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

April, 2010

This presentation can be downloaded at http://rps3.com/

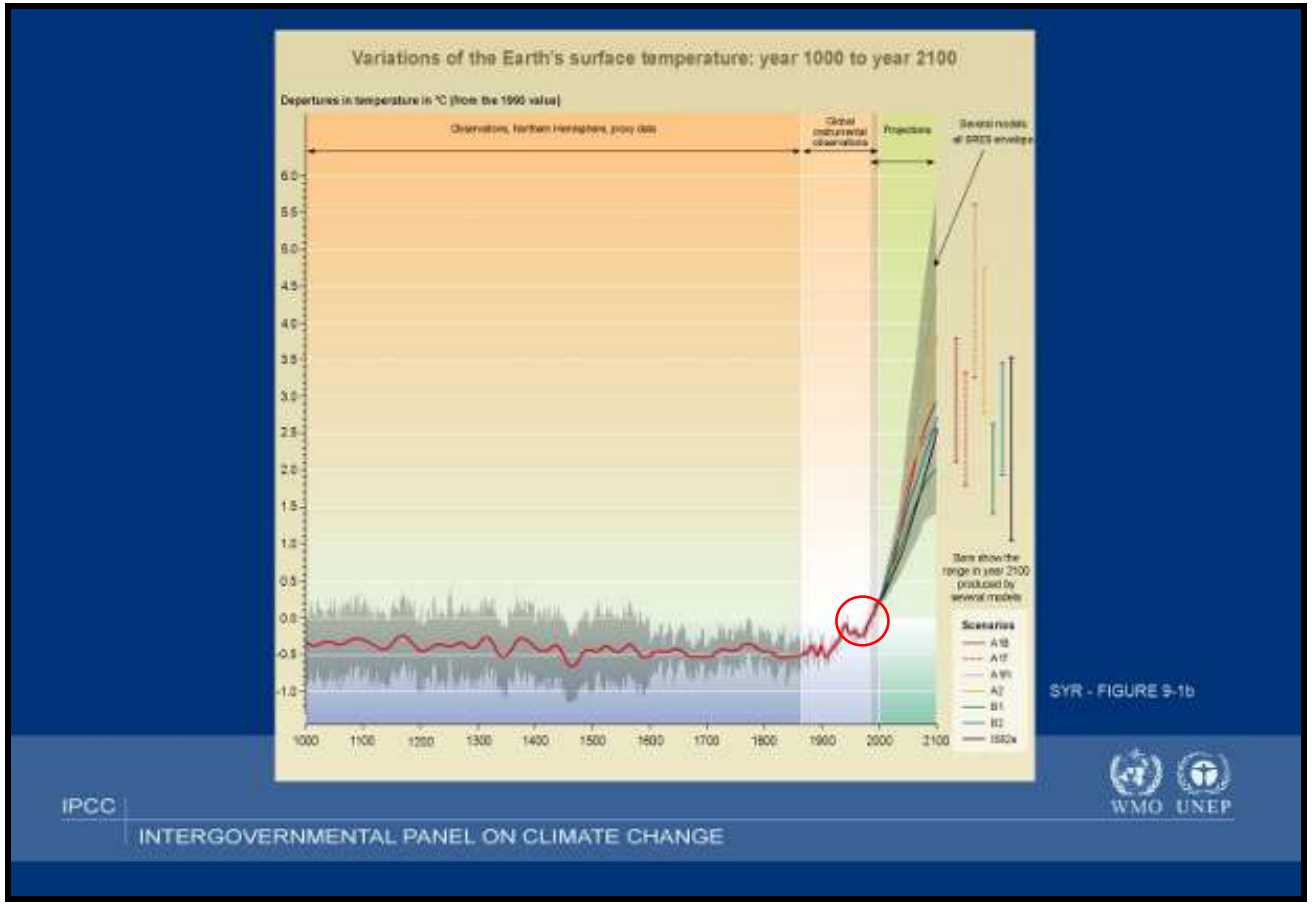
Or, Google "burt rutan climate change"

My Introduction to the Global Warming Scare

United Nations Intergovernmental Panel on Climate Change

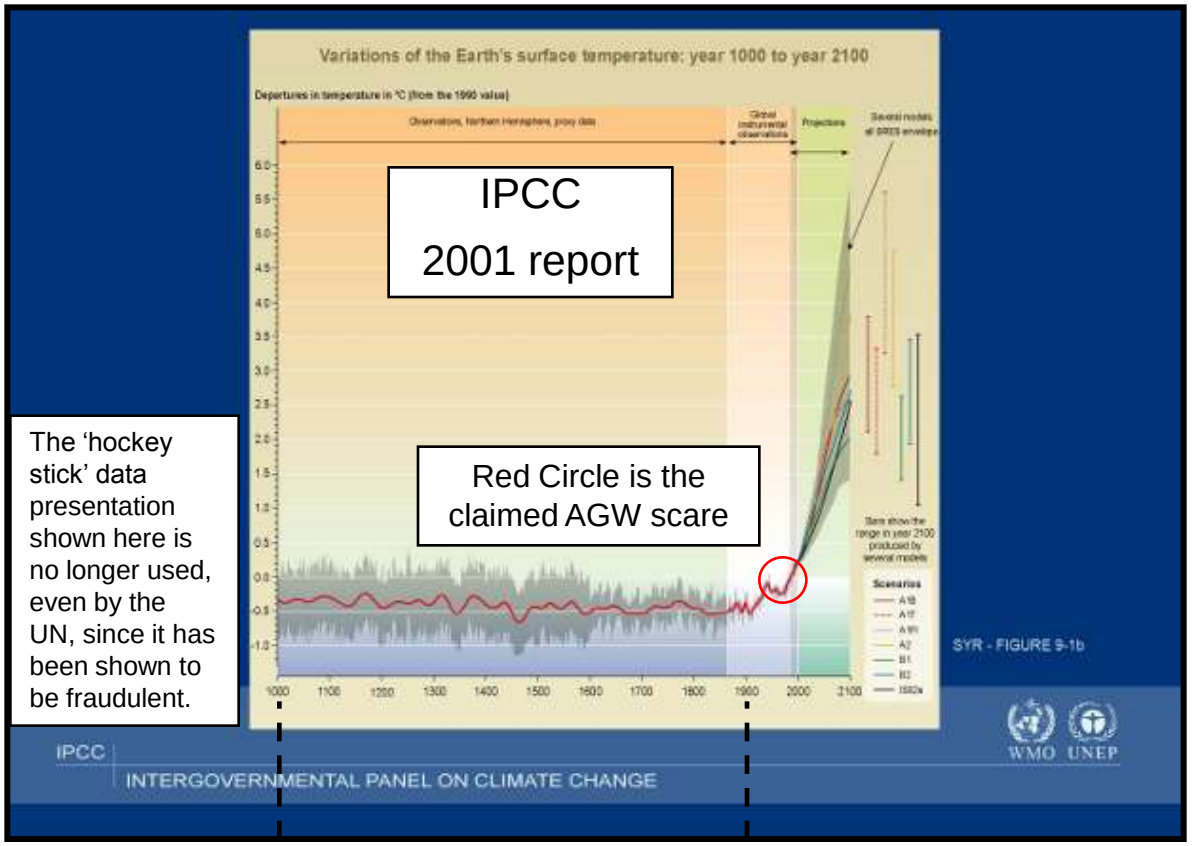
Is there something an engineer can do to solve this?

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 CO_2 greenhouse gas heating from human emissions (AGW).
Chart must be important: Oscar-winning movie, best-selling book and Nobel Prize.

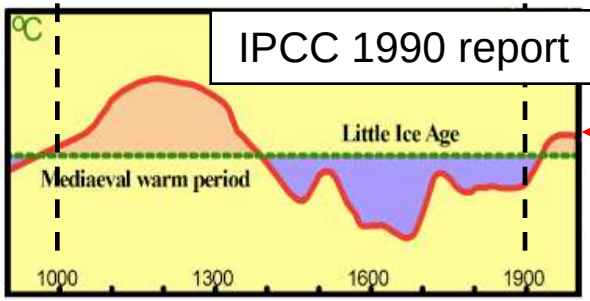


Red Circle is the claimed CAGW scare

A Dramatic Change in the UN Presentation of Global Temperature



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

Players in the CAGW issue:

Government Scientists, Universities, Politicians, Top Leadership, etc.

But…. No engineers or engineering studies/programs are being evaluated for the IPCC Reports.

An Engineering look at Man-Caused Global Warming

- Not a Climatologist's analysis - a view from a flight test engineer who has spent a lifetime in 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.
- My 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 consider if predictions might be valid.

Modern Human-Extinction Scares

- **Population Bomb**, starvation/crowding - 1940s to 1970s
- **Silent Spring,** DDT - 1960s & 1970s (outlawing DDT killed millions)
- **Global Nuclear War** - 1950s thru 1980s
- **Global cooling,** Ice Age/starvation - 1956 to 1977
- **Hole in the Ozone layer,** caused by CFCs, 1970s & 1980s
  (We now know that the Ozone changes were **not** caused by human CFCs)
- **Nuclear Winter,** nuke-caused ice Age - 1980s & 1990s
- **Asteroid Impact** - 1930 to present (a real, but remote risk)
- **Global Warming** - 1929 to 1969 and 1987 to 2003
- **"Climate Change"** - 2003 to present

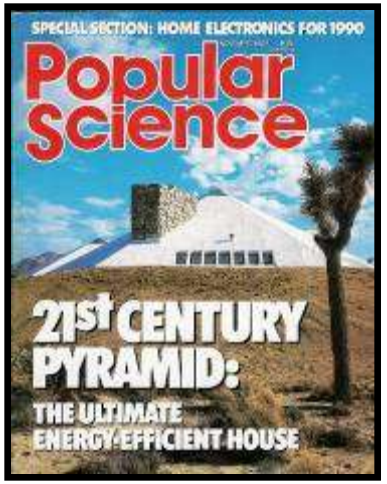
Is 'Climate Change' just another over-blown scare?

Rutan Background Includes Energy Efficiency

Solar Hot Water in the 70s

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

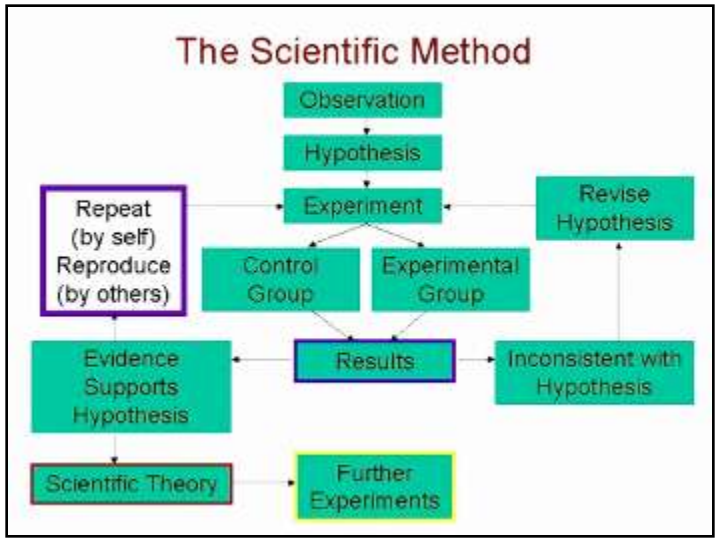
Loss of my EV-1 Electric car in 2004.
General Motors crushed them all



The Difference

Engineering Organization vs. the Scientist

- Engineering organization
  - Development of a product, usually under strict certification rules.
  - Responsible for the product worth and safety
  - Selling the product's adequacy to Management
  - Consequences if wrong
- Scientist
  - Origin of new Theories (hypothesis)
  - Strict process (The Scientific Method) to gain (or lose) confidence in the Theory
  - Not responsible for adequacy or value of product
  - Expected to be 'wrong' most of the time

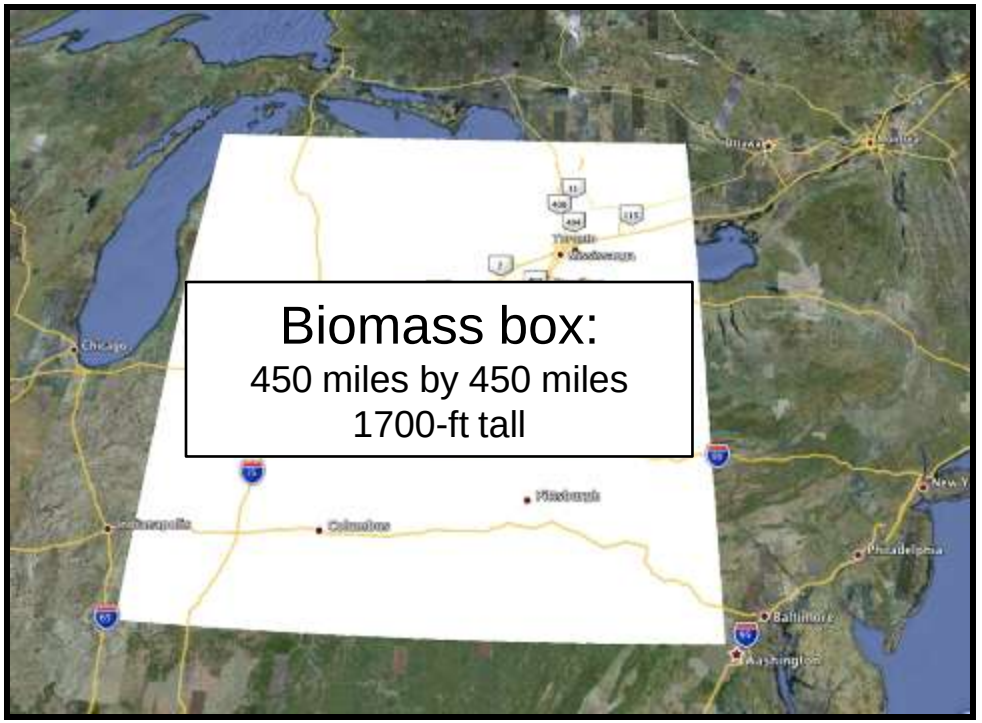


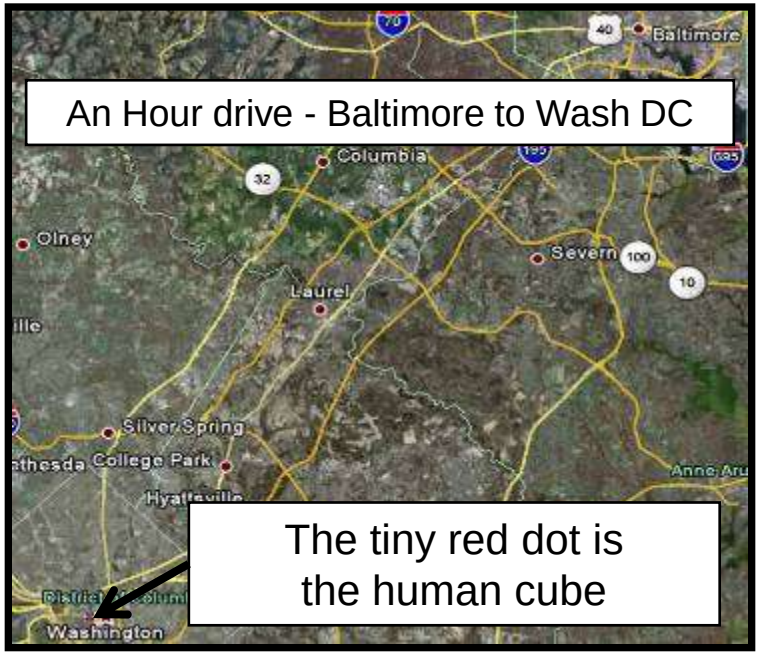
Searching for the humans

Even when stacked together, Humans are Invisible using a magnifying glass on a globe.

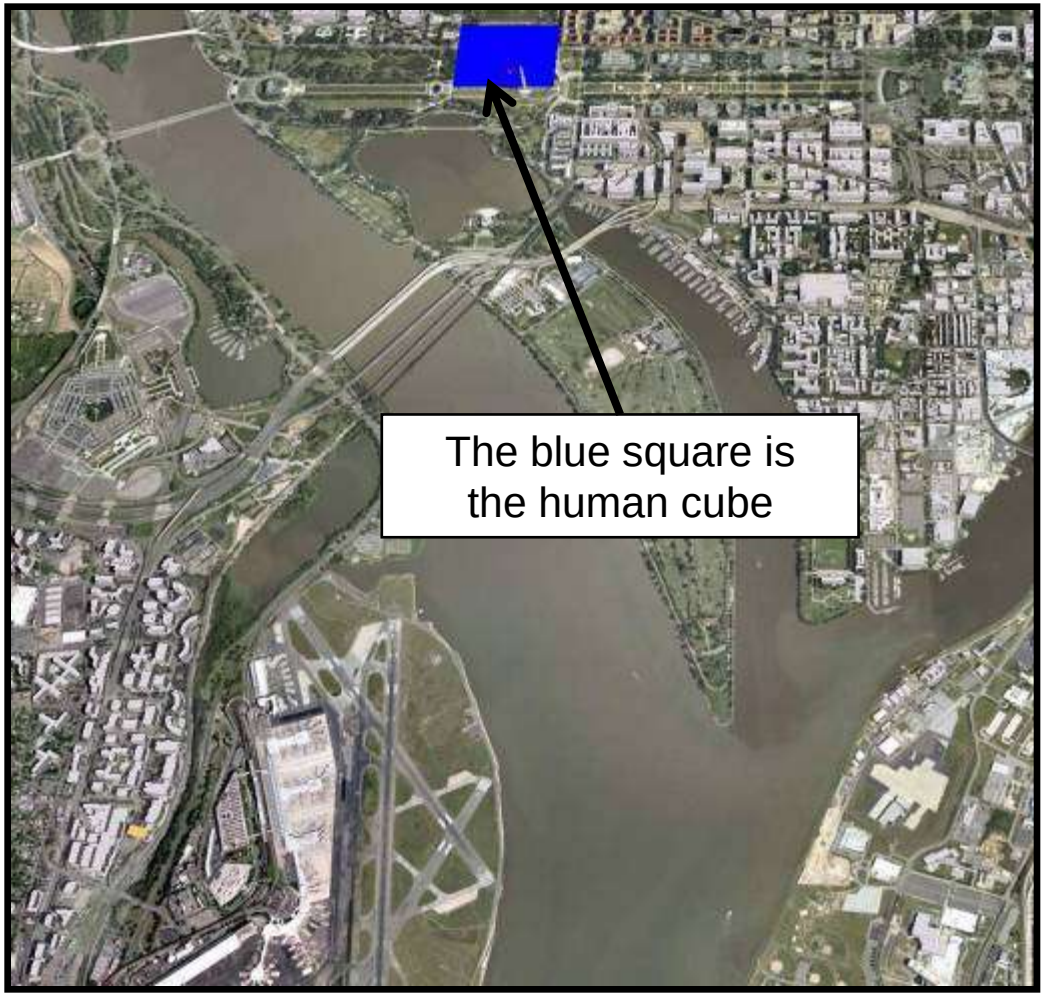
Searching for earth's biomass

Stuffed together in one place, Earth's biomass fits in the large white box.

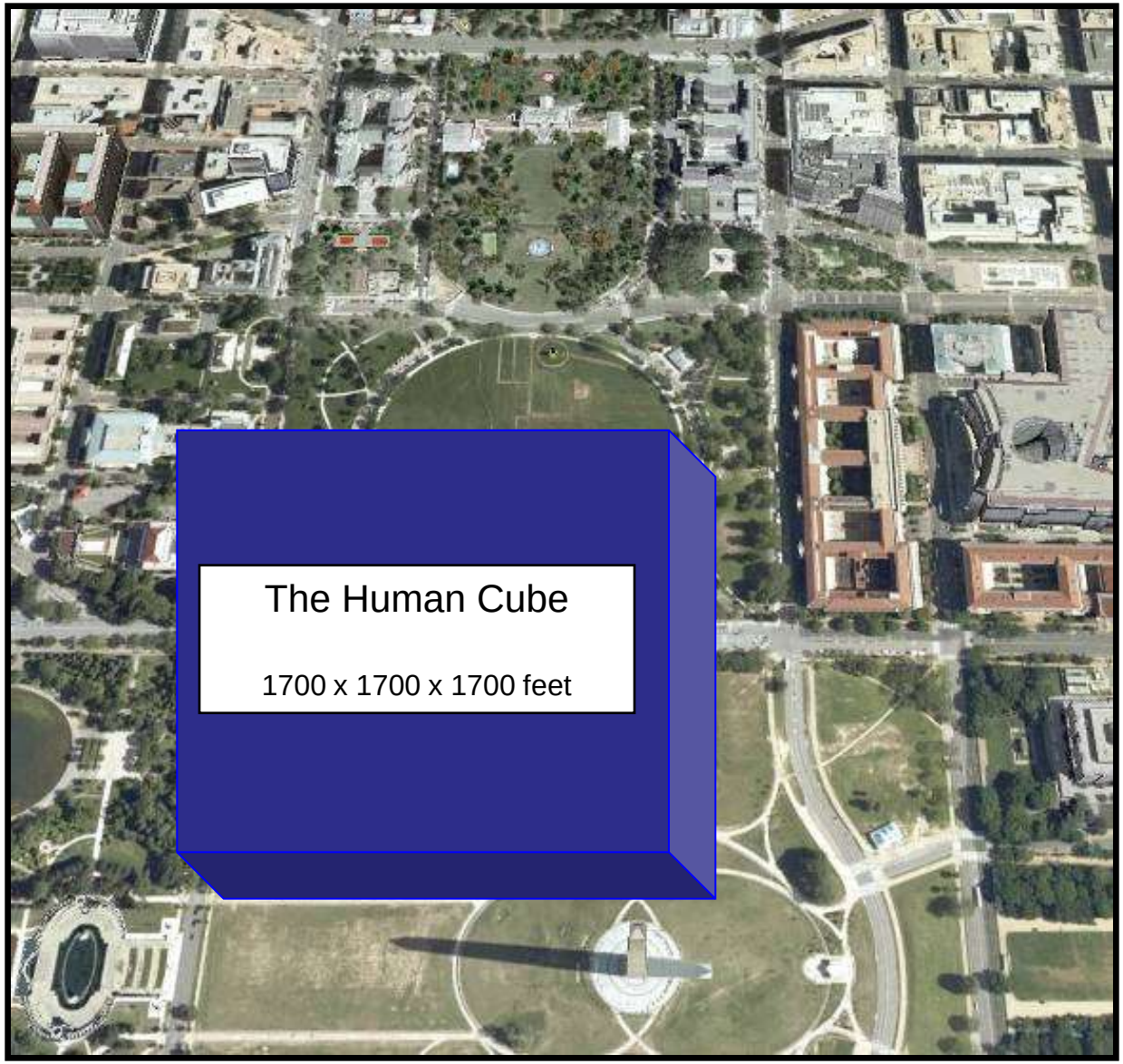




Zooming in:
Humans are visible at this scale

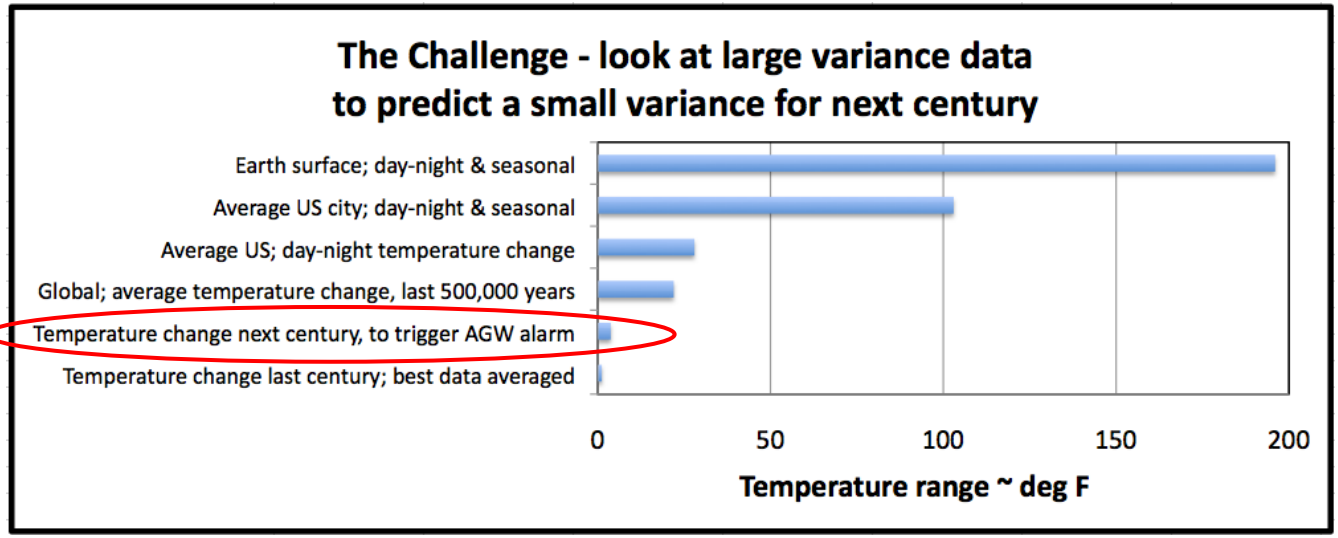


The 6.8-billion humans are a tiny spec on the planet. You can walk around the human cube in 20 minutes.



The Challenge is Massive for the Alarmist

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



The U.S. 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 CO_2 % in this room will increase more during this talk than the atmospheric CO_2 % did in the last 100 years.

