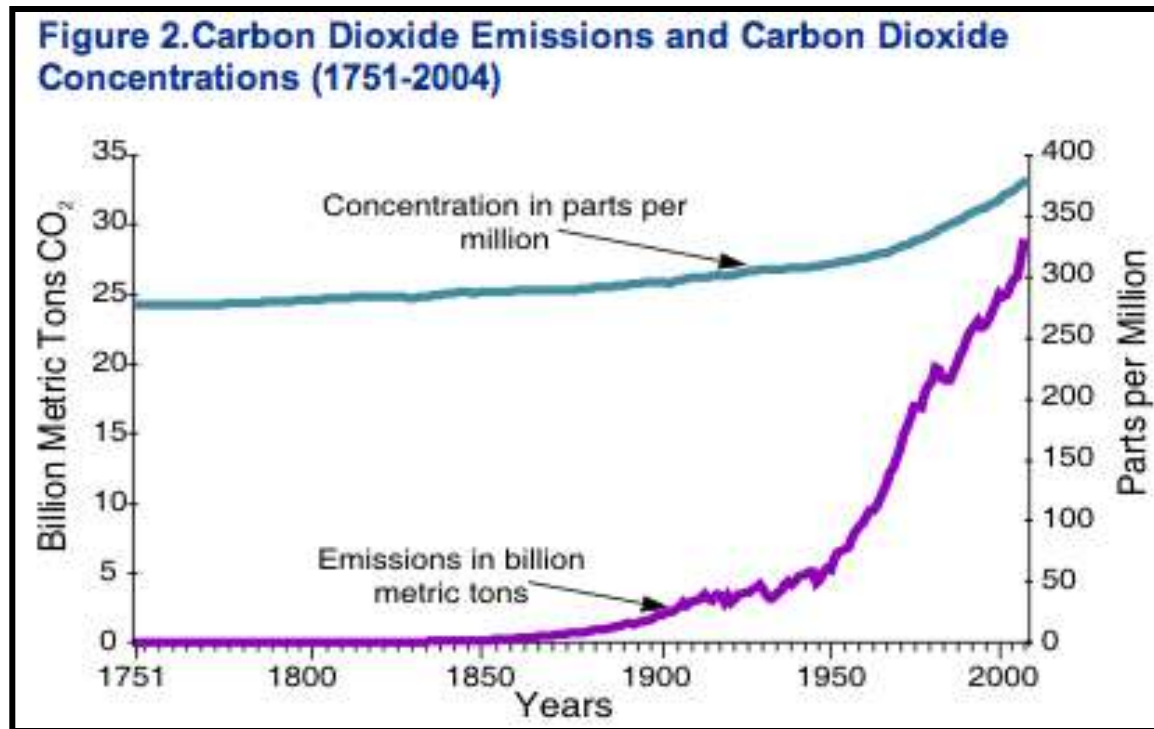
While we refer to ice ages usually as the glacial periods that have happened routinely every 100k years during the last million or 2 years, the whole of the last several million years has actually been a relative ice age. Before that, during diversity growth from sea life through dinosaurs, the planet was much warmer, with little ice at all, sea levels hundreds of feet higher and in general, GREEN from pole to pole. It was green, not dry desert because the earth was fertilized by CO₂ levels 10 to 20 times present.

One thing to bear in mind is that the atmospheric concentration of CO₂ got down to 180 ppm during the glacial periods of the ice age the Earth is currently in (the Holocene is an interglacial in the ice age that started three million years ago). Plant growth shuts down at 150 ppm, so the earth was within 30 ppm of disaster (dry deserts and starving plant life).

Terrestrial life came close to being wiped out by a lack of CO₂ in the atmosphere.

The Basic CO₂ Alarmist's Chart

The claim: CO₂ content is smooth and near-constant for 200 years, and then increases, due to human emissions.



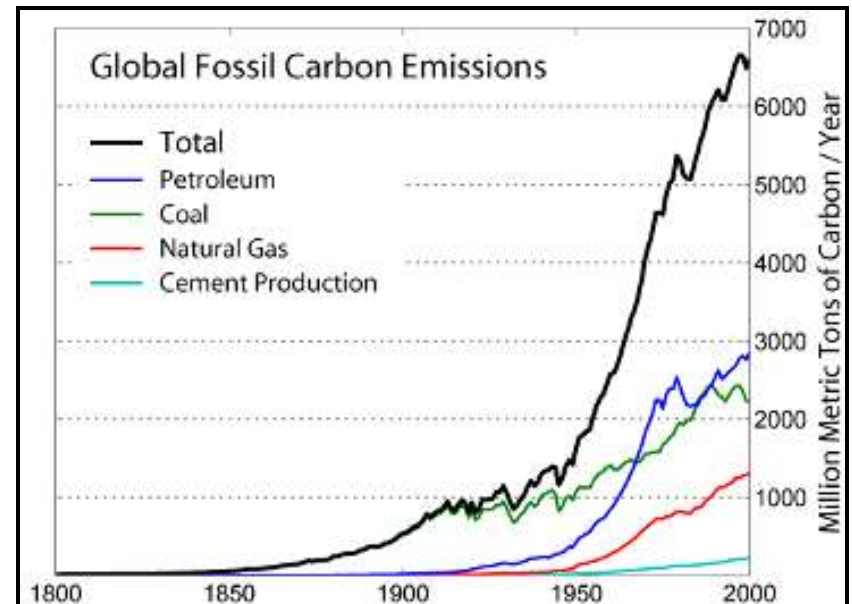
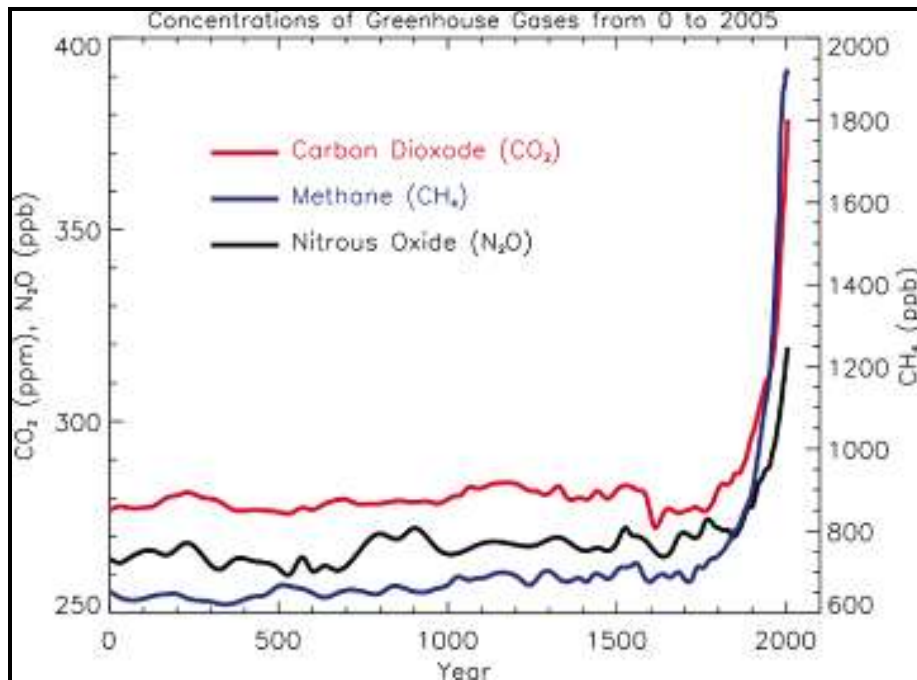
But - accurate CO₂ direct measurements are only available for the last 50 years.

Another Scare chart

The Alarmist' Presentation Tactic

Find a correlation of human emissions to something 'really bad'.

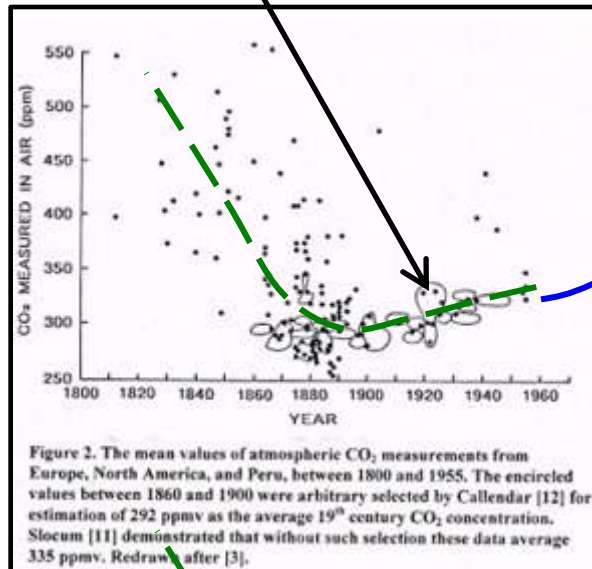
Scale the presentation to show a scare.



They selected only the circled data points that supported their theory.

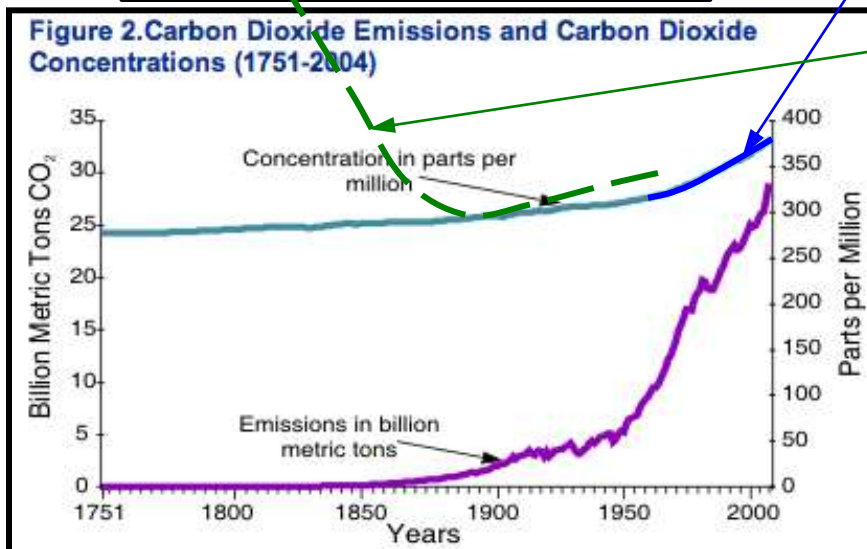
Measured Atmospheric CO₂

Manipulation of measured data for 200 years



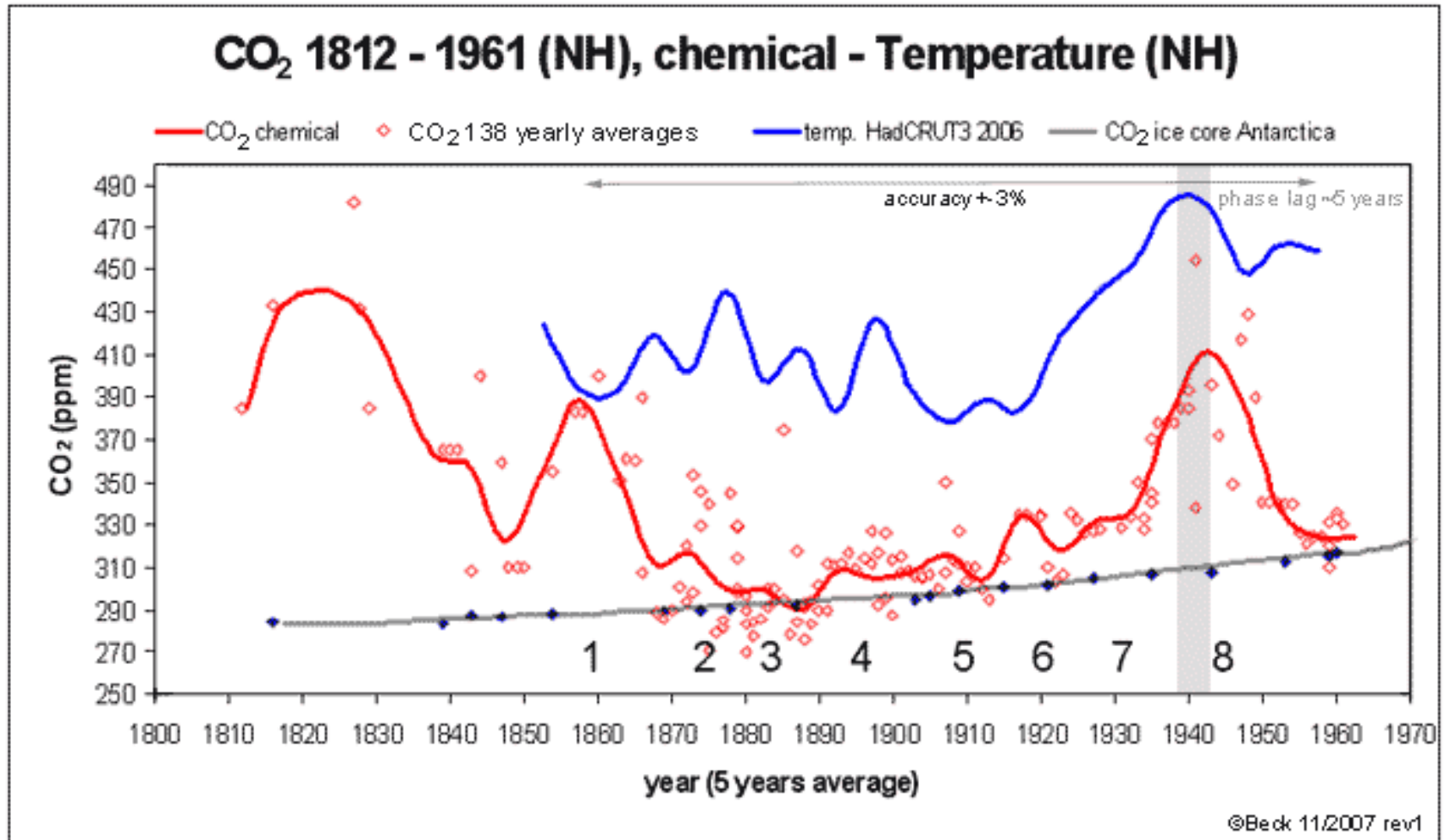
Blue curve is the modern, accurate data, measured at Mauna Loa Observatory, Hawaii.

Green dashed curve is a fairing for all direct CO₂ measurements, back to 1810.



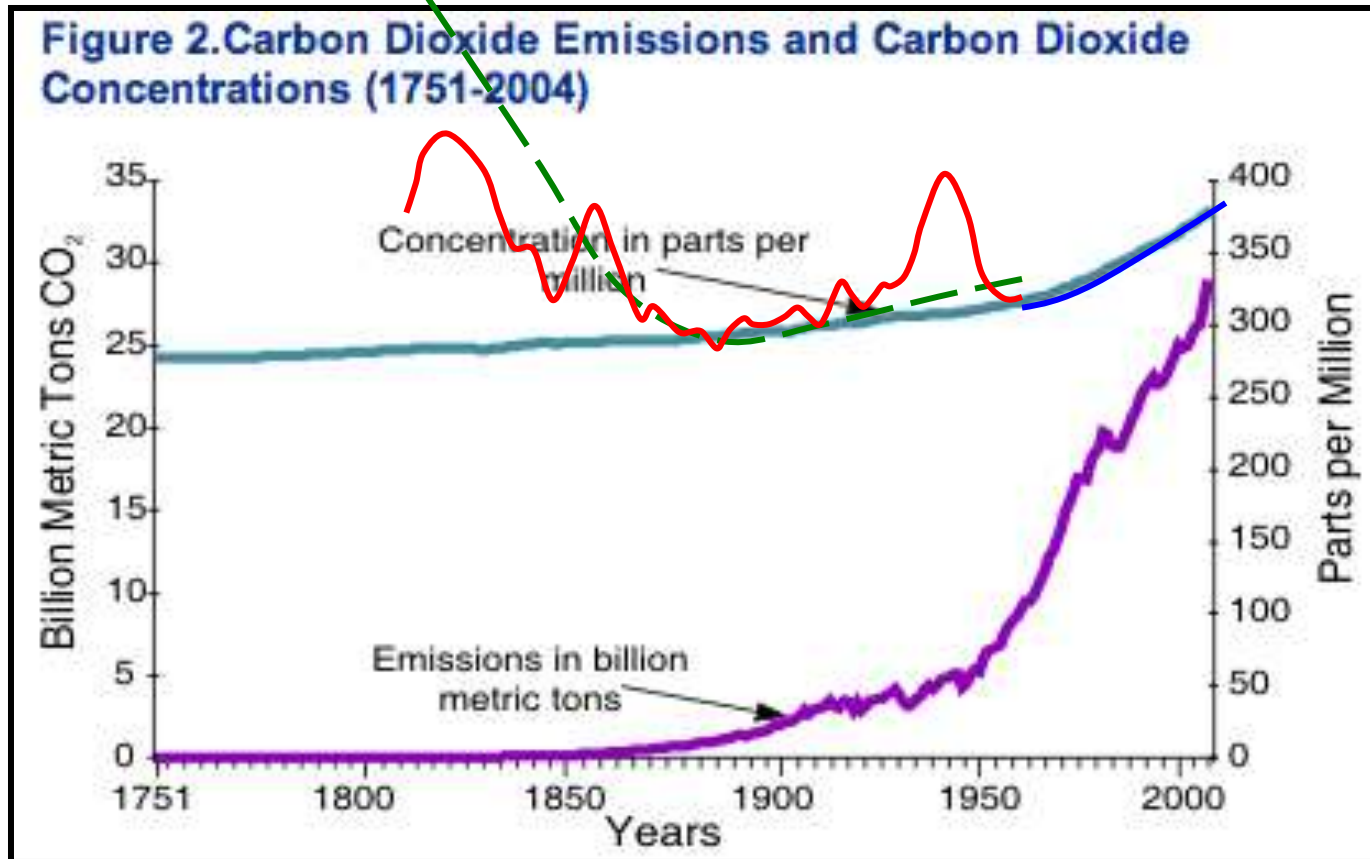
Another CO₂ Measurement Method

Chemical method: data for 1810 to 1962 period.



The 'Basic' CO₂ Chart

Now takes on a different look



Green dashed- Fairing of early, directly-measured CO₂
Red- chemical method
Blue- Mauna Loa modern measurements

Looking Back 1800 years

A CO₂ Measurement Proxy
From stomatal density in fossil pine needles

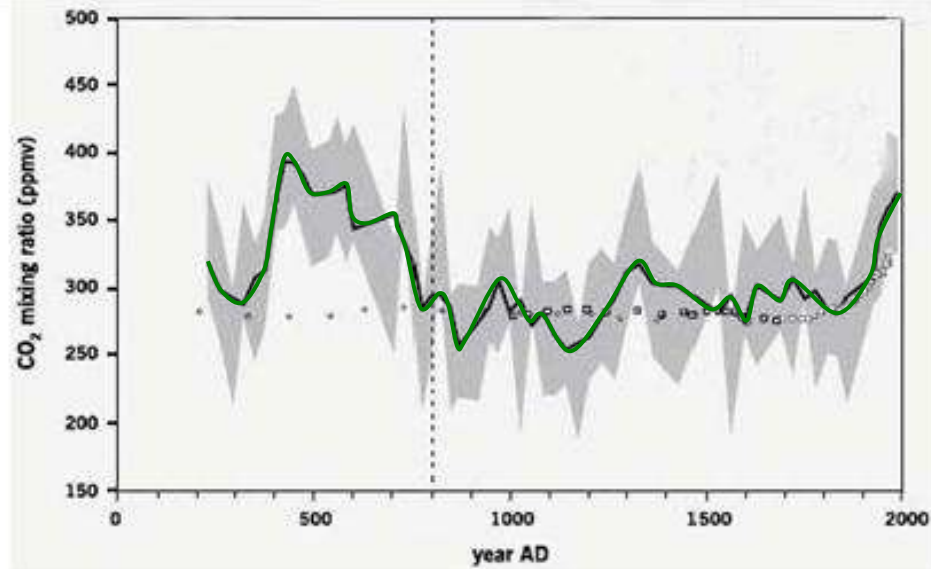


FIG 2 - Reconstruction of paleo-atmospheric carbon dioxide levels for the last 1800 years inferred from stomatal density in fossil pine needles (*Tsuga heterophylla*), northwestern USA (after Kouwenberg, 2005, Figure 5.4). Black line: three-point running average, based on 305 needles per data point; grey shading: error estimate. Open diamonds and squares indicate, respectively, measurements from the Taylor Dome and Law Dome ice cores, Antarctica. The ice core data represent generalised averages, and appear not to preserve the decadal-centennial changes in atmospheric carbon dioxide indicated by the stomatal measurements.

Summary: CO₂ Data for the last 1800 years

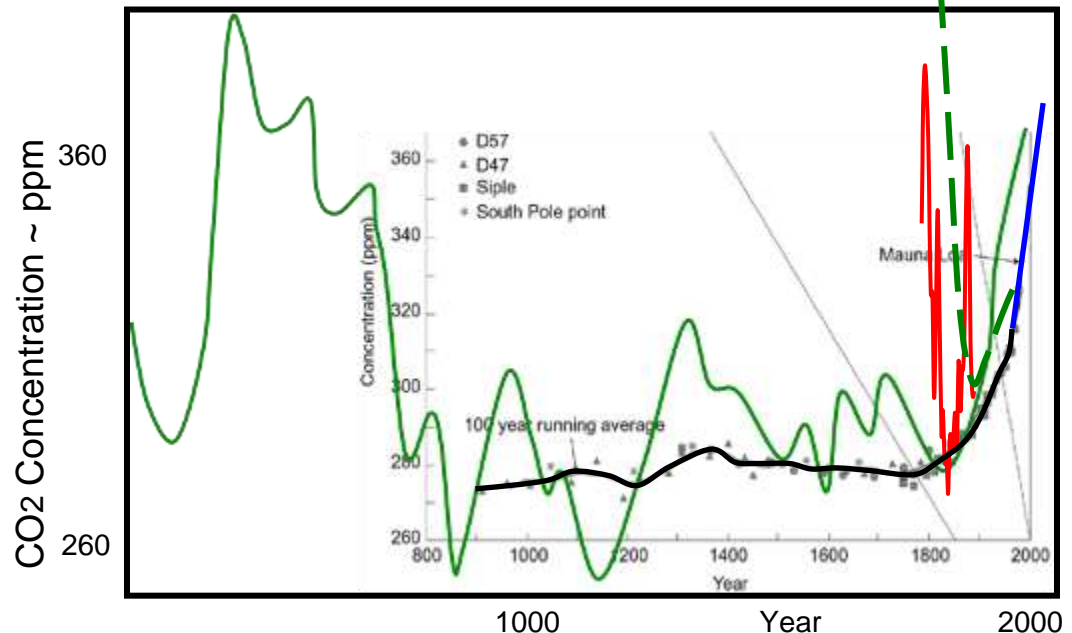
Data from early & modern measurements, Ice core, chemical and pine needles. Not a lot to scare, with this chart.

Is the present CO₂ increase not unusual, or are pine proxies not reliable? Of course, alarmists might say the latter - until they consider the pine tree rings that brought them their most-deceptive chart of all - The hockey stick.

Dashed green - early direct measurements
Green - stomatal density in fossil pine needles
Black - ice cores, 4 locations
Red - chemical method
Blue - modern, Mauna Loa direct measurements

This chart **informs** (five data sources), but does not **scare**. It illustrates the significant scatter seen in the various methods for CO₂ historical data.

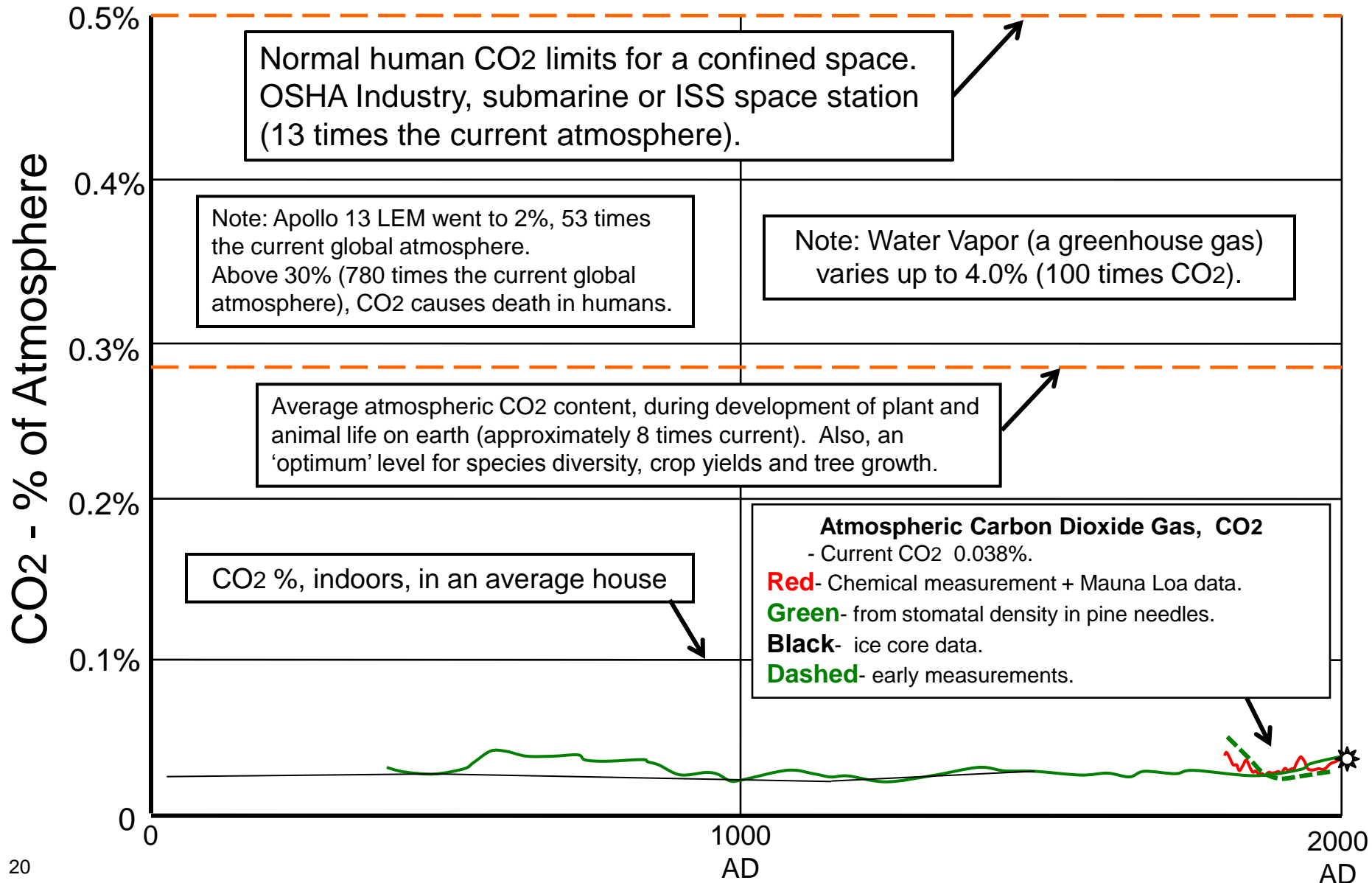
For the proper perspective this data is transferred to the next slide.