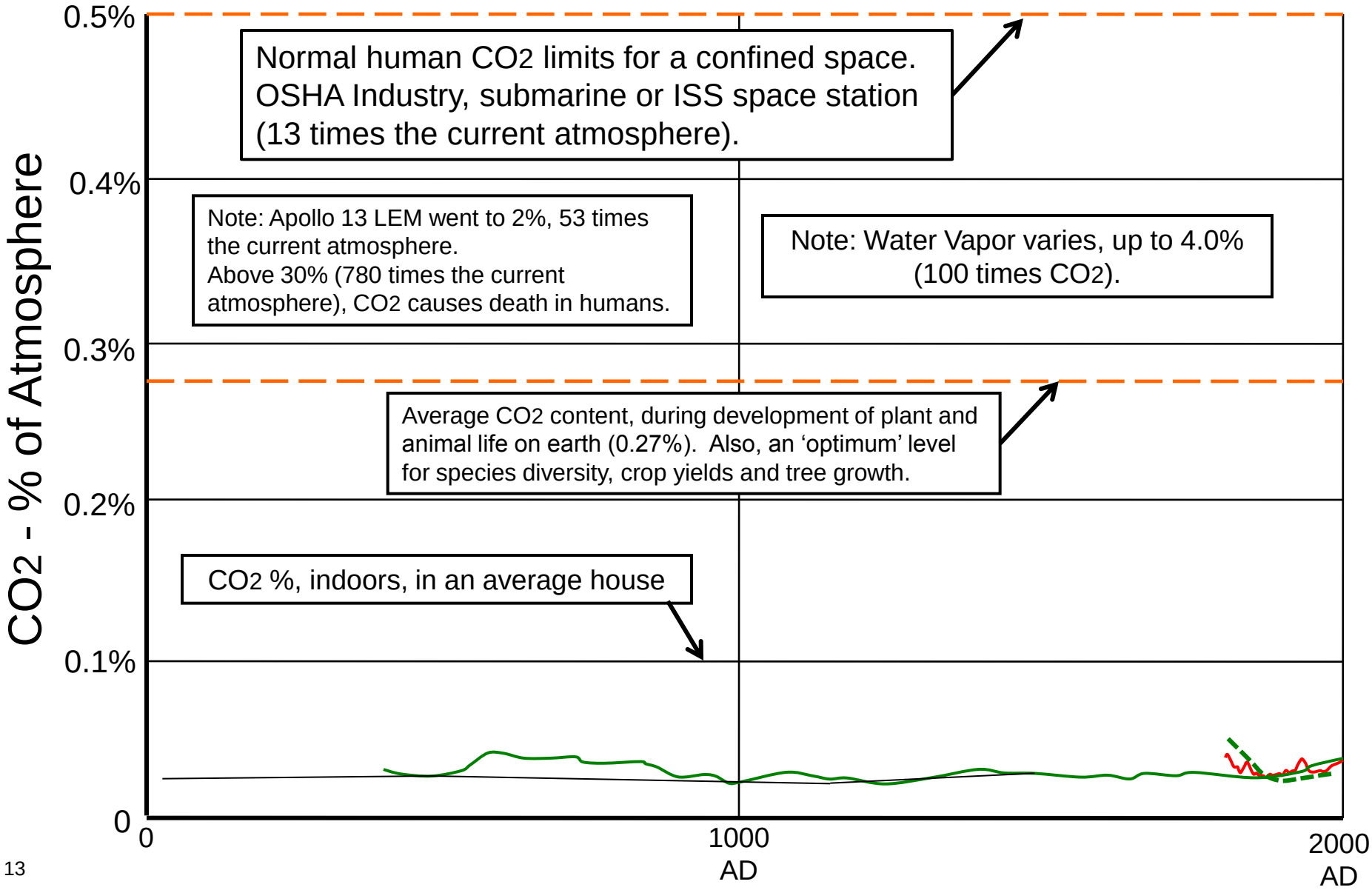
The CAGW call to action (for a Carbon-constrained world) Requires these 5 issues to be true. This report studies these five, in order.

1. Recent human burning of fossil fuels suddenly and dangerously increased CO_2 beyond previous levels.
2. Human CO_2 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 CO_2 increase?

Carbon Dioxide In Perspective - the last 2,000 years

The CO_2 data at the bottom will be described in later slides.

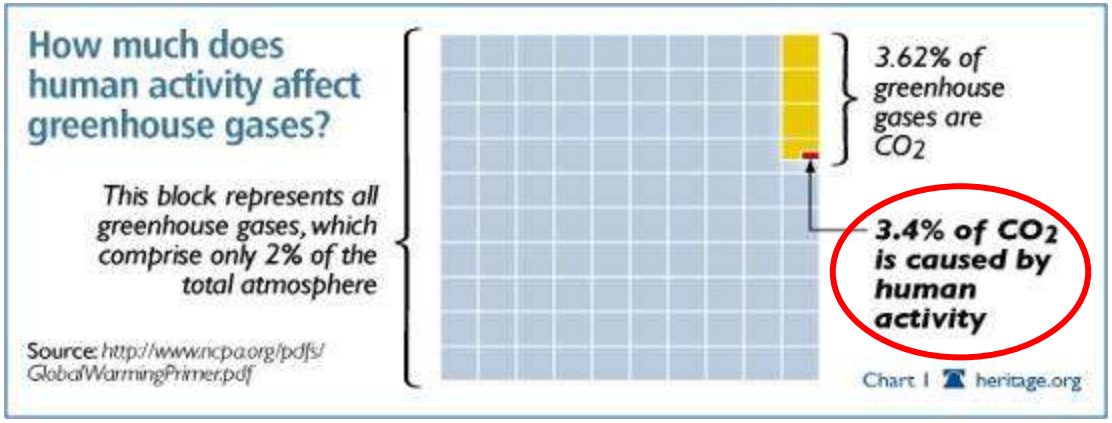


The Challenge is Massive for the Alarmist - to prove his CAGW theory

He must convince us that CO_2 is a pollutant. But calling it a pollutant is an uninformed, cruel joke. CO_2, along with oxygen and water is essential for all life.

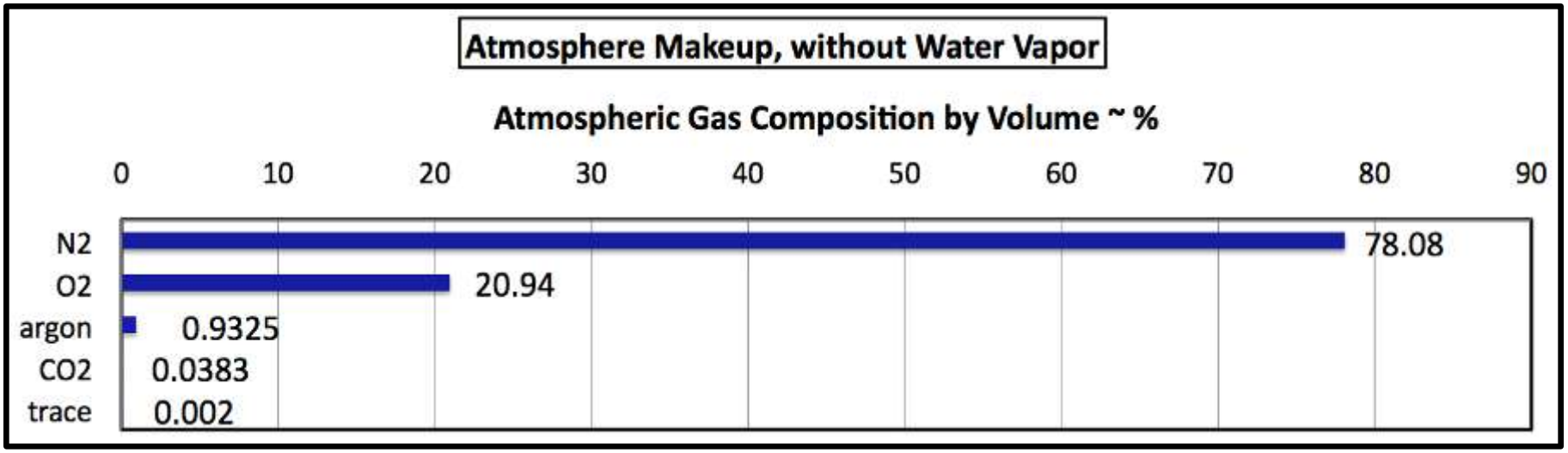
Look at a leaf, a grain, a flower. Half of what you see was made from CO_2. Recent rising CO_2 has resulted in 15 to 30% more crop yields and large increases in forest growth.

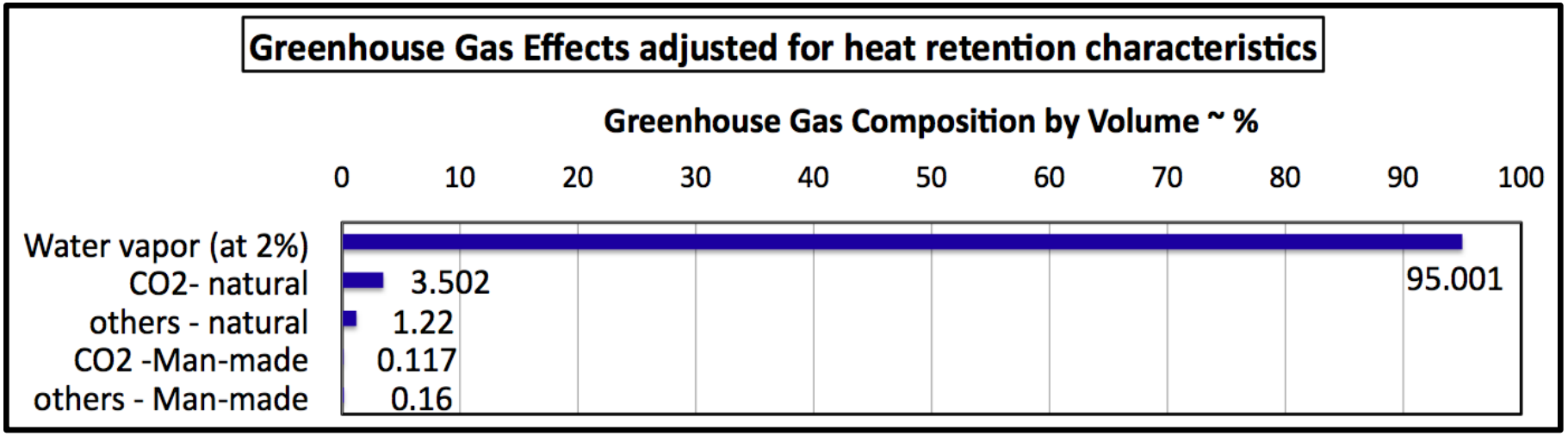
However, human Emissions of CO_2 are Tiny.



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

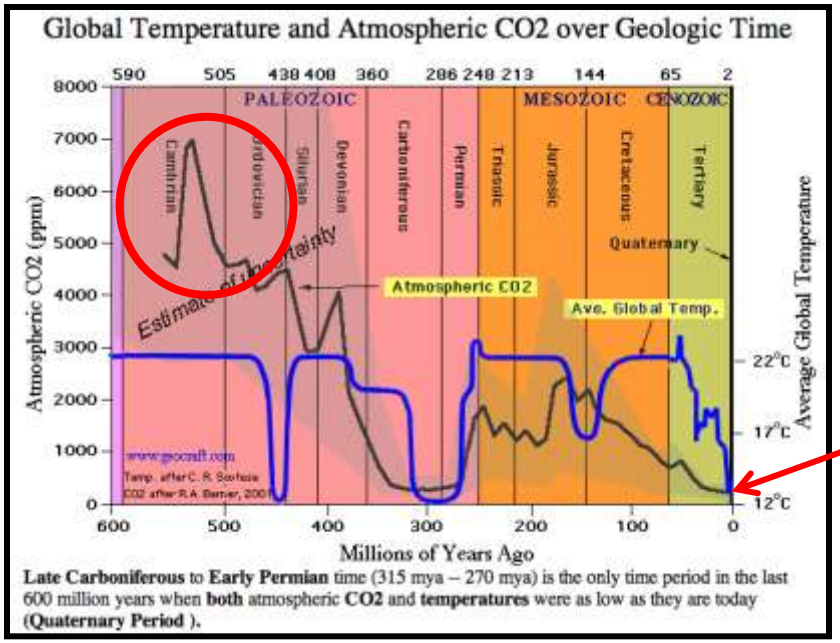




Man's emissions of CO_2 contribute only 0.117% of the total greenhouse gas warming effect.

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. It was 4 times the current level when the dinosaurs were killed by an asteroid. The only extended time CO_2 was low, (like today) was an extended period 300 million years ago.



Now

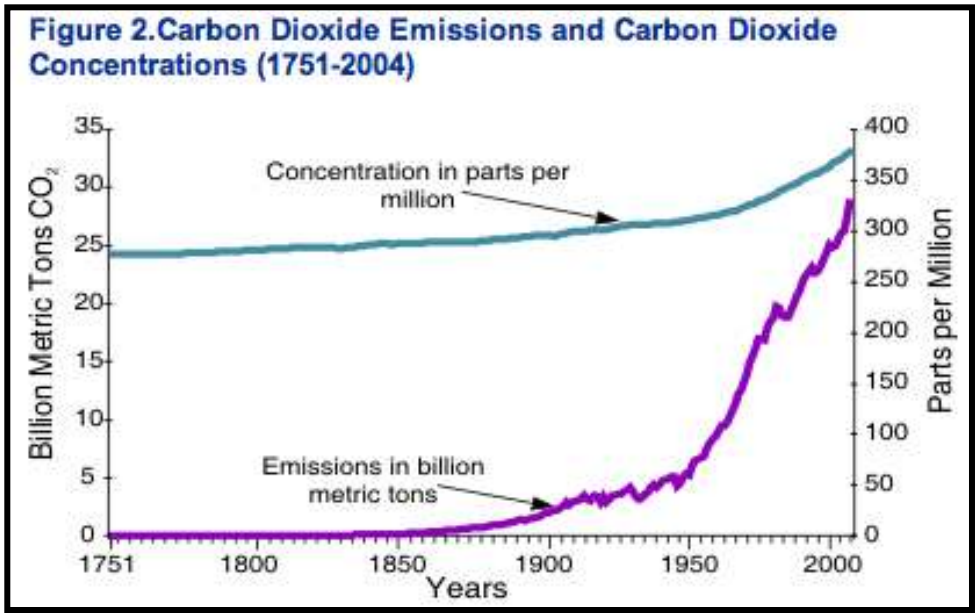
In the big picture we are now in a **low** CO_2 period. The 20th century increase shows as an insignificant dot at this scale.

Do we risk **runaway greenhouse warming** if our CO_2 concentration gets too high? It has never significantly driven temperature before.
Venus may have runaway greenhouse warming, but its CO_2, at 96.5% is 2,500 **times** the level of CO_2 in the earth's atmosphere.

The Basic CO_2 Alarmist's Chart

The claim: CO_2 content is smooth and near-constant for 200 years, and then increases, due to human emissions.

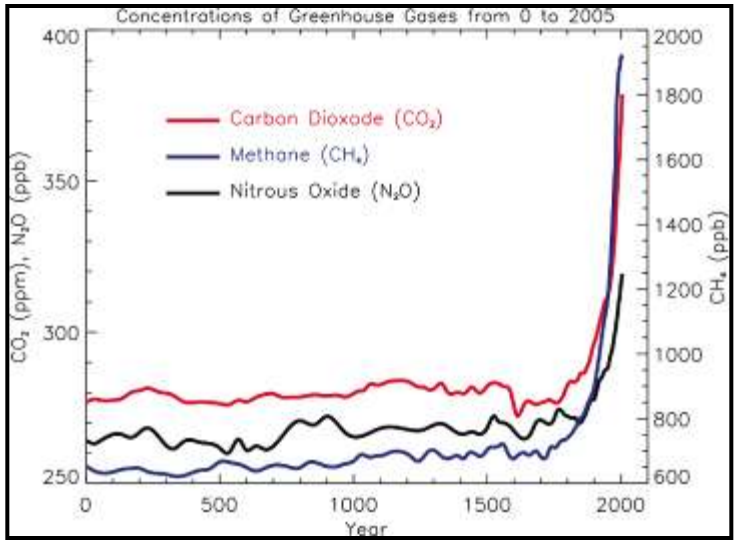
But - accurate, CO_2 direct measurements are only available for the last 50 years.

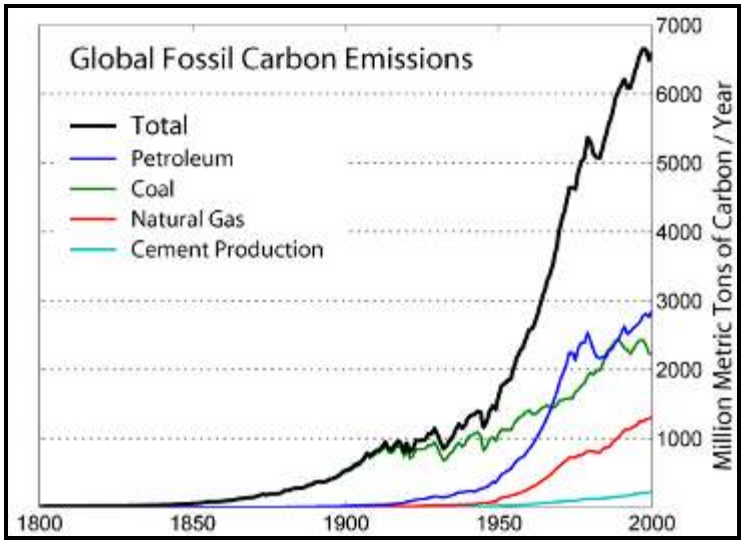


Another Scare chart

The Alarmist' Presentation Tactic

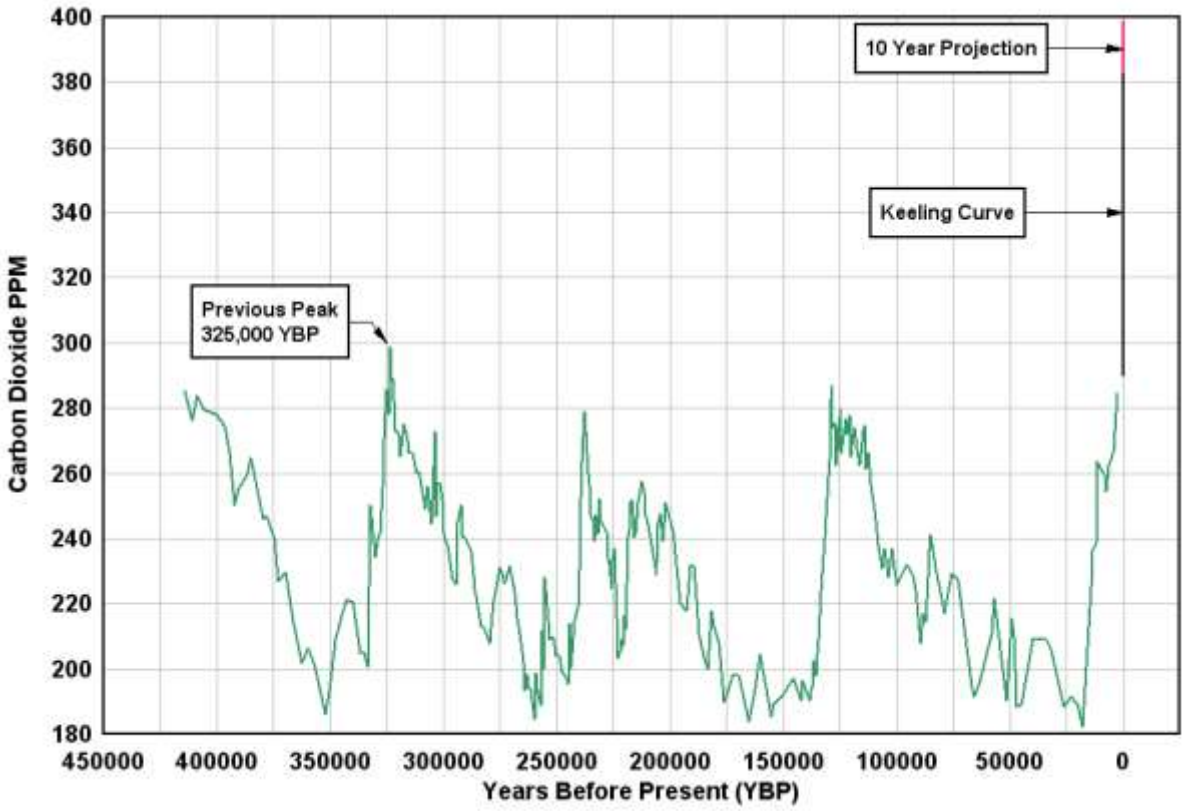
Find a correlation of human emissions to something 'really bad'.
Scale the presentation to show a scare.





A Horrific scare chart

The Jump to Ice core data, back 400,000 years
"CO_2 is highest in a million years"



Note the time scale.
Ice core data does not measure recent conditions.

Measured Atmospheric CO2

Manipulation of measured data for 200 years

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

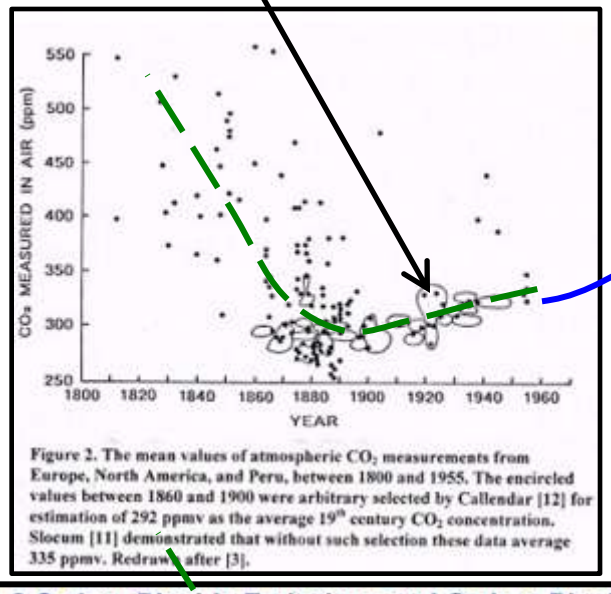
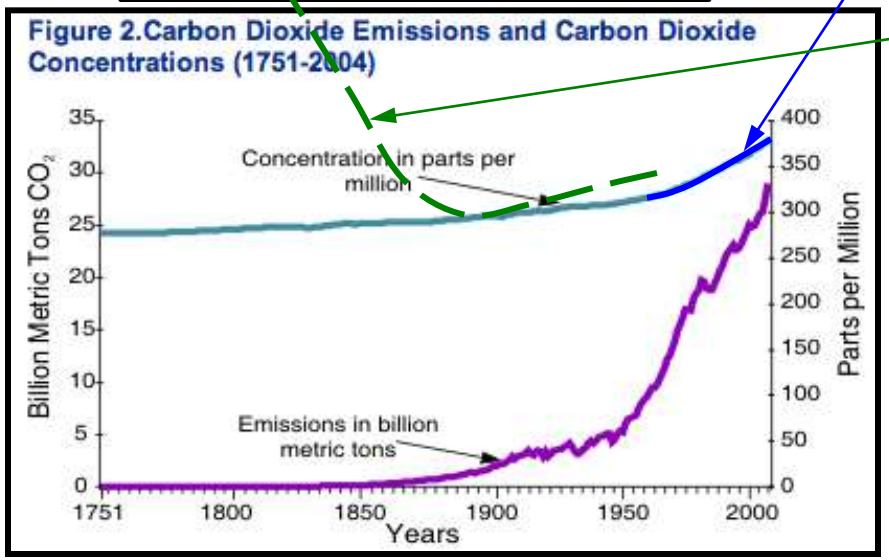


Figure 2. The mean values of atmospheric CO_2 measurements from Europe, North America, and Peru, between 1800 and 1955. The encircled values between 1860 and 1900 were arbitrary selected by Callendar [12] for estimation of 292 ppmv as the average 19th century CO_2 concentration. Slocum [11] demonstrated that without such selection these data average 335 ppmv. Redrawn after [3].

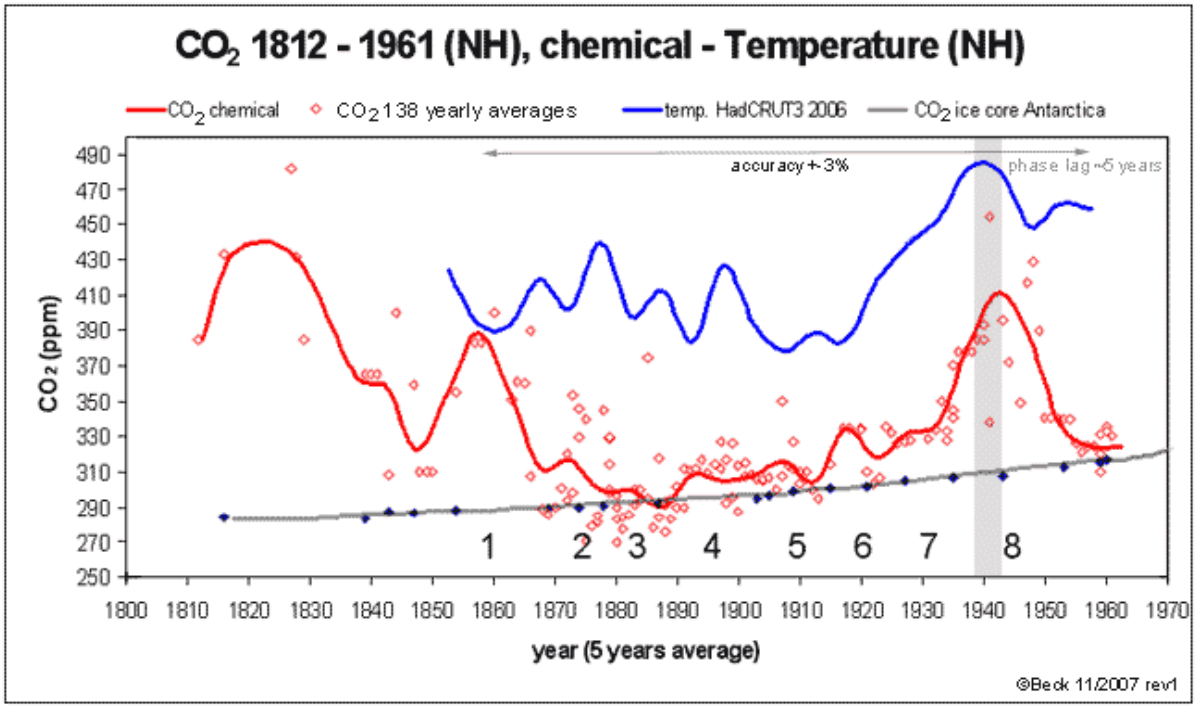
Blue curve is the modern, accurate data, measured at Mauna Loa Observatory, Hawaii.

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



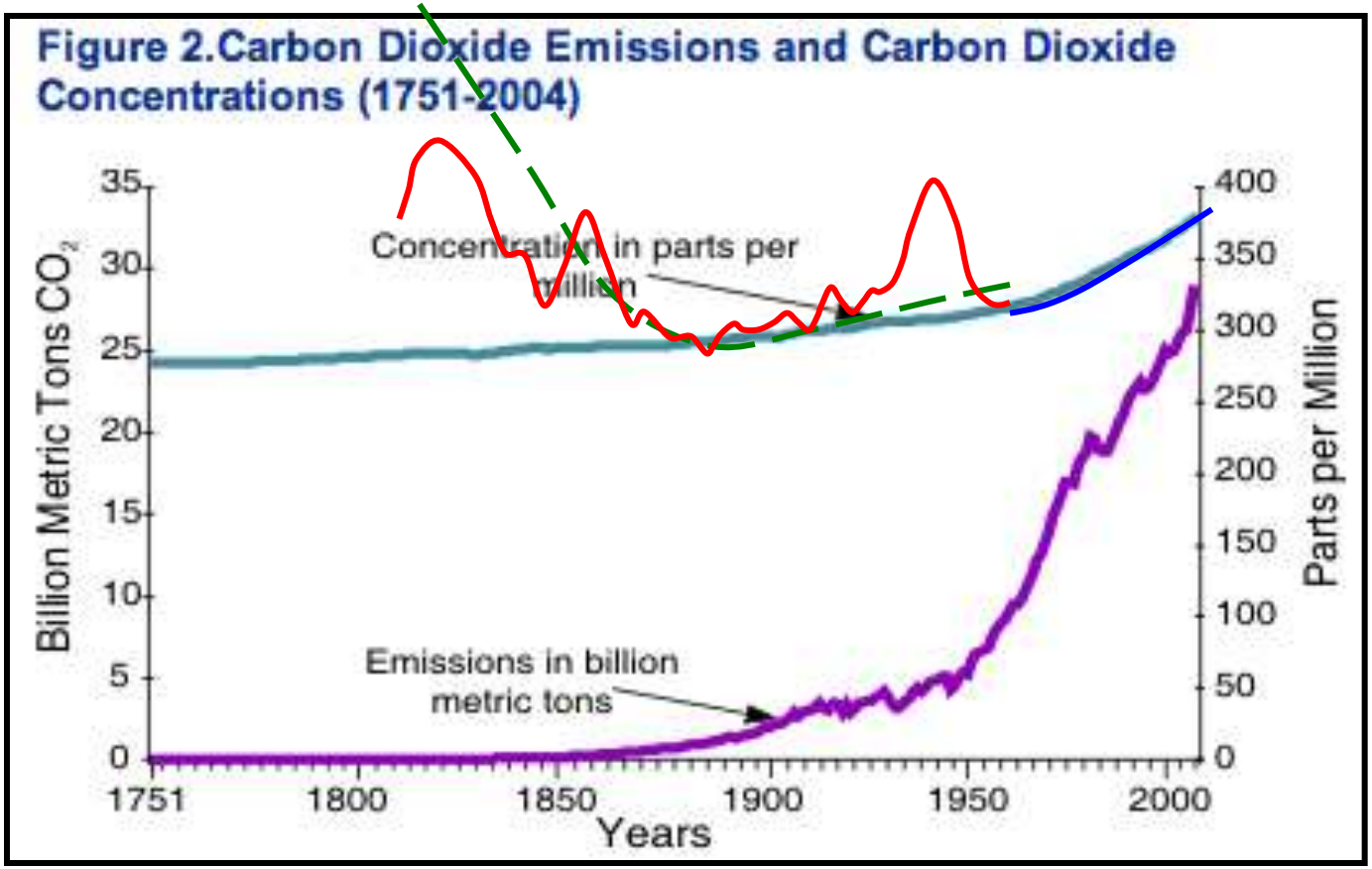
Another CO_2 Measurement Method

Chemical method data for 1810 to 1962 period



The Basic CO_2 Chart

Now takes on a different look



Green dashed - Fairing of early, directly-measured CO_2
Red - chemical method
Blue - Mauna Loa modern measurements

Looking Back 1800 years

A CO2 Measurement Proxy
From stomatal density in fossil pine needles

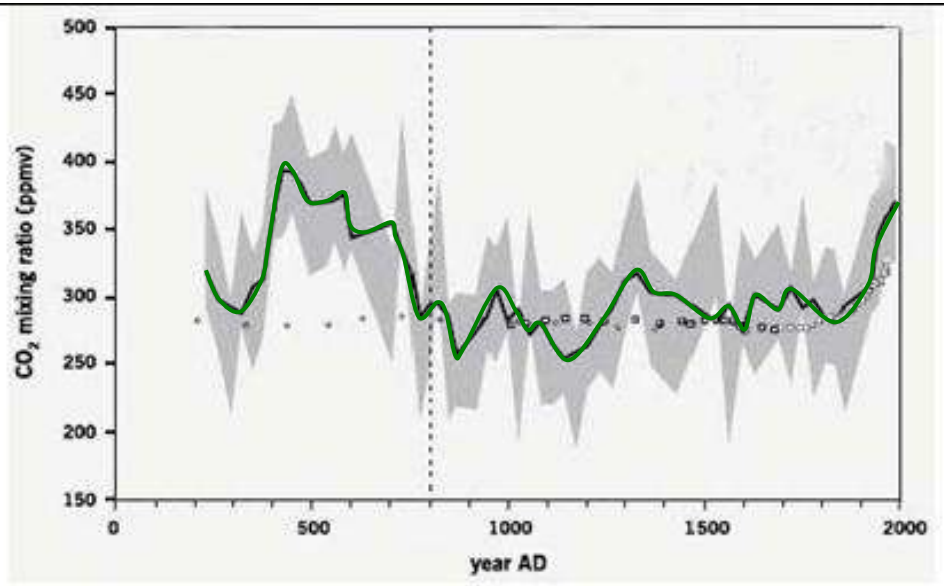


FIG 2 - Reconstruction of paleo-atmospheric carbon dioxide levels for the last 1800 years inferred from stomatal density in fossil pine needles (Tsuga heterophylla), northwestern USA (after Kouwenberg, 2005, Figure 5.4). Black line: three-point running average, based on 305 needles per data point; grey 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: CO_2 Data for the last 1800 years

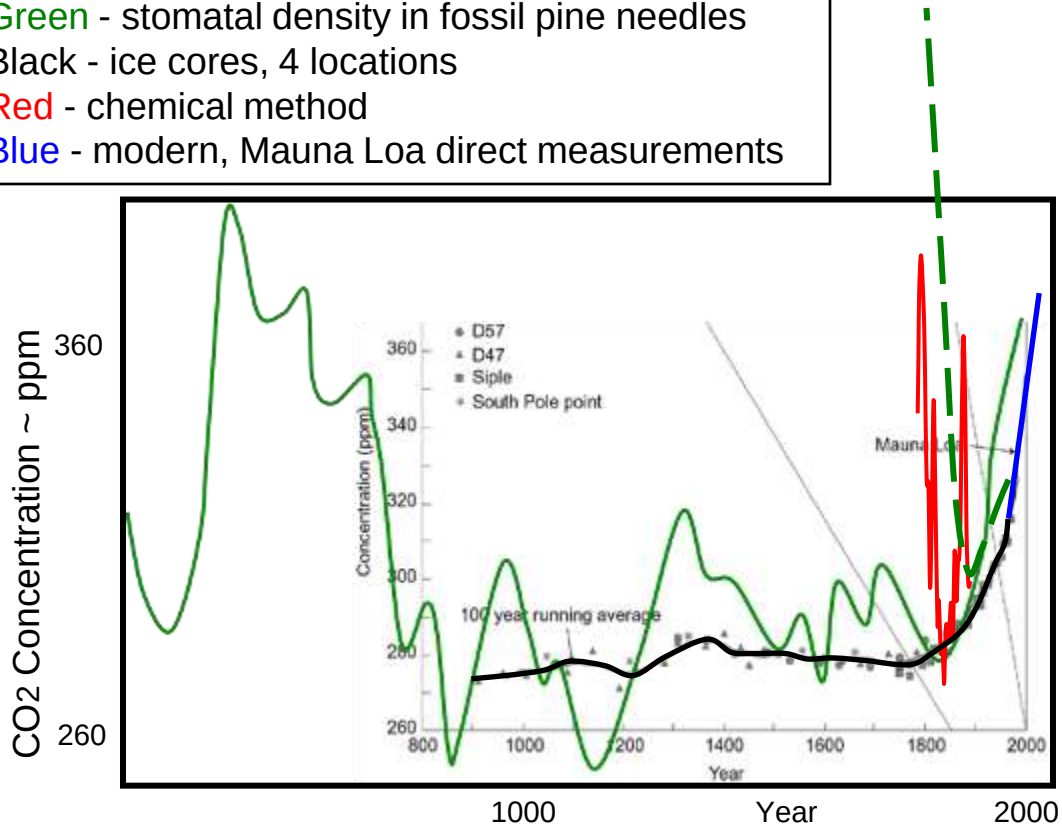
Data from early & modern measurements, Ice core, chemical and pine needles. Not a lot to scare, with this chart.

Is the present CO_2 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.

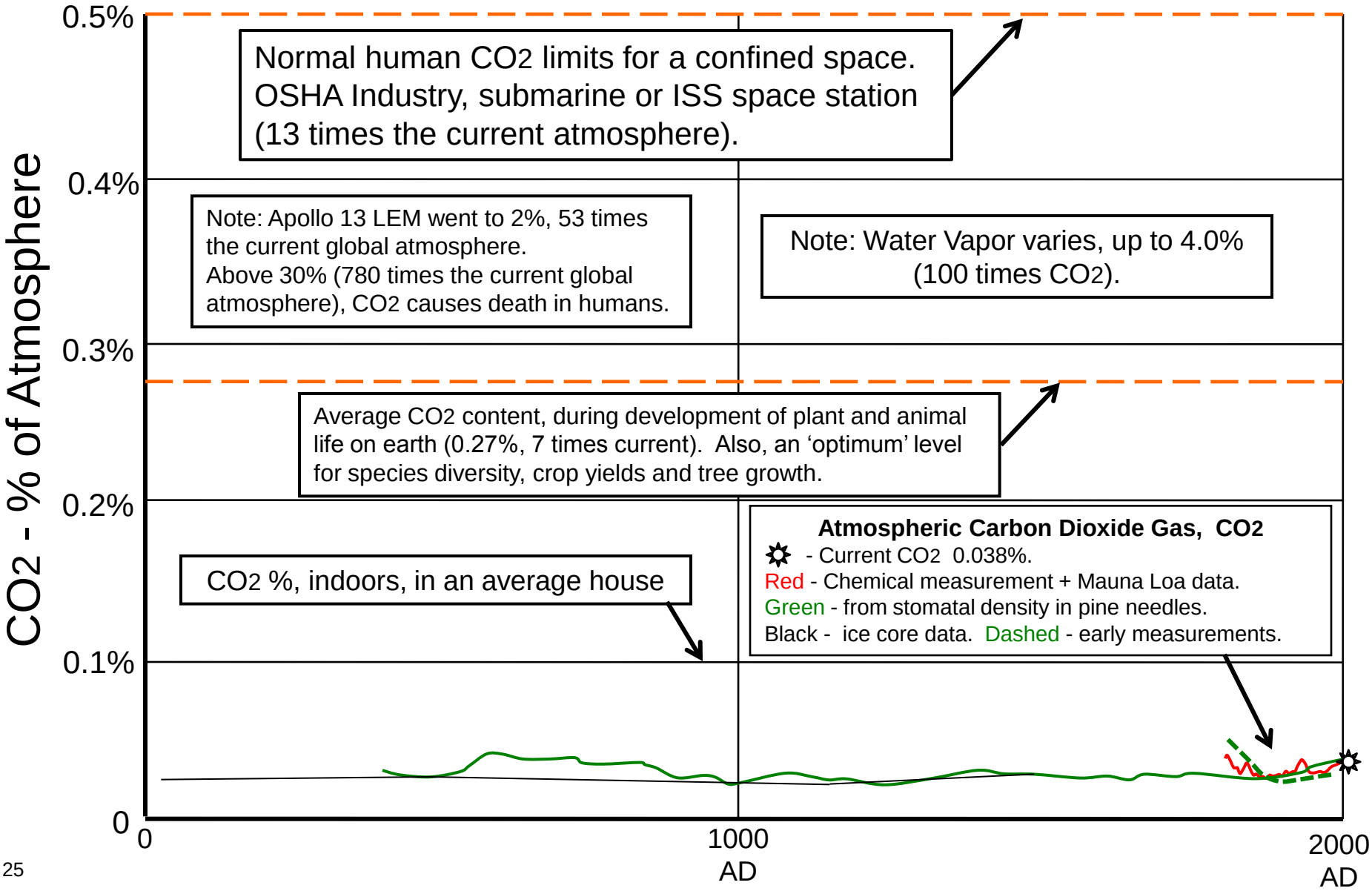
For the proper perspective this data is transferred to the next slide.



Another Look at the Perspective Chart

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

This shows CO_2 in its proper role as a trace gas, not something that has to be immediately eliminated.



Some CO2 Facts

An average of 34% increase in agricultural productively from 1990 to 2004. Much of that increase was due to an increase in atmospheric CO2.
Plants need less water, with more CO2.

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

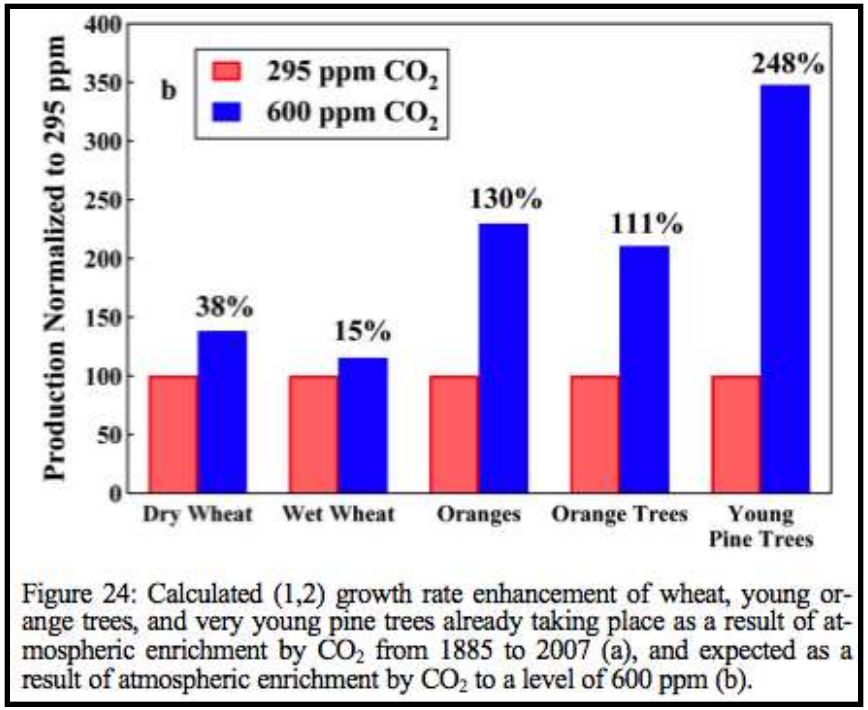


Figure 24: Calculated (1,2) growth rate enhancement of wheat, young orange trees, and very young pine trees already taking place as a result of atmospheric enrichment by CO_2 from 1885 to 2007 (a), and expected as a result of atmospheric enrichment by CO_2 to a level of 600 ppm (b).

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.

More info at http://www.co2science.org/subject/t/summaries/earlyspringgrowth.php

#1. - Yes - Due partially to human emissions, the atmospheric content of CO_2 has increased 22% in the last 50 years. CO_2 might now be the highest in the human era.
However, CO_2 is only 0.038% of the atmosphere and CO_2 is only 3.6% of all the greenhouse gasses.

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

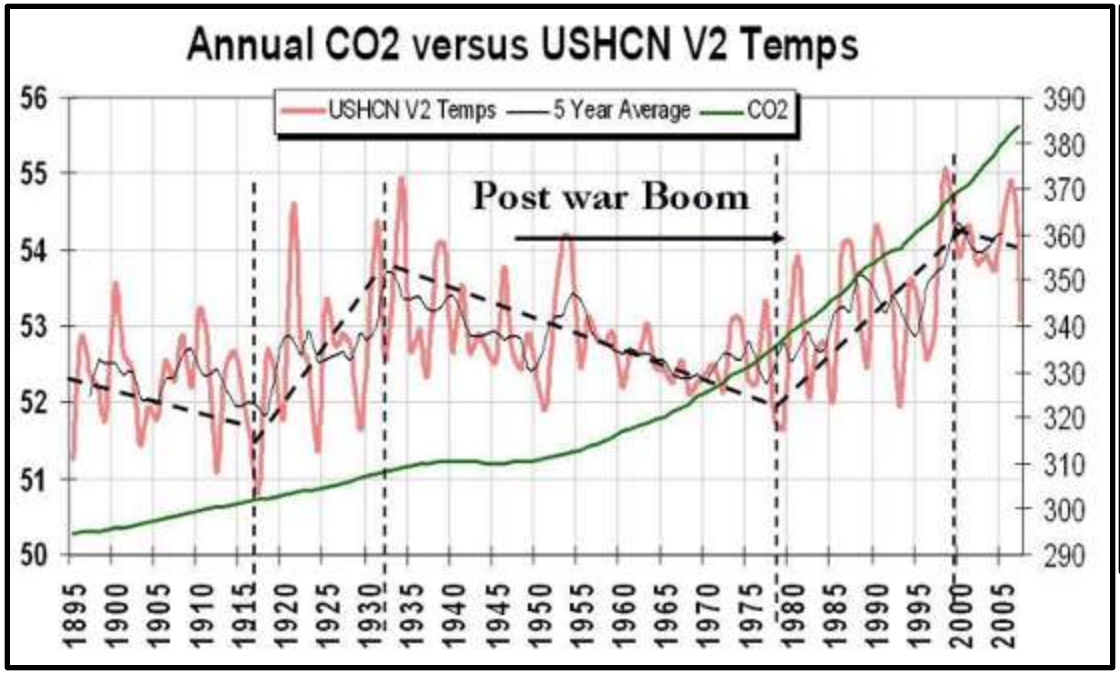
CO_2 is a trace gas; it has been 18 **times** current levels during times of life's greatest species diversity growth. Increases are beneficial.

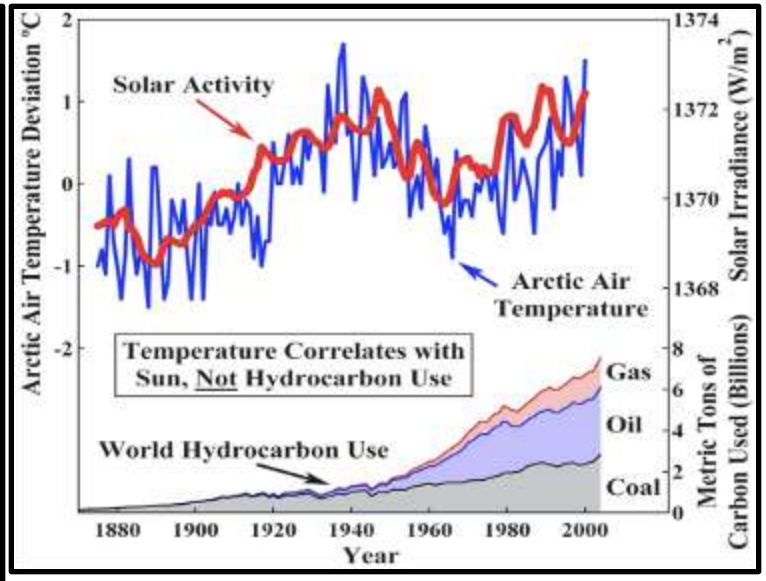
1. **Recent human burning of fossil fuels suddenly and dangerously increased CO_2 beyond previous levels – Yes/No**
2. Human CO_2 emissions causes greenhouse warming.
3. Dangerous, sudden global warming occurred the last 50 years.
4. The current Temperature is **too Hot** &further warming is **Bad**.
5. It is more difficult to adapt to climate changes than to attempt to control them.

Next is #2. Okay, so CO_2 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.

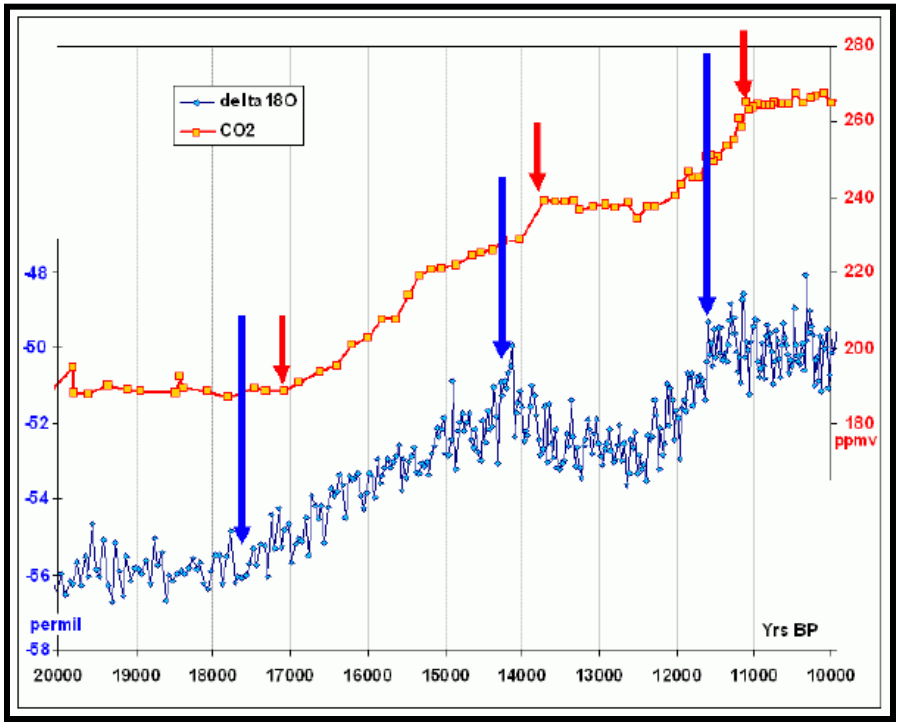




CO_2 is Not the Likely Driver of Greenhouse Warming

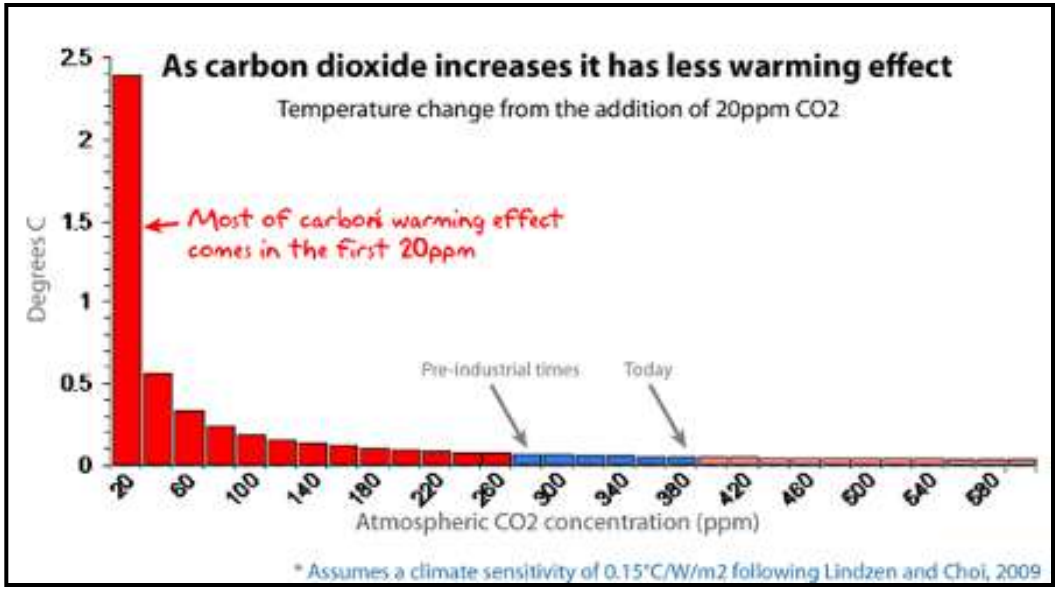
CO_2 changes happen **after** temperature changes.
Data basis - ice cores, to 460,000 years ago.

Chart shows a 10,000-year period during the last ice age recovery. Temperature changes, **then** CO_2 responds 500 to 800 years later.



The Big Greenhouse Gas Warming Effect is **only** for small amounts of CO_2

Doubling the concentration now would have little effect on warming.



The CO_2 already in the atmosphere absorbs most of the light it can. The CO_2 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 CO_2 and most of the extra gas is just "unemployed" molecules.
Mars is cold, despite having 95% CO_2.

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

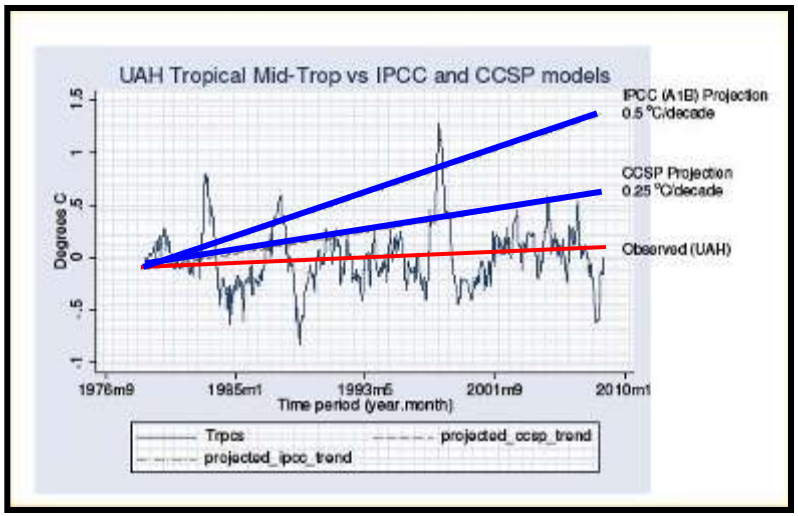
"Question, Never Defend" *

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 CO_2 rise. This discredits the theory of greenhouse-gas-warming.

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

Climate models fail to Predict

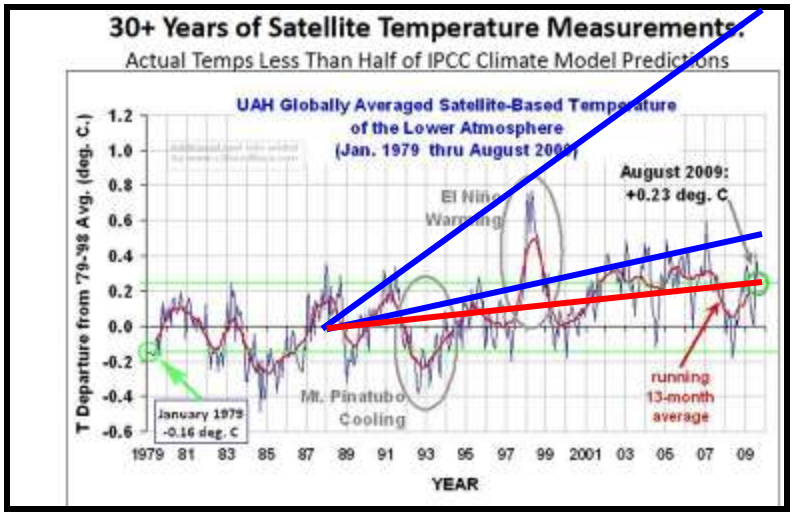


News Media and Nature magazines often report that Global Warming is “worse than predictions”. In the vast majority of cases, they are lying.

They always can find a full range of predictions to pick from. Alarmists and media usually quote the ‘high’ IPCC estimate, to increase the scare factor.