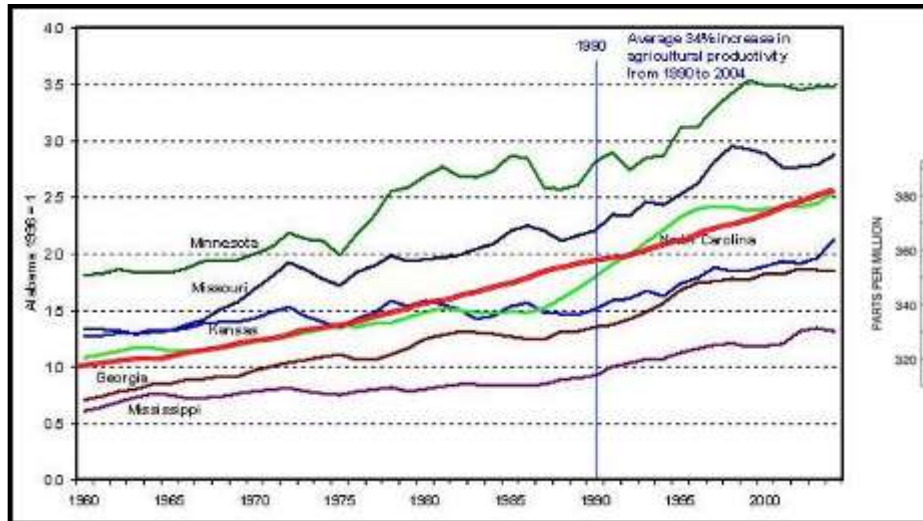
Now, to put Atmospheric CO₂ in Perspective

This chart is presented to **Inform**, not to **Scare**.

This shows CO₂ in its proper role as a trace gas, not something that has to be immediately eliminated.



Agricultural productivity increased an average of 34% from 1990 to 2004. Much of that increase was due to the increase in atmospheric CO₂. Plants need less water, with more CO₂.

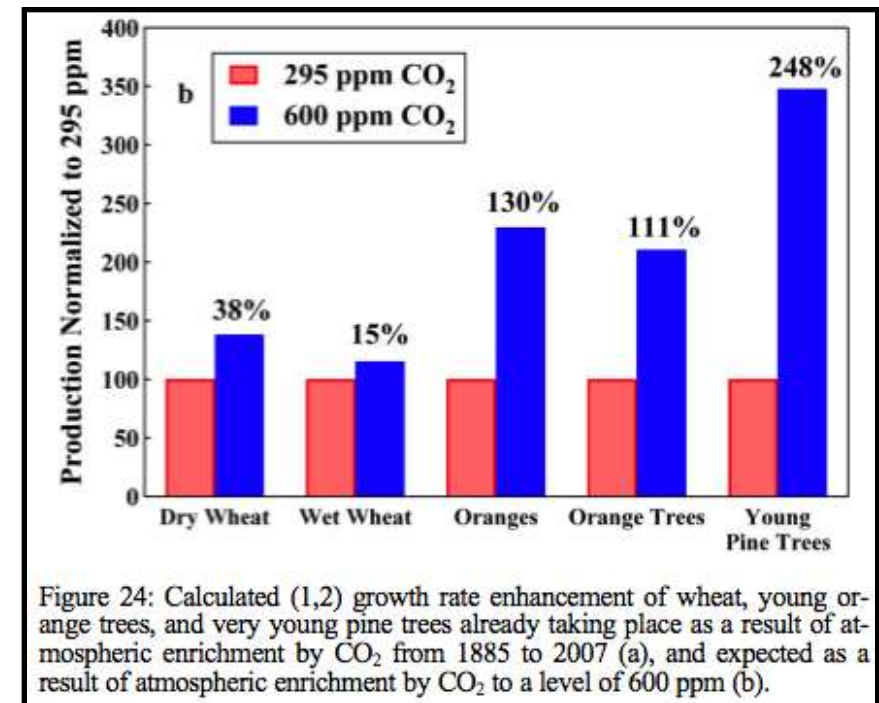


A claim:

About 500 million people (7% of today's population) are alive today, who wouldn't be, if carbon dioxide had not risen in the last century.

A Pollutant? No, CO₂ is critical for life

A doubling of CO₂ would greatly improve crop yields & forest growth. Decreasing CO₂ to half the current % would be catastrophic.



#1. - Increase? **Yes** - Due partially to human emissions, the atmospheric content of CO₂ has increased 20% in the last 50 years. CO₂ might now be the highest in the human era. However, CO₂ is only 0.038% of the atmosphere and CO₂ is only 3.6% of all the greenhouse gasses.

Dangerous increase? **No**, not unless it causes a dangerous result. Dangerous? yes, if it **decreases** 50%.

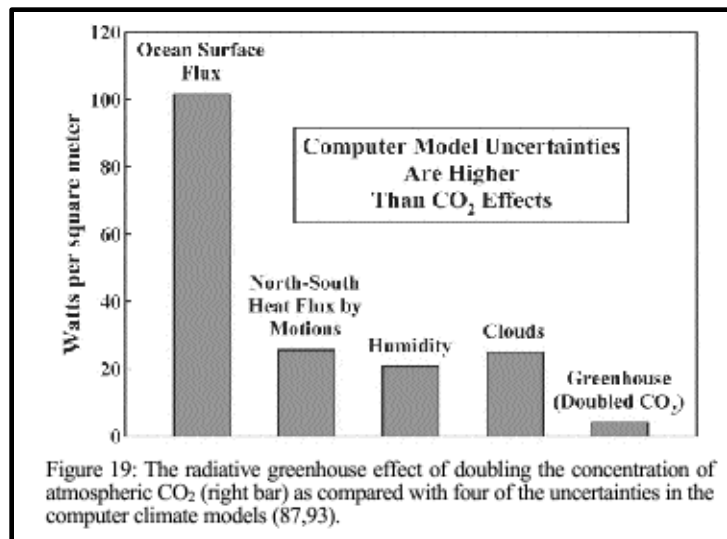
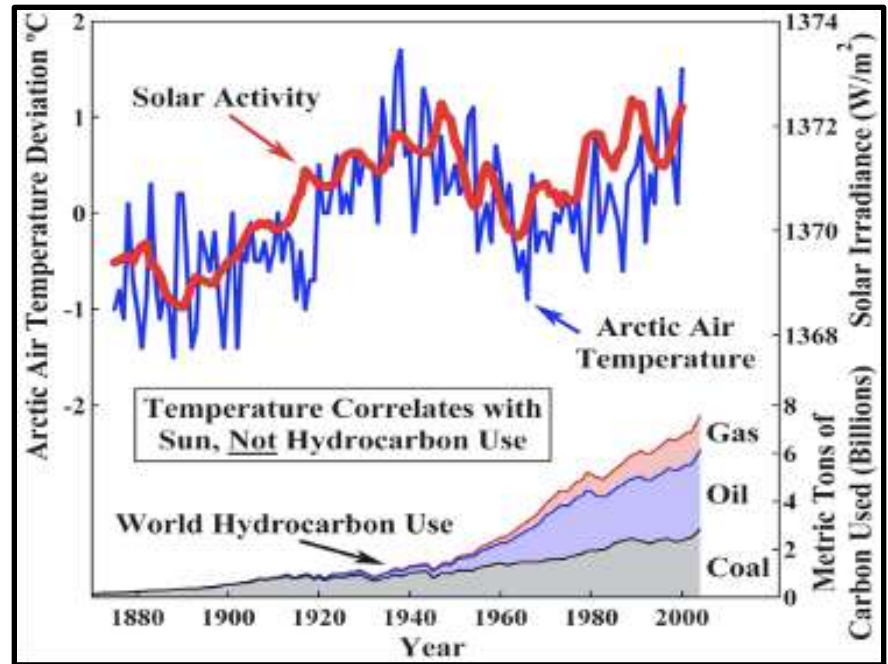
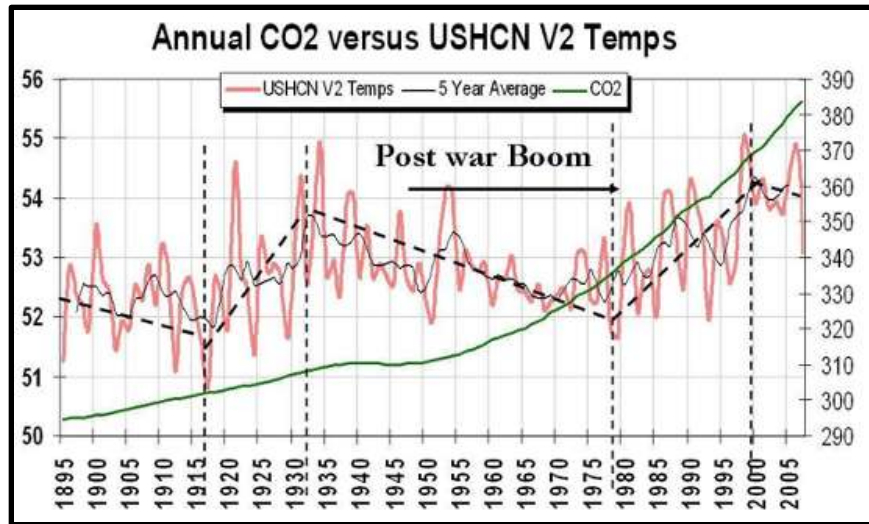
CO₂ is a trace gas; it has been 18 **times** current levels during times of life's greatest species diversity growth. Increases are beneficial.

1. **Recent human burning of fossil fuels suddenly and dangerously increased CO₂ beyond previous levels – Yes/No**
2. Human CO₂ emissions causes greenhouse warming.
3. Dangerous, sudden global warming occurred the last 50 years.
4. The current Temperature is **too Hot** & further warming is **Bad**.
5. It is more difficult to adapt to climate changes than to attempt to control them.

Next is #2. Okay, so CO₂ is not a problem for plants, animals and humans, but is it causing the planet to get warmer via the greenhouse effect?

Assessing the Blame for Global Warming

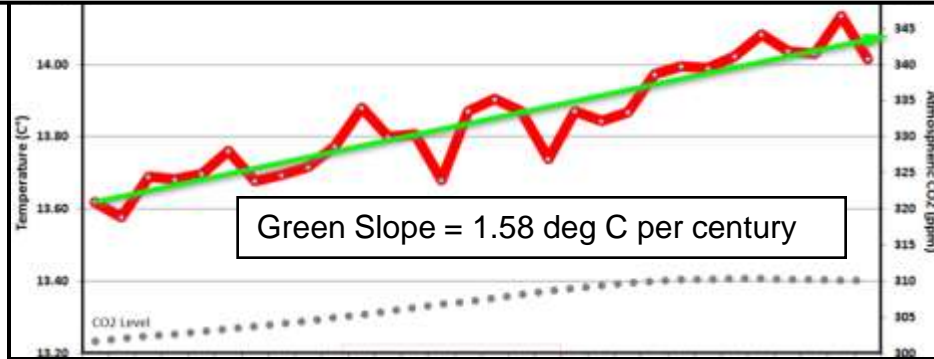
Atmospheric warming with human carbon emissions shows 'good' correlation only after 1970.



These four uncertainties in the Climate Models swamp the warming due to doubling CO₂.

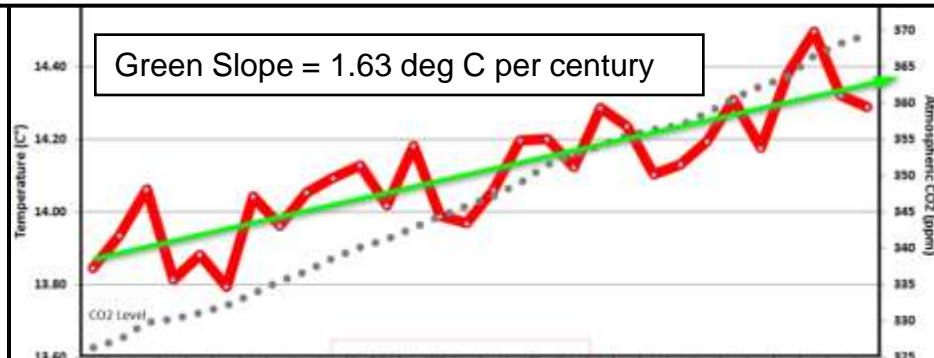
A Comparison, for the two most-recent warmings: “Natural” Global Warming vs. “CO2-caused” Global Warming.

Warming Prior to Large Human CO₂ Emissions.
1915 to 1945 with 2.7% rise in CO₂



The two 30-year warming periods are nearly identical, in spite of large differences in emissions and atmospheric CO₂ levels.

Warming During Large Human CO₂ Emissions.
1970 to 2000 with 13.2% rise in CO₂



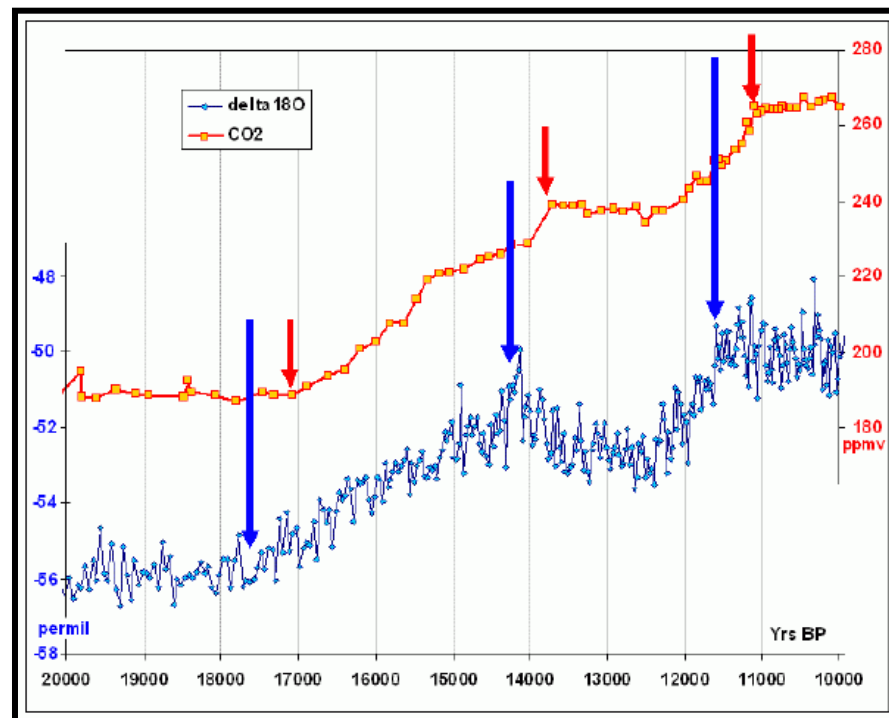
Global temperatures **cooled** from 1945 to 1970, even though CO₂ rose by 5%.

The “Correlation With Human emissions” claim is baseless.

Temperature Increases Drive CO2 Rise, Not Vice Versa

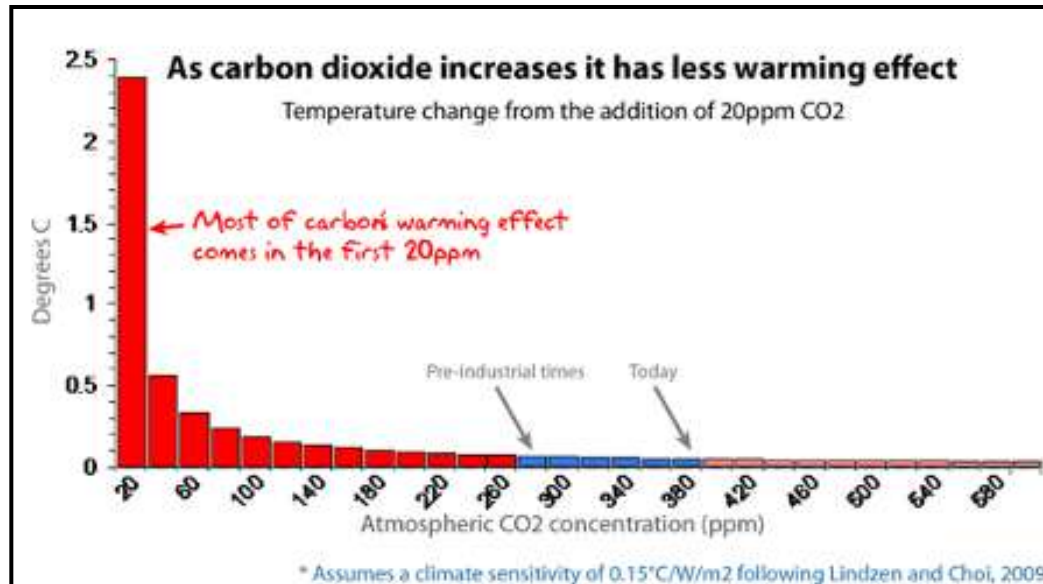
CO2 changes happen **after** temperature changes.
Data basis - ice cores.

This chart shows a 10,000-year period during the last ice age recovery. The temperature changes, **then** CO2 responds 500 to 800 years later.



The Big Greenhouse Gas Warming Effect is **only** for small amounts of CO₂

Doubling the concentration now would have little effect on warming.



The CO₂ already in the atmosphere absorbs most of the light it can. The CO₂ only “soaks up” its favorite wavelengths of light and it’s close to its saturation point. It can’t do much more, because there are not many left-over photons at the right wavelengths.

The natural greenhouse effect is real, and it helps keep us warm, but it’s already nearly reached its peak performance. Add more CO₂ and most of the extra gas is just “unemployed” molecules.

Using Computer Models to Predict Future Climate Changes

Engineers and Scientists know that you cannot merely extrapolate data that are scattered due to chaotic effects. So, scientists propose a theory, model it to predict and then turn the dials to match the model to the historic data. They then use the model to predict the future.

A big problem with the Scientist - he falls in love with the theory. If new data does not fit his prediction, he refuses to drop the theory, he just continues to tweak the dials. Instead, an Engineer looks for another theory, or refuses to predict - Hey, his decisions have consequences.

The lesson here is one that applies to risk management

“Question, Never Defend” *

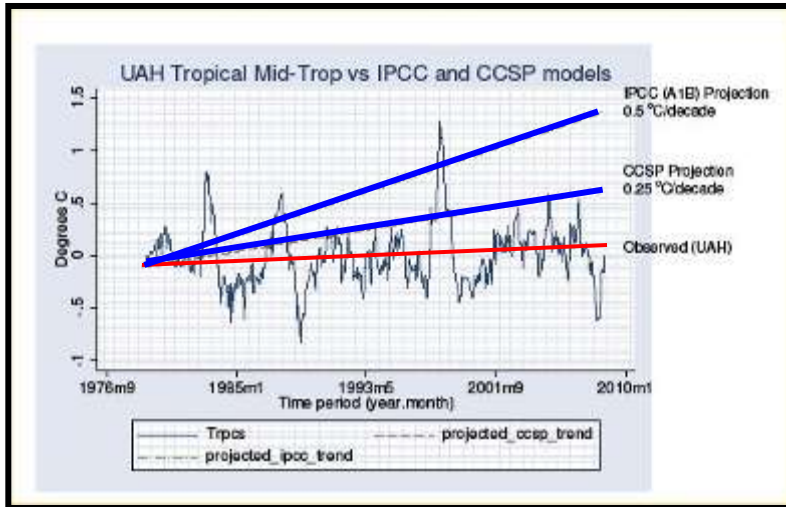
Note that NONE of the dozens of computer models predicted the last decade of cooling. Excuses and dial-tweaks were made **after the fact**.

The following charts show examples of poor IPCC predictions of warming, even though they can accurately tie emissions to CO2 rise. This discredits the theory of greenhouse-gas-warming being the primary warming cause.

* Rutan policy for aircraft flight safety reviews and always enforced for Flight Readiness Approvals.

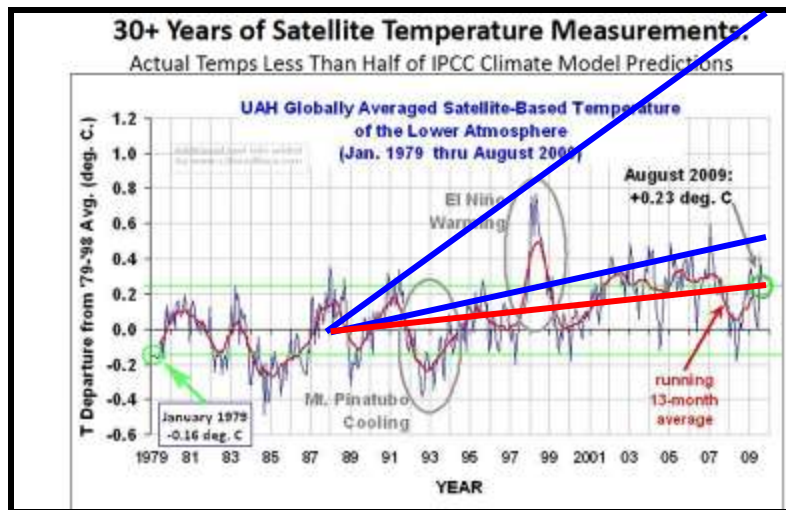
Climate models fail to Predict

News Media and Nature magazines often report that Global Warming is “worse than predictions”. In the vast majority of cases, they are wrong.



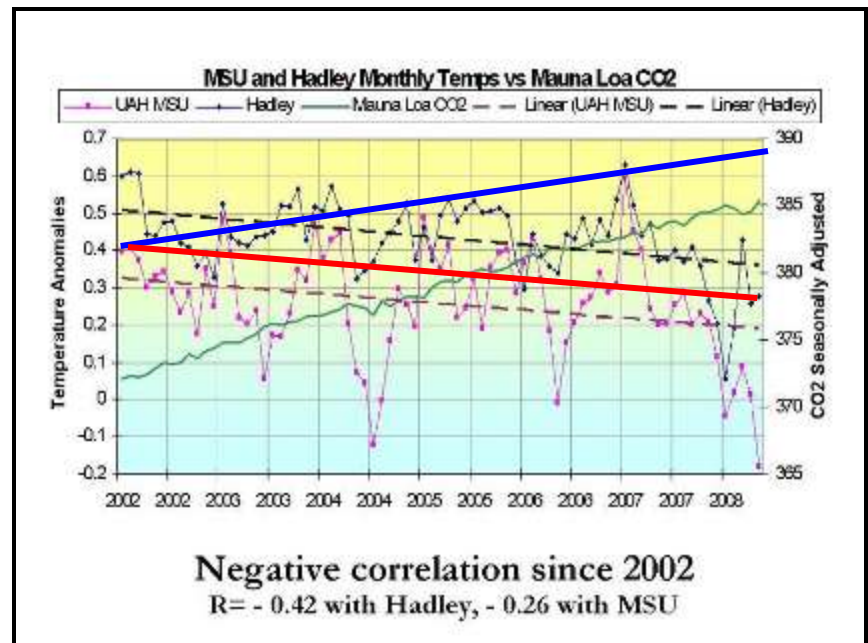
UN IPCC Prediction

Blue = prediction range (high and low) Red = actual data



Atmosphere Temperature Prediction

Blue = prediction slope (low range) Red = actual data



NASA's James Hansen

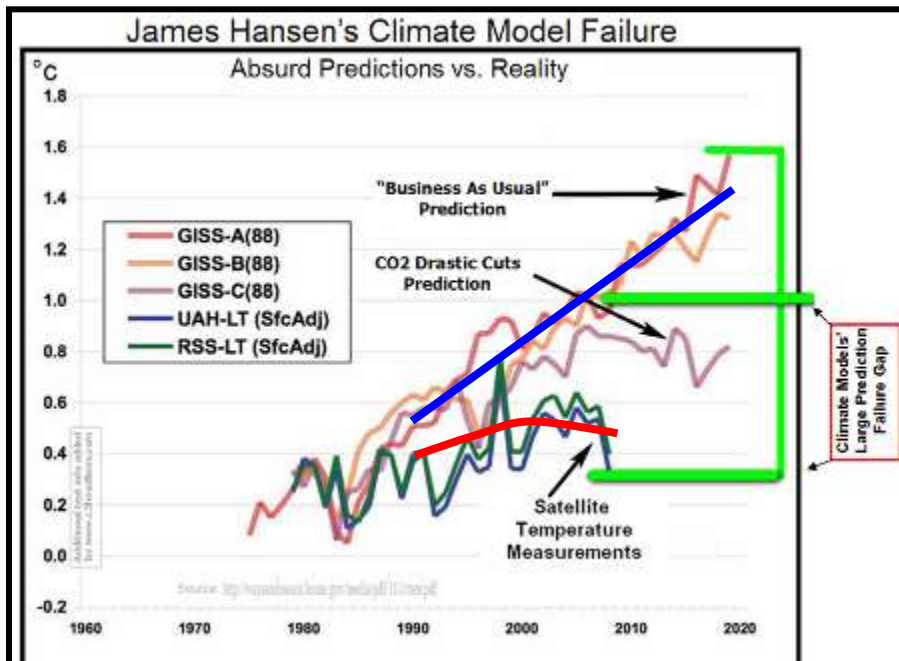
Calling the computer models “evidence” in Congress in 1988, Hansen predicted a leveling of warming by 2006, **ONLY** if drastic cuts were made in emissions.

Real data - it is cooler, **WITHOUT** the cuts. The planet is now the same temperature as when he testified.

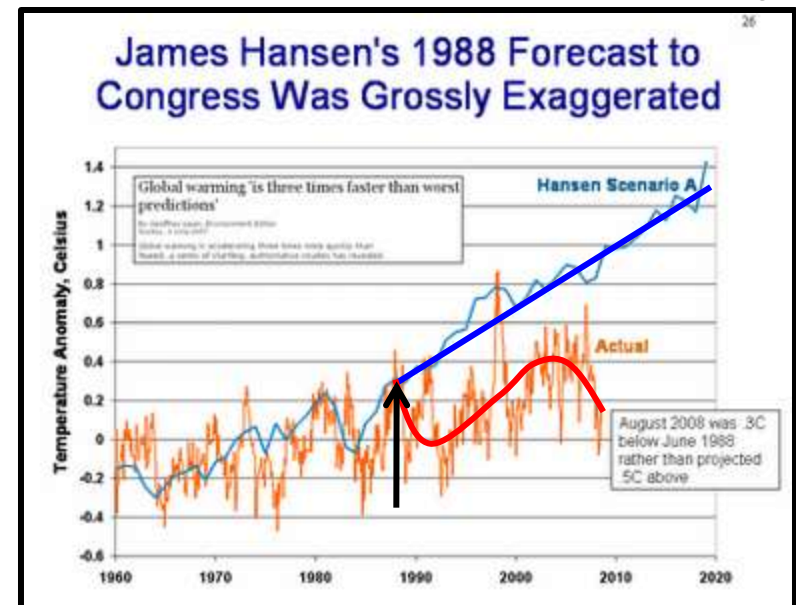
Strangest fact - He is **still** invited to congress to scare the inmates. Maybe he **should** have been muzzled after all?