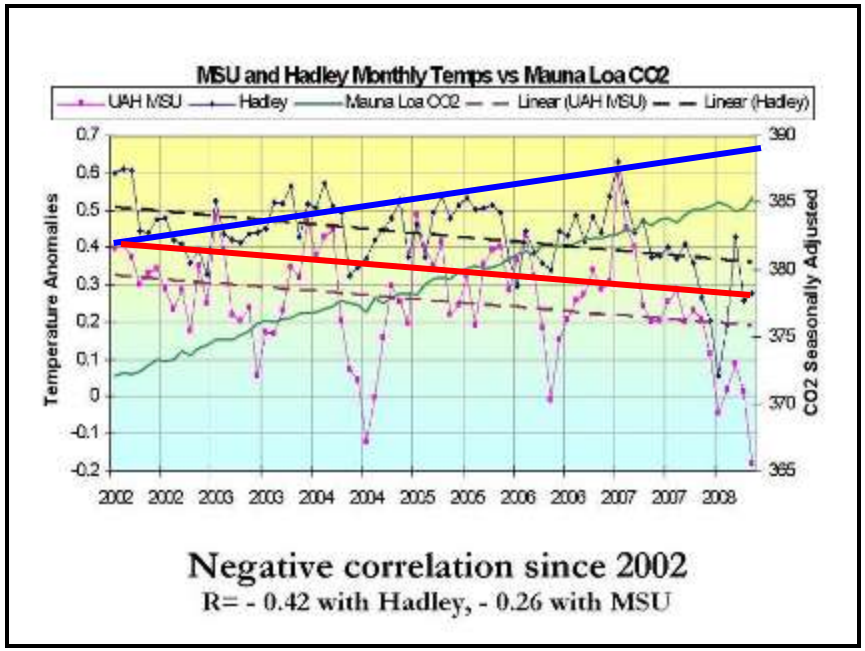
UN IPCC Prediction

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



Atmosphere Temperature Prediction

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

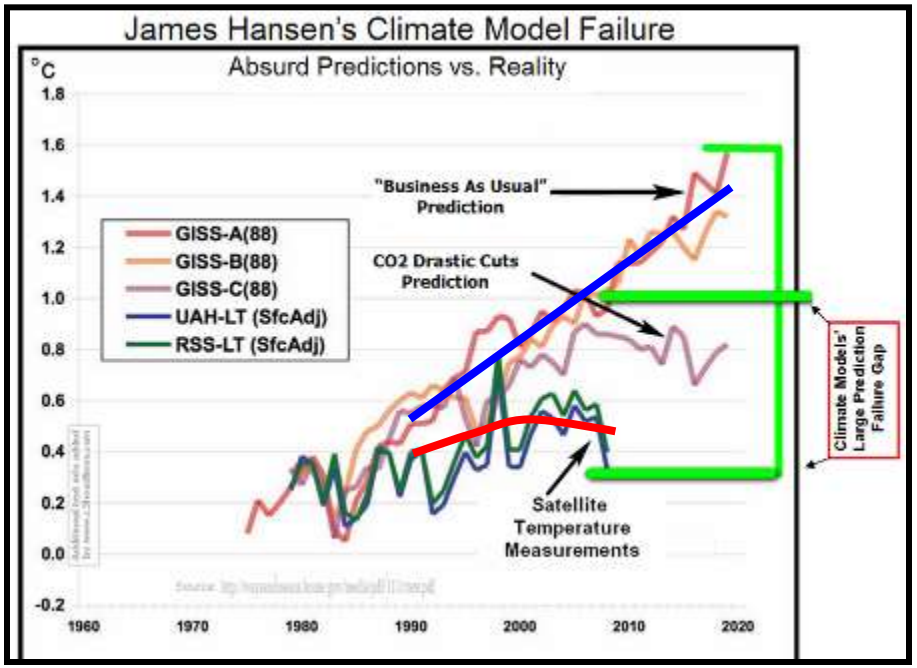


NASA's James Hanson

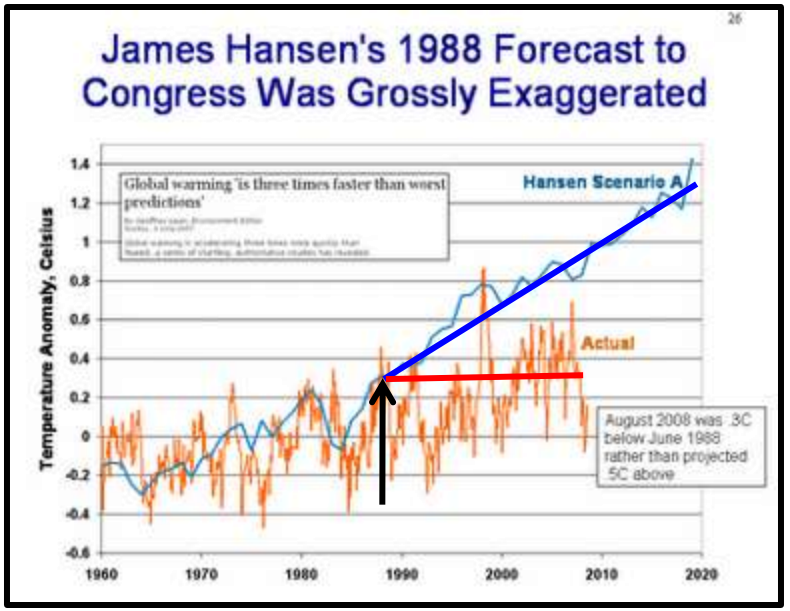
Calling the computer models "evidence" in Congress in 1988, Hanson predicted a leveling of warming by 2006, **ONLY** if drastic cuts were made in emissions.
Real data - it is cooler, **WITHOUT** the cuts. The planet is now the same temperature as when he testified.

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



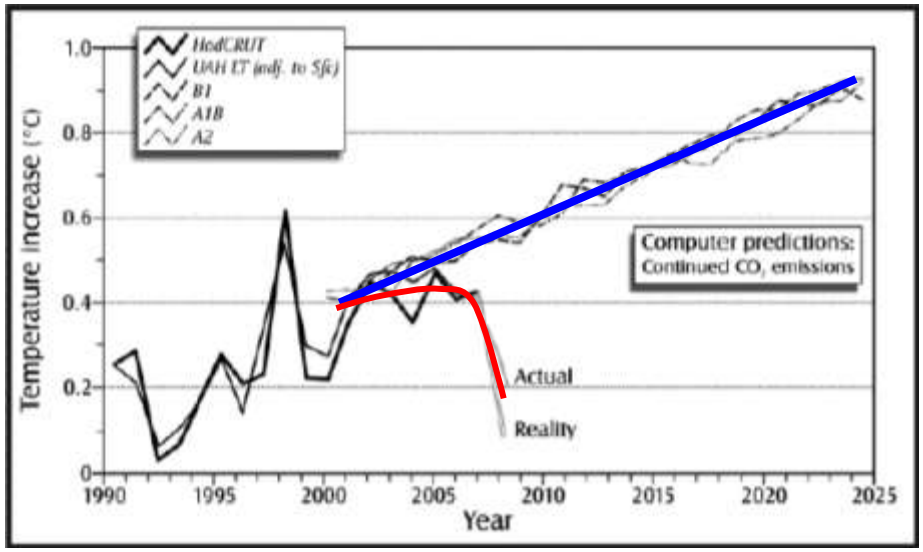
Blue = prediction Red = actual data fairing



More Failed Predictions from the Computer Models

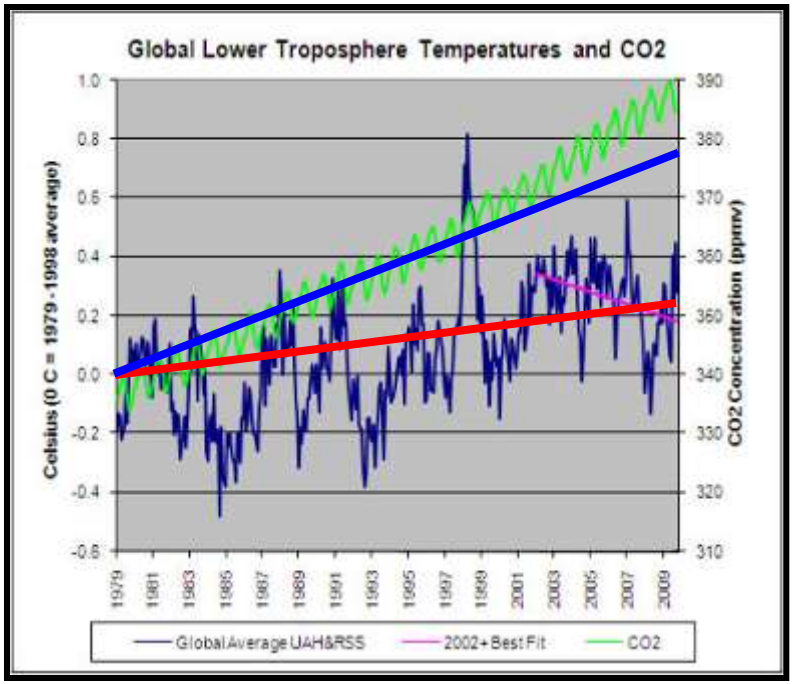
Five computer models predict greenhouse warming.
Data show no support for model's validity

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



Troposphere Temps, a 31 year Trend

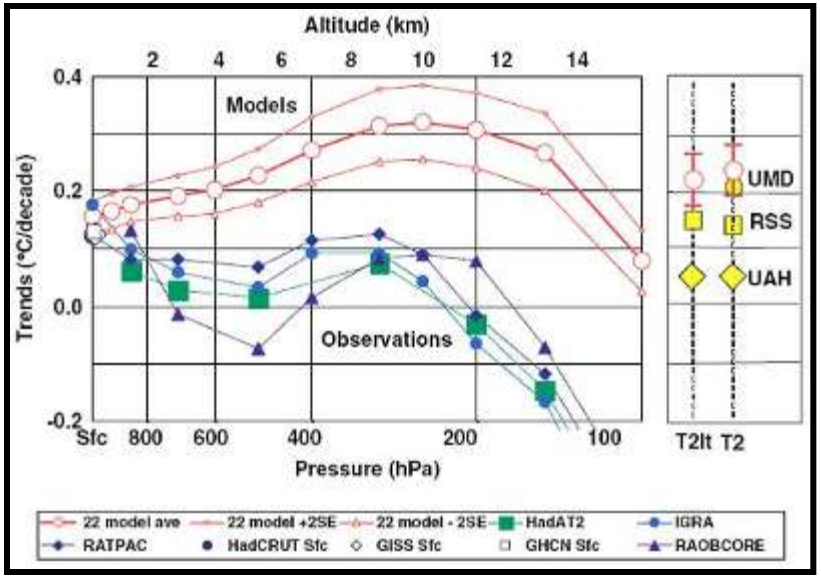
Blue = 2.5 deg/century slope Red = data trend



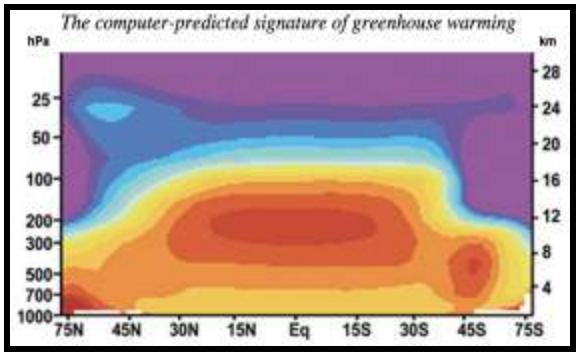
A Generic Problem With Greenhouse Warming Models

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?

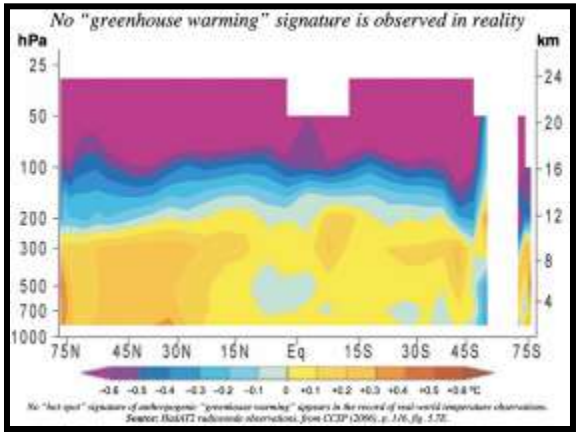
Models show warming rate (deg C per decade) at 4 to 14 km altitude, while measurements show rate is flat to 10km, then cool above.



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



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

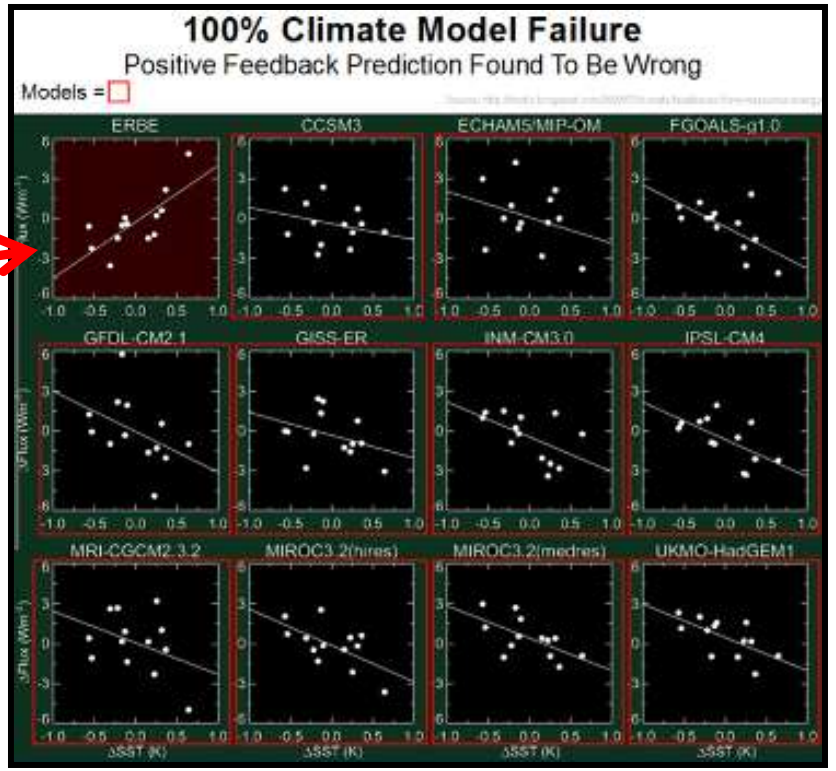


Are the Greenhouse-Gas-Warming Computer Models Wrong?

Climate models generally assume positive feedback, while some actual measurements indicate negative feedback.

The measured data show negative feedback

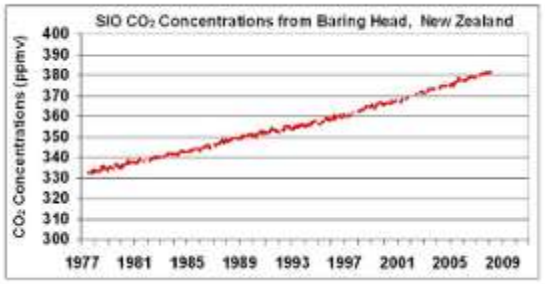
The eleven computer models assume positive feedback.

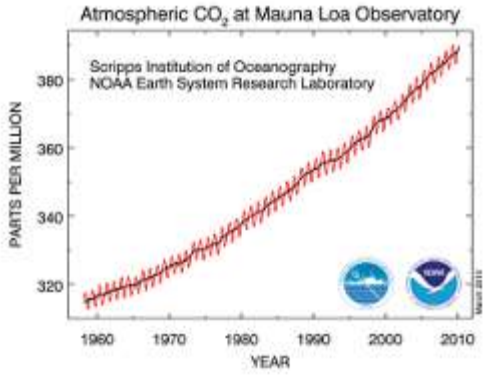


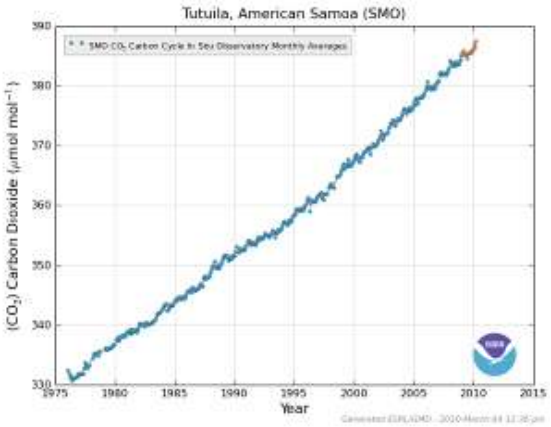
The real world climate may operate opposite from the model assumptions. Thus, warming caused by emissions is only a small fraction of the IPCC model prediction.

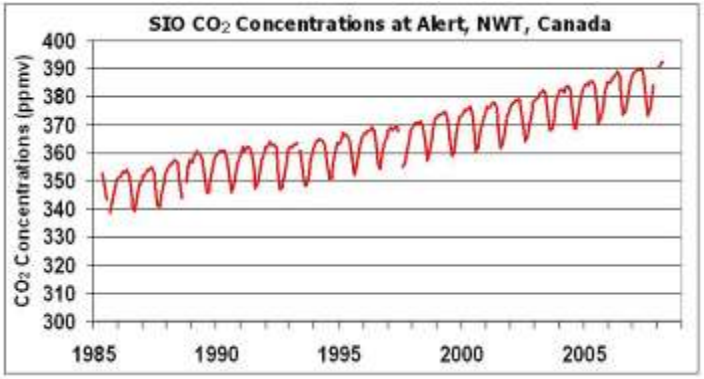
Greenhouse Models Cannot Predict Future Warming
But, what **can** be used for prediction?

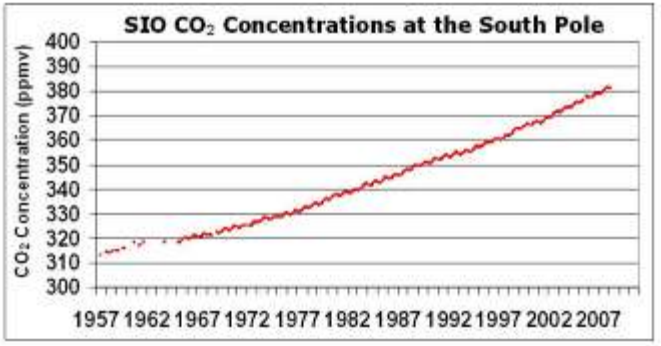
If the engineer can find consistent, accurate, redundant data, he often extrapolates it to predict the near future.
One climate data set that qualifies is the modern measurement (last 50 years) of atmospheric CO2. Data fairings on the next slide.









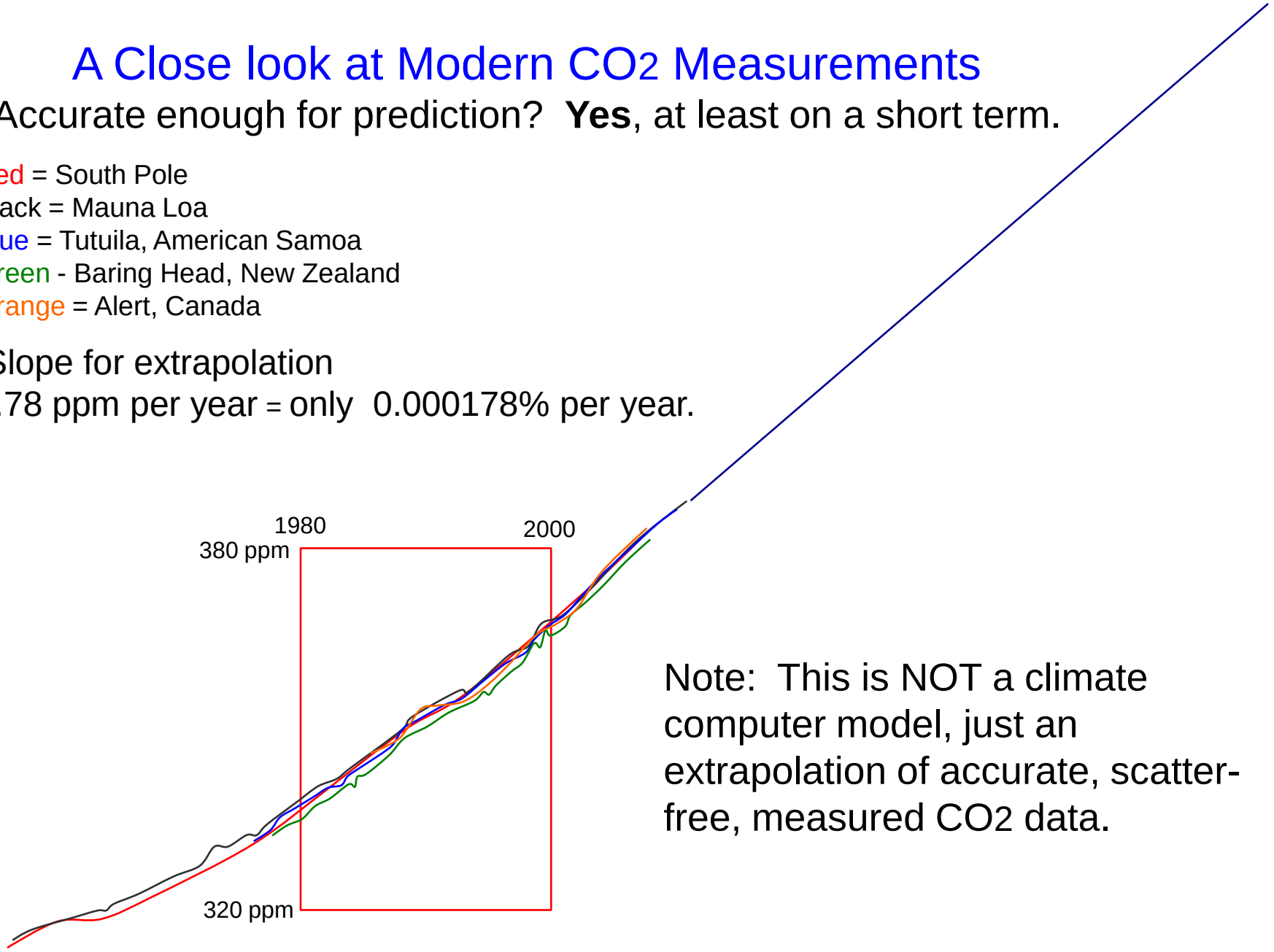


A Close look at Modern CO_2 Measurements

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

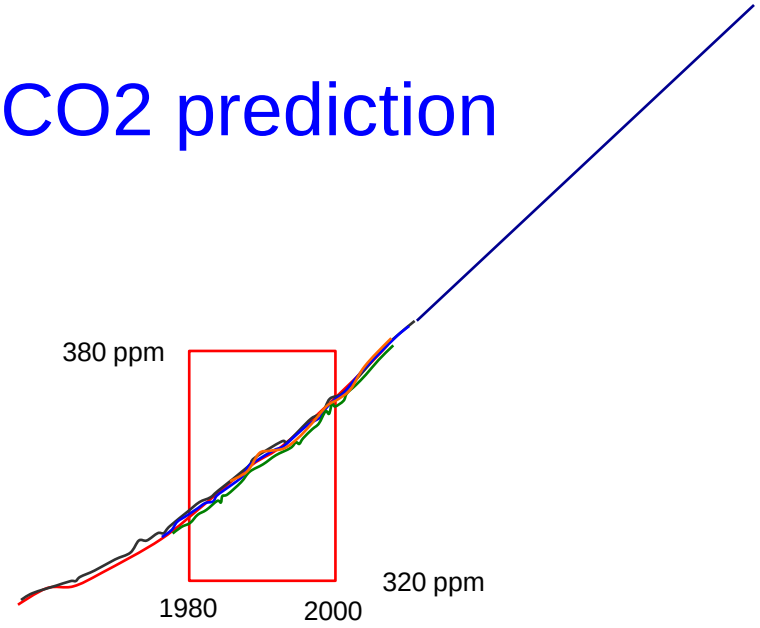
Red = South Pole
Black = Mauna Loa
Blue = Tutuila, American Samoa
Green - Baring Head, New Zealand
Orange = Alert, Canada

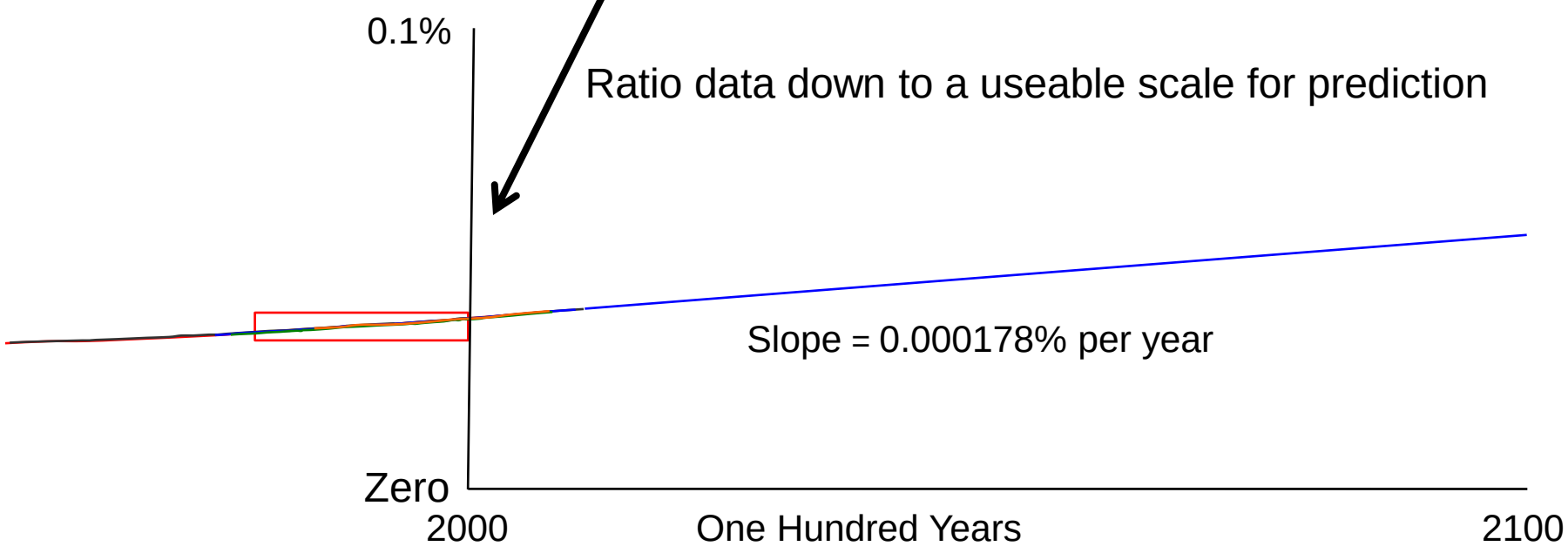
Slope for extrapolation
1.78 ppm per year = only 0.000178% per year.



Note: This is NOT a climate computer model, just an extrapolation of accurate, scatter-free, measured CO_2 data.