Blue = prediction Red = actual data fairing



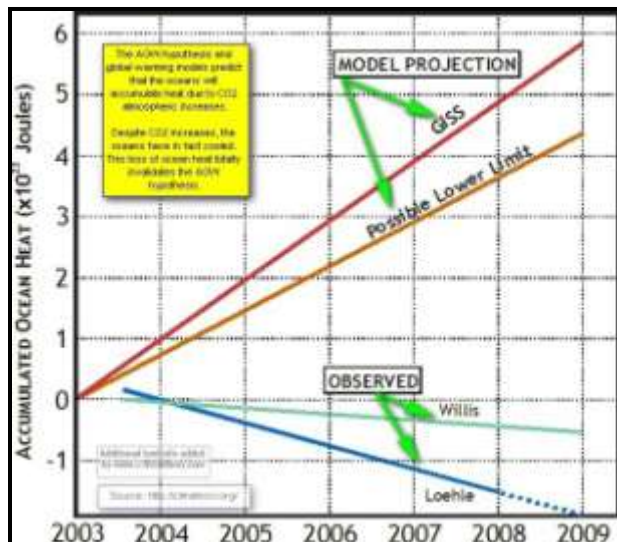
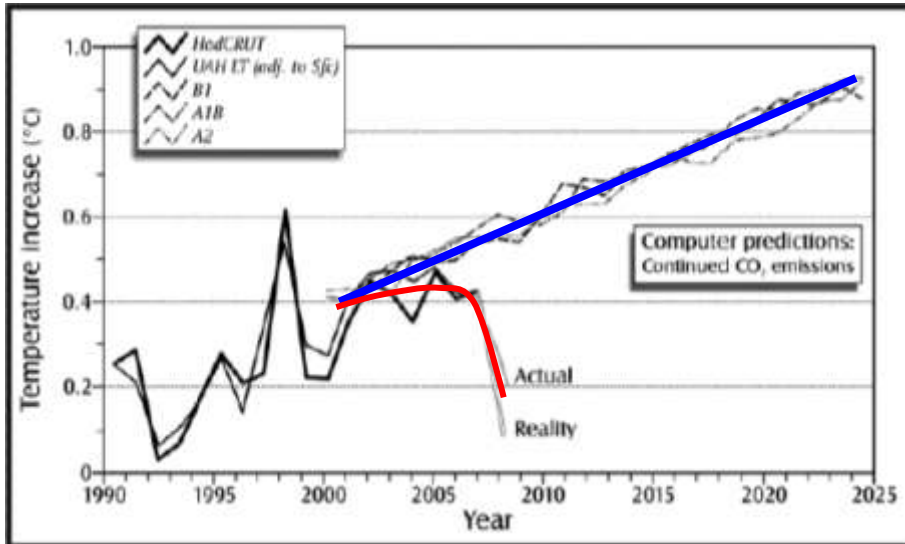
Blue = prediction Red = actual data fairing



More Failed Predictions from the Computer Models

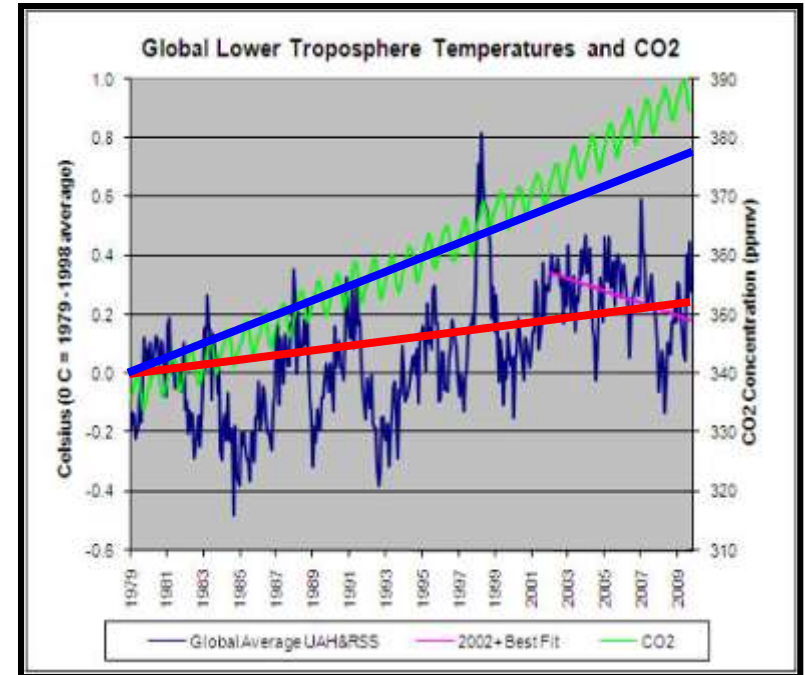
Five computer models predict greenhouse warming.
Data show no support for model's validity

Blue = model prediction, 2.2 deg/century Red = actual data



Troposphere Temps, a 31 year Trend

Blue = 2.5 deg/century slope Red = data trend

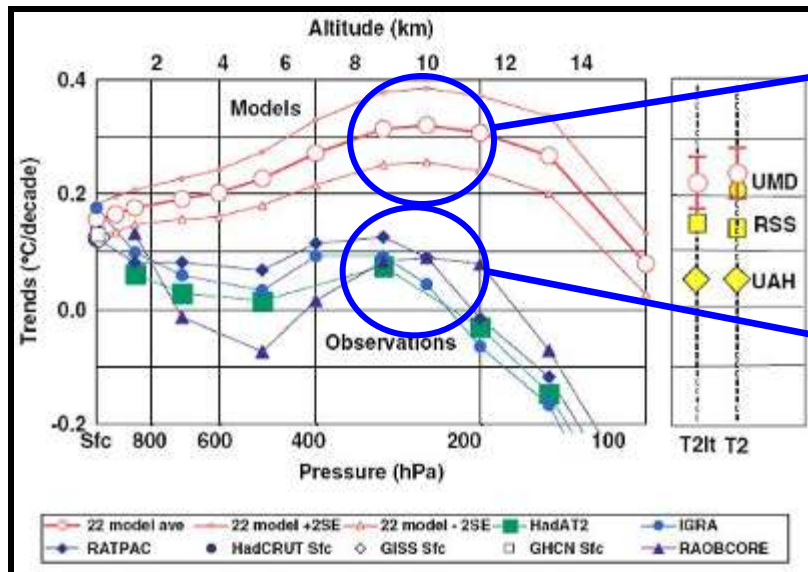


Ocean heat:
Opposite of prediction.

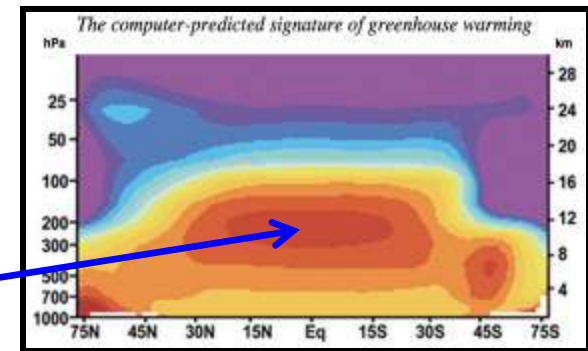
A Generic Problem With Greenhouse Warming Models

The character and distribution of the warming in the atmosphere (as measured) is dramatically different than predicted by the climate computer models. This brings the model's assumptions into question. How can we rely on the warming predictions, if the models **incorrectly** predict atmosphere warming?

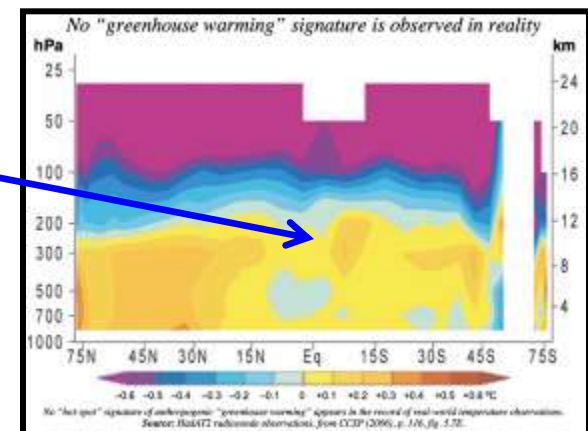
Models show warming rate (deg C per decade) at 4 to 14 km altitude, while measurements show rate is flat to 10km, then cool above.



Model predicts hot spot at 8 to 13 km for mid latitudes



But, the atmosphere does **not** warm at 8 to 13 km altitude

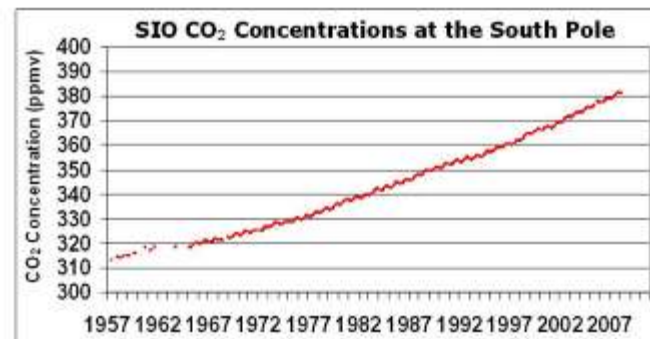
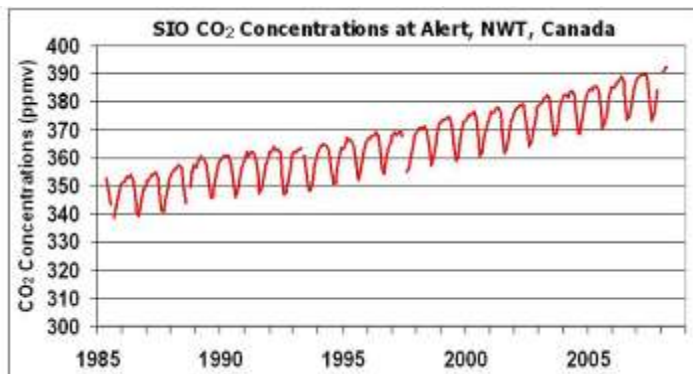
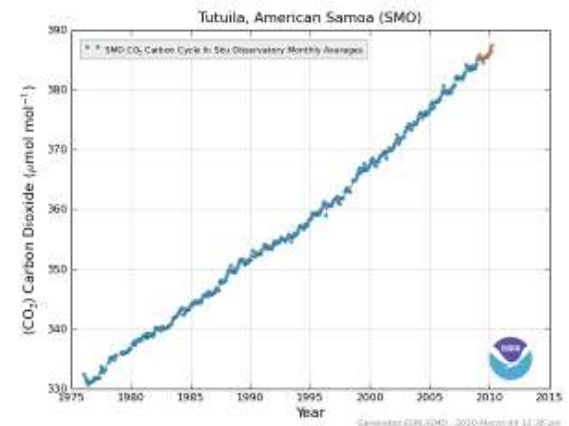
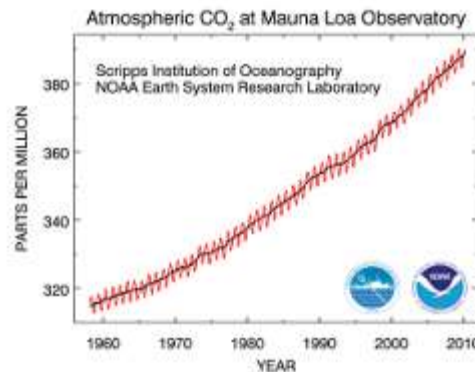
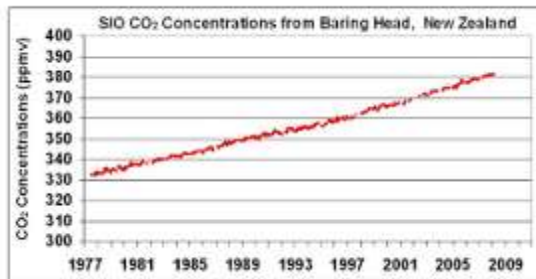


Greenhouse Models Cannot Predict Future Warming

But, what **can** be used for prediction?

If the engineer can find consistent, accurate, redundant data, he often extrapolates it to predict the near future.

One climate data set that qualifies is the modern measurement (last 50 years) of atmospheric CO₂. Data fairings on the next slide.



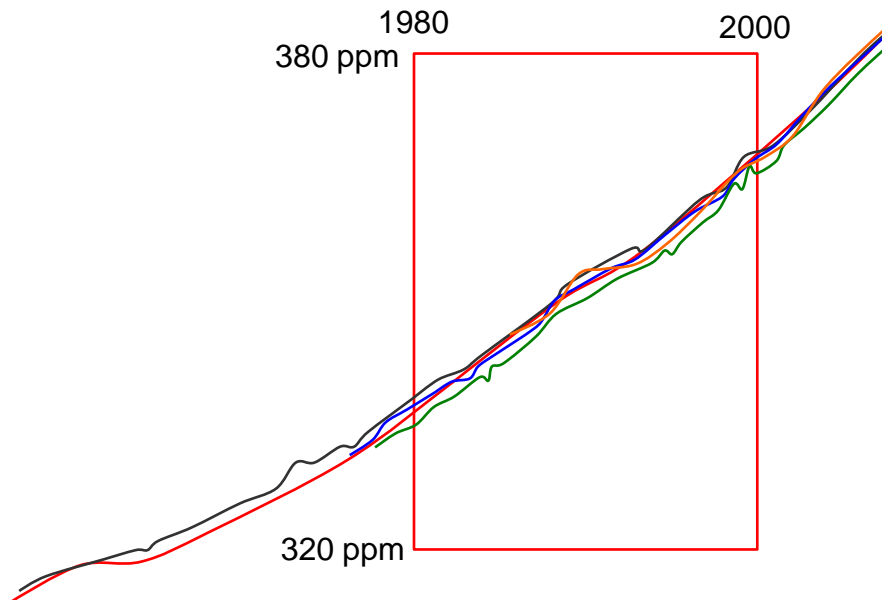
A Close look at Modern CO₂ Measurements

Accurate enough for prediction? **Yes**, at least on a short term.

Red = South Pole
Black = Mauna Loa
Blue = Tutuila, American Samoa
Green = Baring Head, New Zealand
Orange = Alert, Canada

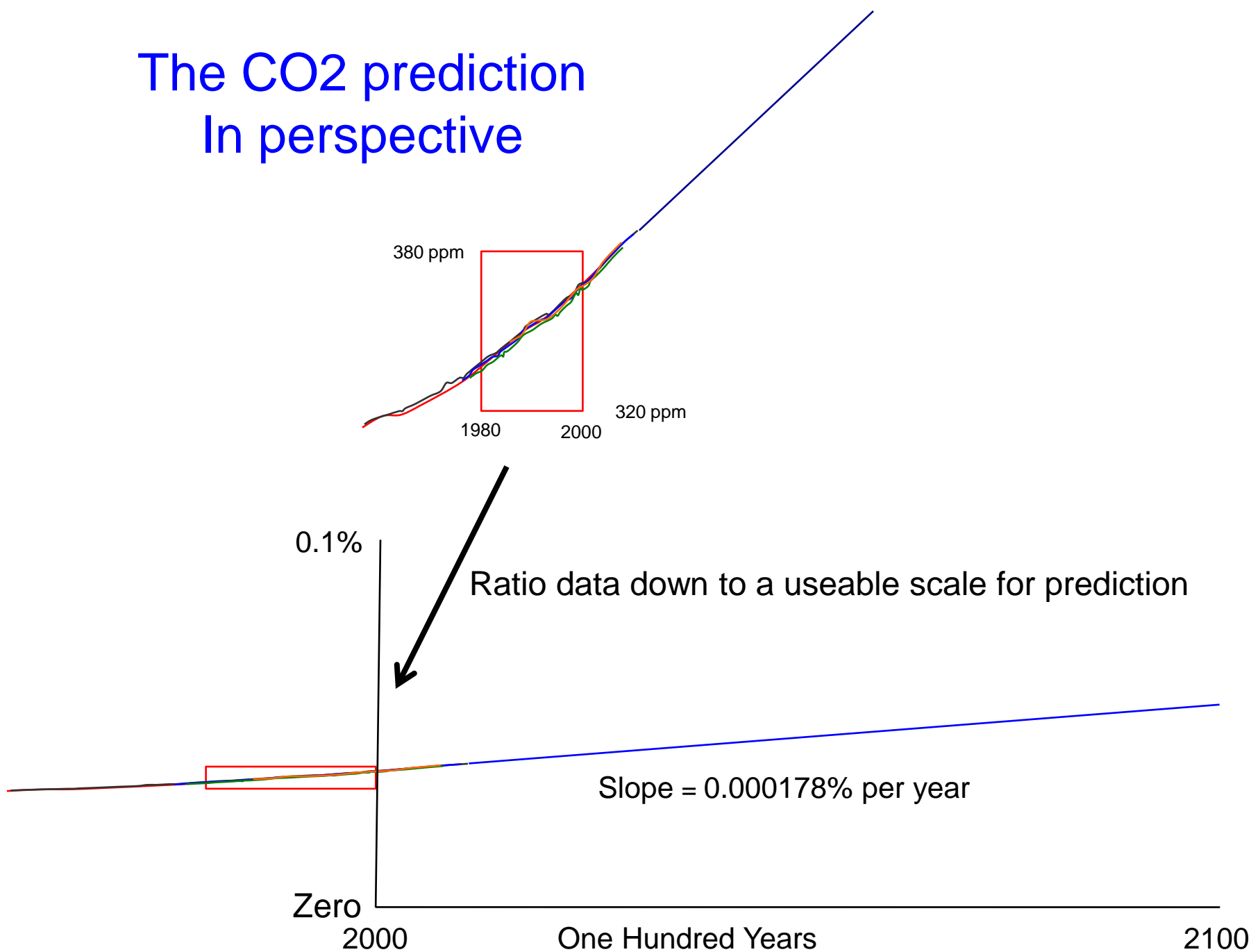
Slope for extrapolation

1.78 ppm per year = only 0.000178% per year.



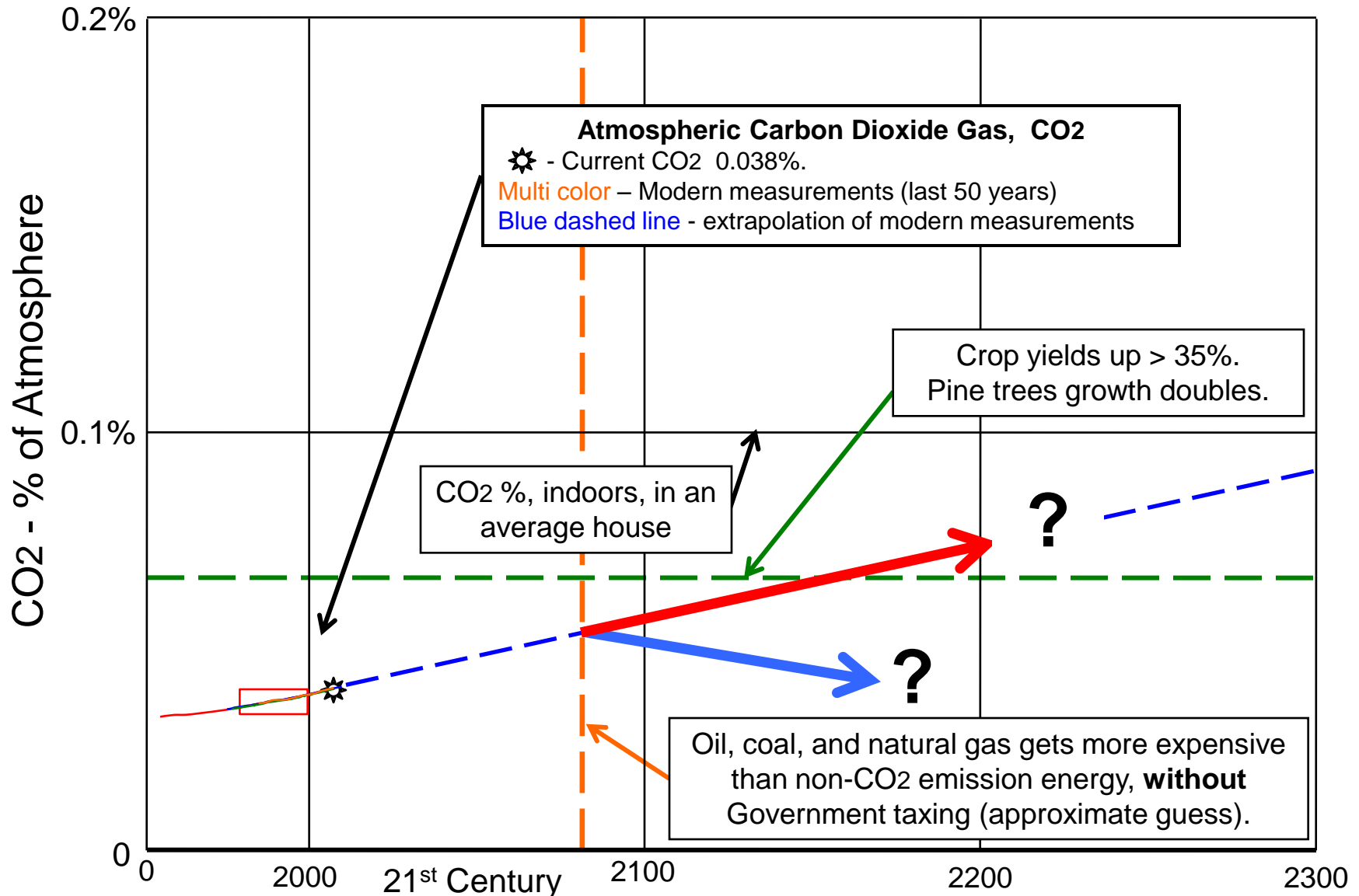
Note: This is NOT a climate computer model, just an extrapolation of accurate, scatter-free, measured CO₂ data.

The CO2 prediction In perspective



A Carbon Dioxide Prediction

An extrapolation of the accurate modern measurements.
An estimate of what might happen **without** Government's taxing energy.
This Chart is structured to **Inform**, not to **Scare**.



Notes on continuing our use of fossil fuels

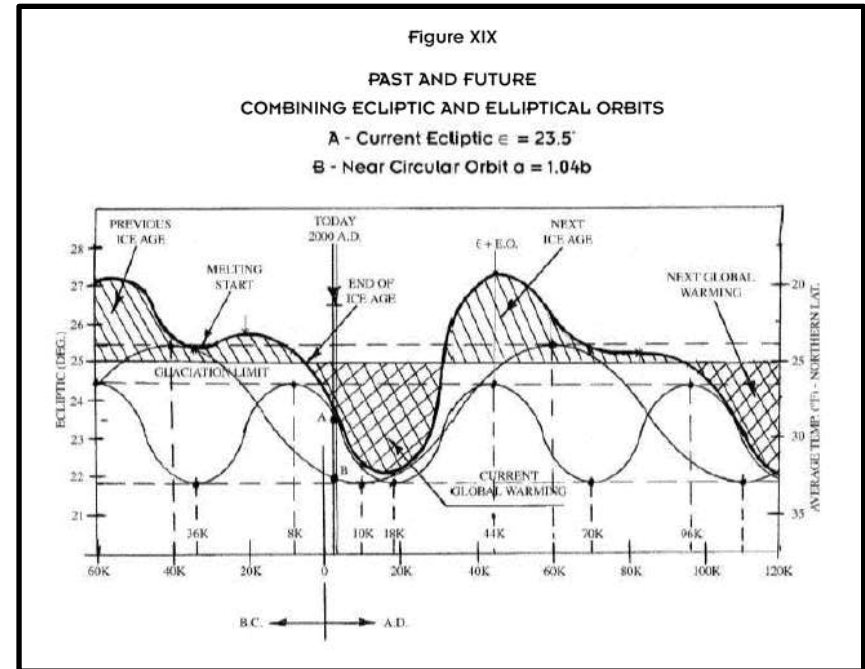
- An “optimum” CO₂ level for plants and animals would be reached in about 1000 years **if** the current rate of emissions could be continued.
- We do **not** have enough fossil fuels to drive the atmospheric level of CO₂ to anywhere close to a dangerous level.
- Two more centuries of emissions like the last are not possible and not dangerous.
- Using all the reserves of fossil fuels now, would have little effect on global temperatures (beyond the natural warming).
- CO₂ level will drop, in response to decreasing temperatures about 500 to 800 years after the planet experiences its normal 90k-year cycle – cooling into the next big ice age.
- We cannot burn fossil fuels to prevent the next ice age – the greenhouse gas effect is far too weak for that.
- Since our current fuels (coal, oil, natural gas) are non-renewable, as they become scarce their cost will force a change to alternatives **without** Government control or Tax. This market-driven change will occur **earlier** if Governments do **not** constrain use of the current fuels.

Greenhouse CO₂ Effect is a **minor** player in global warming

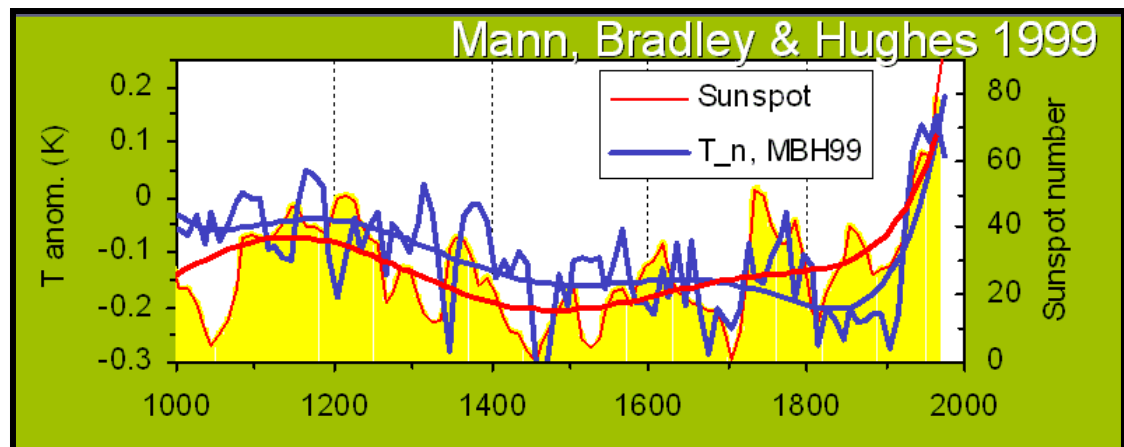
- The important climate thermostats are **too chaotic to model**:
 - **Precipitation and Cloud formation**; A <2% precipitation change more than offsets a **doubling** of CO₂, but rain and clouds are too chaotic to model, even short term.
 - **The Pacific heat vent**; observed and powerful, but cannot be modeled. It is also a stable, temperature control thermostat.
- Water vapor is the primary greenhouse gas, overwhelming CO₂, but even the EPA will not call water a “pollutant”.
- The “clouds and humidity” factor is chaotic and bogglingly complex. High clouds tend to warm the planet but at the same time, low clouds tend to cool it. Which effect rules?