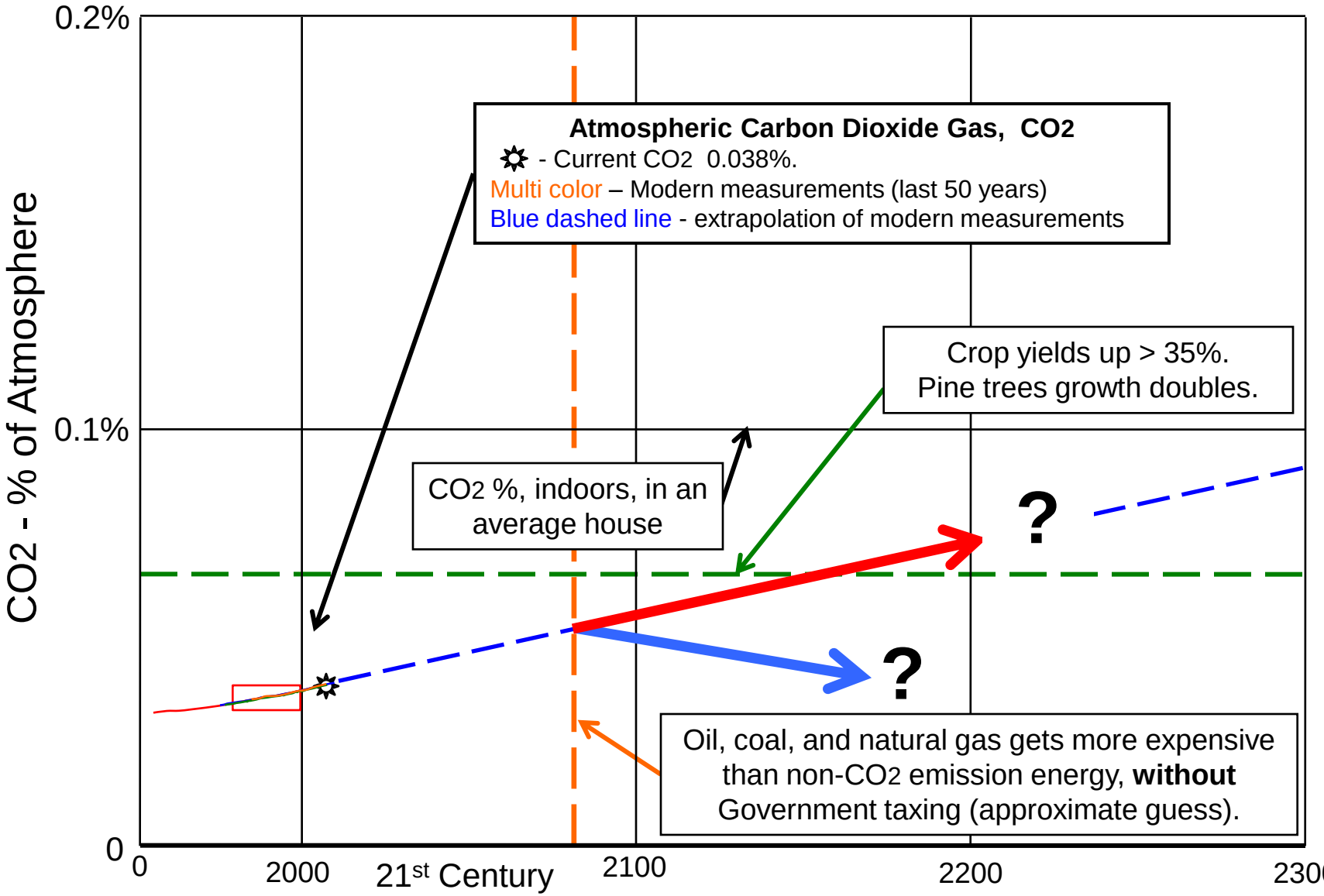
Using the CO2 prediction





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

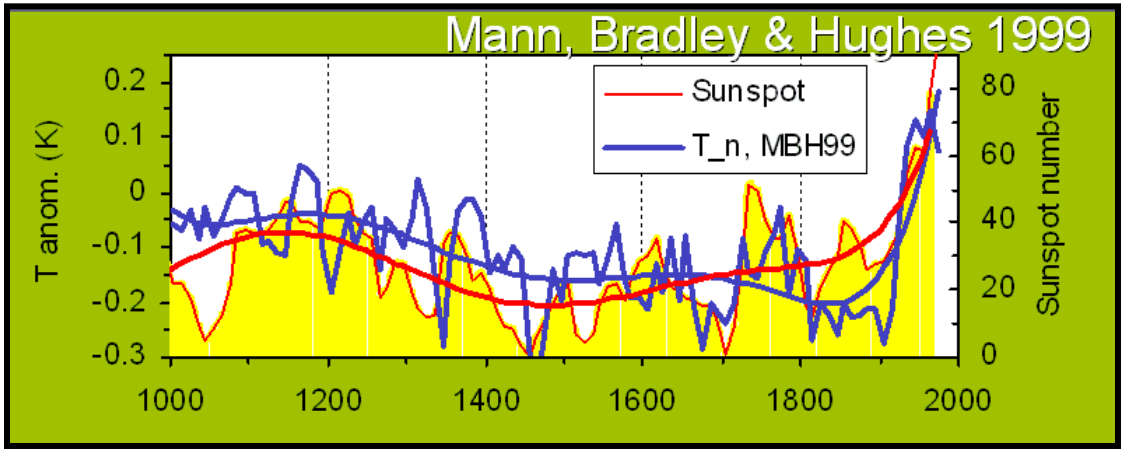
- An “optimum” CO_2 level for plants and animals would be reached in about 1000 years **if** the current rate of emissions could be continued.
- We do **not** have enough fossil fuels to drive the atmospheric level of CO_2 to anywhere close to a dangerous level.
- Two more centuries of emissions like 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).
- CO_2 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 CO_2 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 CO_2, 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 CO_2, 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?

Some Believe That Sunspots
might be driving the 20th Century Warming

This debate will likely still be argued next century



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 CO_2 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 CO_2 is the main cause of the recent global warming is an **assumption,** repeated numerous times. But repetition is not proof, and nowhere do the scientists present any actual evidence.

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

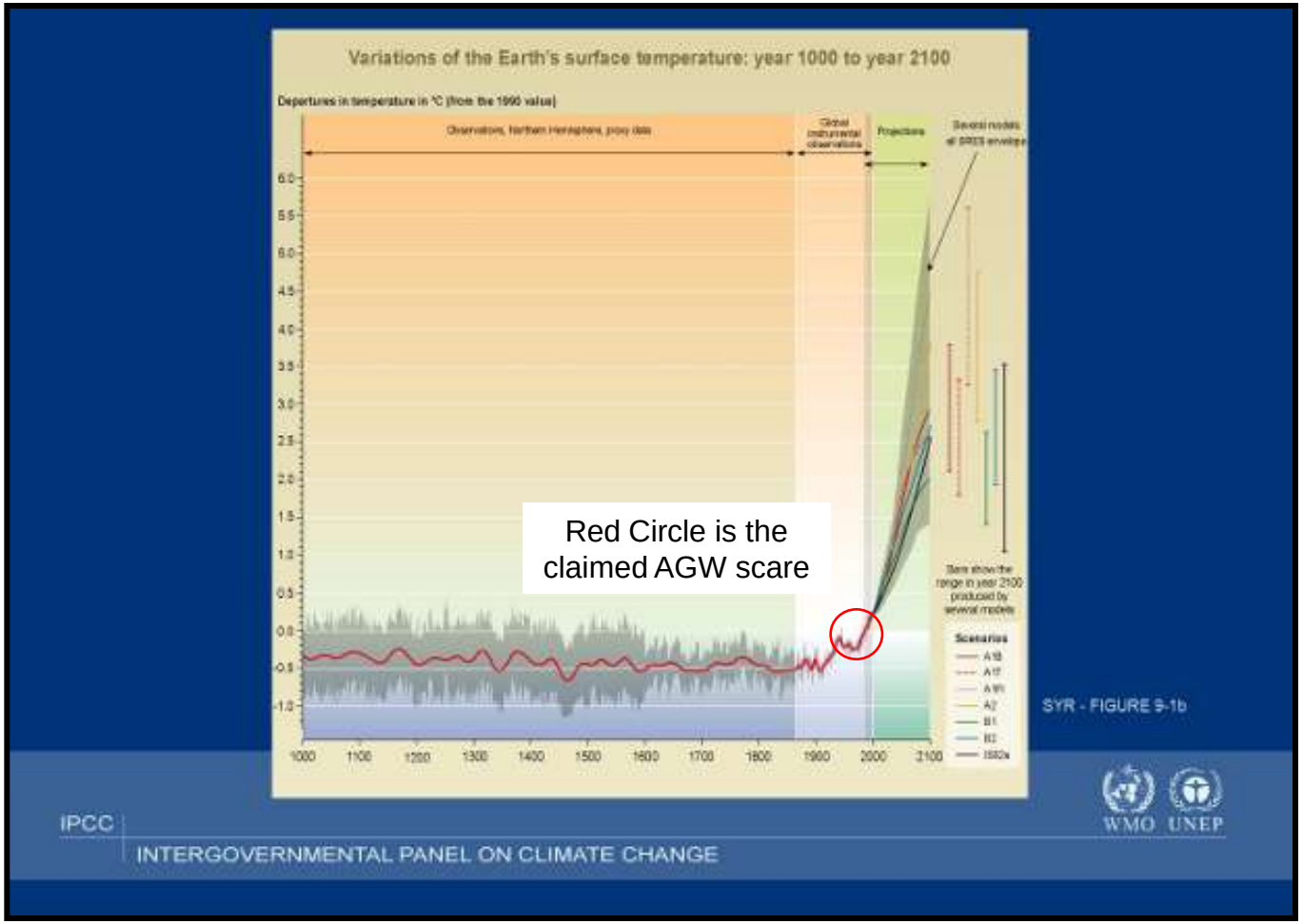
There is no evidence that carbon dioxide emissions are the main cause of the recent global warming.
Our small warming/cooling cycles are mainly caused by chaotic formation of clouds/precipitation and solar input variation, not by CO_2 greenhouse effects.
Despite spending $billions over the last 20 years 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 CO_2 beyond previous levels – Yes/No.
2. **Human CO_2 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 CO_2 - 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 and most of the data shown in this chart are now known to be wrong.

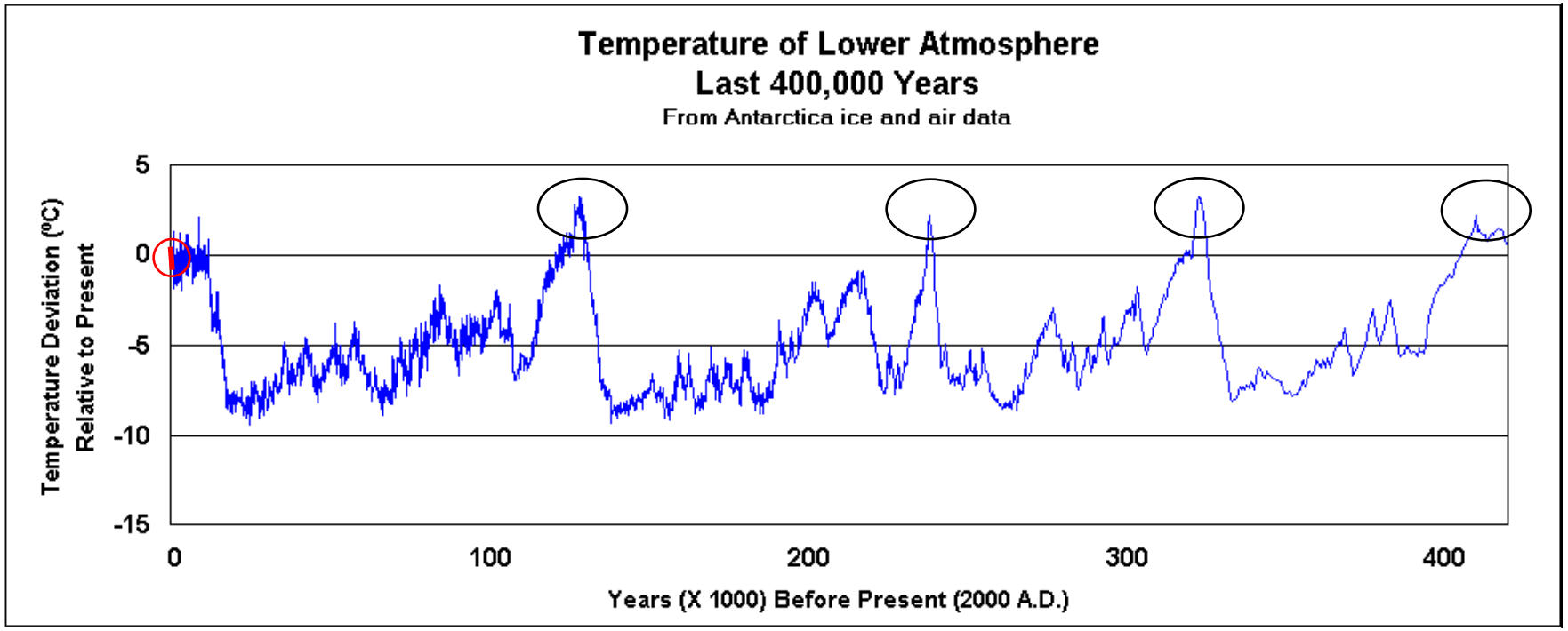


Back to reality…..Global Temperature Data

Looking Back 400,000 years

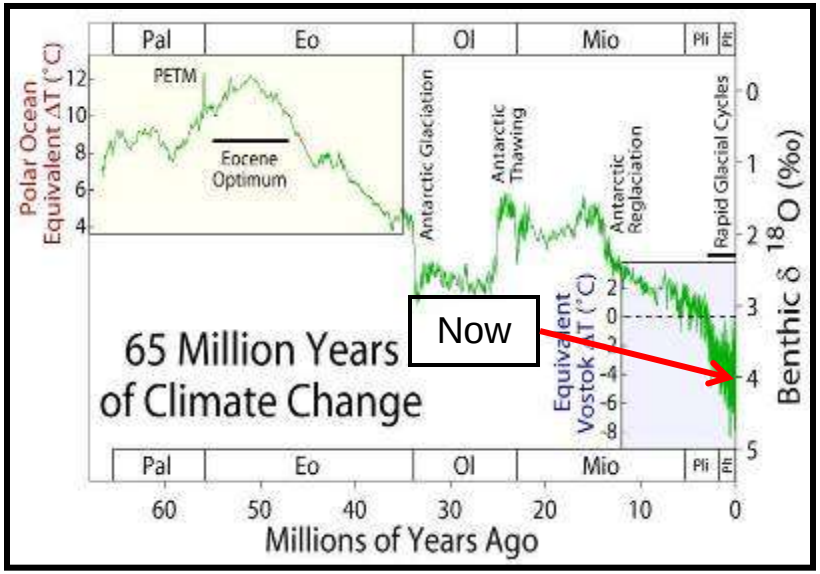
The last 1,000 years' temperatures were completely **normal** (red line in the red circle), among the recent 11,000-year scatter.

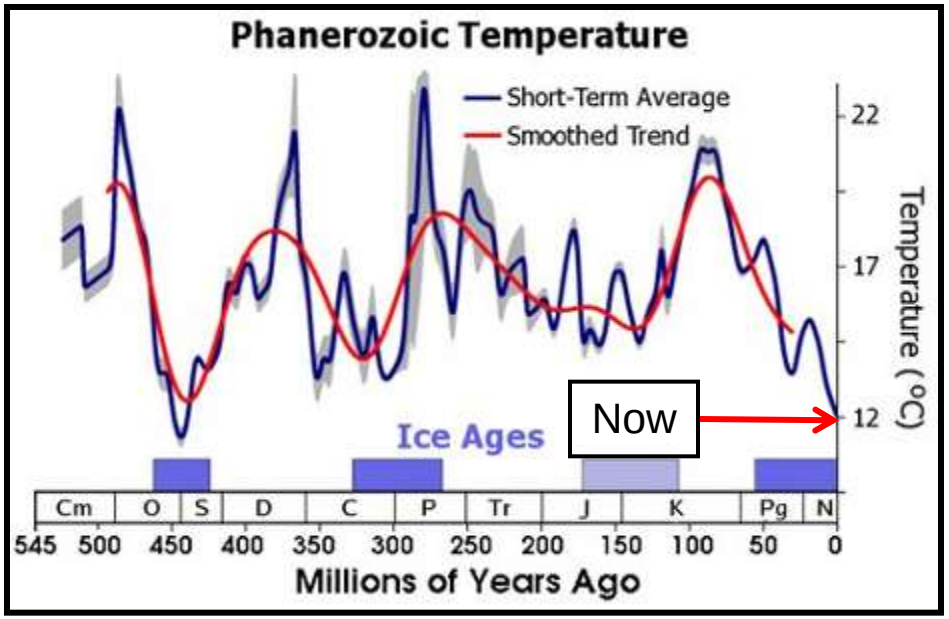
The four previous interglacial warm periods were all **warmer** than the current one (data in the black ovals).



Remember; recent CO_2 increase **is** unusual, but **not** global temperature - further indication that emissions are **not** the driver of Global Warming.

Looking Back Millions of years

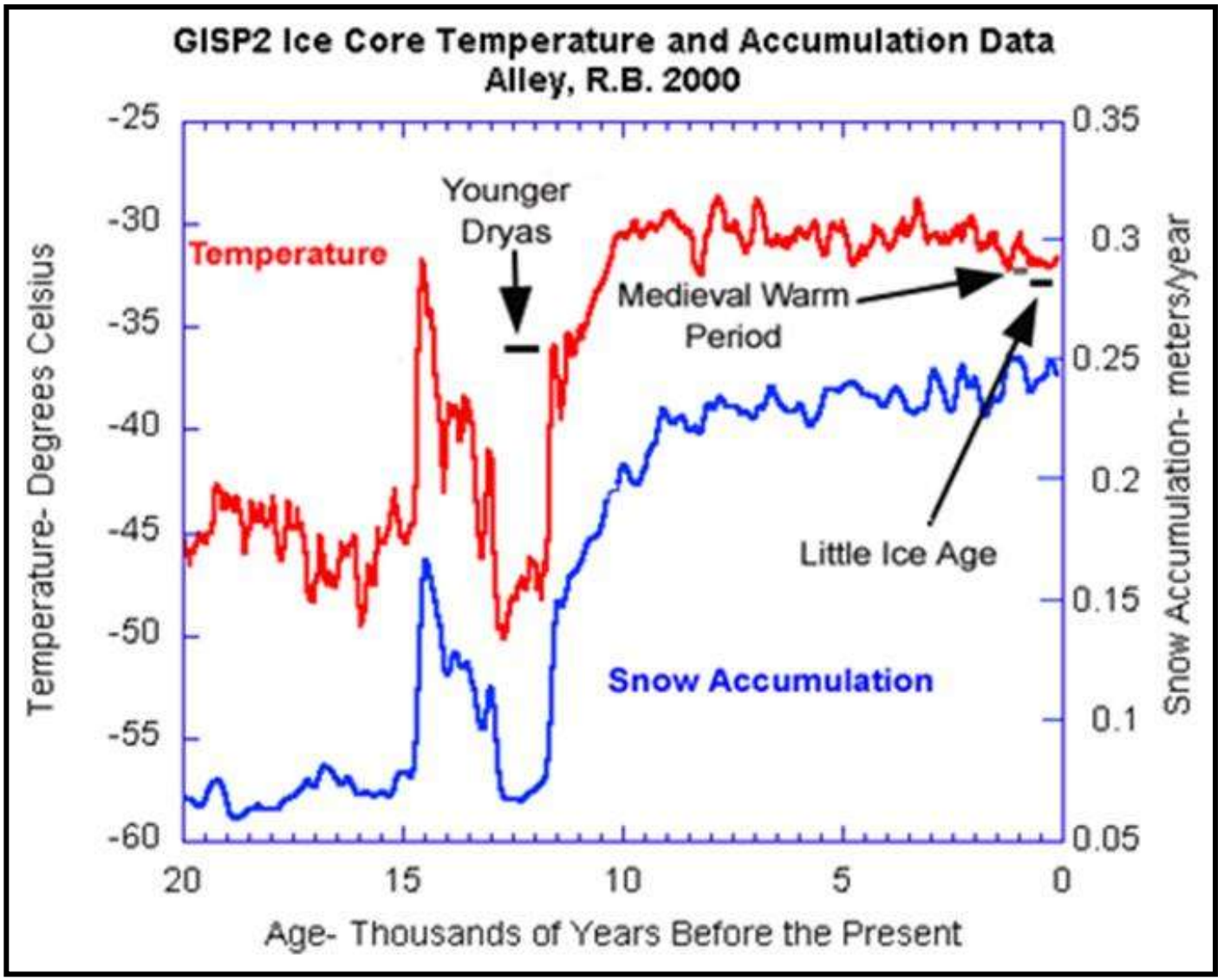




We are in a comparative **cold** period and the 20th century warming is **insignificant**. Historic big ice ages were warmer.

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

Even the ice core data show it has been consistently warmer the last 11,000 years



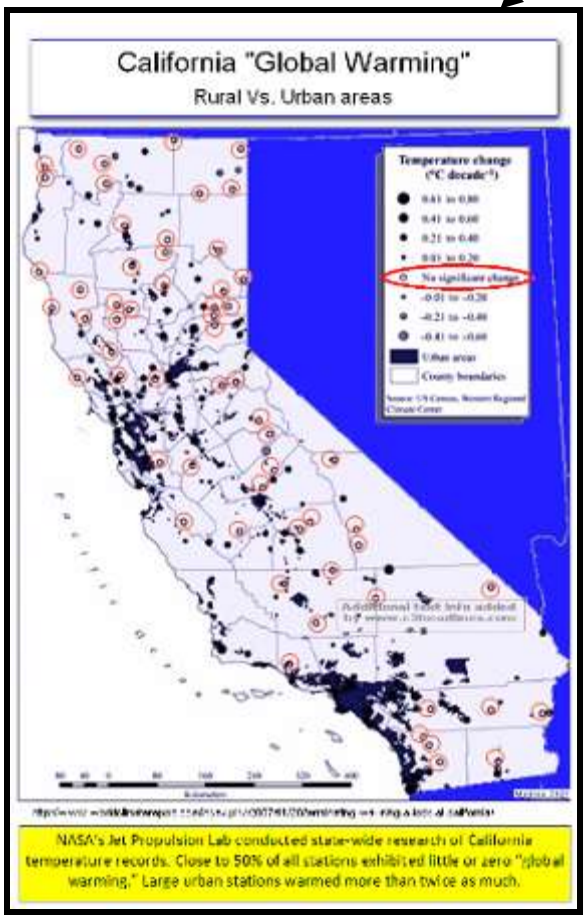
Surface Thermometer Measurements

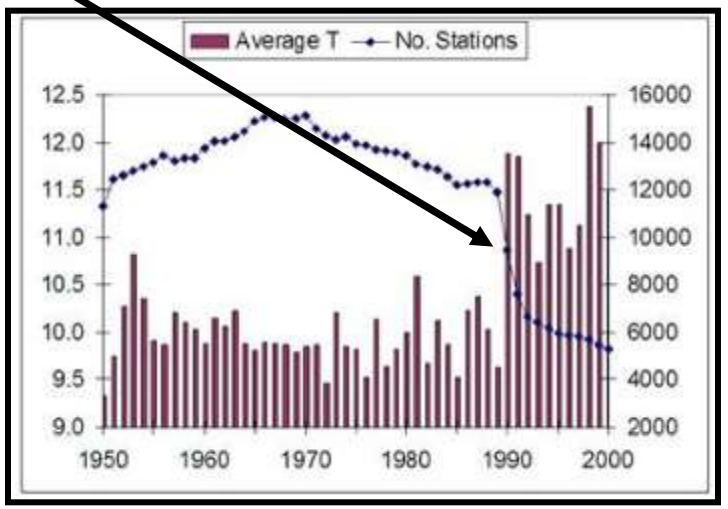
and the ‘urban-heating’ proof

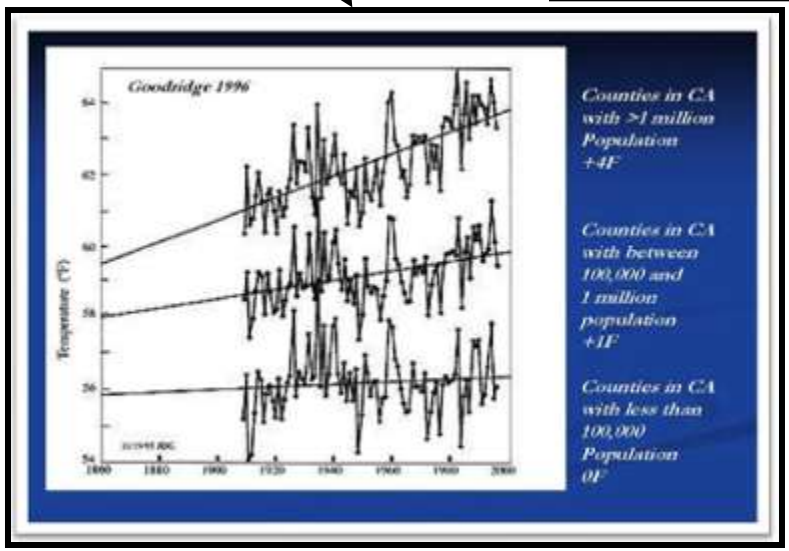
The number of stations grossly changed when Soviet union fell - biasing the calculation of Global Average Temperature. Soviets had paid outposts for fuel based on how cold they were. Then, ‘warming’ happened when the policy was ended.

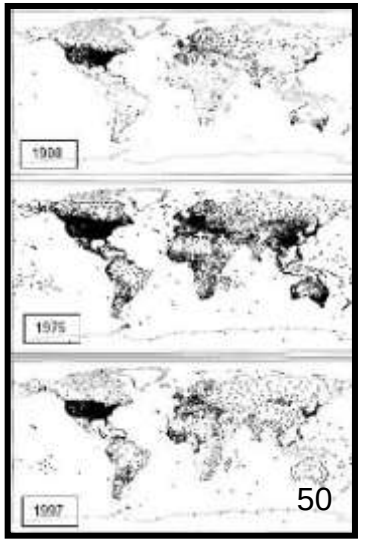
California shows no warming in counties that did not have a big increase in population during the last 100 years.

Population locally biases the sensors hotter.





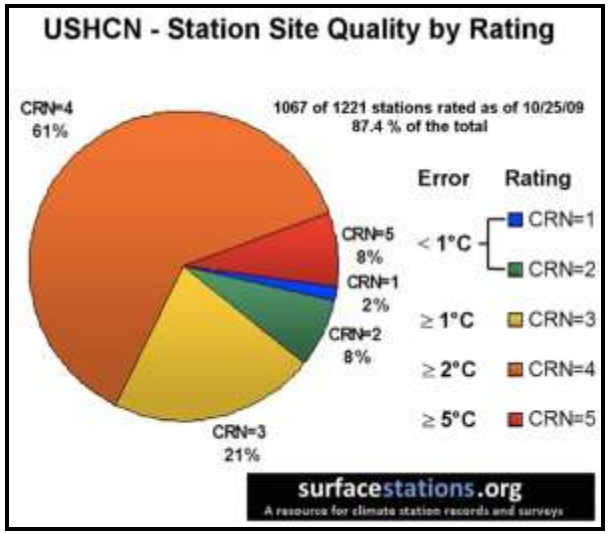




Surface Thermometer Measurement (2)

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

Numerous sensors are located at waste treatment plants. An infrared image of the scene shows the output of heat from the waste treatment beds right next to the sensor. (Photos by Anthony Watts, surfacestations.org.)



A station at Tucson, AZ, in a parking lot on pavement. (Photo by Warren Meyer, courtesy of surfacestations.org.)

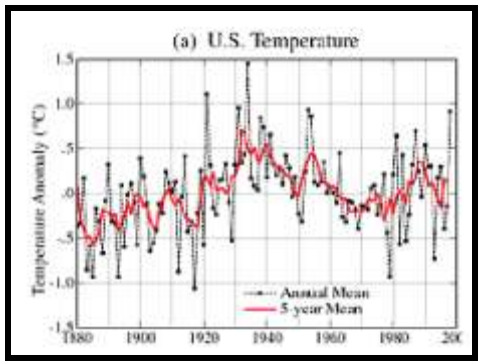
Local effects, added recently, all bias the temperature higher.

USHCN weather station at Hopkinsville, KY (Pielke et al., 2006). The station is sited too c to a building, too close to a large area of tarmac, and directly above a barbecue.

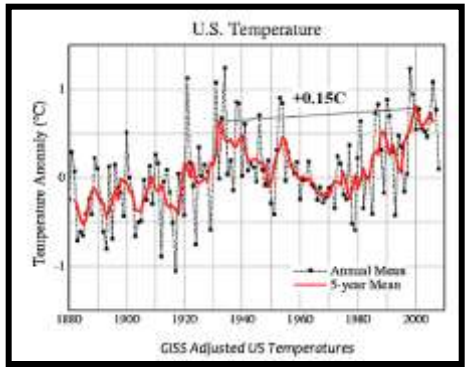
Surface Thermometer Measurement (3)

Data manipulation

US surface temp, presented by NASA in1999

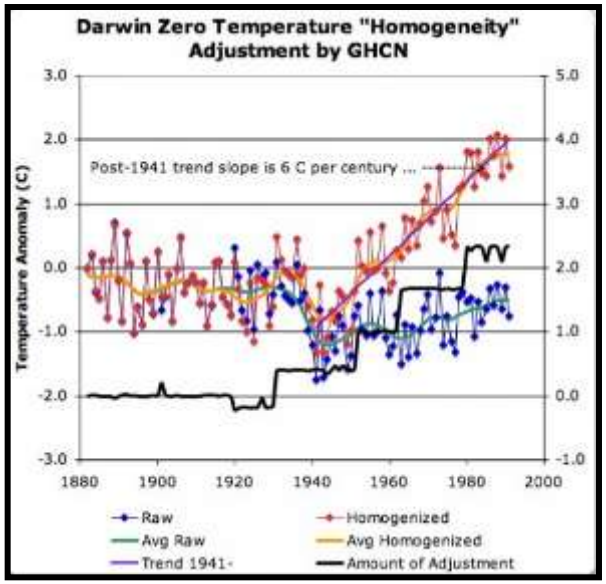


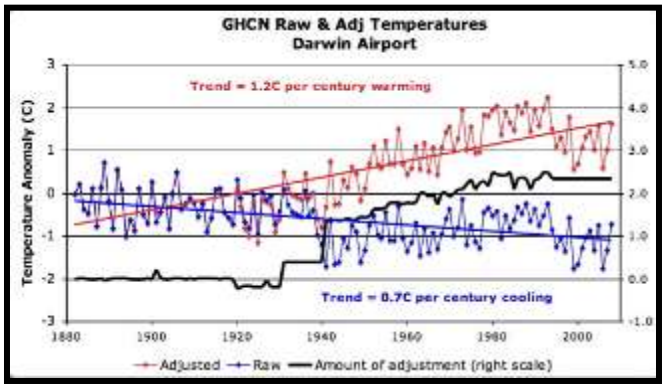
The same data were later 'adjusted' by NASA GISS



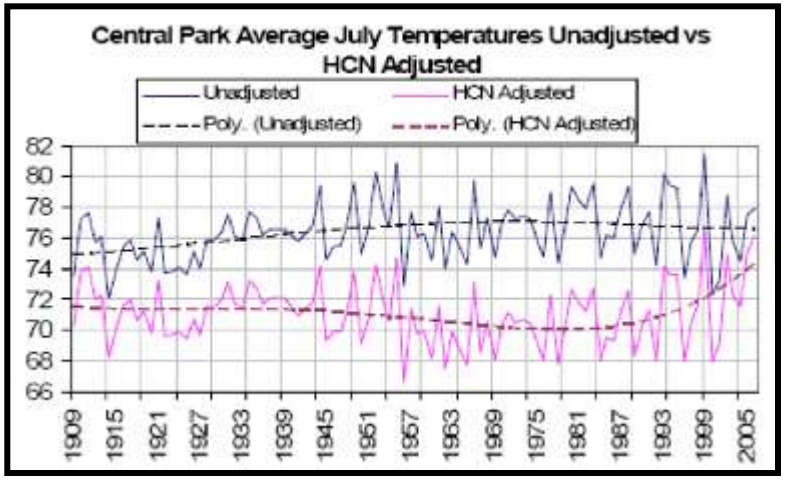
The Darwin Australia "Adjustments"

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





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



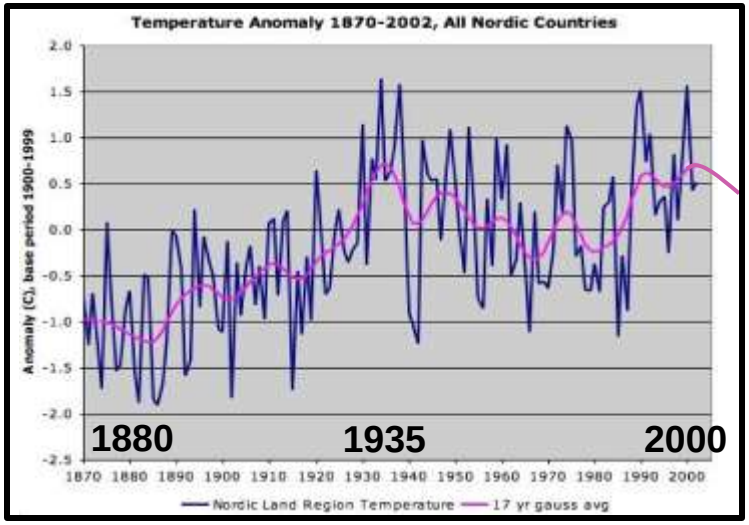
The Surface Temperature Record
The last ~ 200 years

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.

Nordic Surface Measurements.
All Nordic countries.
With no evidence of manipulation.
Current temp is **lower** than in 1935



http://scienceandpublicpolicy.org/images/stories/papers/originals/surface_temp.pdf

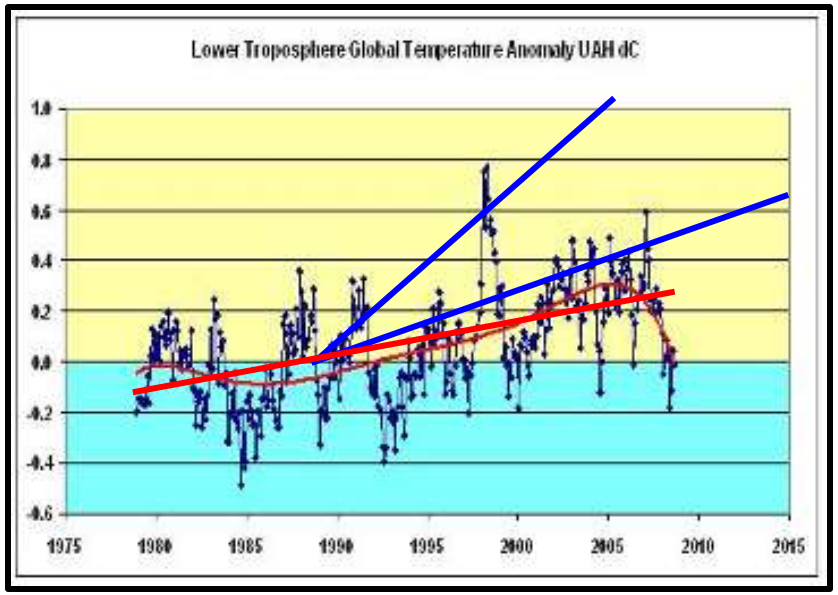
There is no credible **surface** temperature-measured data to prove the 20th-century global warming.

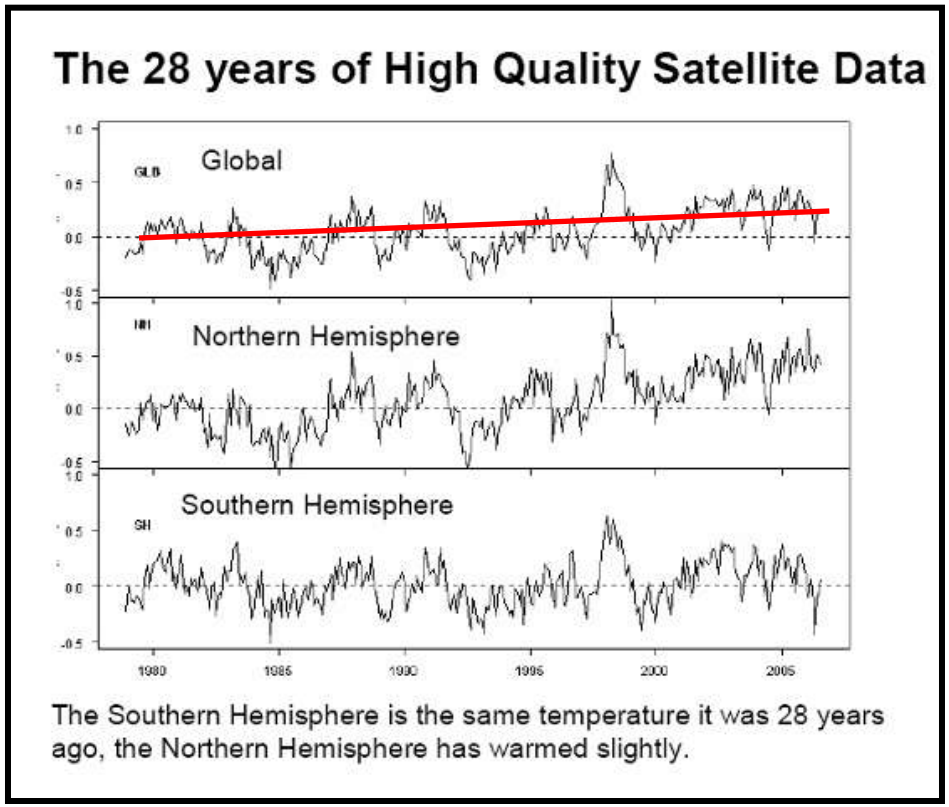
Okay, how about **atmospheric** measurements?

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**.

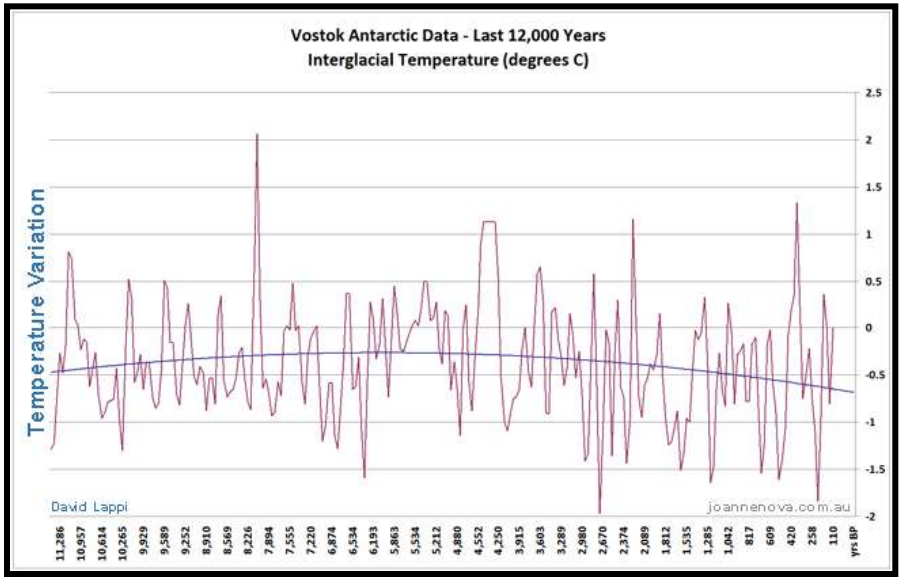




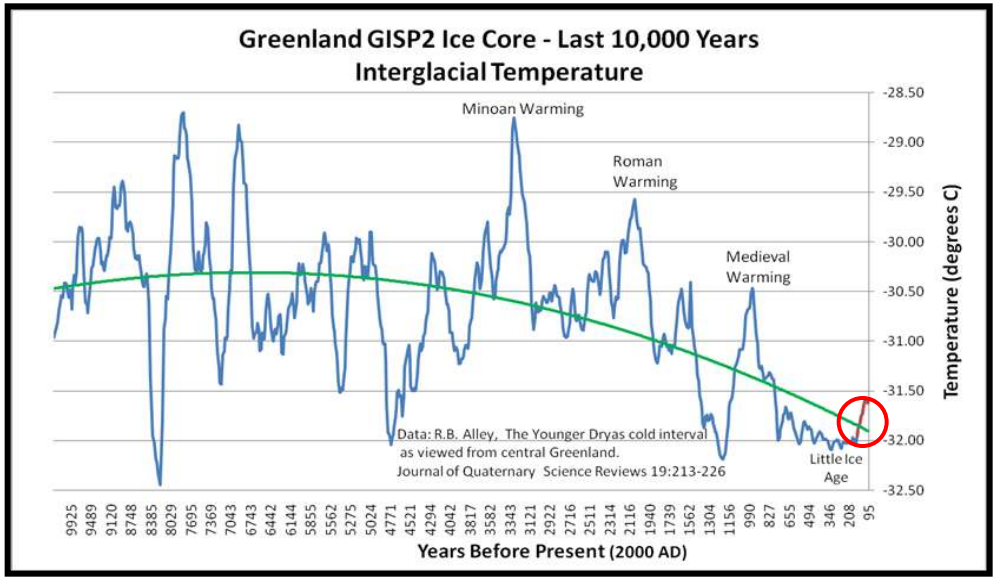
Focus now on the entire warm period after the ice age recovery - The last 11,000 years

First, the ice core data - ice cores cover the entire 11k year period.

Russian Vostok ice cores, Antarctica



GISP2 ice cores, Greenland



Red Circle is the claimed AGW scare

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

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

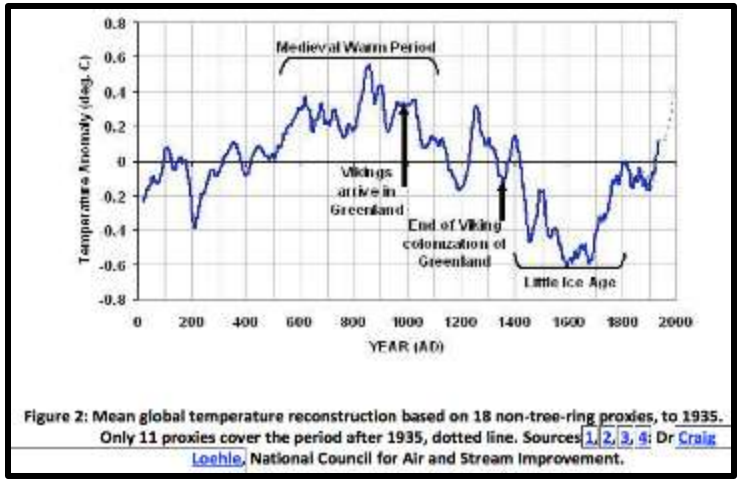
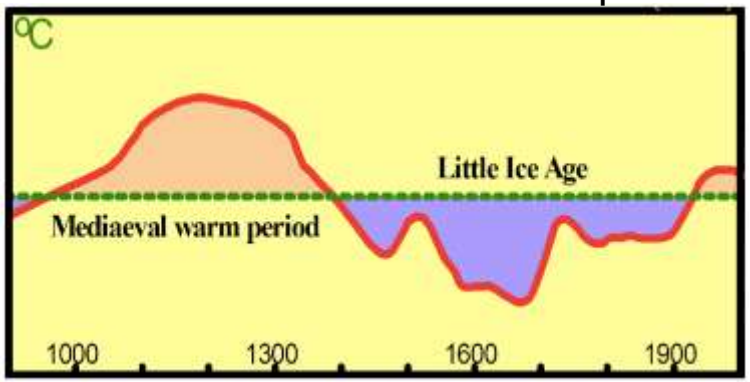
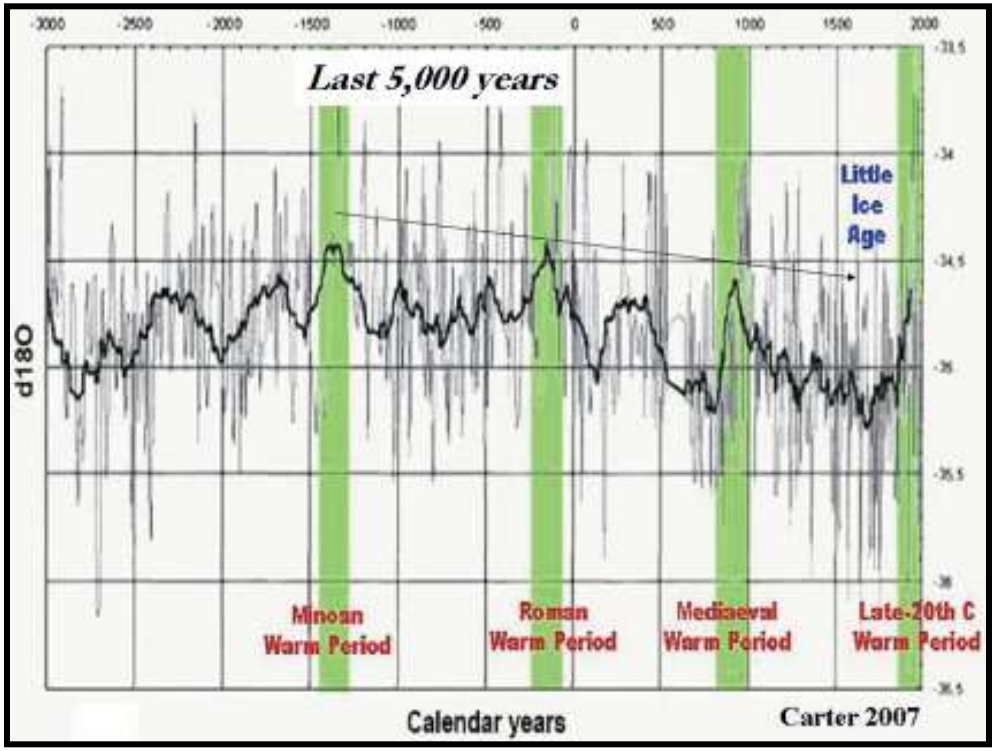


Figure 2: Mean global temperature reconstruction based on 18 non-tree-ring proxies, to 1935. Only 11 proxies cover the period after 1935, dotted line. Sources 1, 2, 3, 4: Dr Craig Loehle, National Council for Air and Stream Improvement.

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



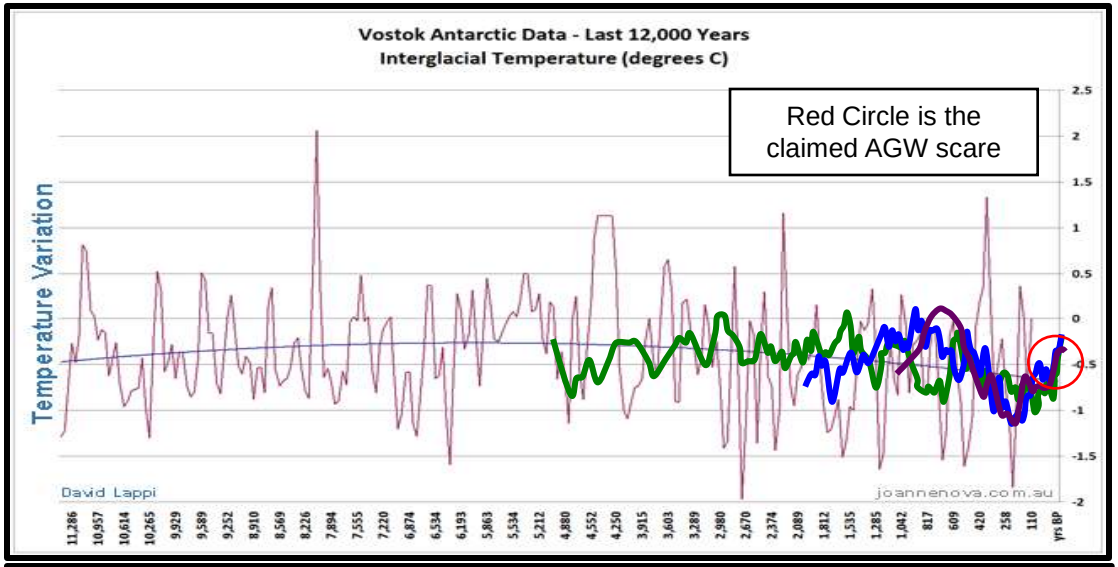
Last 5,000 years from other proxies Carter 2007.

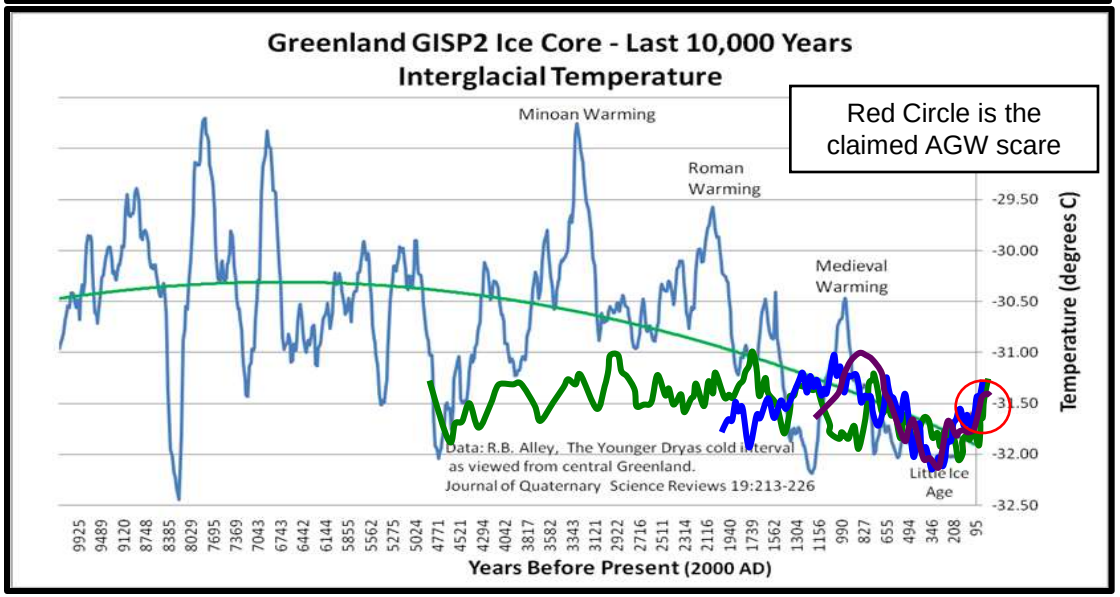


Note: Curve fits for these three charts appear on the next slide and on slide # 59.

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)

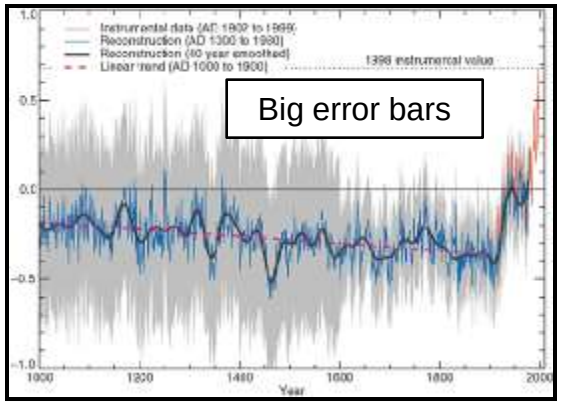
It was **warmest** 8,000 years ago, and 3,500 years ago.

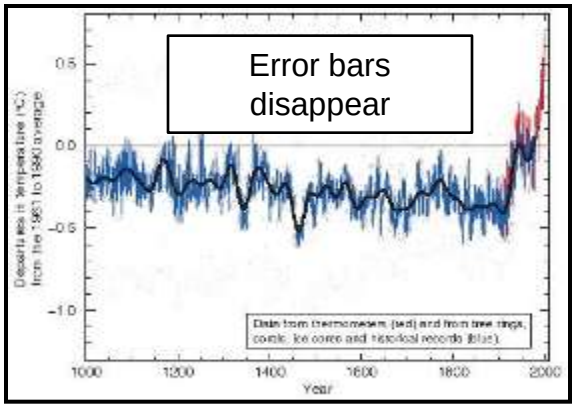
It was significantly **warmer** than today, during the Roman expansion and the later Medieval Warm Period (900 years ago.
The current, 11,000-year non-glacial warm period is the **COLDEST** one in the last million years.

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

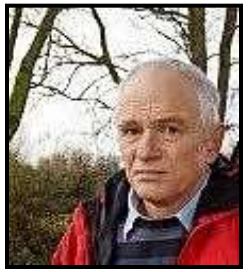
UN IPCC 2001 Report, 6 places, full color (the only chart so honored).
An Inconvenient Truth - NYT best selling book.
Oscar-winning ‘Documentary’ Film – Inconvenient Truth.
Nobel Prize, IPCC and Al Gore - highlight award justification.





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 lets take a look at what we do know…….

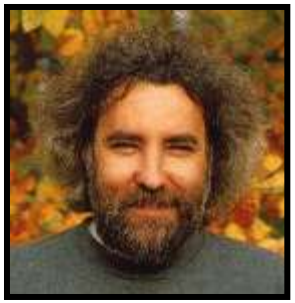
A challenge, to meet the IPCC mission

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 Report 3.
Research areas: climate reconstruction using climate "proxy" data networks, and model/data comparisons:
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.

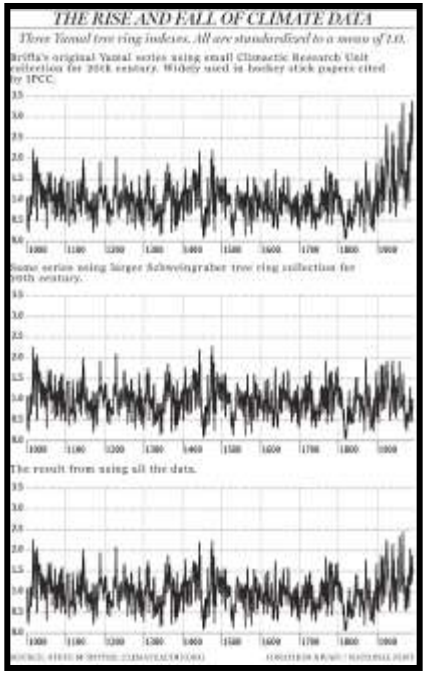
Tree rings can indeed give an approximate indication of past temperatures, **if** the science is handled properly:

- 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"

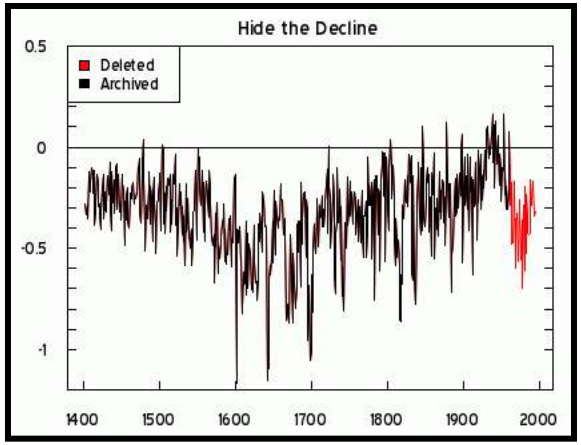
Steps along the way, to generate history's most damaging Scare Chart



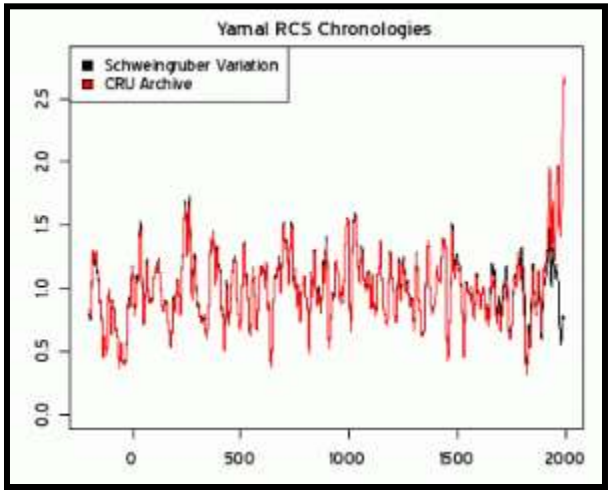
Briffa's original selection of Yamal trees. A tiny sample used after 1900.