Earth orbit cycles and sunspots: Likely drivers of warming cycles

Combining Ecliptic and Elliptical orbits correlates with last 60k years' temperatures and predicts future climate.



Sunspots correlate with last 1,000 years temperatures.



Where is the evidence that human emissions cause greenhouse global warming?

Computer models are not evidence.

There once was supporting evidence on greenhouse feedback extent. However, there are now at least three independent pieces of evidence that the temperature rises predicted by the IPCC due to CO₂ emissions are exaggerated by a factor of between 2 and 10. The scientists have assumed overly-positive water vapor feedback in the climate models.

Chapter 9 of IPCC latest Assessment Report 4 (2007), “Understanding and Attributing Climate Change”, **contains no evidence**. The claim that CO₂ is the main cause of the recent global warming is an **assumption**, repeated numerous times. But repetition is not proof, and the scientists and policy makers’ summary report presents no actual evidence.

#2 - Emissions caused greenhouse warming? **Not likely**, and **not** supported by data.

There is no evidence that carbon dioxide emissions are the main cause of the recent global warming.

Our small warming/cooling cycles are mainly caused by chaotic formation of clouds/precipitation and solar input variation, not by CO2 greenhouse effects.

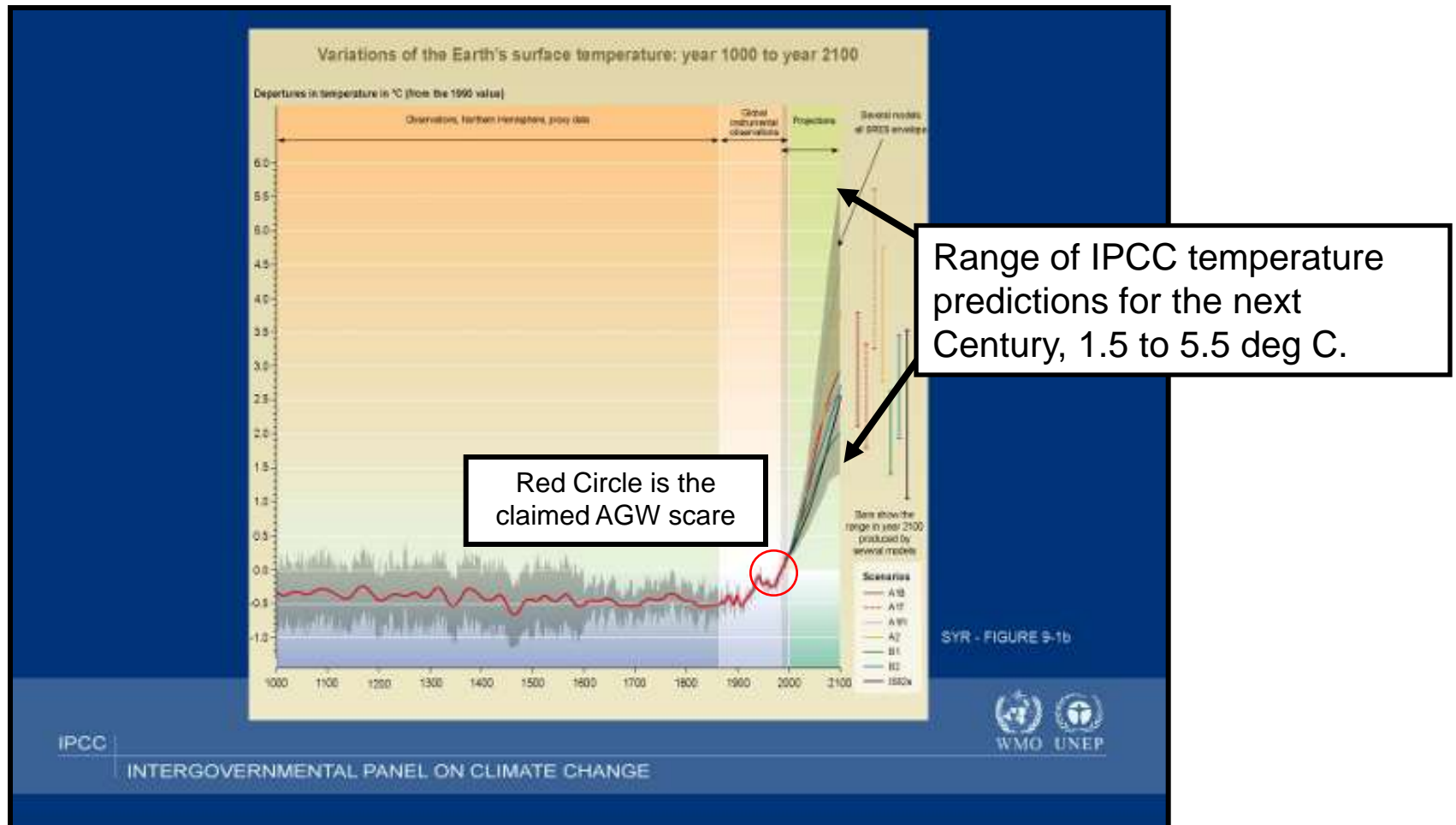
Despite spending \$billions over the last 20 years looking for evidence, the scientists have found none. In two instances they expected to find it, but in both cases they found only evidence of the opposite.

1. Recent human burning of fossil fuels suddenly and dangerously increased CO2 beyond previous levels – Yes/No.
2. **Human CO2 emissions causes greenhouse warming – No.**
3. Dangerous, sudden global warming occurred the last 50 years.
4. The current Temperature is **too Hot** & further warming is **Bad**.
5. It is more difficult to adapt to climate changes than to attempt to control them.

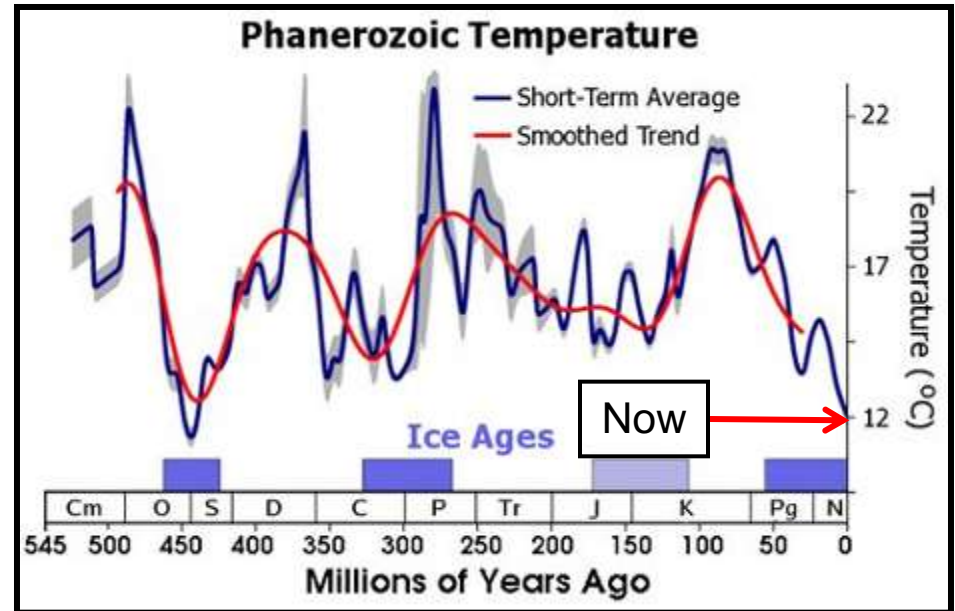
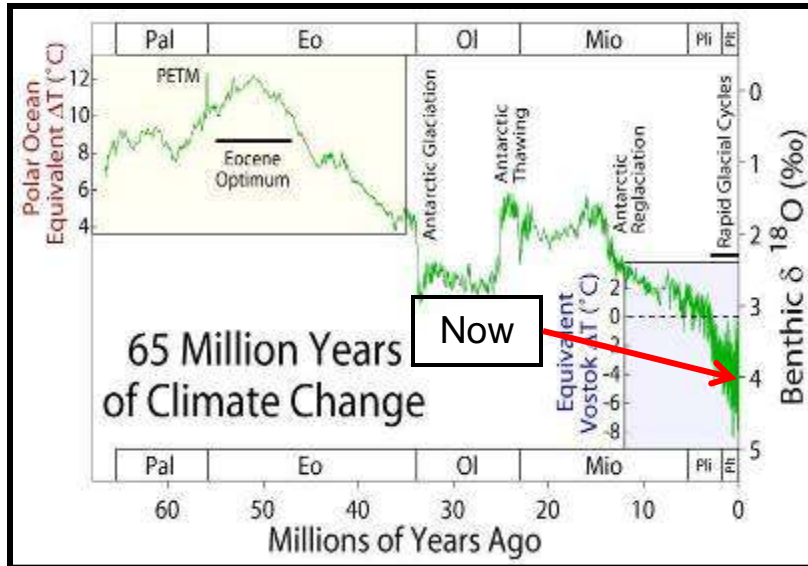
Next is #3. OK, we are done with looking at CO2. Lets now look at global temperatures: did the planet indeed experience sudden, dangerous warming in the last 50 years?

Looking again at the UN temperature scare

This chart includes a large number of predictions - all of them showing big problems or catastrophe in the next century. None of the predictions are based on reliable, tested evidence. Most of the data shown in this chart are now known to be wrong.



Looking Back Millions of years



We are in a comparative **cold** period and the 20th century warming is **insignificant**.

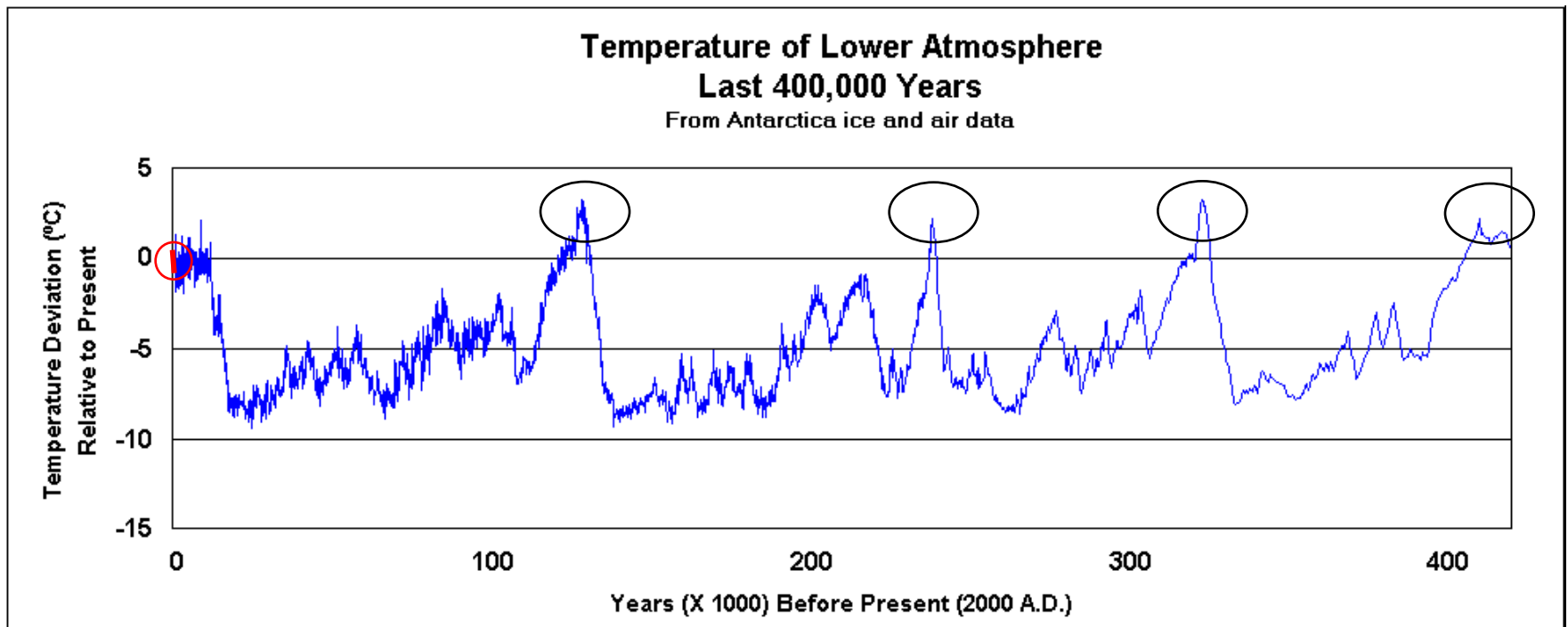
Runaway greenhouse destruction of our planet would have happened in the distant past (if catastrophic greenhouse theory were correct).

More Recent Global Temperature Data

Looking Back 400,000 years

The current, 11,000-year non-glacial warm period is the longest running and the **COLDEST** one in the last half million years. The four previous interglacial warm periods were all **warmer** than the current one (data in the black ovals).

The recent 1,000 years' temperatures were completely **normal** (red line in the red circle), among the recent 11,000-year warm period.

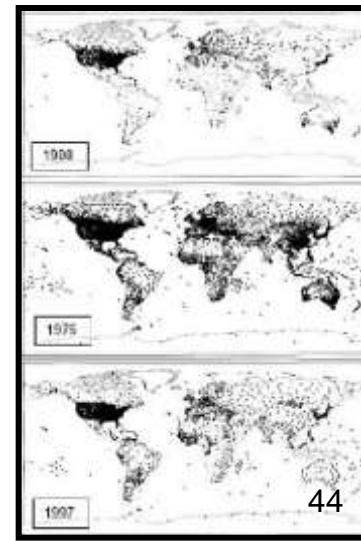
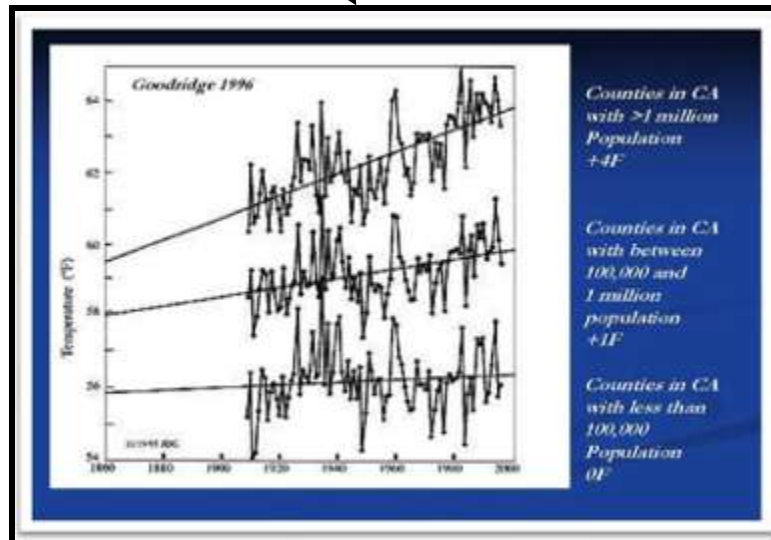
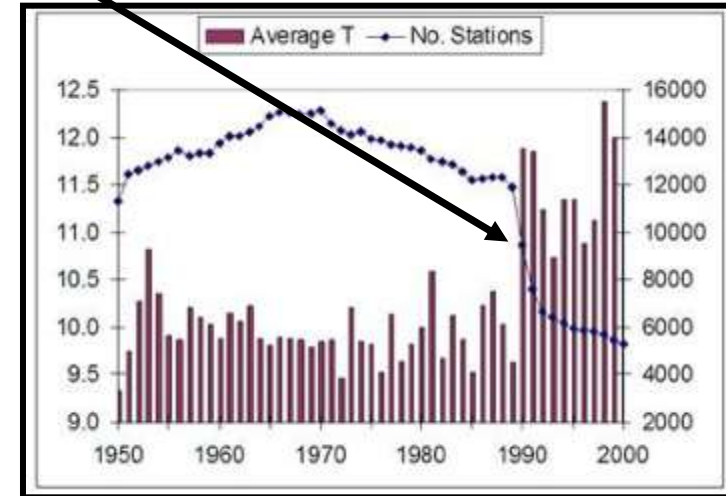
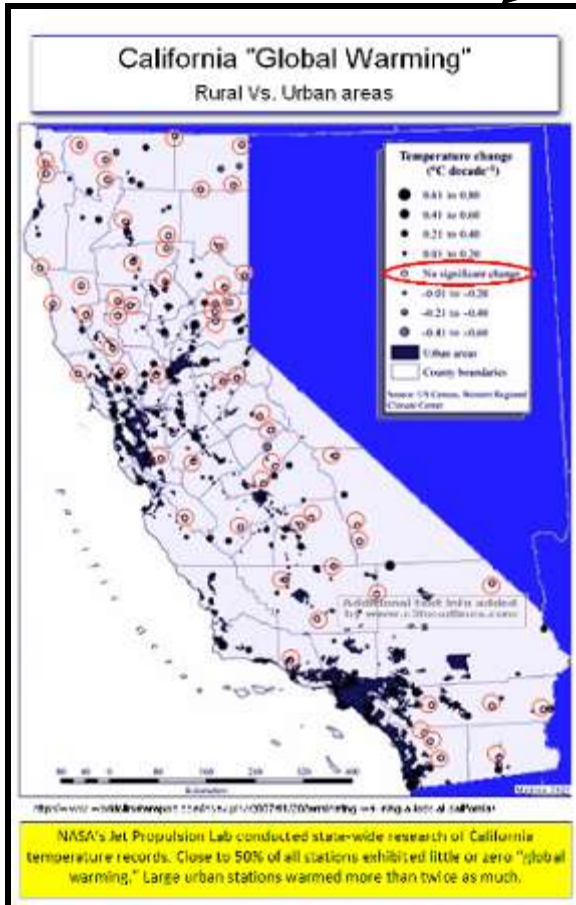


Remember; recent CO₂ increase **is** unusual, but **not** global temperature - further indication that emissions are **not** the driver of Global Warming.

Surface Thermometer Measurements and the 'urban-heating' proof

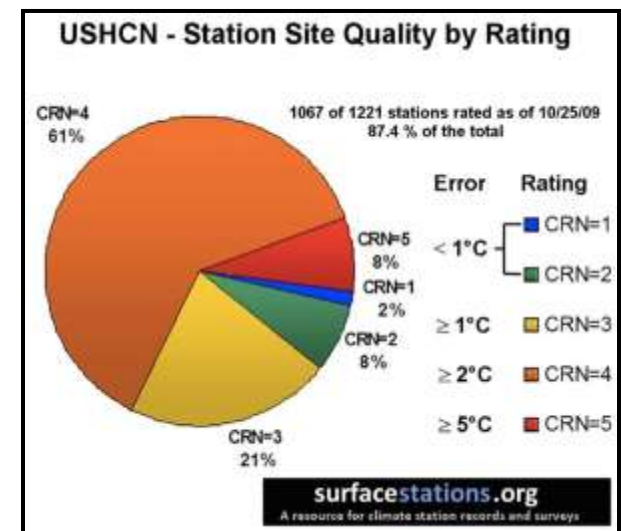
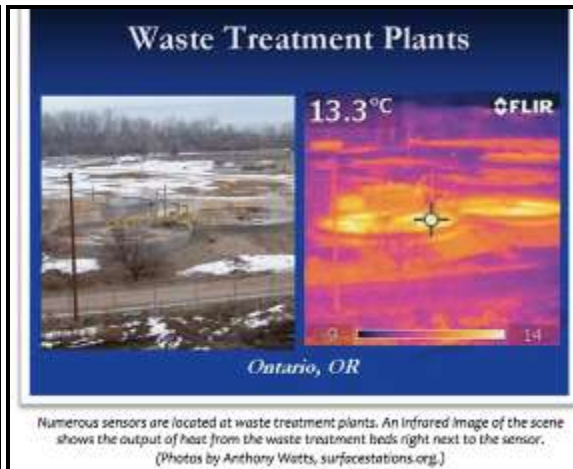
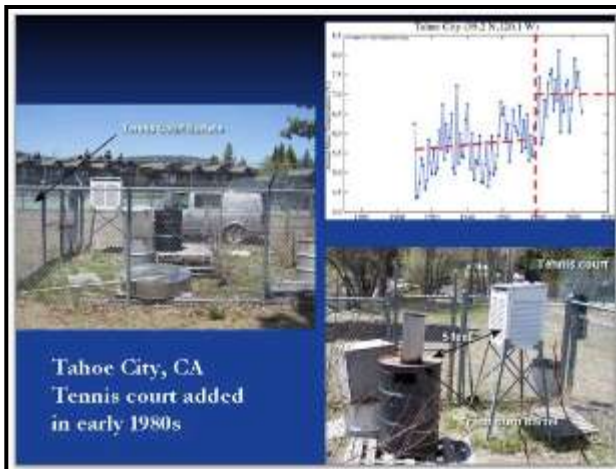
The number of stations grossly changed when Soviet union fell - biasing the calculation of Global Average Temperature. Soviets had paid outposts for fuel based on how cold they were. Then, 'warming' happened when the policy was ended.

California shows no warming in counties that did not have a big increase in population during the last 100 years. Population locally biases the sensors hotter.



Surface Thermometer Measurement (2)

90% of US sensors do not meet site quality standards.



Local effects, added recently, all bias the temperature higher.



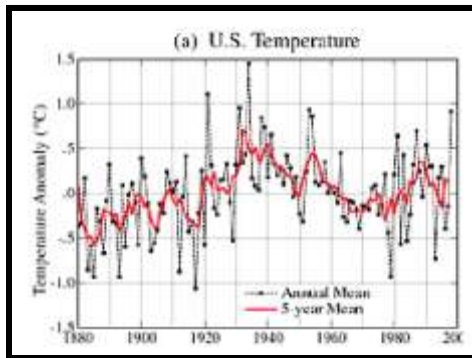
Surface Thermometer Measurement (3)

Data manipulation

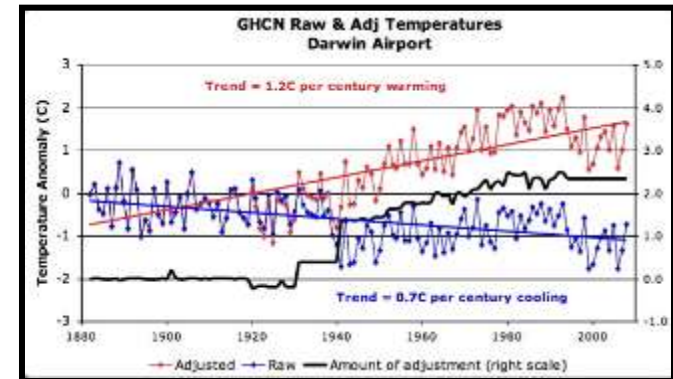
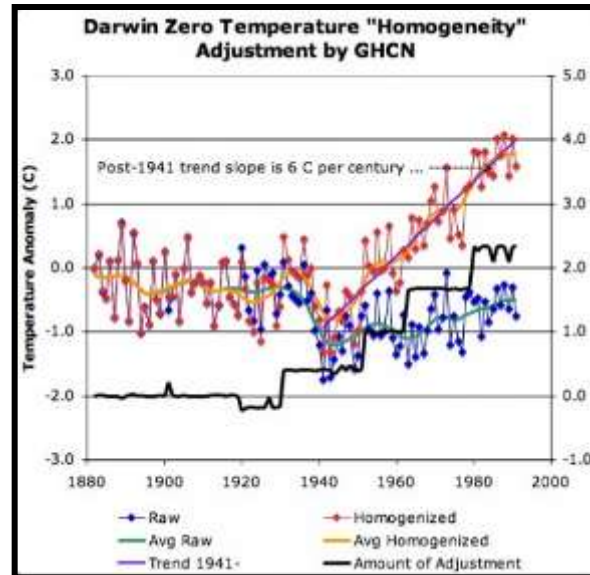
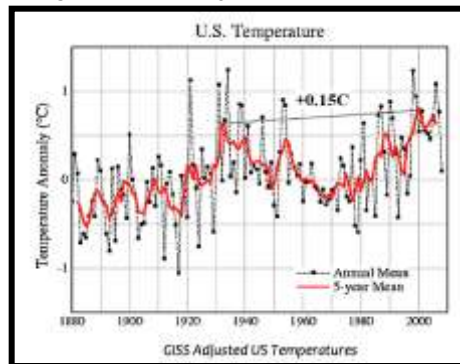
The Darwin Australia "Adjustments"

Blue = raw data Red = Adjusted Black = the arbitrary adjustment.

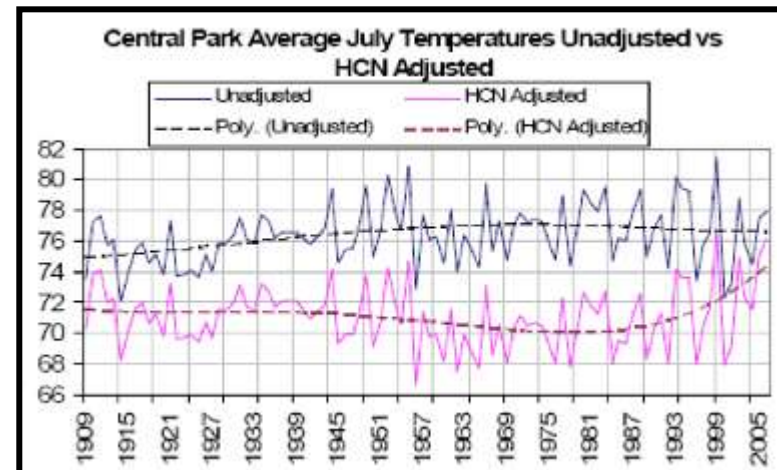
US surface temp,
presented by NASA
in 1999



The same data were later
'adjusted' by NASA GISS



Urban-Heat Corrections of Central Park
Infers NYC depopulated 1987 to 2006!



Surface Temperature Record

The last ~ 200 years

Science and Public Policy Institute
Surface Temp study, Jan 2010 report.

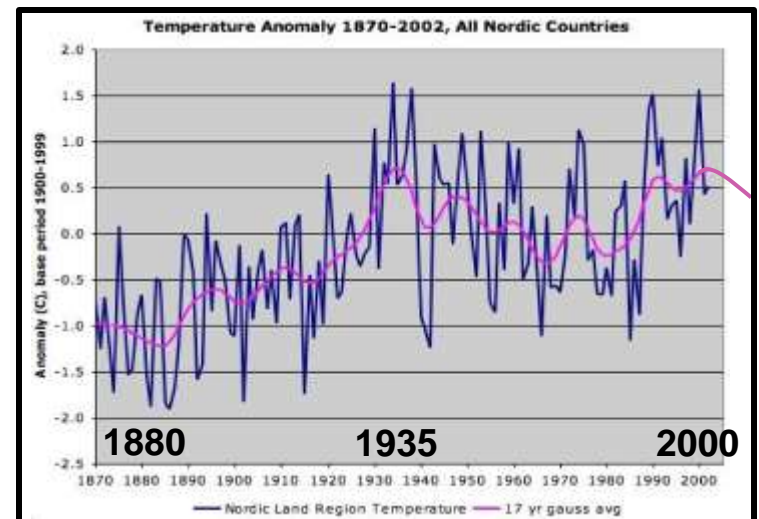
Selected conclusions:

1. Instrumental temperature data for the pre-satellite era (1850-1980) have been so **widely, tampered with** that it cannot be credibly asserted there has been any significant global warming in the 20th century.
2. All terrestrial surface-temperature databases exhibit serious problems that render them **useless** for determining accurate long-term temperature trends.
5. There has been a bias towards removing higher-latitude and rural stations, leading to a **serious overstatement** of global warming.
13. Global terrestrial data bases are seriously flawed and can **no longer be trusted** to assess climate trends or validate model forecasts.

A sample of data with **no evidence of manipulation.**

Surface Measurements for all Nordic countries.

Current temp is **lower** than in 1935



There is no credible **surface** temperature-measured data to prove the 20th-century global warming.

Okay, how about **atmospheric** measurements?

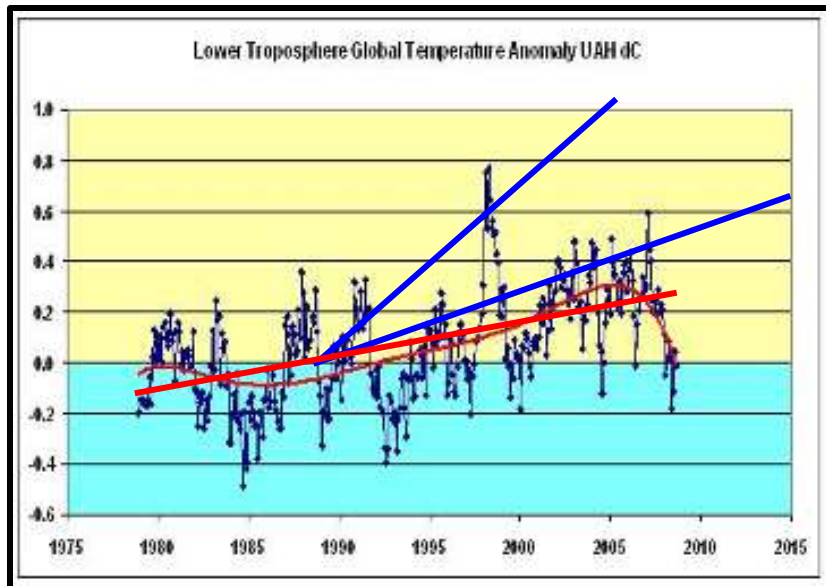
The most accurate data are from satellites, since they measure the entire globe.

All the satellite data show a global warming slope **the same** as the entire 19th-century average, i.e. the recent, big human emissions are **doing nothing** to the natural global warming trend.

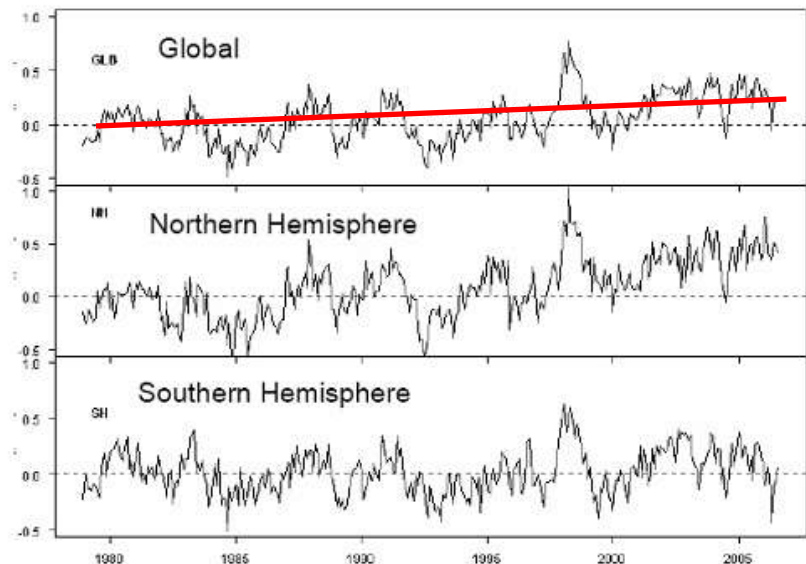
Lower Tropical Global Temp Anomaly, UAH

The overall trend is only 50% of the 'low' IPCC forecast.

The current temperature is **identical to 1979**.



The 28 years of High Quality Satellite Data



The Southern Hemisphere is the same temperature it was 28 years ago, the Northern Hemisphere has warmed slightly.

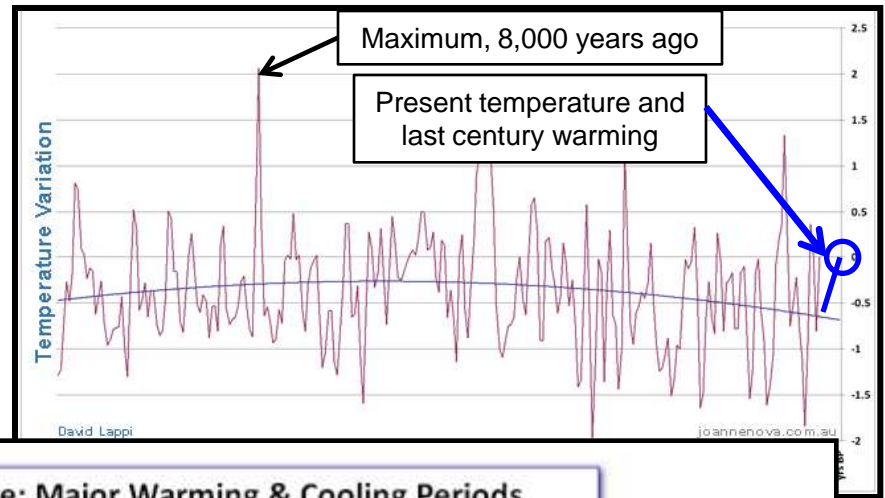
The Greenland ice core data show it has been consistently warmer for the last 11,000 years.

Today's climate is not even close to being the "warmest on record".

Note the wild variances in temperatures during thousands of years of constant CO2 levels (green data).

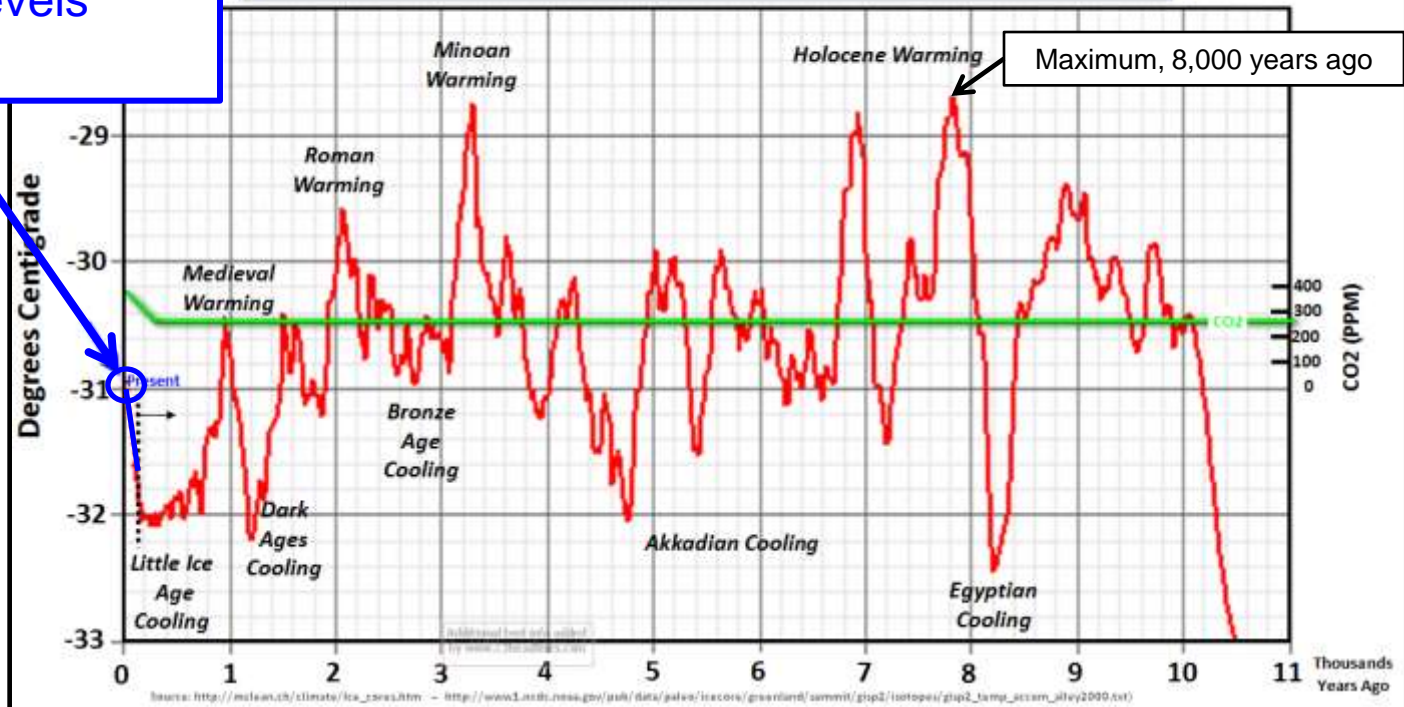
Present temperature and last century warming

Russian Vostok ice cores, Antarctica



Greenland Ice Core: Major Warming & Cooling Periods

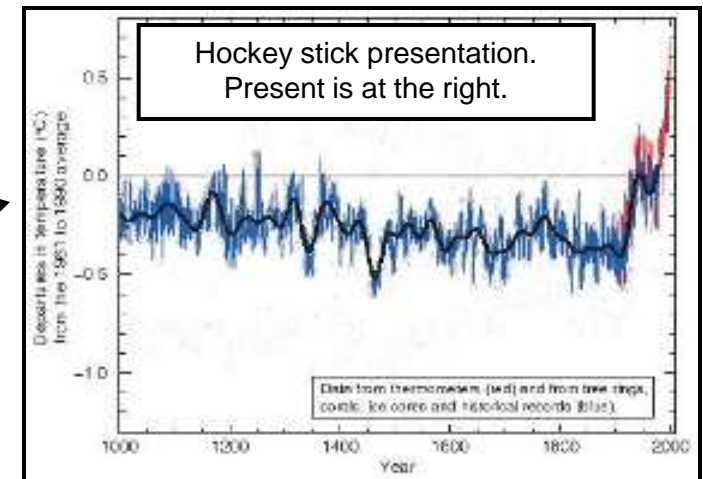
"Unprecedented" Modern Warming Substantially Below Medieval, Roman, Minoan, and Holocene Warming Periods



Three Alarmist' and UN-IPCC claims:

1. Global temperatures have been moderate, before human fossil fuel emissions caused unprecedented warming the last 50 years.
2. Ice cores are local data, not global.
3. The Medieval Warming Period was limited to Northern Europe and the Atlantic (not global).

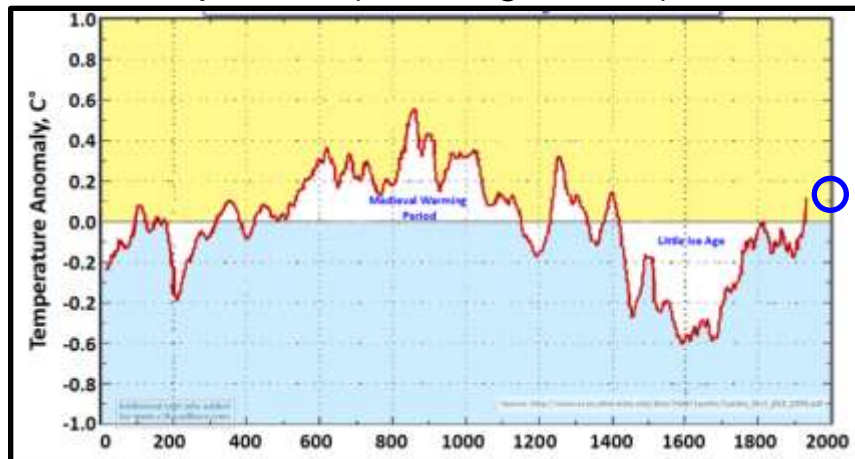
They want you to believe the global past and the recent warming looks just like the hockey stick graph here.



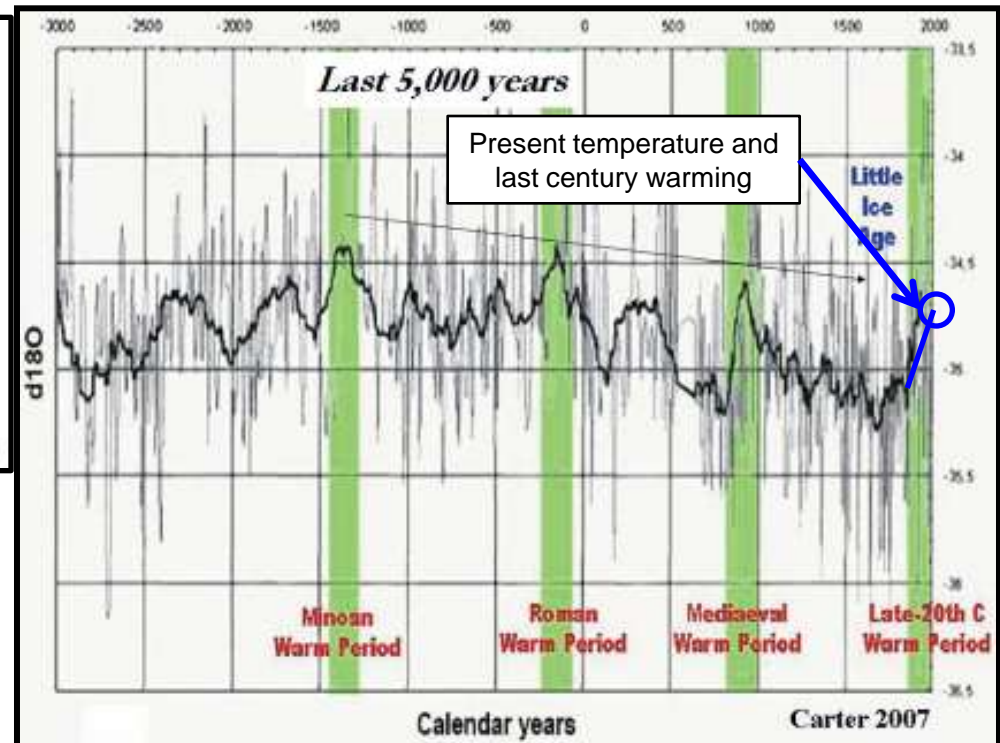
The next five slides show data the IPCC does not want you to see. They show that all the above three claims are bogus.

Some Temperature Proxies (non-ice core, non-thermometer) Within the recent 11,000-year warm period

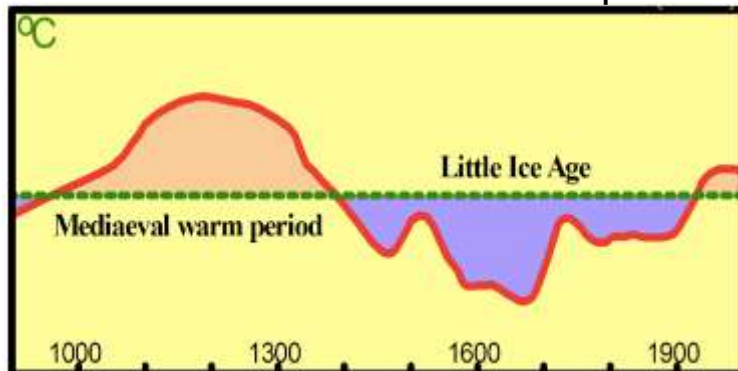
Last 2,000 years from 18 non-tree ring proxies (Dr Craig Loehle).



Last 5,000 years from other proxies
Carter 2007.



Last 1200 years from historical records.
Shown in the 1990 IPCC Report.



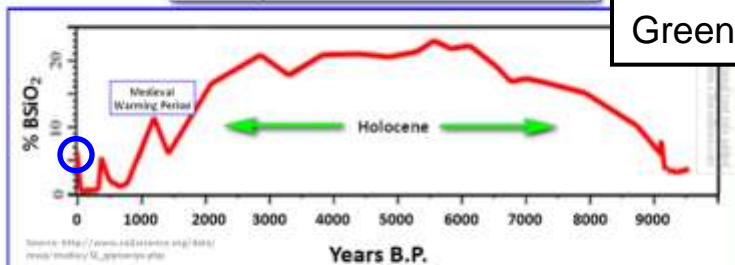
Conclusion: The claim that emissions have caused
unprecedented warming is not supported by the data.

More proxies or temperature trend indicators; Within the recent 11,000-year warm period, many parts of the globe.

Past Global Warming Higher

Temperatures From Lake In Greenland

Core sediments of a
Greenland lake, 9k years.

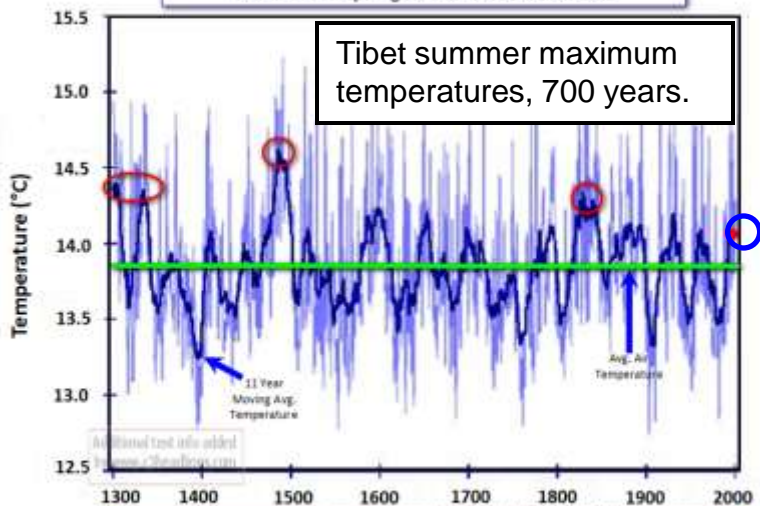


The graph above depicts past temperatures reconstructed from core sediments of a Greenland lake. The research found that the Medieval Warming Period had higher temperatures than those experienced during modern times. In addition, temperatures prior to two thousand years ago were much higher for an extended period, known as the Holocene. Global warming alarmists claim that today's temperature are "unprecedented" in terms of warmth, counter to actual temperature history.

Little Ice Age Summer Temperatures In Tibet

Maximum Temps Higher Than Modern Summers

Tibet summer maximum
temperatures, 700 years.

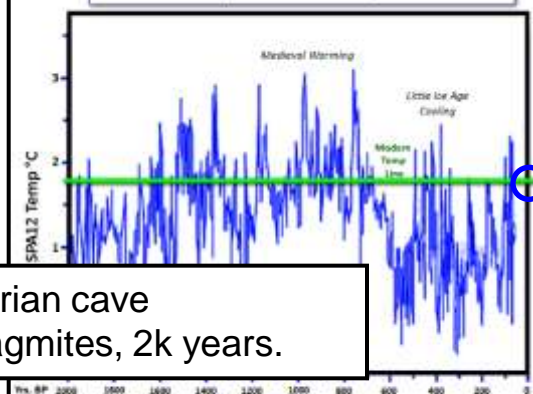


Above is history of summer temperatures from a valley in the Tibetan Plateau. It's a 700 history spanning the Little Ice Age to current times. As shown, even summer temperatures in the midst of the Little Ice Age exceeded those of modern day temperatures, what climate alarmist scientists refer to as "unprecedented" global warming.

Blue circles show
present conditions

Austrian Alps: Medieval Warming Hotter Than Now

Temperatures 1.0 to 1.5°C Higher



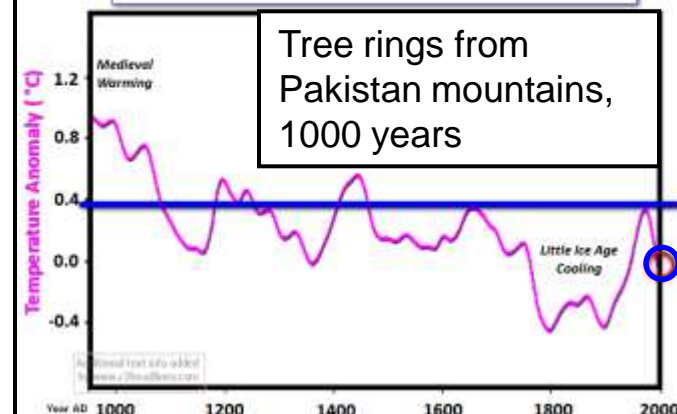
Austrian cave
stalagmites, 2k years.

Analysis (2005 & 2007) of Austrian cave stalagmites indicated Medieval Warming temperatures exceeded current temperatures. Climate alarmist scientists claimed that modern temperatures were "unprecedented" in terms of global warming, which the above chart refutes. The high temperatures above were not a result of high levels of human CO2.

N. Pakistan Mountains Warmer During Medieval Period

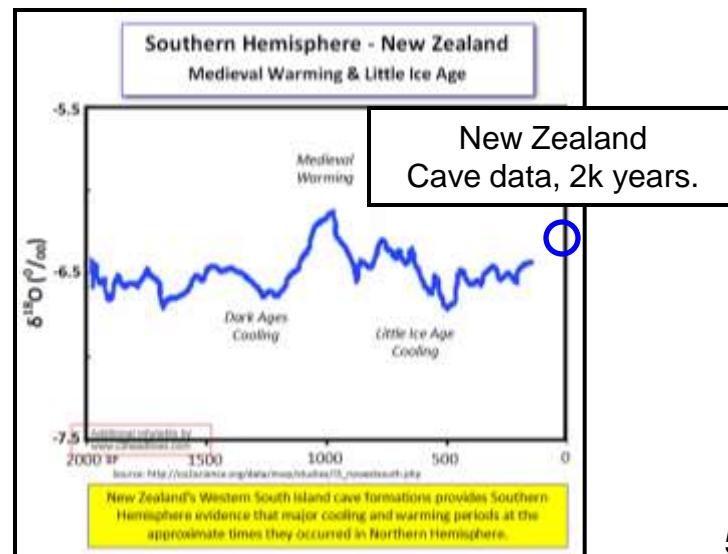
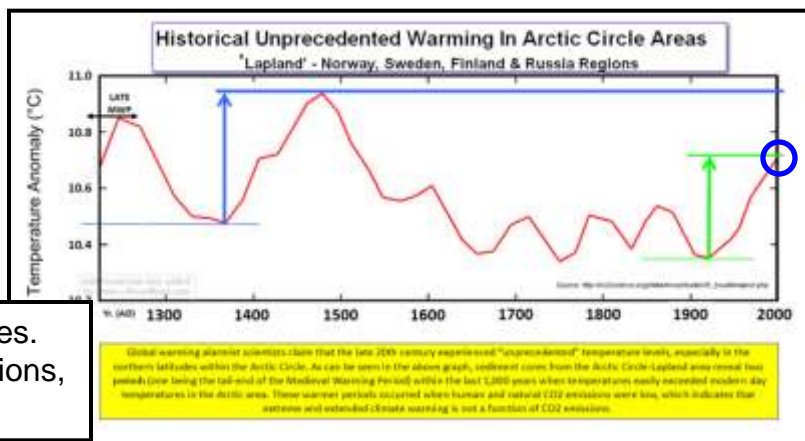
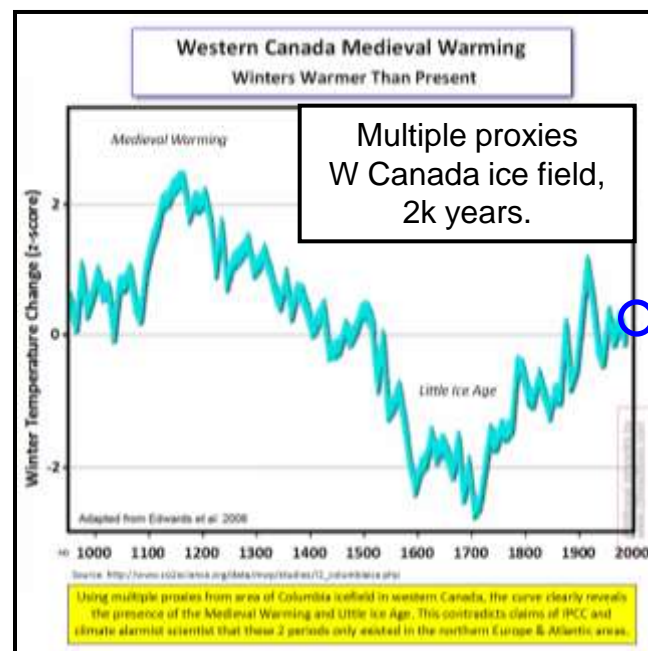
Summer Temps Higher With Less CO2

Tree rings from
Pakistan mountains,
1000 years



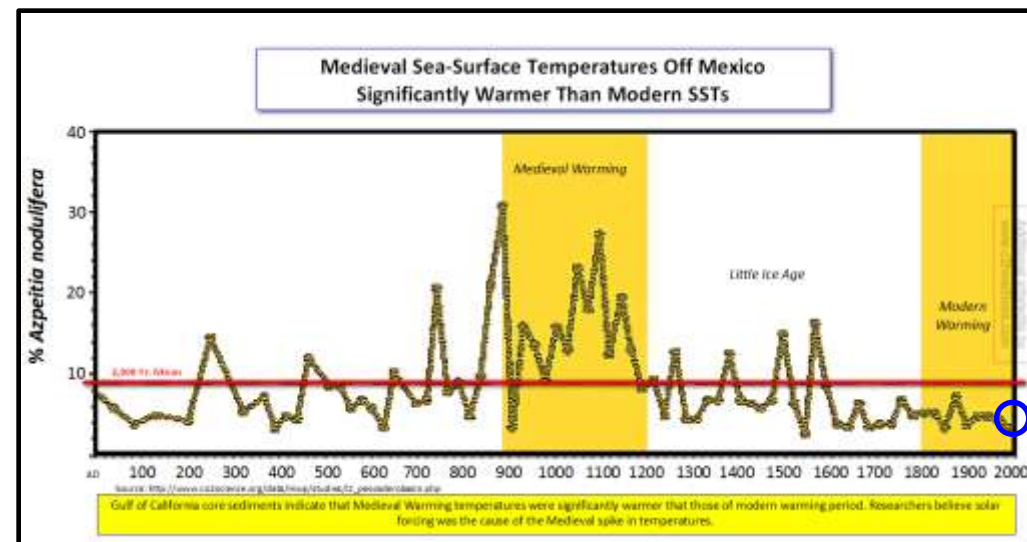
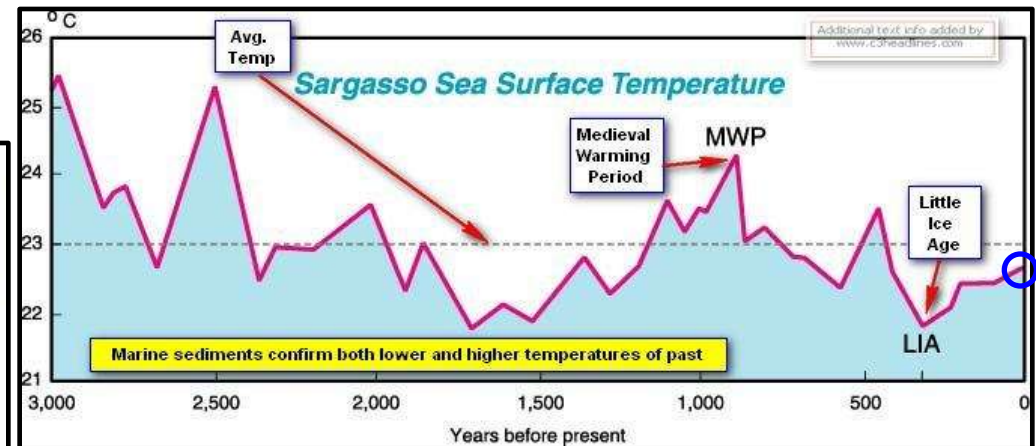
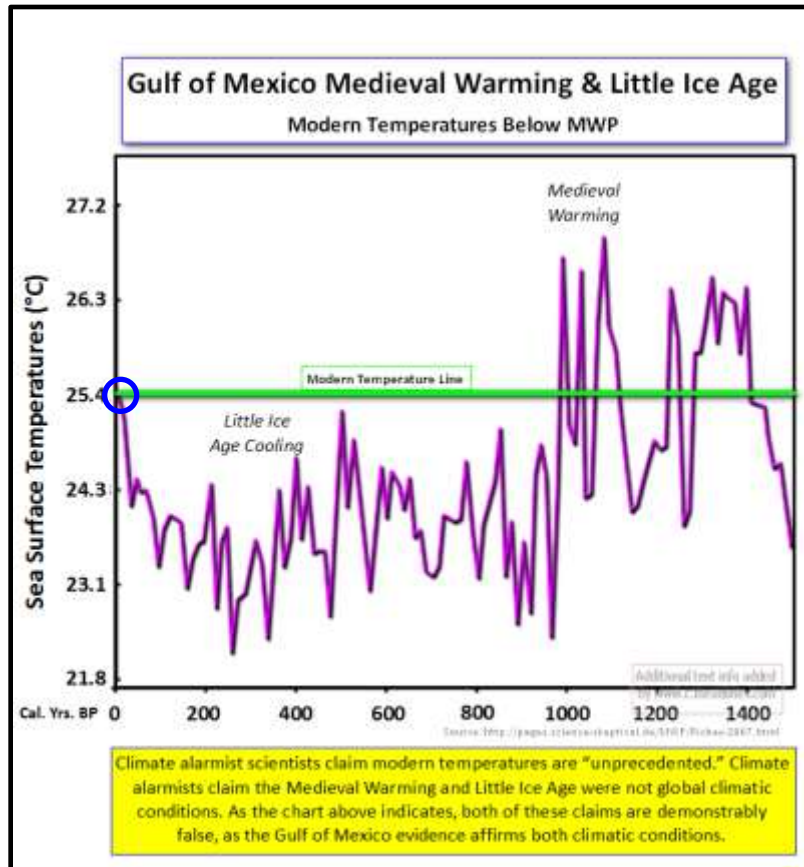
Conclusion: The claim that emissions have caused unprecedented warming is not supported by the data.