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:

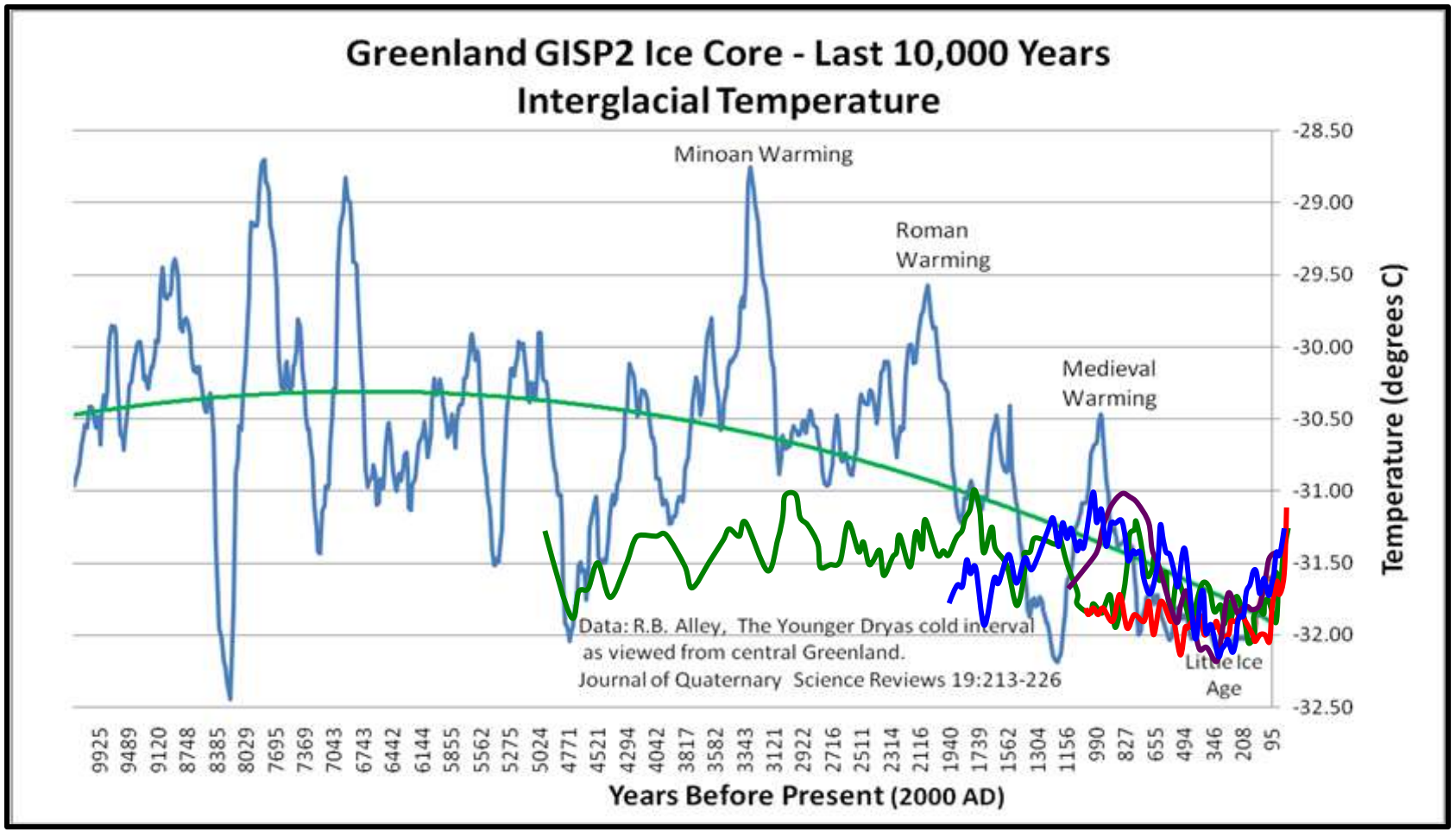
The computer program written to process the tree-ring temperature proxy data produces a hockey stick shape even when the inputs are **random numbers**……. Huh?? Apparently his program gave higher weighting to data that better resembles the hockey stick.

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 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.

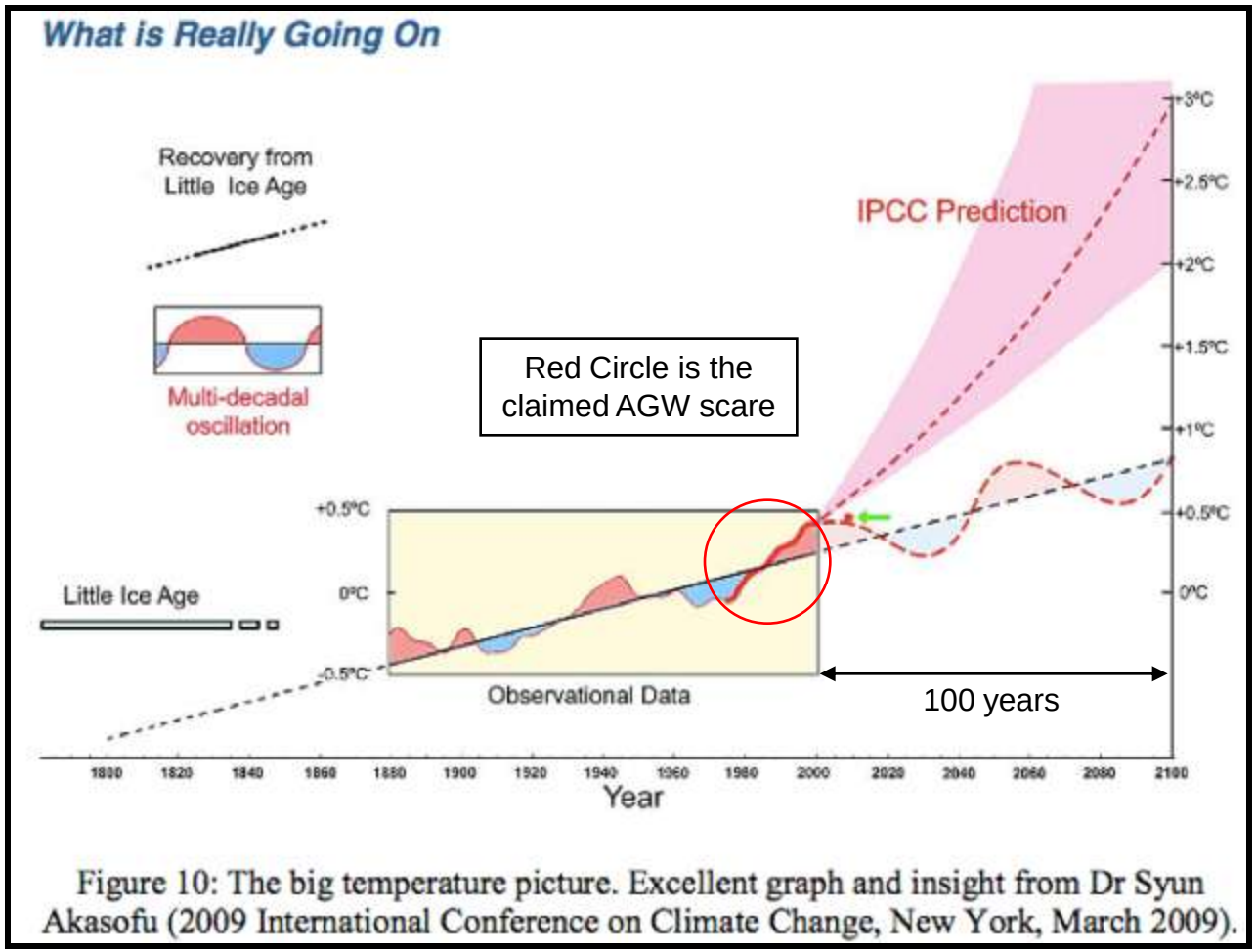


Figure 10: The big temperature picture. Excellent graph and insight from Dr Syun Akasofu (2009 International Conference on Climate Change, New York, March 2009).

#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.

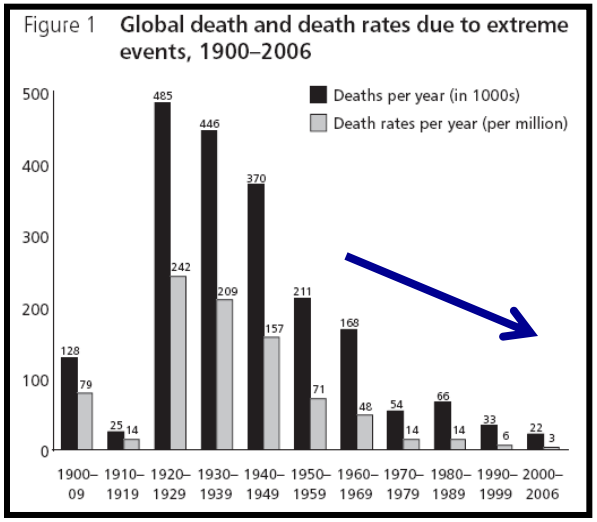
1. Recent human burning of fossil fuels suddenly and dangerously increased CO_2 beyond previous levels – Yes/No.
2. Human CO_2 emissions causes greenhouse warming – No.
3. **Dangerous, sudden global warming occurred the last 50 years – No.**
4. The current Temperature is **too Hot** & further warming 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" CO_2 content? Is the earth worse if it warms a few more degrees?

Alarmist Claims: Human CO_2 emissions Causes Disasters

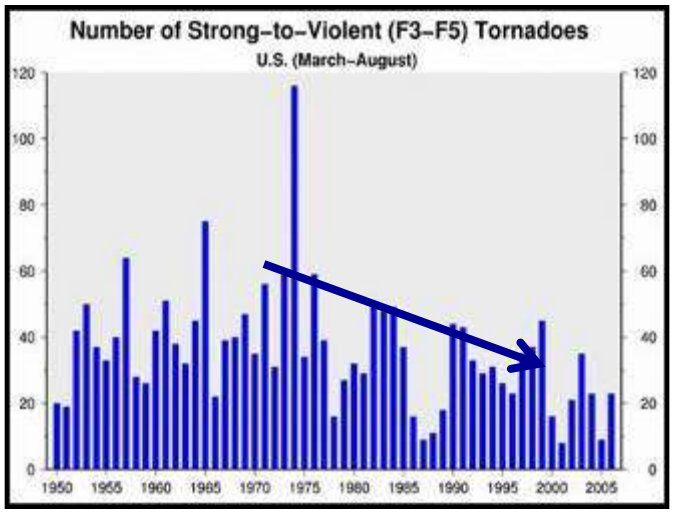
Tell them - "Show me the data"

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

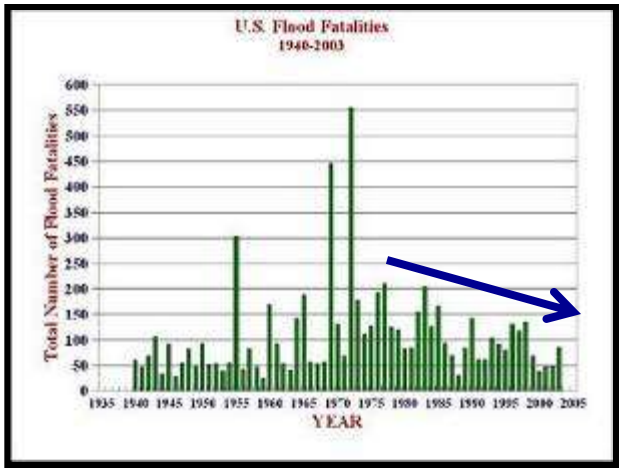


DOWN

Extreme events- caused deaths

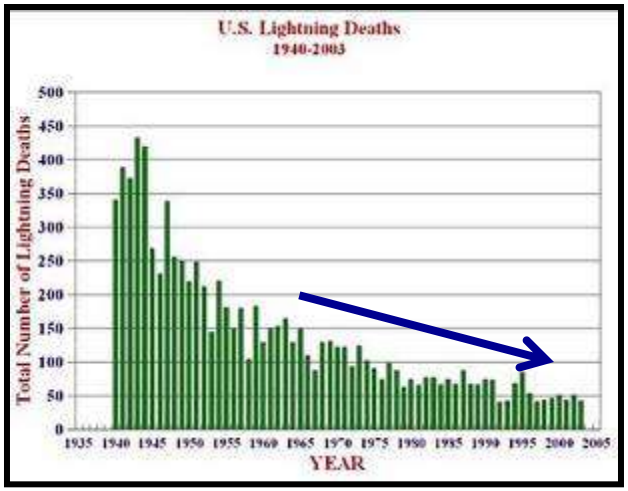


Number of F3-F5 tornados



DOWN

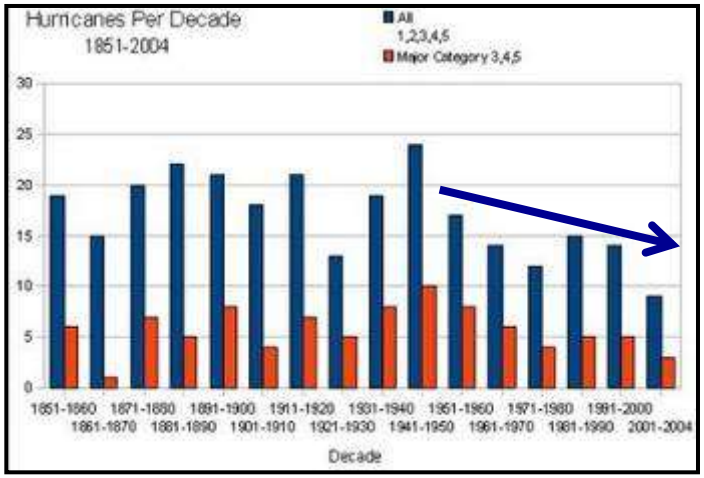
Flood fatalities



Lightning deaths

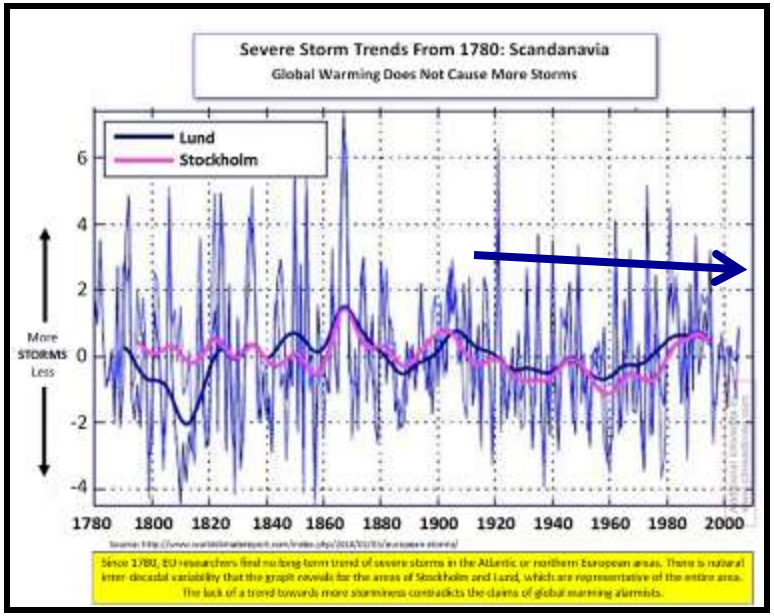
Human CO_2 emissions Causes Disasters?

"Show me the data" (2)

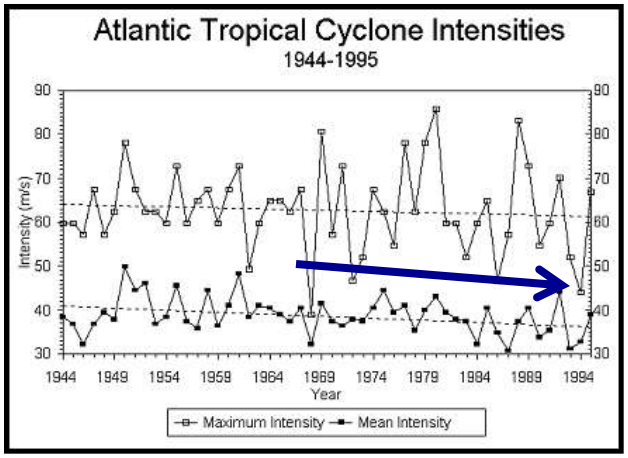


DOWN

Hurricanes
Per decade

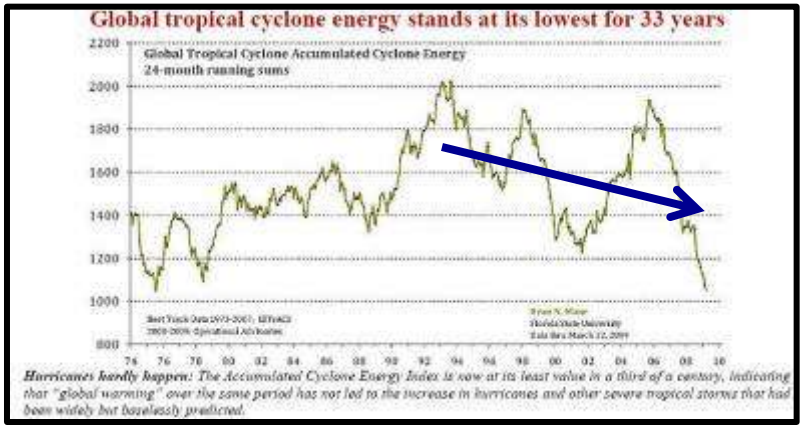


Scandinavia
severe storms



DOWN

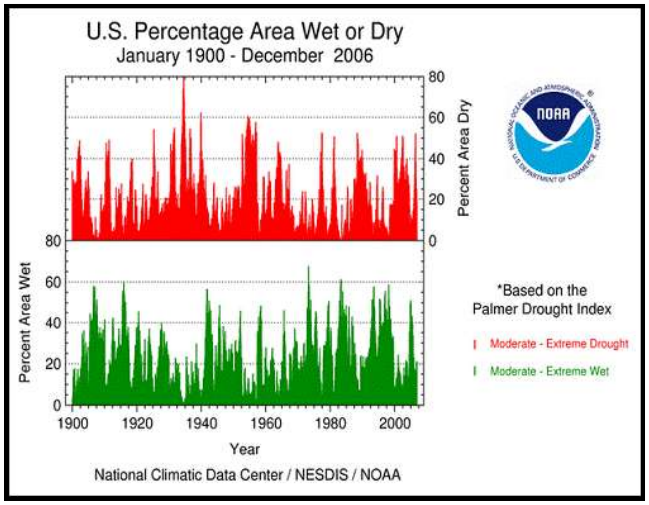
Cyclone
Intensities



Cyclone
Energy
lowest in 33 yr

Human CO_2 emissions Causes Disasters?

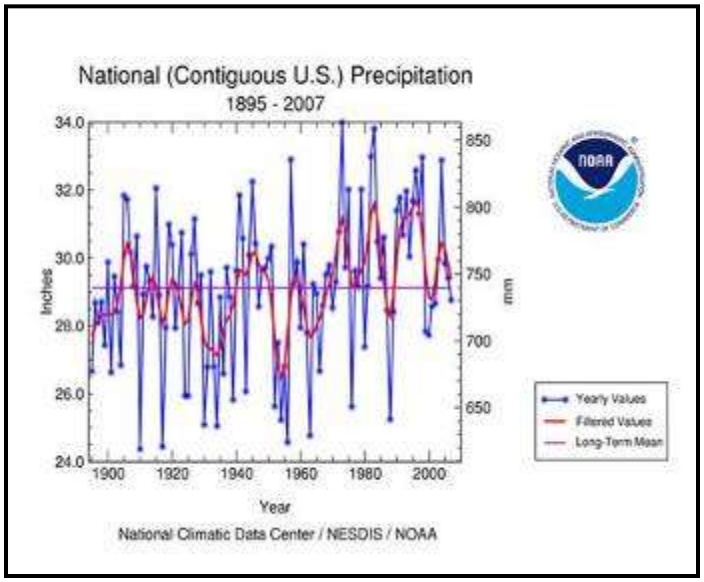
"Show me the data" (3)

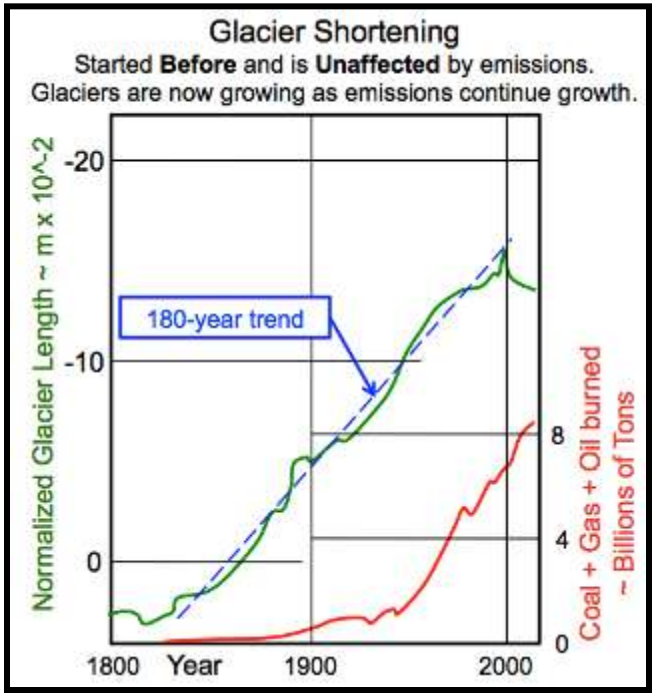


FLAT

Droughts & Floods

Precipitation Modulates Temperature changes

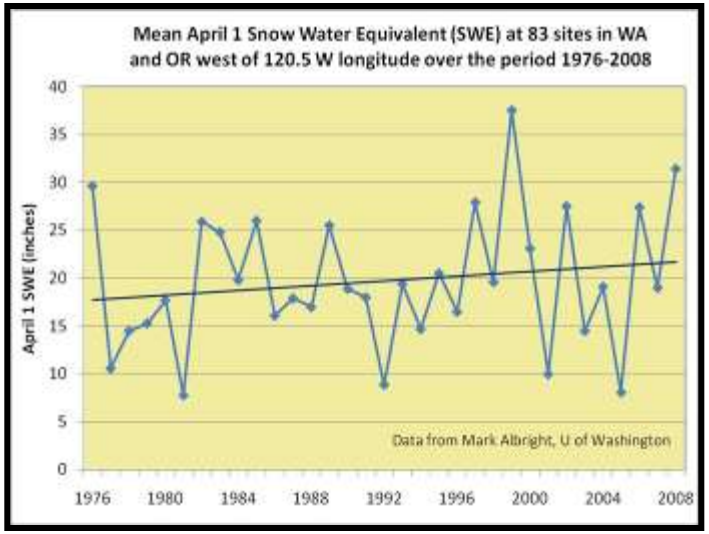




No Correlation

Glacier shortening Unaffected by emissions

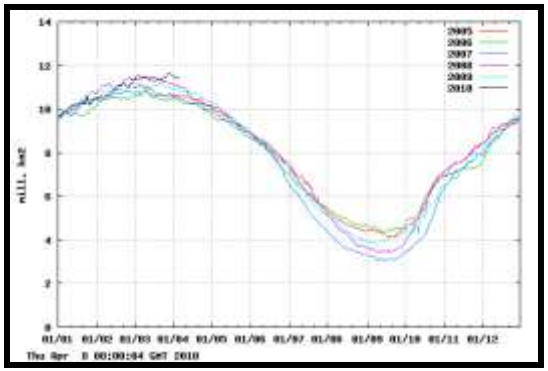
Washington Governor said the snow pack has declined 20% over the past 30 years. Actual snow pack = 22% INCREASE.

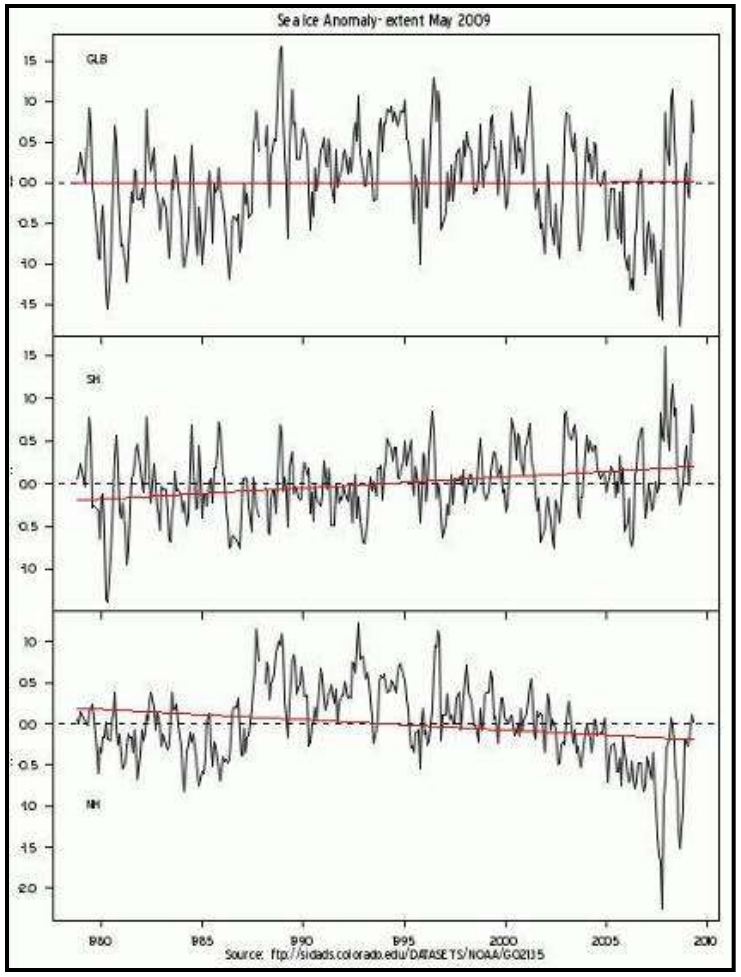


Human CO_2 emissions Causes Disasters?

Arctic Sea Ice, 1978 to 2010 "Show me the data" (4)

Arctic sea ice
Has now (March 2010) recovered to the 1979-2000 average.