Still more proxies or temperature trend indicators; Within the recent 11,000-year warm period, many parts of the globe.



Conclusion: The claim that emissions have caused unprecedented warming is not supported by the data.

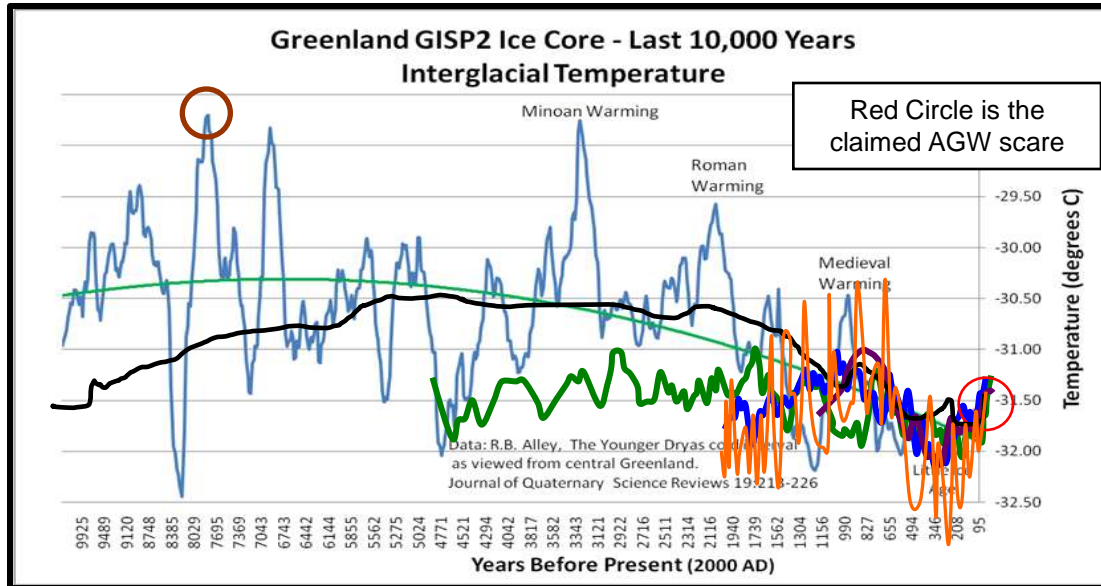
Sea Surface Temperatures are trend indicators for global warming, Proving that the Medieval Warm Period did exist.



Conclusion: The claim that emissions have caused unprecedented warming is not supported by the data.

I'll Bet You Have Never Seen These Charts

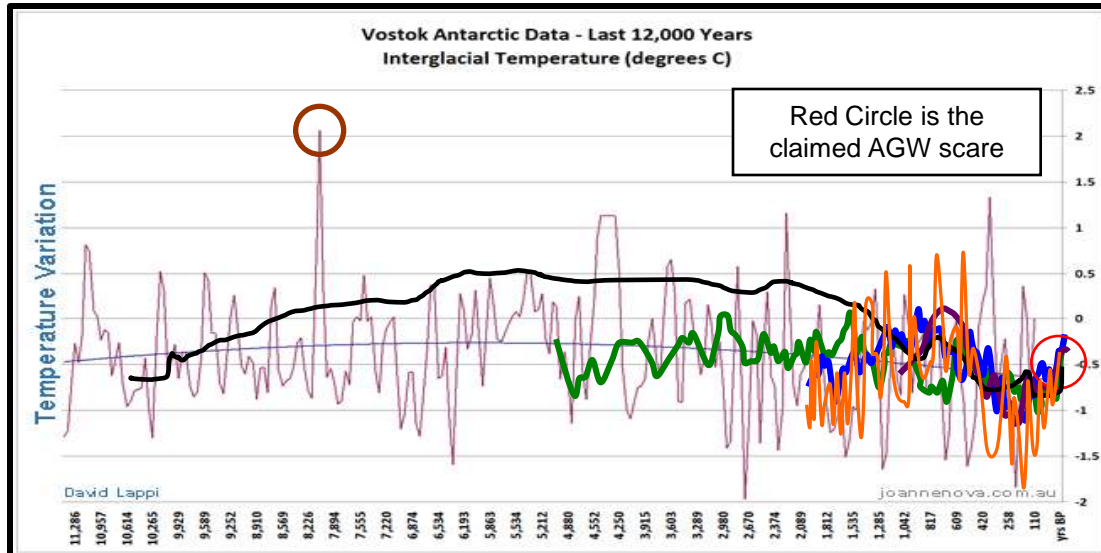
Global Temperature, The Last 11,000 Years (current, non-glacial warm period)
Ice core data, overlaid with other proxy temperatures.



You haven't seen them, because they are **not** scary. They are **not** presented in an attempt to blame humans.

Overlaid on Ice Core Data:

- Blue = Loehle, 18 non-tree-ring proxies
- Green = Carter
- Purple = Historical Record (IPCC, 1999)
- Black = Greenland lake core sediments
- Orange = Austrian cave stalagmites

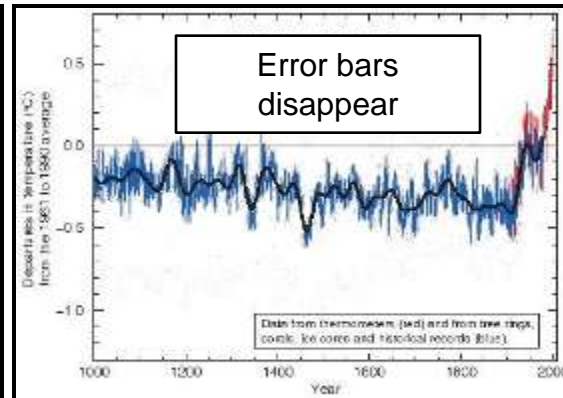
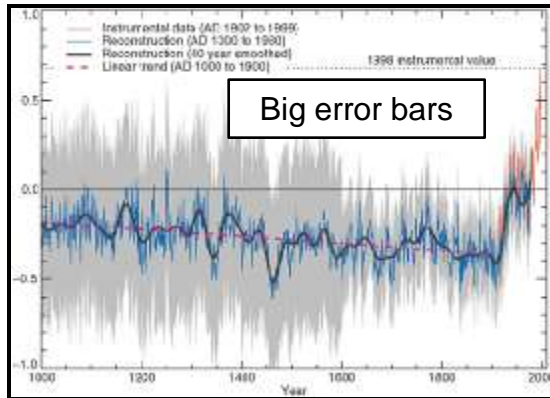


From ice cores, it was **warmest** 8,000 years ago (two brown circles). It was significantly **warmer** than today, during the Roman expansion and the later Medieval Warm Period.

However, you **have** probably seen this one

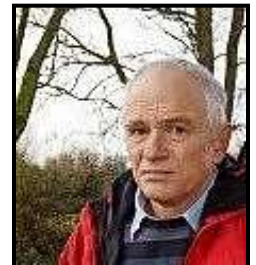
The World 'Famous' "Hockey Stick" - 1000 years of stable, decreasing temperature followed by a **sudden rise** after 1900

UN IPCC 2001 Report, 6 places, full color (the only chart so honored).
An Inconvenient Truth - NYT best selling book.
Oscar-winning 'Documentary' Film – Inconvenient Truth.
Nobel Prize, IPCC and Al Gore - highlight award justification.



The initial claim: this chart is genuine; it was generated by scientists from corals, tree rings, historical records and thermometers.

The Hockey Team



How the Hockey Stick was Developed

No one admits to how it started, so let's take a look at what we do know.....

A challenge, to meet the IPCC mission



Jonathon Overpeck, Co-director of the Institute for Environment at U of Arizona (a lead author of the IPCC report) sent an e-mail to Briffa and Osborn saying he wants to:

“deal a mortal blow to the Medieval Warm Period (and Holocene Optimum) myths”.

Note: In fact, in order to generate the desired hockey stick shape it was required to hide **both** the MWP and the LIA (little ice age).



Dr. Michael Mann, Penn State U, Meteorology, Geosciences A lead Author, IPCC Rpt 3. Research areas: climate reconstruction using climate “proxy” data networks, and model/data comparisons: Briffa and Mann used model bias and cherry-picked data to build the hockey stick.

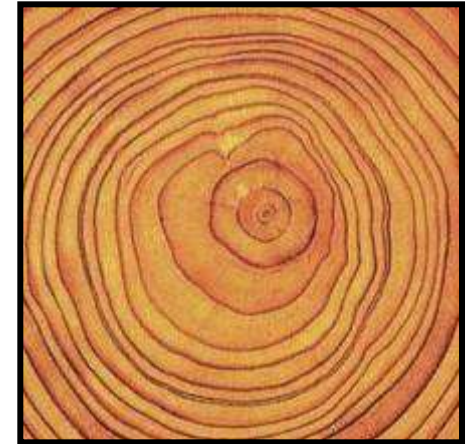


Phil Jones, IPCC lead author: Responding to a request by an independent researcher for his climate data “We have 25 years invested in the work. Why should I make the data available to you, when your aim is to try to find something wrong with it.”



Keith Briffa CRU Climatologist. Tree-ring specialist. Some suspect he is the ‘covert whistleblower’ who leaked the incriminating emails in 2009.

Note spacing difference in tree ring photo between 3-o’clock and 8-o’clock bores.

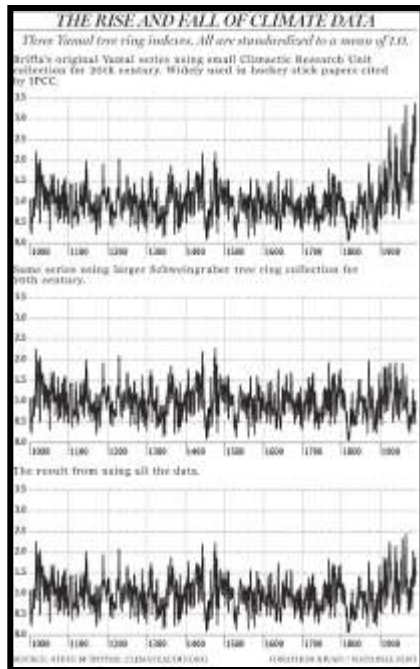


Tree rings can indeed give an approximate indication of past temperatures, **if** the science is handled properly:

- Other factors effecting tree growth are considered (precipitation, soil, slope, altitude, local cloud cover, position relative to ocean, rivers, tree-line, etc).
 - Thousands of trees in hundreds of locations are needed, in order to get just a rough idea of historic global temperature trends.
 - Small, selected samples can result in large data bias.
- Thus - **very useful** for those seeking a specific answer.

Building a Hockey Stick The “Tree Ring Circus”

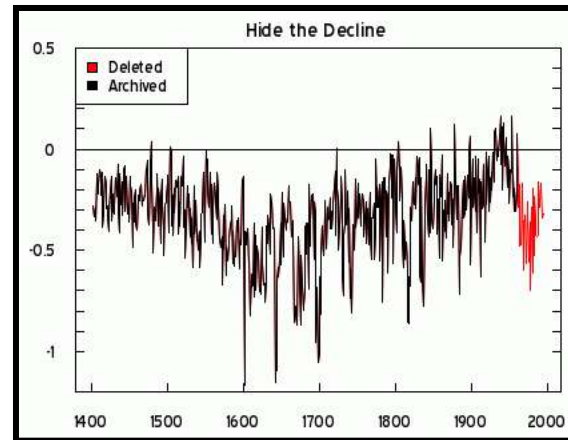
Steps along the way, to generate history's most damaging Scare Chart



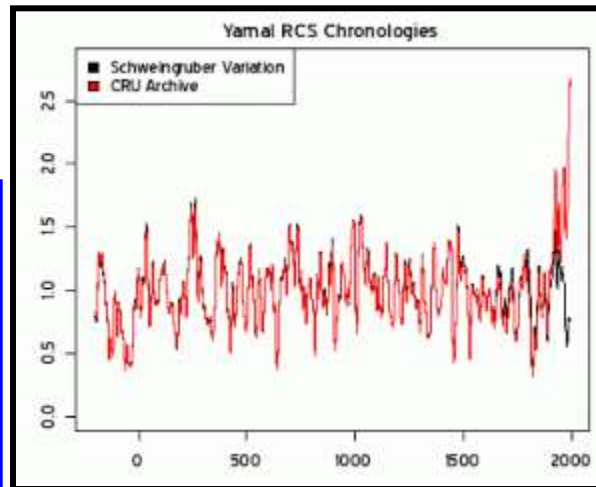
Briffa's original selection of Yamal trees. A tiny sample used after 1900.

Same data set, except a larger number of trees used after 1900.

Now, using all 20th century trees without 'quality selection'.



Processing the data, by Michael Mann. Hiding the decline. Shorter time interval. Red data was **deleted** without explaining why!



There, fixed it. Red data: Use of a **single**, non-Yamal bristlecone tree (yes, only 18 rings) after 1990!

The desired result - a scary Hockey Stick!

A strange finding:

The computer program written to process the tree-ring temperature proxy data produces a hockey stick shape even when the inputs are **random numbers**.....

Huh??

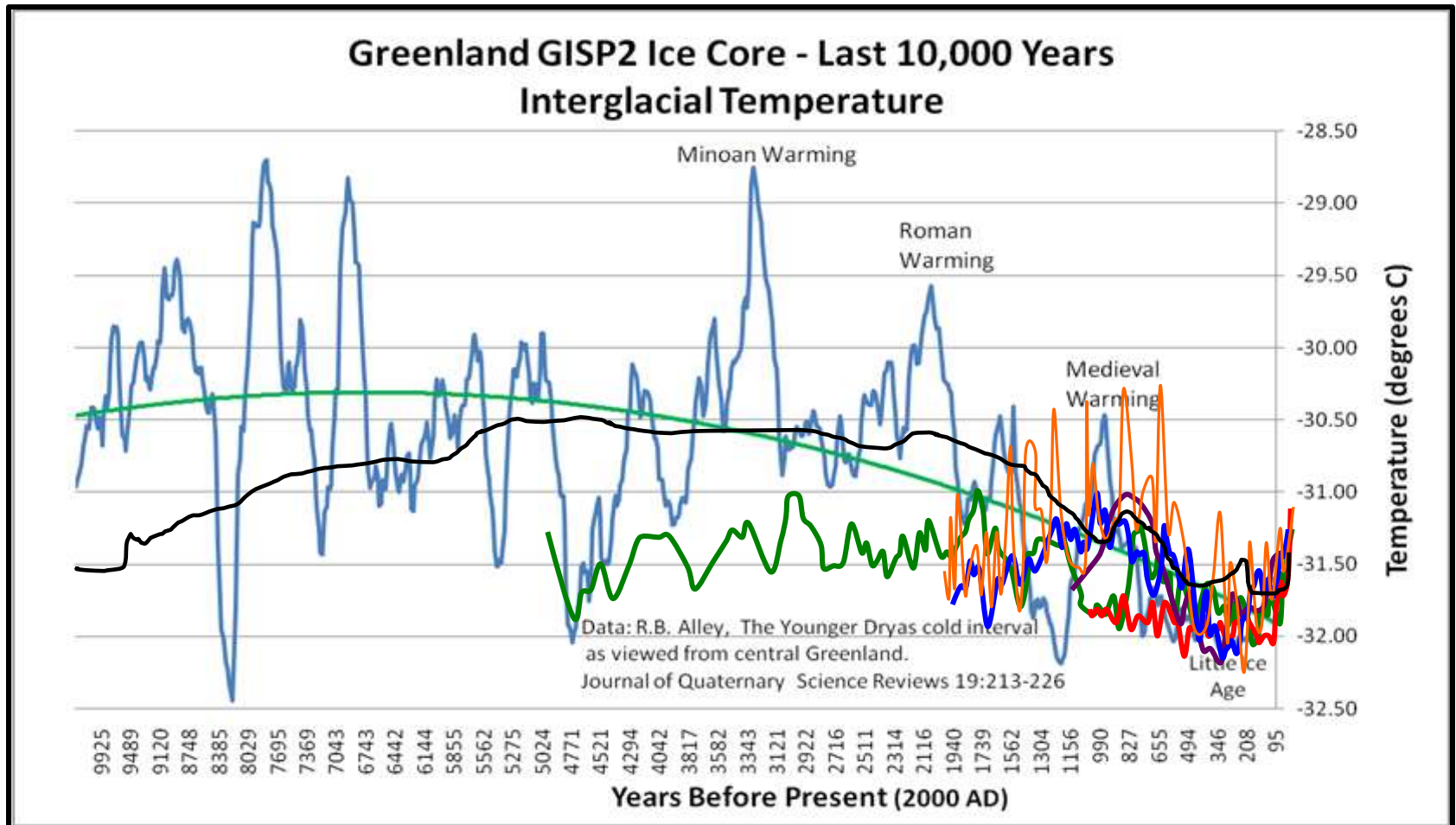
Apparently his program gave higher weighting to data that better resembles the hockey stick.

While one of the Hockey team has been 'cleared' by his college staff, these points were not made in the investigation:

- Briffa and Mann had a **Choice** to make when selecting trees and rings in their preparation of the hockey stick chart. They studied all their tree ring data and **chose** to present only a tiny selection, knowing it supported a desired result but was not representative of the mass of data.
- They had a scientific **Responsibility** to **reveal** and **justify** their choices. Instead they cherry picked, hoped no one would ever check their data, refused to share it, agreed to destroy evidence and failed for years to respond to FOIA lawsuits. Clearly they knew their fraudulent chart would be used as 'proof' of a result desired by IPCC and their funding sources.
- An obvious question - **What were they thinking** on Oscar night and Nobel prize day? Also, what was James Hanson thinking after he defined thousands of Russian September temperature readings as being for October, in order to then claim that it was the warmest October on record; even though weather reports were showing record cold that month. None of these 'scientists' admitted their errors until **after** independent researchers challenged them.

Oh, I bet you were wondering.....

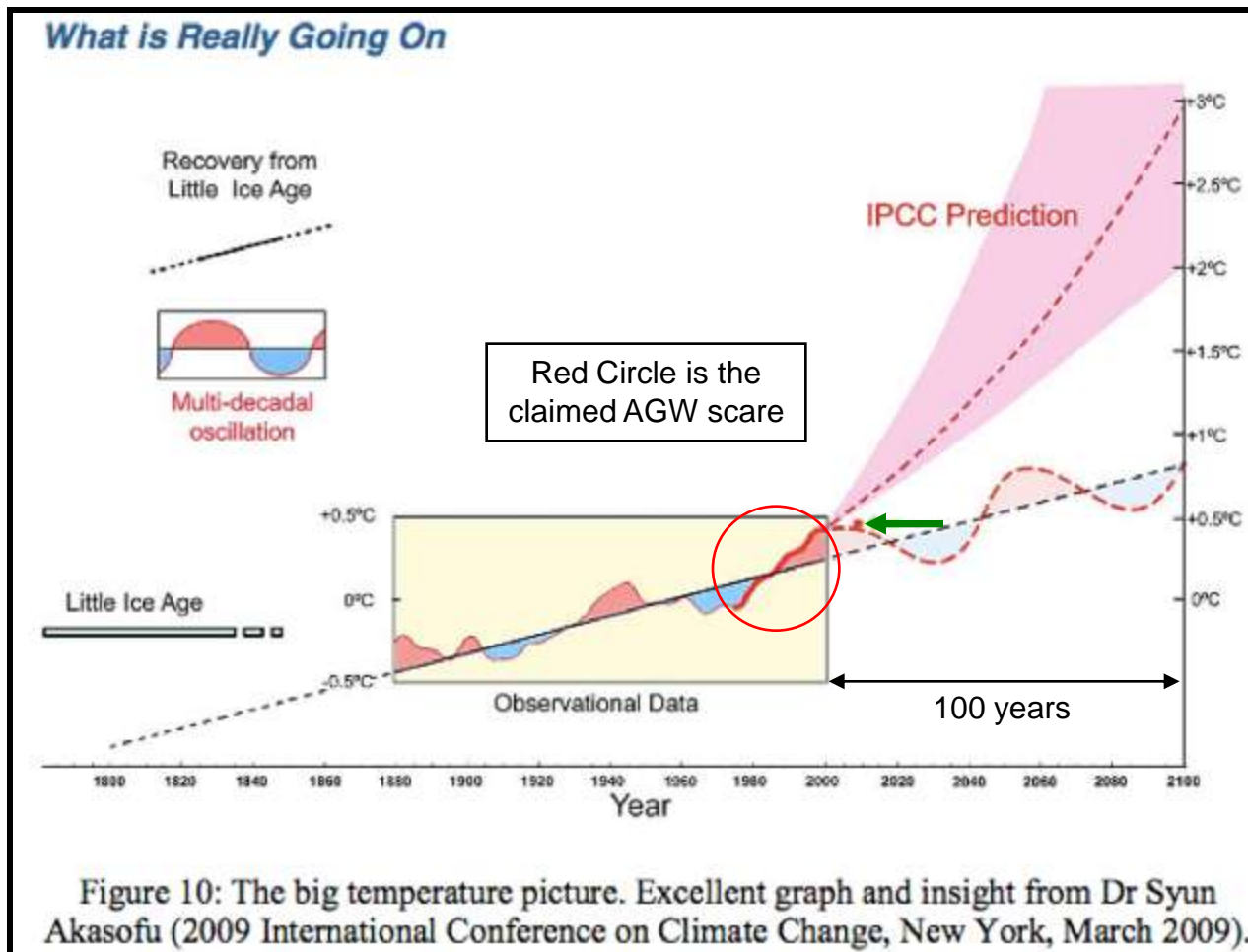
Add the Hockey stick (**Red** data) to our 11k-year chart.
Even the fraudulent Hockey stick doesn't look that scary on a chart meant to **Inform**, not to **Scare**.



Best Prediction for the next 100 years?

A 0.6 deg C rise, similar to the last 100 years.

Note, the last 30-year warming and last decade's cooling (red dot and green arrow) does not look unusual.

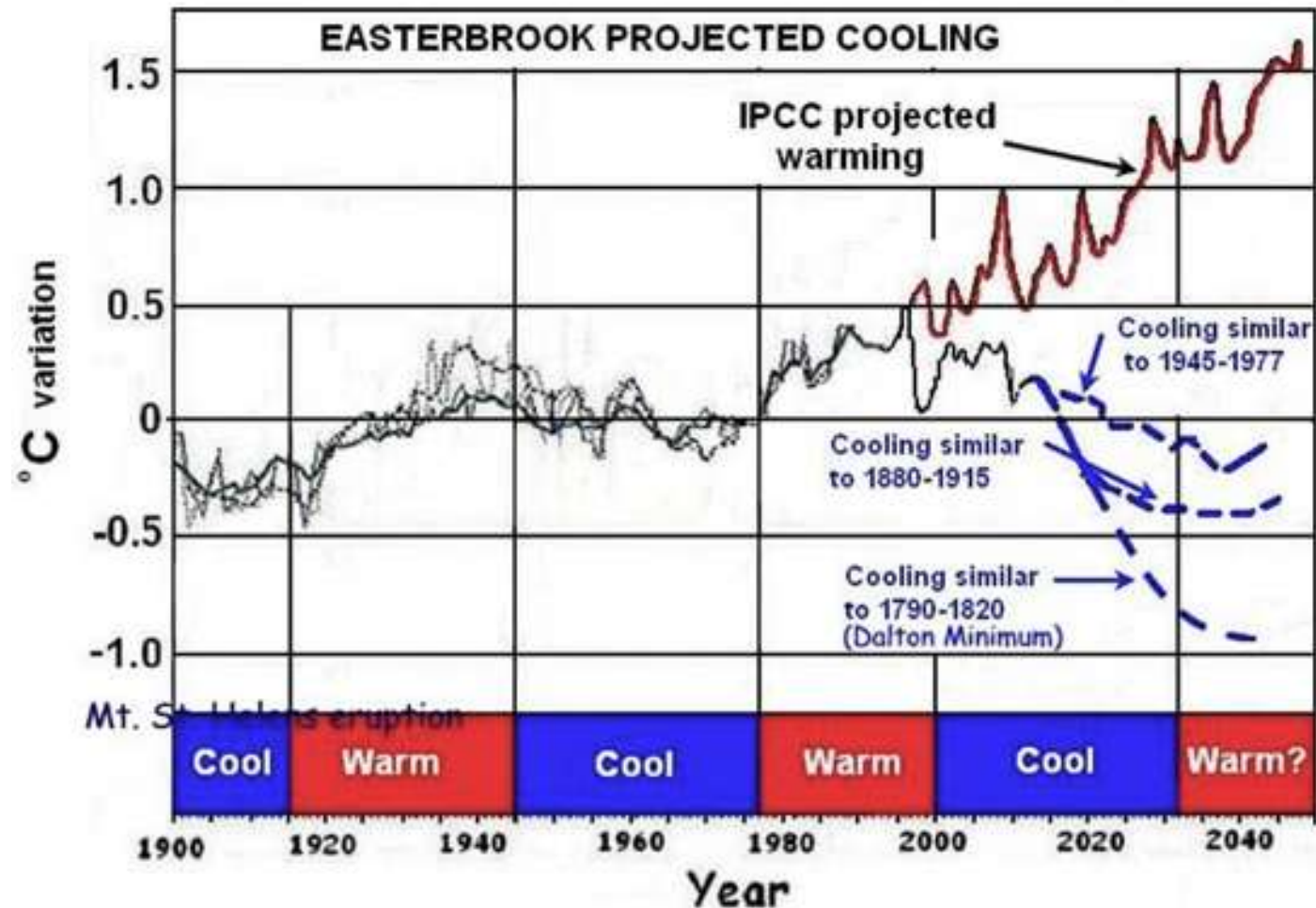


Another Prediction, based on the last century

Continuation of the recent warming/cooling cycles.

The three extrapolations are a repeat of the last three cooling periods.

Note the departure of the real data after the 2001 IPCC forecast.



#3 - Dangerous, unusual warming the last 50 years? **No.**

When corrected for the local urban warming of sensors and the Soviet/Russian site issues, there was **no unusual global surface warming**. Atmospheric warming measurements in the satellite era also show **nothing** to indicate a warming alarm. Other reported data indicating warming has been shown to be cherry-picked and manipulated.

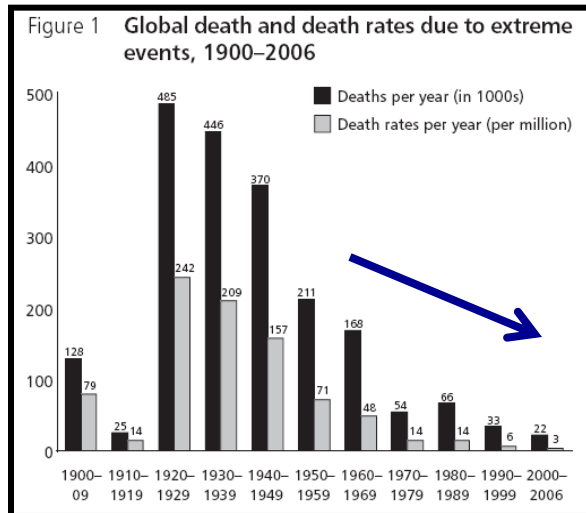
1. Recent human burning of fossil fuels suddenly and dangerously increased CO2 beyond previous levels – Yes/No.
2. Human CO2 emissions causes greenhouse warming – No.
3. **Dangerous, sudden global warming occurred the last 50 years – No.**
4. The current Temperature is **too Hot** & further warming is **Bad**.
5. It is more difficult to adapt to climate changes than to attempt to control them.

Next is #4. Now, let's consider this: Has the last 50-years of human emissions caused anything bad? What is the “best” temperature or “best” CO2 content? Is the earth worse if it warms a few more degrees?

Alarmist Claims: Human CO2 emissions Causes Disasters

Tell them - “Show me the data”

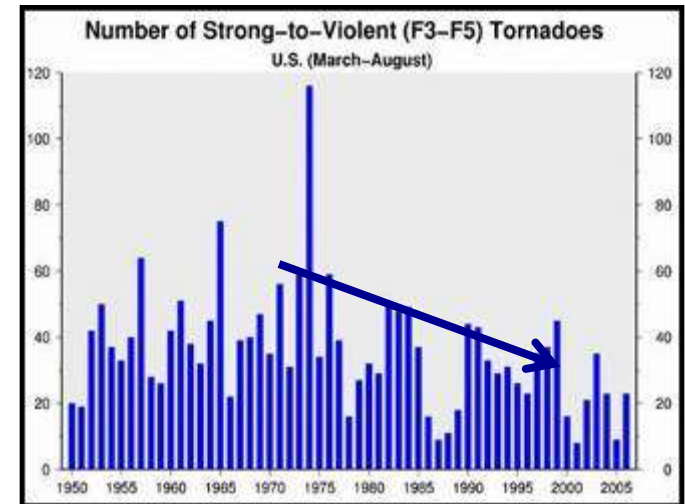
Records show that twice as many die from extreme cold events than extreme hot events. Thus, Human survival would **improve** if it were warmer.



DOWN

Extreme events- caused deaths

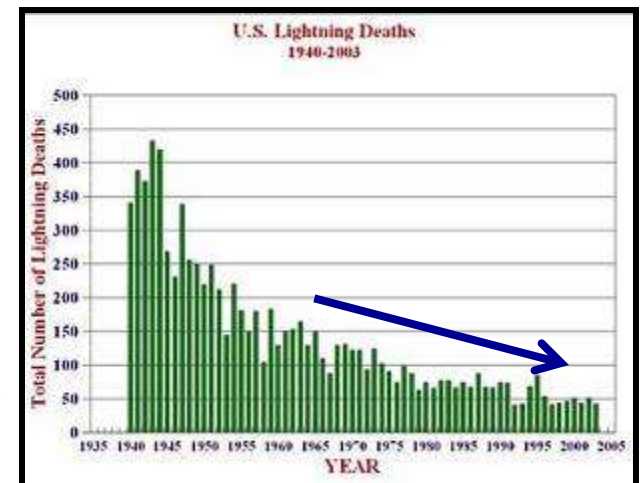
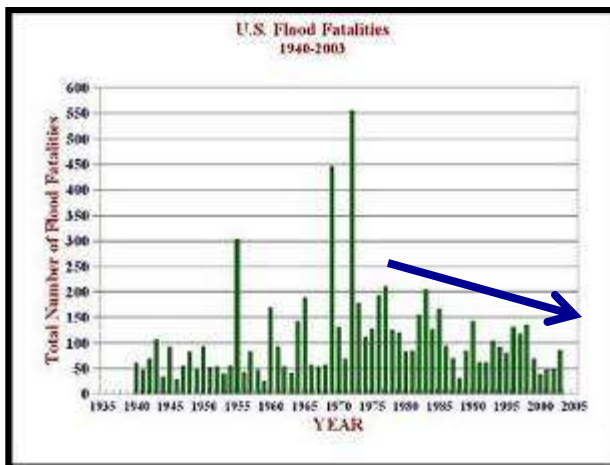
Number of F3-F5 tornados



DOWN

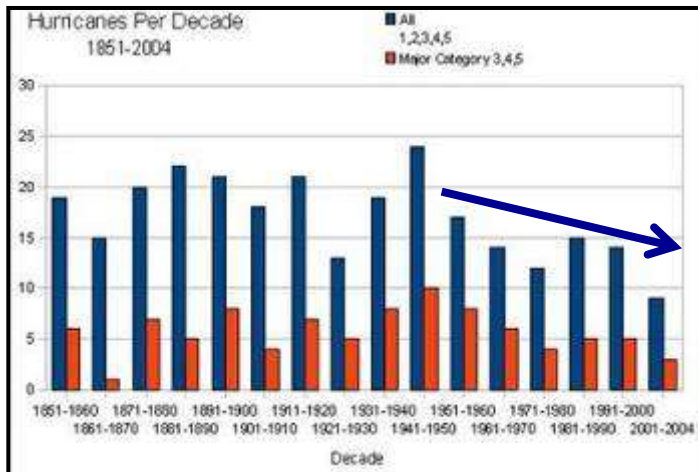
Flood fatalities

Lightning deaths



Human CO2 emissions Causes Disasters?

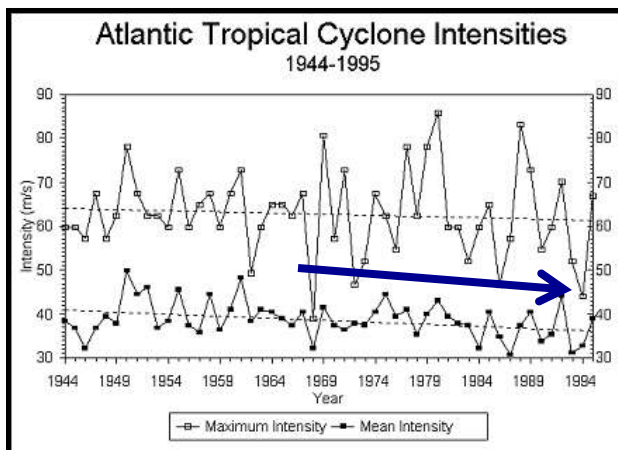
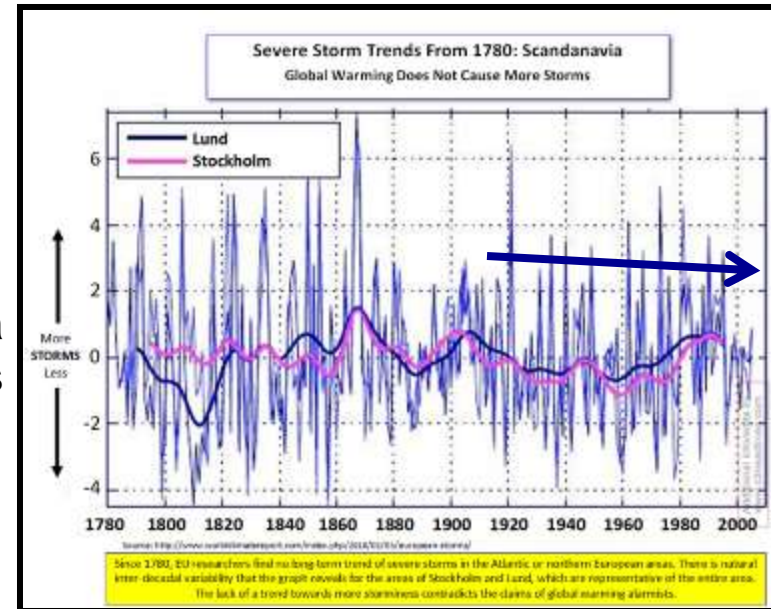
“Show me the data” (2)



DOWN

Hurricanes
Per decade

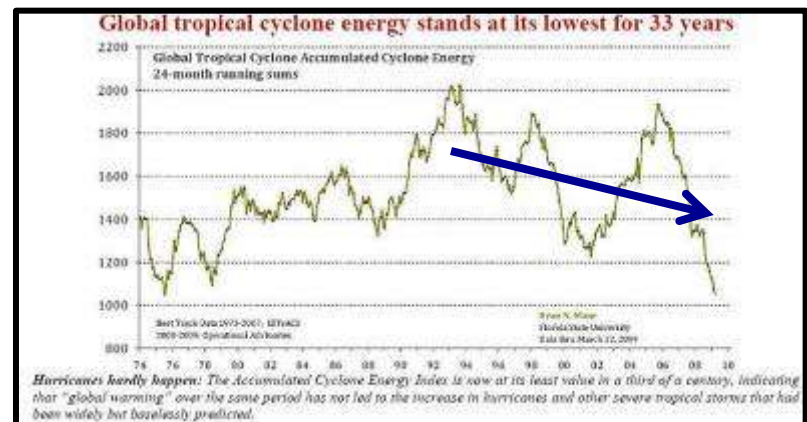
Scandinavia
severe storms



DOWN

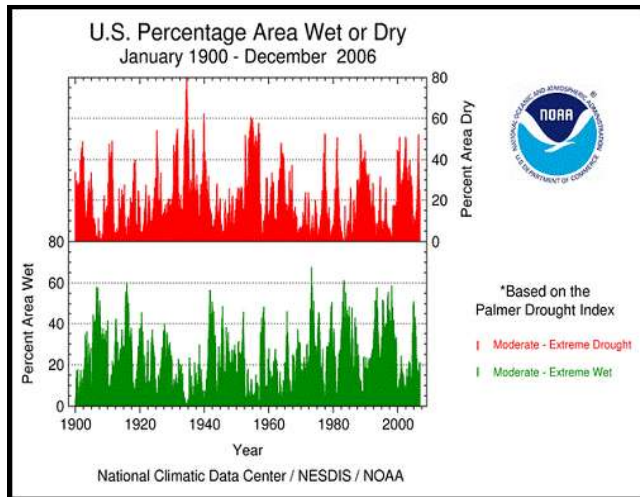
Cyclone
Intensities

Cyclone
Energy
lowest in 33 yr



Human CO2 emissions Causes Disasters?

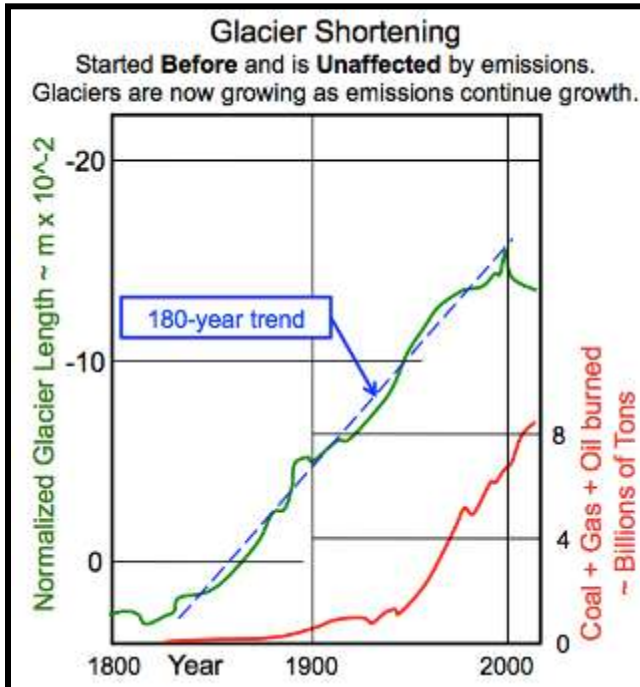
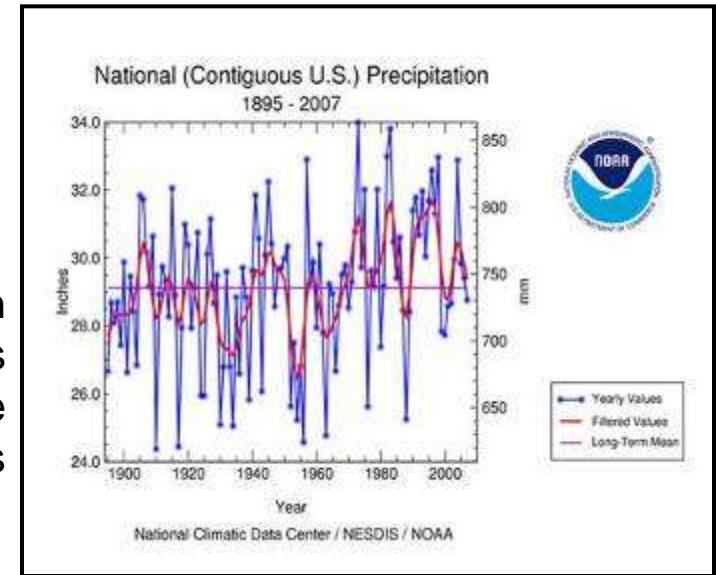
“Show me the data” (3)



FLAT

Droughts & Floods

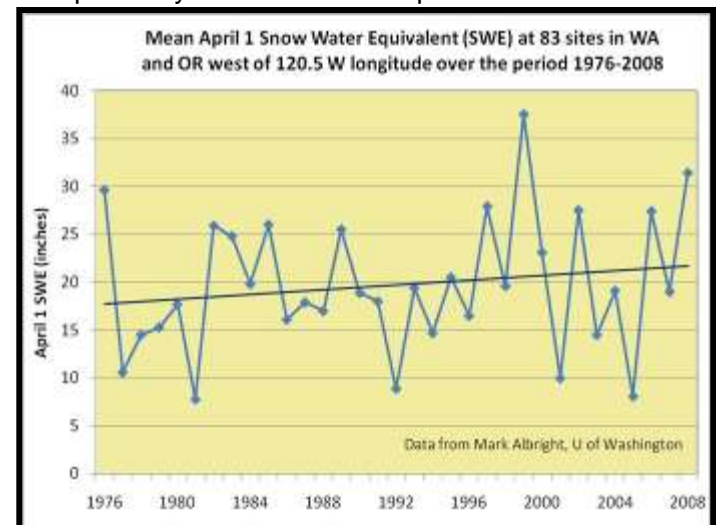
Precipitation
Modulates
Temperature
changes



No Correlation

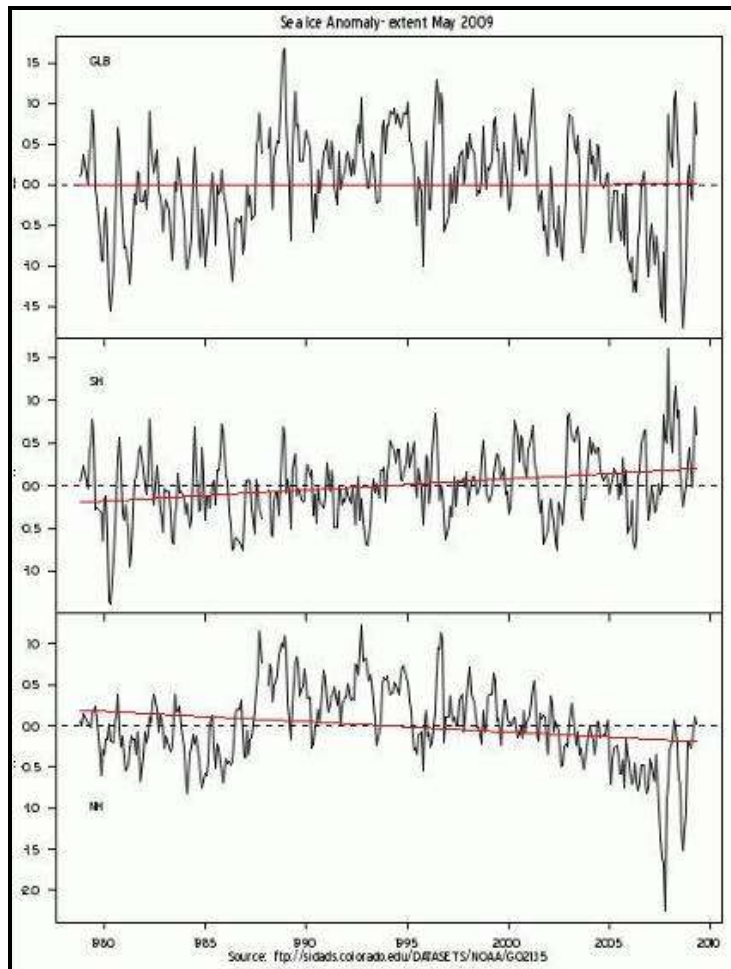
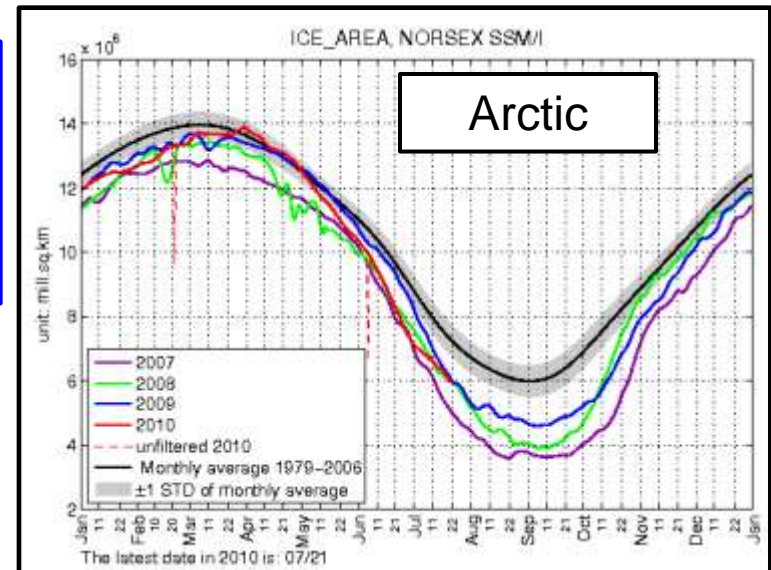
Glacier shortening
Unaffected by
emissions

Washington Governor said the snow pack has declined 20% over the past 30 years. Actual snow pack = 22% INCREASE.



Human CO2 emissions Causes Disasters? “Show me the data” (4)

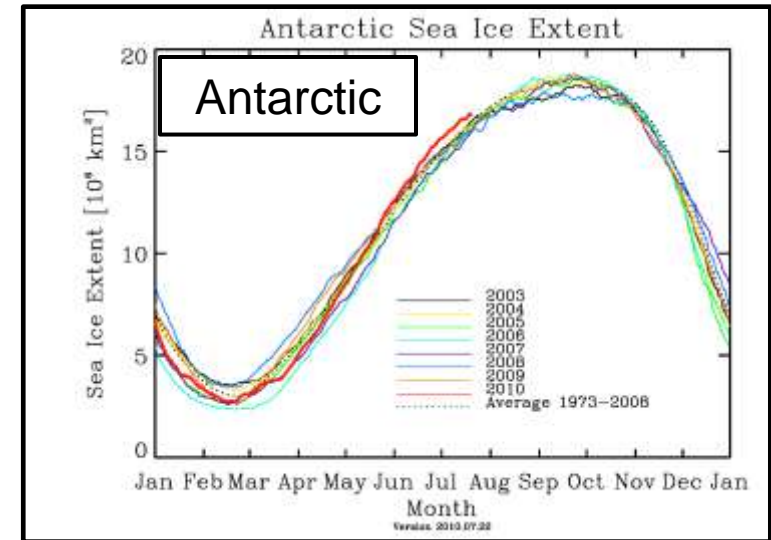
Arctic sea ice extent 1978 to July 2010. During March and April 2010 the ice recovered to the 1979-2000 average. It then decreased by mid July to the 2008/2009 July extent. However, Global sea ice extent remained flat during the 30 year period.



FLAT
Global Sea Ice
Extent

INCREASING
Southern
Hemisphere
Sea ice extent

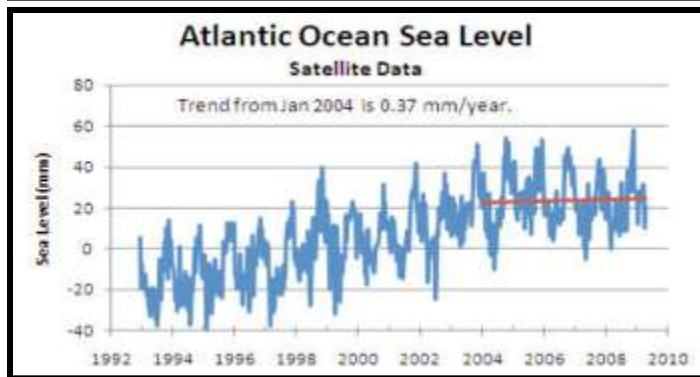
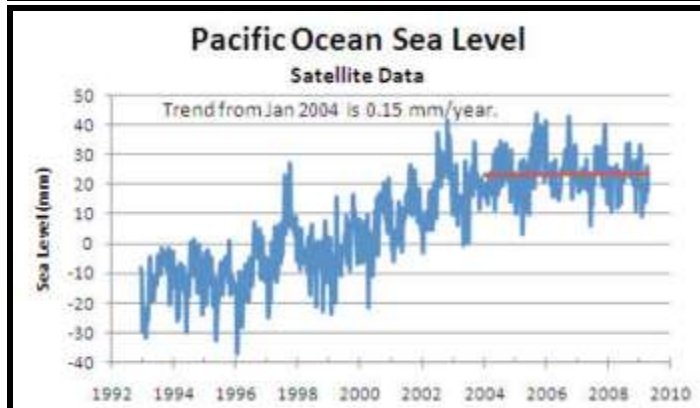
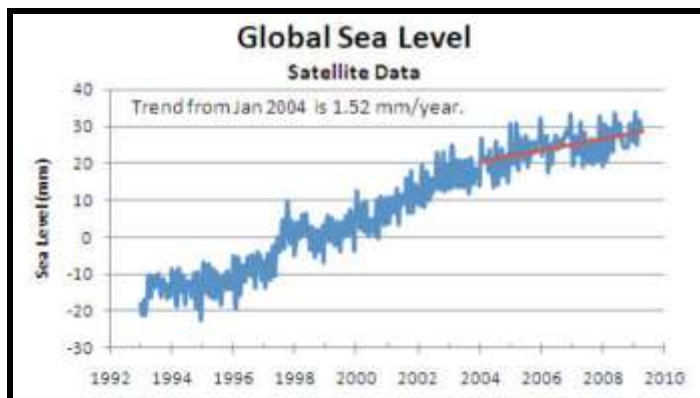
DECREASING
Northern
Hemisphere
Sea ice extent



Polar Bear Population
1950 - 5,000
1980 - 10,000
Current - 24,000

Human CO₂ emissions Causes Disasters?

Sea Levels “Show me the data” (5)

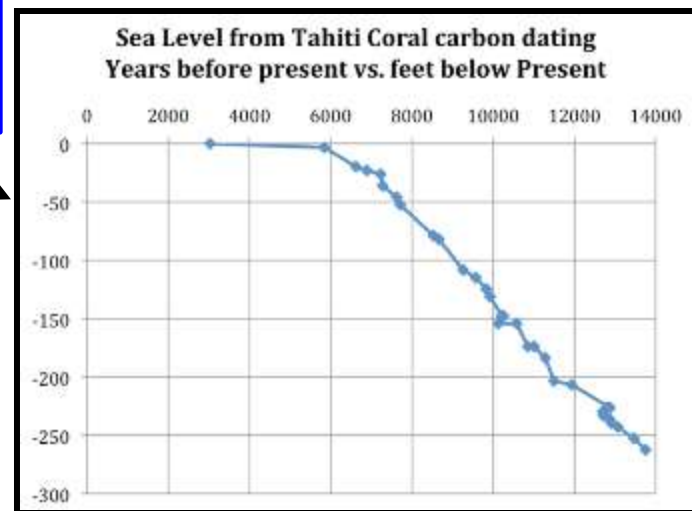
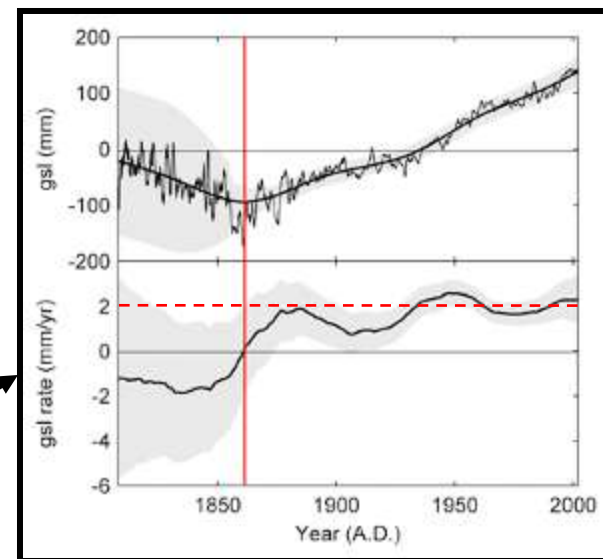


Sea Levels are merely continuing their slow rise since the end of the Little Ice Age.