FLAT
Global Sea Ice Extent

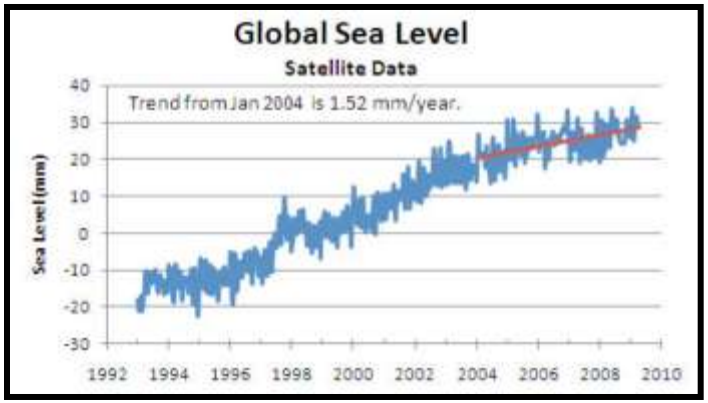
INCREASING
Southern Hemisphere Sea ice extent

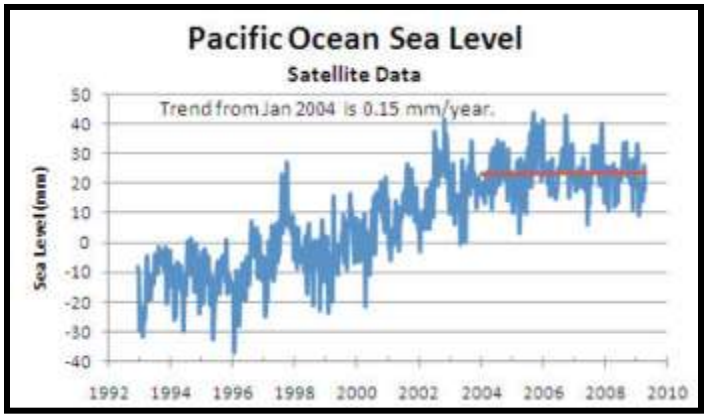
DECREASING
Northern Hemisphere Sea ice extent

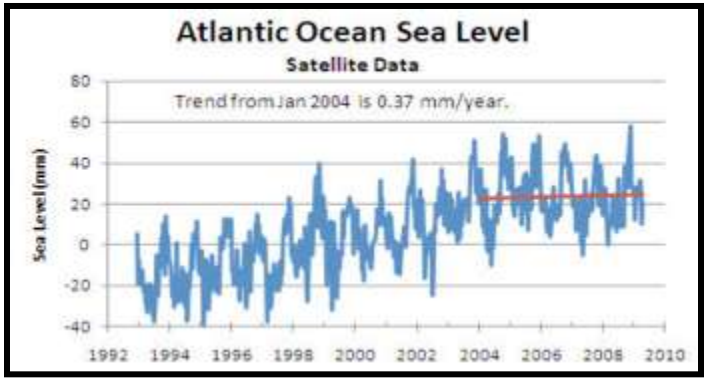
Polar Bear Population
1950 - 5,000
1980 - 10,000
Current - 22,000

Human CO_2 emissions Causes Disasters?

Sea Levels "Show me the data" (5)

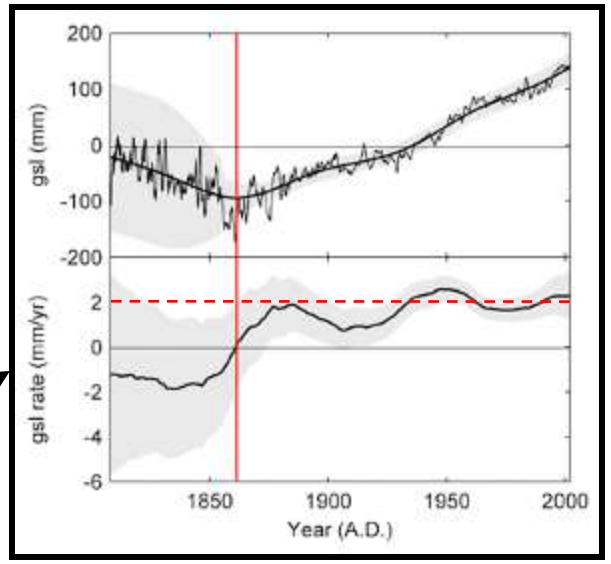




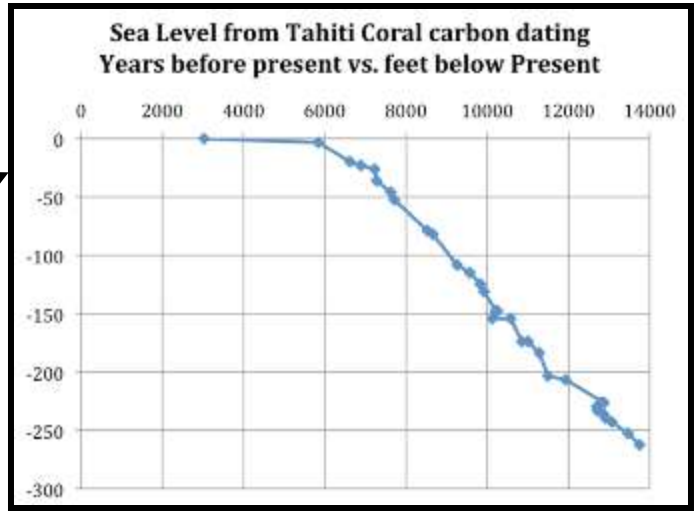


Sea Levels are merely continuing their slow rise since the end of the Little Ice Age.

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



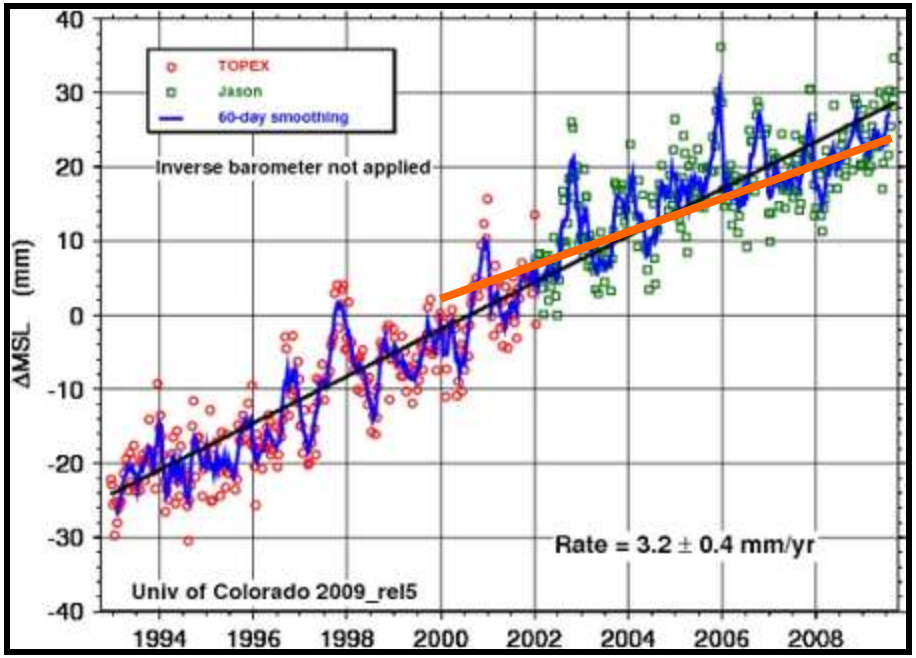
This chart shows the large sea level recovery from the latest big ice age.



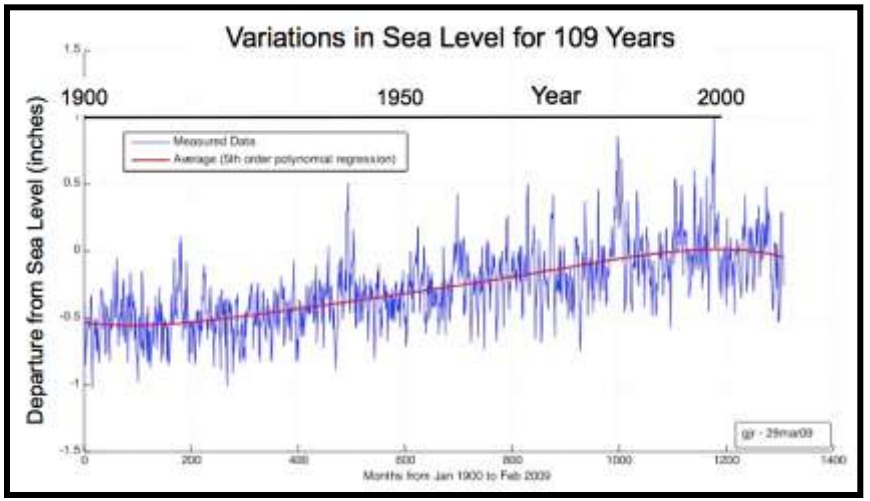
The Fallacies of Curve-Fitting Sea-Level Data

Linear fits are subject to cherry-picking of periods.
Regression fitting of longer periods are equally misleading (sea level reducing now).
A biased 'scientist' or skeptic can show anything he wants.
There is no justification for fears of acceleration of the last 1000 years slow rise (1.4 to 2 mm/year).
Land-borne ice levels have recently been increasing and many of the previously-receding glaciers are now growing. Future S/L rise will be mainly due to the lag in global temperatures finally warming the sea, not due to melting of land-borne ice.

Black line = 12.6 inches per century (last 18 years)
Orange line = 8.7 inches per century (last 10 years)

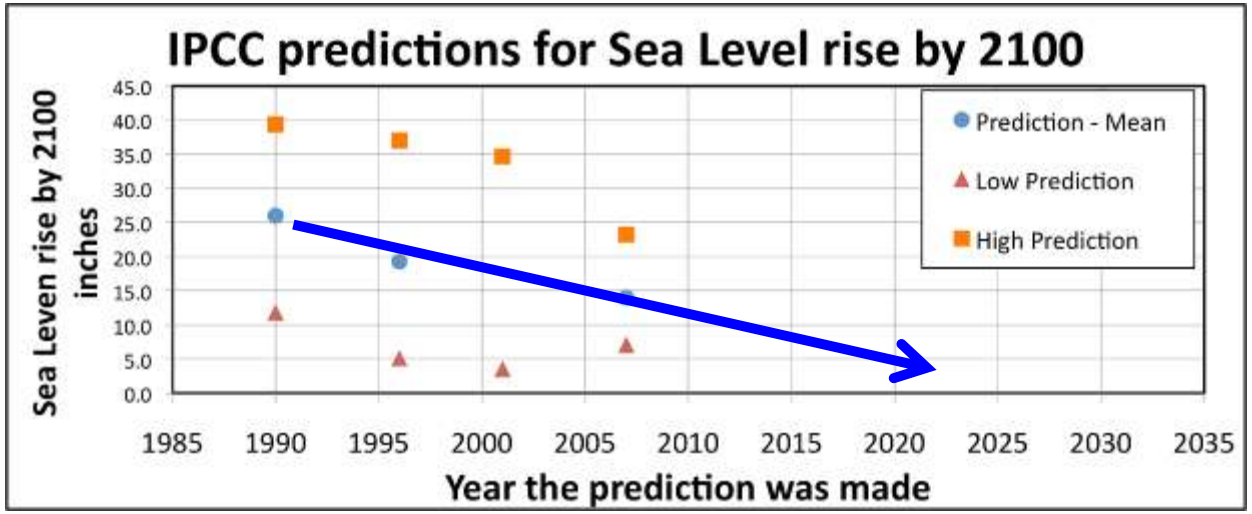


This curve fit shows the sea now falling
Red Curve = 5th order polynomial regression



Another 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 CO_2 be good? **Yes**.

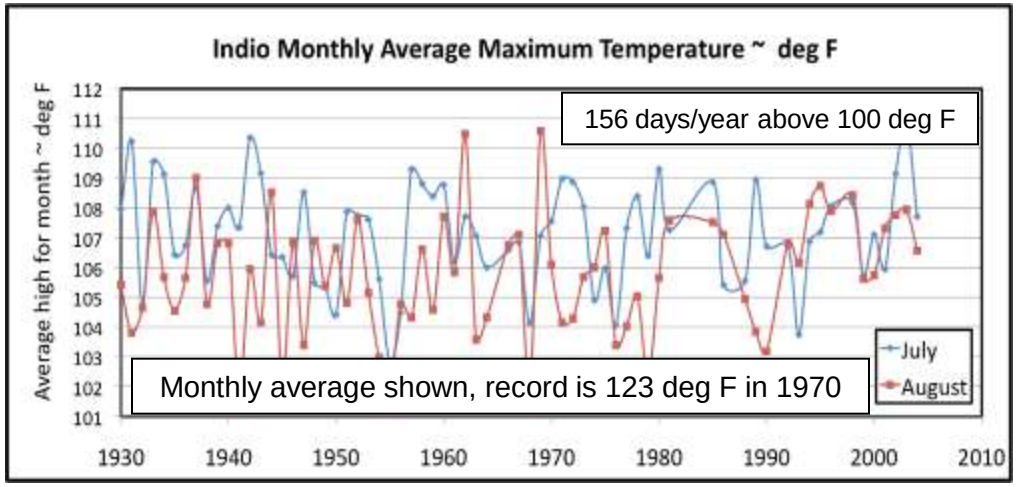
Recent climate changes have not caused weather or extinction degradation. Overall, adverse weather events and the number of extinctions will not increase if the next century or two warms like the last one. A CO_2-fertilized atmosphere will enhance plant growth, increase drop yields and allow more people 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 CO_2 beyond previous levels – Yes/No.
2. Human CO_2 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.

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.



Yes, I live 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

Death Valley

Adapt to cold

South Pole

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.

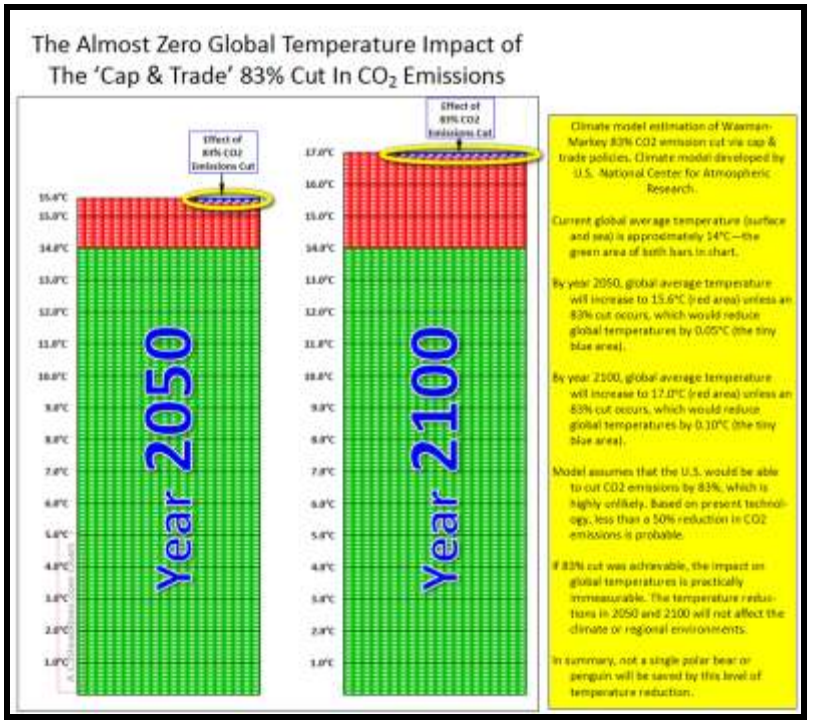
What do we get by taxing energy to constrain use?

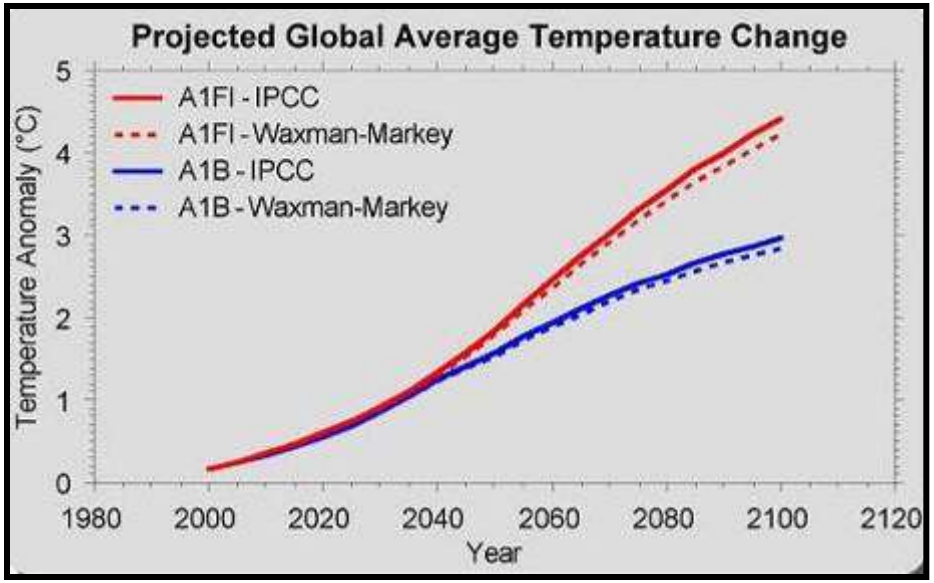
Even if it is possible, it is unbelievably expensive to control climate

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 ruining the economy, 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.





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 environ is not good for creativity, innovation and breakthroughs.
Ration Energy = huddle/freeze in the dark

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

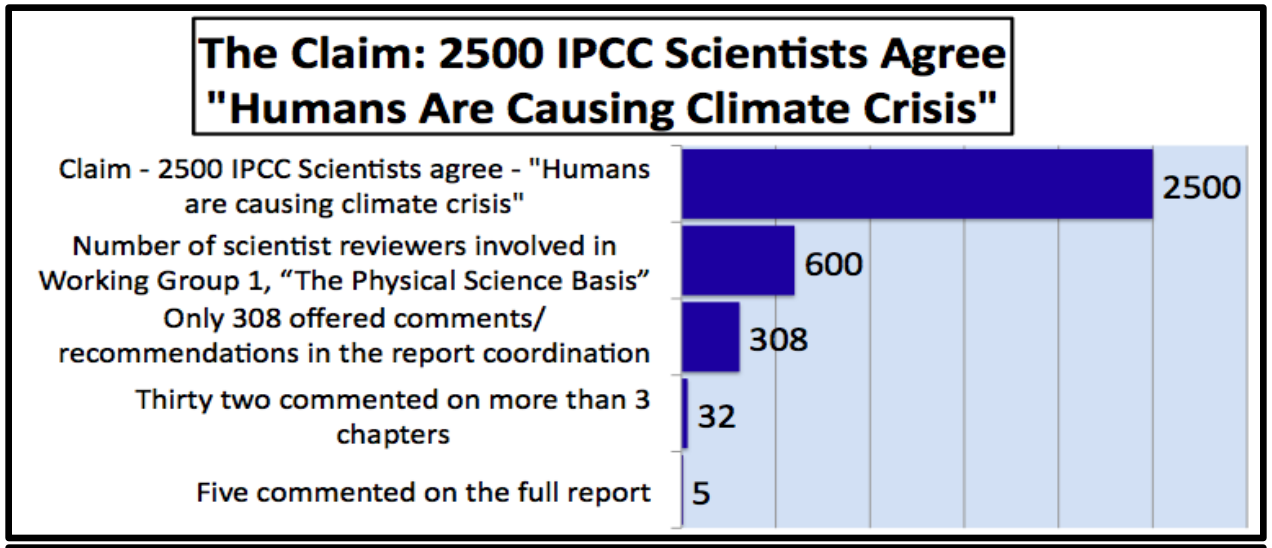
No.

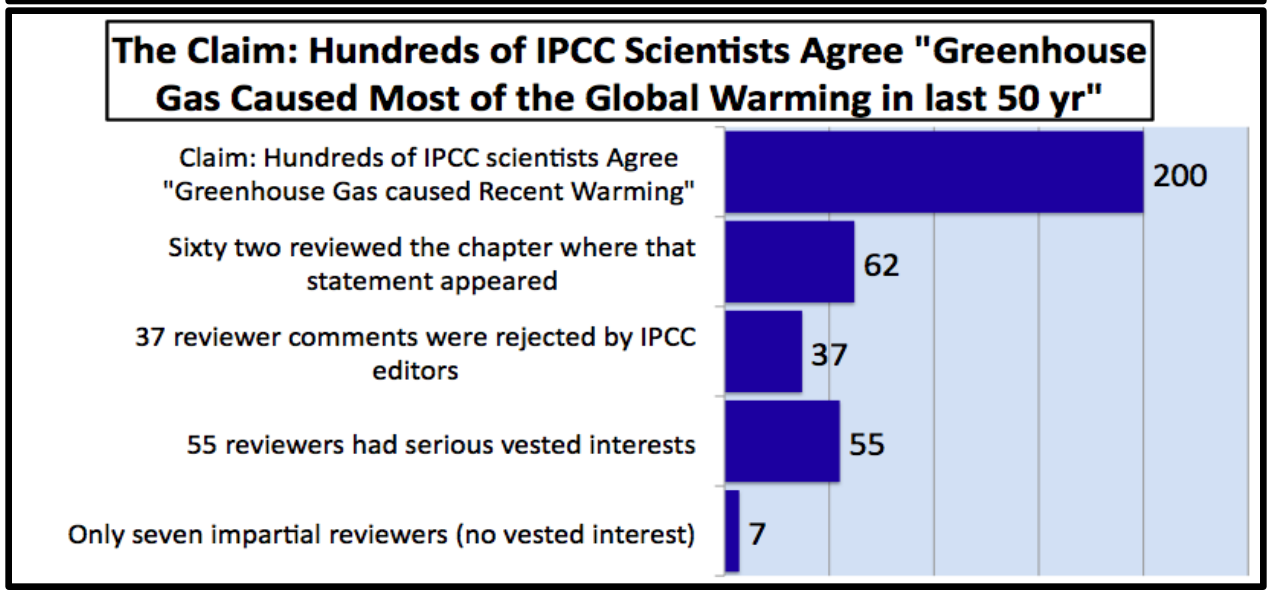
It is **possible** to constrain energy use with taxes/fees. But, even if imposed, it is **not possible** to significantly change climate. An energy-constrained economy will not allow the economic growth to fund technical solutions for adaptation or solutions for control, if they are discovered in the 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 CO_2 beyond previous levels – Yes/No
2. Human CO_2 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 – 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 McKitrick 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)

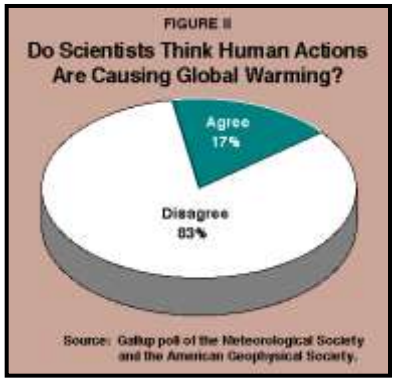
Petition signed by 31,000 scientists, 9,100 with PhDs

"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 CO_2 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/

Gallup poll of the Meteorological Society and the American Geophysical Society



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.

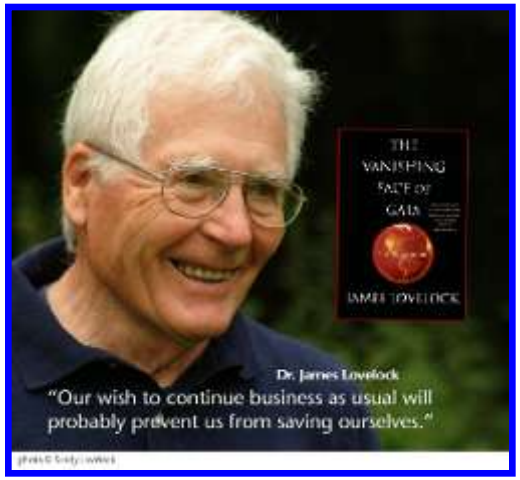
Now, lets look at some quotes

Eric Hoffer,
"One of the surprising privileges of intellectuals is that they are free to be scandalously asinine without harming their reputation."

Dr. James Lovelock
1970s Author of GAIA

One of the honest science guys. Although being a Global Warming Alarmist, he has criticized the IPCC, and the Government plans to constrain energy. However, he has recently presented an opposing view on catastrophic warming and now talks about the science fraud that occurred during the ozone hole scare of the 70s ("80% of the measurements being made during that time were either faked, or incompetently done"), comparing that with the recent AGW science fraud.

The 90-year-old British scientist, who has worked for NASA and paved the way for the detection of man-made aerosol and refrigerant gases in the atmosphere, now calls for greater caution in climate research.



Excerpted from Frank Davis, 'Lovelock Walks Away'

http://frank-davis.livejournal.com/58819.html

Dr. Lovelock in 2006:

"We are responsible and will suffer the consequences of Global Warming"

Dr. Lovelock in 2007:

"By 2040, the Sahara will be moving into Europe, and Berlin will be as hot as Baghdad. Phoenix will become uninhabitable. By 2100, the Earth's population will be culled from today's 6.6 billion to as few as 500 million, with most of the survivors…in Iceland, Scandinavia, the Arctic".

Dr. Lovelock in 2008:

"… global warming is now irreversible, and nothing can prevent large parts of the planet becoming too hot to inhabit, or sinking underwater… famine and epidemics".

Dr. James Lovelock Now - March 2010:

At London's Science Museum Dr Lovelock said: "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….We're just fiddling around. It is worth thinking that what we are doing in creating all these carbon emissions, far from being something frightful, is stopping the onset of a new ice age….we can look at our part as holding that up…..I hate all this business about feeling guilty about what we're doing…..We're not guilty, we never intended to pump CO_2 into the atmosphere, it's just something we did."

He compared today's climate change controversy to the "wildly inaccurate" early work on aerosol gases and their alleged role in depletion of the ozone layer: "Quite often, observations done by hand are accurate but all the theoretical stuff in between tends to be very dodgy and I think they are seeing this with climate change….We haven't learned the lessons of the ozone-hole debate. It's important to know just how much you have got to be careful"

"I think you have to accept that the skeptics have kept us sane….They have been a breath of fresh air. They have kept us from regarding the science of climate change as a religion. It has gone too far that way. There is a role for skeptics in science. They shouldn't be brushed aside. It is clear that the 'angel side' wasn't without sin".

From Frank Davis - Perhaps this is what happens when people realize they're wrong. They start talking as if they'd always urged caution, had always warned of the danger of inaccurate scientific predictions and manipulated data.

Do these folks believe in the importance of practicing the Scientific Method?

Stephen H. Schneider
Scientist/Alarmist
In a 1989 Discover Magazine interview, Professor Schneider said [Scientists should consider stretching the truth] "to get some broad-based support, to capture the public's imagination. That, of course, entails getting loads of media coverage. So we have to offer up scary scenarios, make simplified, dramatic statements, and make little mention of any doubts we might have".

Fmr Colorado Sen. Tim Wirth, now president of the U N Foundation,
in 1990 said, "We've got to ride the global warming issue. Even if the theory of global warming is wrong, we'll be doing the right thing"

Dr John Holdren
Director of the White House Office of Science and Technology Policy
Co-author with Paul Ehrlich of "The Population Bomb"
"... security might be provided by an armed international organization, a global analogue of a police force. The first step necessarily involves partial surrender of sovereignty to an international organization".

Environmentalist Professor Paul Ehrlich,
Co-author with Dr. Holdren, now giving advice to the warmers, Ehrlich is an good example of Hoffer's observation. In his 1968 book, "The Population Bomb," he predicted: "The battle to feed humanity is over. In the 1970s, the world will undergo famines. Hundreds of millions of people are going to starve to death in spite of any crash programs embarked upon now". Ehrlich also predicted the earth's then-5 billion population would starve back to 2 billion people by 2025.

"Nobody is interested in solutions if they don't think there's a problem. I believe it is appropriate to have an **over-representation of factual presentations** on how dangerous (global warming) is, as a predicate for opening up the audience to listen to what the solutions are".
Al Gore, Grist Magazine, May 2006

The Difference between an Environmentalist and a Denier

You can easily tell if someone is a **true environmentalist**, i.e. an advocate for a healthy planet - he is one who is happy to hear the news that the arctic ice has returned. He is one who celebrates when the recent climate data show the alarmist's predictions of catastrophic warming might be wrong. **The denier**, if he is an eco/political activist, **always denies new data** that show the planet may be healthy after all. The Media usually defines deniers as those who deny the scientist's computer model predictions. However, denying the measured climate data meets a better definition in the world of science.

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