Since 1870
Steady ~ 2 mm/yr
(8 inches/century)

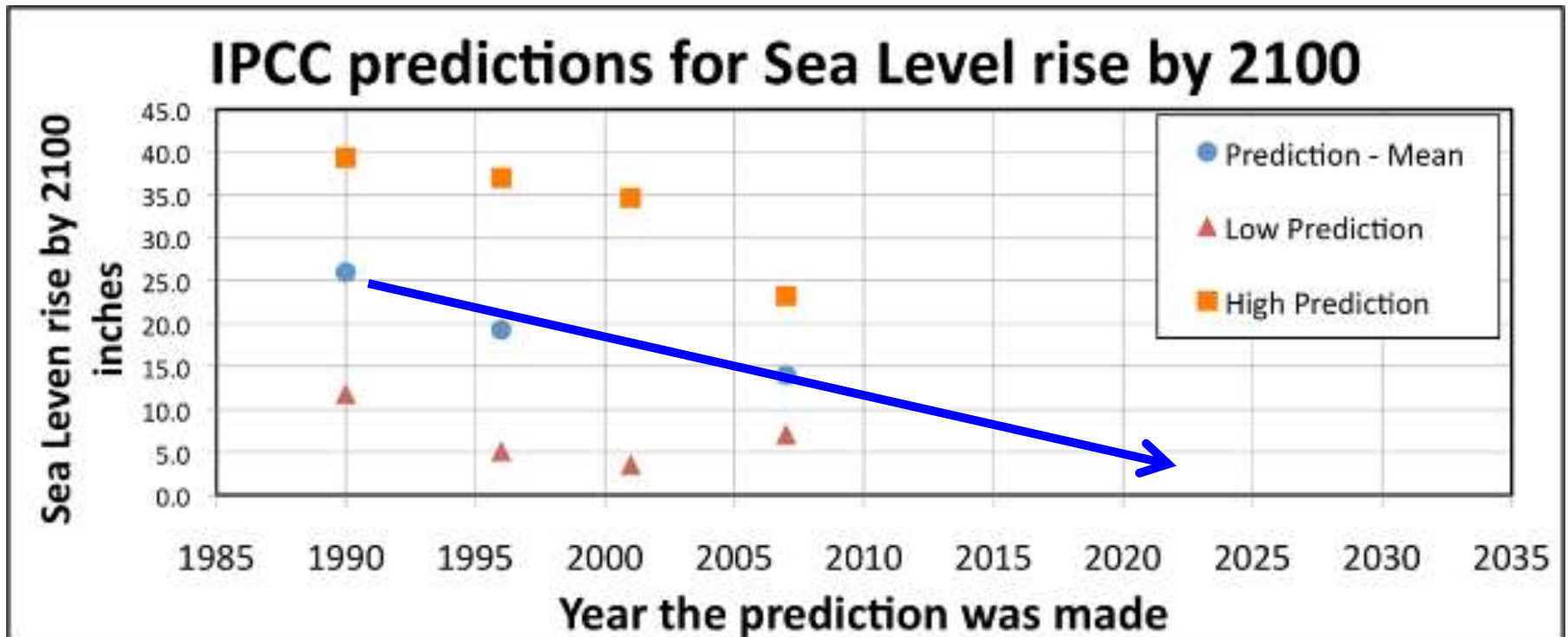
This chart shows the large sea level recovery from the latest big ice age.

Conclusion:
The most-likely
next-century
rise = 5 to 8
inches.



Another Sea Level Prediction.....

Just extrapolate the **predictions** of the UN IPCC.
Hey, in 16 years even the UN will predict no next-century
sea level rise!



#4. - Is the current temperature perfect? Unlikely.

Will warming and increase in CO2 be good? **Yes.**

Recent climate changes have not caused weather or extinction degradation. Overall, adverse weather events and the number of extinctions will not increase if the next century or two warms like the last one. A CO2-fertilized atmosphere will enhance plant growth, increase crop yields and allow more people to live in, and farm our lower-populated higher latitudes - saving tens of millions of human lives.

1. Recent human burning of fossil fuels suddenly and dangerously increased CO2 beyond previous levels – Yes/No.
2. Human CO2 emissions causes greenhouse warming – No.
3. Dangerous, sudden global warming occurred the last 50 years – No.
4. **The current Temperature is too Hot & further warming is Bad – No.**
5. It is more difficult to adapt to climate changes than to attempt to control them.

Next is #5. Few in the CAGW debate ever discuss adaptation. However, early man and modern man has always used his intellect to adapt to just about every environment and every hazard he encounters throughout planet earth.

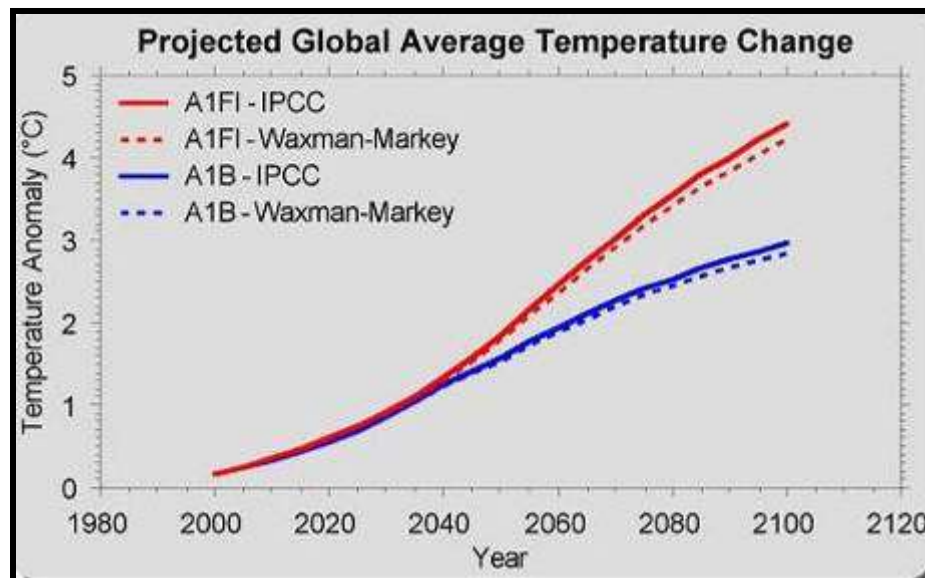
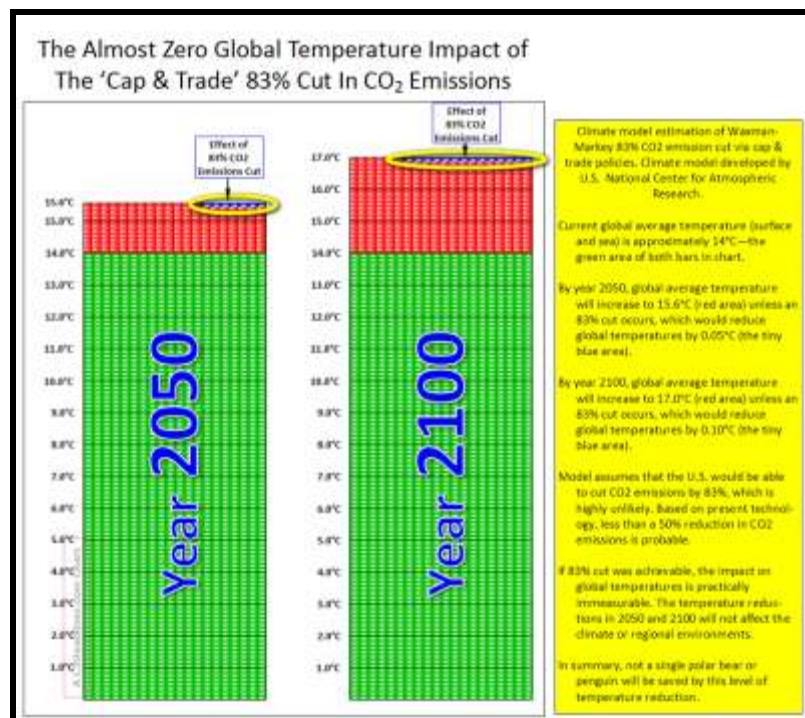
What do we get by taxing energy to constrain use?

Even if it is possible, it is unbelievably expensive to control climate

The human control of the climate is not only in doubt, it is Horribly expensive.

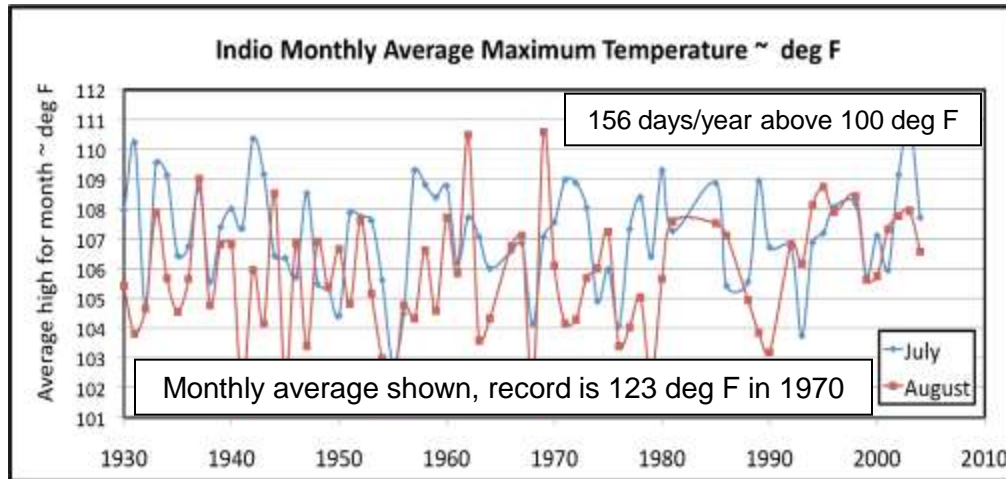
Example - even assuming the greenhouse theory is correct, Waxman-Markey, after doubling not only energy costs, but raising costs of everything tied to energy, would delay Global Warming by 3.8 years, a hundred years from now!

Any engineered adaptation would be cheap by comparison.



The California Lower Desert Has Brutal Summers

But, adaptation is rapid and affordable, using low-cost energy and innovation. Car A/C is 71 years old (1939 Packard) and became common in the 70s. It will be even easier next century to adapt much quicker than the climate can change - again using energy and the human brain.



Rutan lives below sea level.
Coral below the line, rock above.



Rutan in his Ice-cooled Arctic Hat,
golfing in the 115-degree heat

With energy and innovation.



Without, humans die.



Humans Can Adapt in a Generation or Two

Adapt to heat



Dubai

Adapt to cold



South Pole

Death Valley



Fairbanks



In Only 100 years, Humans Adapted to **Severe** Conditions

By using innovation, technology and energy

Much colder than Mars, 15% of sea level pressure, 700 mph wind (twice that of Jupiter's Red Spot hurricane).



Higher pressure than the surface of Venus



No atmosphere at all.

Adaptation Works, Constraining fails

- No up-front costs. Adapt only when the need is certain and focus expenses on the real need.
- The optimum way to move quicker to alternate/renewable energy is to use our oil and coal faster, not slower. Drill it out and sell it to the world. The prosperity would allow quicker alternative energy development.
- Technology products move quickly to the poor in a prosperous, free-market.
- The poor stay poor and are joined by the rich in an energy-constrained, over-regulated environment.
- The poor had no home air conditioning only 50 years ago.
- We will need economic prosperity to fund development of new energy breakthroughs (deep geothermal, fusion, ZPE, TBD, etc).

The Result of A Decision; to **control** rather than **adapt**.

The caveman option, with constrained energy use. This environment is not good for creativity, innovation and breakthroughs.

Ration Energy = huddle/freeze in the dark



#5 - Is it cheaper to constrain, than to adapt?

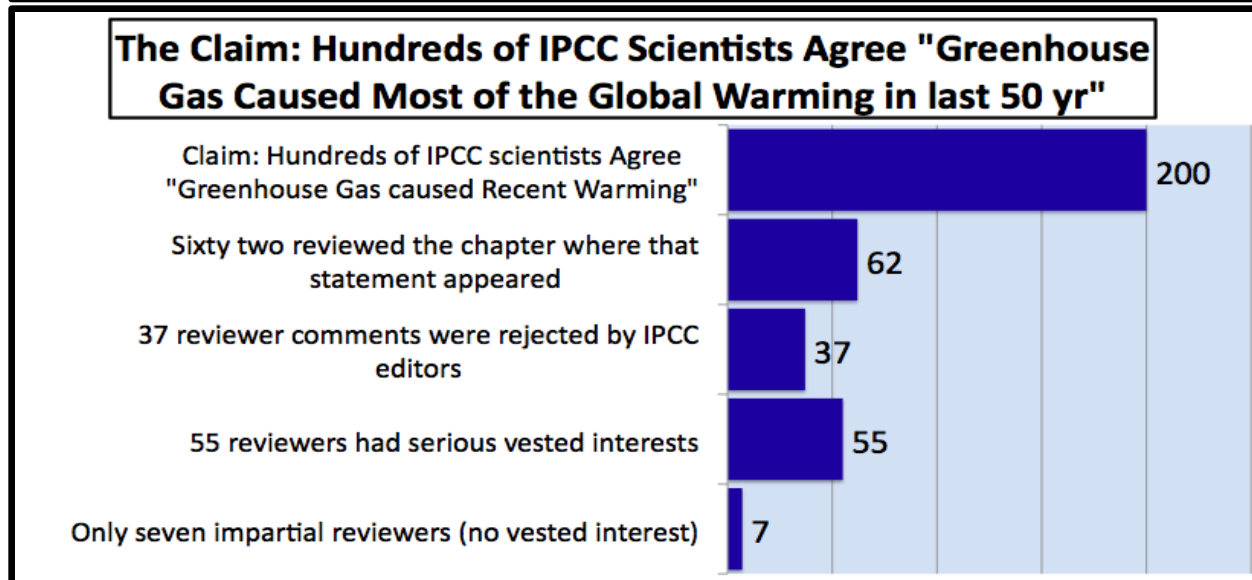
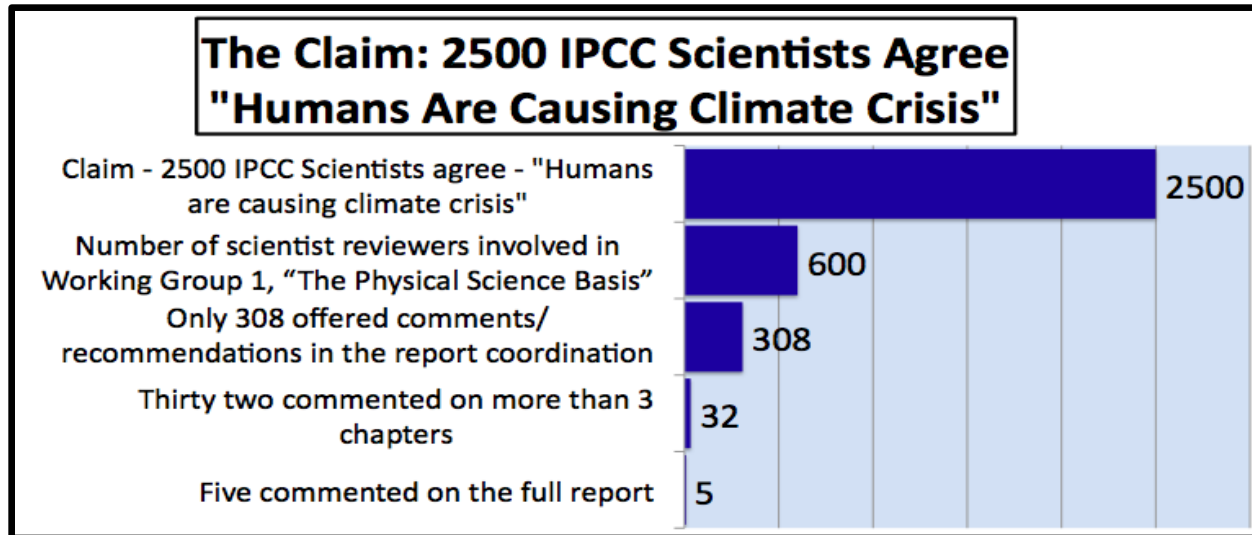
No.

It is **possible** to constrain energy use with taxes/fees. But, even if imposed, it is **not possible** to significantly change climate. An energy-constrained economy will not allow the economic growth to fund technical solutions for adaptation or solutions for control, if they are discovered in the future. Those that forecast seem to forget that **with people come minds** - Minds that **innovate** to adapt to changes. We are no longer Cavemen.

1. Recent human burning of fossil fuels suddenly and dangerously increased CO₂ beyond previous levels – Yes/No
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5. **It is more difficult to adapt to climate changes than to attempt to control them – No.**

Scientist Consensus?

Under pressure, the UN released the comments and recommendations of its in-house scientist reviewers who coordinated the drafts of the latest IPCC report. This is what it revealed.



Scientist Consensus? (2)

Of the **seven IPCC impartial scientists** that coordinated and commented on the statement that “human greenhouse gas caused the recent warming”, two of them accepted interviews:

1. Dr Ross McKittrick University of Guelph: "A categorical summary statement like this is **not supported by the evidence** in the IPCC WG-I report"
2. Dr Vincent Gray of New Zealand: "Typical IPCC doubletalk...The text of the IPCC report shows that this is **decided by a guess** from persons with a conflict of interest, not from a tested model"

Quote of the month:

"I'm sticking with the 2,500 scientists"

Carol Browner, Director of the White House Office of Energy and Climate Change Policy

Scientist Consensus? (3)

Petition signed by 31,000 scientists, 9,100 with PhDs

“There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause catastrophic heating of the Earth’s atmosphere and disruption of the Earth’s climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth” www.petitionproject.org/index.php

The Manhattan Declaration

Endorsed by scientists in 40 countries

“Attempts by governments to legislate costly regulations on industry and individual citizens to encourage CO2 reduction will slow development while having no appreciable impact on the future trajectory of global climate change. Such policies will markedly diminish future prosperity and so reduce the ability of societies to adapt to inevitable climate change, thereby increasing, not decreasing human suffering.” www.climatescienceinternational.org/

Meteorologists Reject U.N.’s Global Warming Claims

Small minority of AMS members agree with AMS Position Statement.

24% agree that “Most of the warming since 1950 is likely human-induced”

19% agree that “Global Climate Models can reliably predict”

http://www.heartland.org/publications/environment%20climate/article/26794/Meteorologists_Reject_UNs_Global_Warming_Claims.html

Observations

- The **only** 'evidence' that humans cause global warming comes from computer models. The creator of the model can make it show whatever he wants, by adjusting parameters.
- Man has **not** demonstrated an ability to change global temperatures, nor to forecast future climate conditions.
- It would be **desirable** to have more atmospheric CO₂ than present, to increase crop yields and forest growth. This would save tens of millions of lives next century.
- The warming experienced in the last century and the warming expected in the next, **did not** and **will not** cause a net increase in extinctions or weather calamities.
- We do not know the important stuff - what causes the dangerous drop into the major ice ages or what causes the cyclic return to the brief interglacial warm periods.
- Is the debate over? "It is **error** only, and not **truth**, that shrinks from inquiry."

Conclusions

- The CAGW agenda is supported with deceptively altered science. In spite of recent, human-caused atmospheric CO₂ increases, there is nothing out of the ordinary happening with our climate.
- Climate Change is real. The earth has been naturally warming since the “Little Ice Age”, with cooling cycles.
- Fossil fuel use adds a small % to an important trace gas, that is not only beneficial, but is the essence of life itself.
- We cannot burn fossil fuels to prevent the next ice age; the greenhouse gas effect is far too weak for that.
- Current fuels will become naturally constrained by cost as they become scarce. Government taxes are **not** required.
- If Man, in the future, achieves a capability to change global temperatures, he will likely use that technology to **warm** the planet, not to **cool** it.
- Manmade global warming is over. It existed only in the minds of grant-seeking scientists and academics, ratings-obsessed media and opportunistic eco/political-activists.

Recommendations

- **Recognize** that, in terms of cost and human lives, the Government efforts to constrain use and increase the cost of energy are orders of magnitude more important than the certification of a new airliner.
- We cannot assure airline public safety by using a computer model to predict airline safety; we must do extensive **testing** under real conditions and **pay attention** to **all** the results.
- **Require** an engineering task as rigid as the certification of an airliner. Apply that task to the 'theory of climate modification by man'. **Mandate** that 'engineering certification' be done **before** governments can impose taxes, fees or regulations to constrain our use of any product to fuel our energy needs.
- Engineers do listen to scientists and use their work to help them plan the testing/validation needed to complete their certification goals. However, using scientists to direct airliner certification, would be as **disastrous** as scientists proposing theories to direct National or World energy policy.

A subject for future study:

Why some scientists are 'Religious Warmites'.

Analyzing/Debating the CAGW Alarmist.

Two examples of those I have debated:

- 1) Impartial, no current grants, 90+ years old
 - World-class Alarmist, back to before the Ozone-Hole scare. In 2007: “By 2100, the Earth’s population will be ... as few as 500 million, with most of the survivors...in Iceland, Scandinavia, the Arctic”
 - Now, 2010: “If we hadn’t appeared on the earth, it would be due to go through another ice age... greenhouse gases that have warmed the planet are likely to prevent a big freeze”. “the skeptics have kept us sane...They have kept us from regarding the science of climate change as a religion”. “We haven’t learned the lessons of the ozone-hole... (80% of the measurements were faked or incompetently done)”.
- 2) An unnamed Climate Scientist/University Professor
 - Past, Current and Future vested interests.
 - Alarmists huddle within an echo chamber, attack messengers and refuse to inspect the data that forms their opinions. They focus almost solely on various ways to support the CO2 GHG theory.
 - Data correction example. Canada forest infestation example.

Questions?



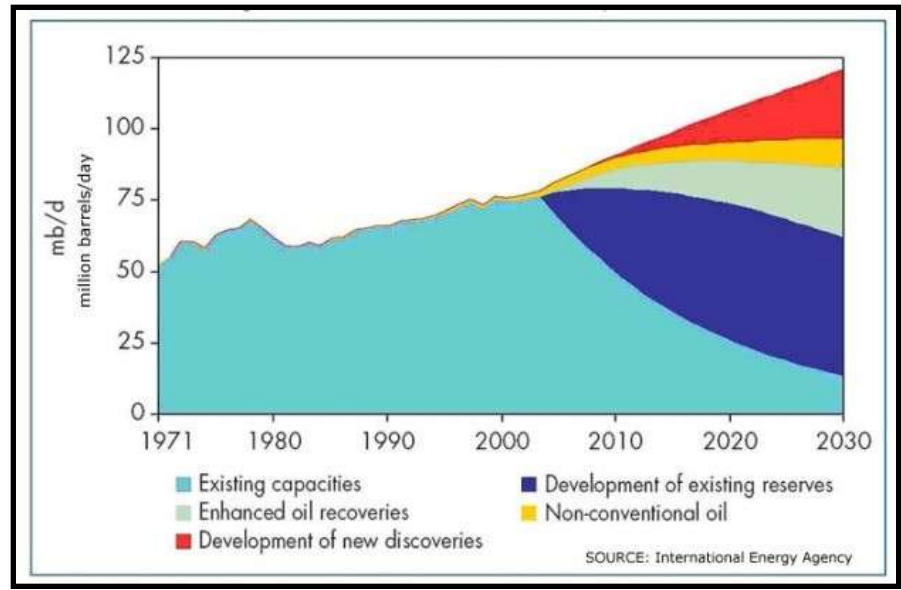
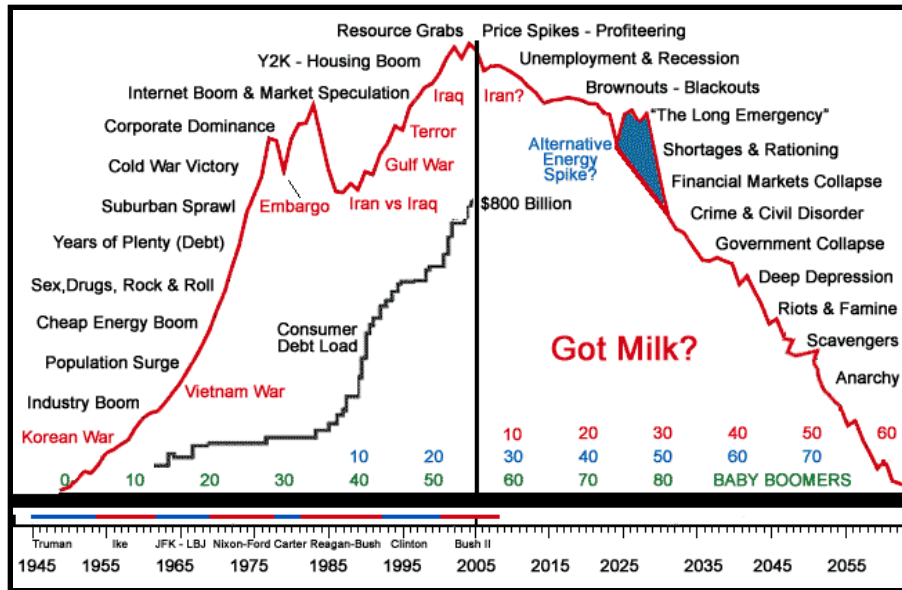
“The Alarmist (scientist, journalist, politician etc.) chooses to huddle with other alarmists inside an echo chamber, attacking messengers who arrive, but spends no time to carefully inspect the data that forms his opinions, nor to notice the reporting of fraud”

Burt Rutan, 2009

Peak Oil

- Defined as being near since the 1930s
- Technology always extends the prediction

Most predictions of “Peak Oil” do not consider advances in technology; this one does.



Peak Lithium (for Batteries)

- Demand will soon increase cost
- But, technology develops alternatives.

Peak Neodymium (rare earth for motor magnets)

- China already limiting exports
- But, technology discovers alternatives.

