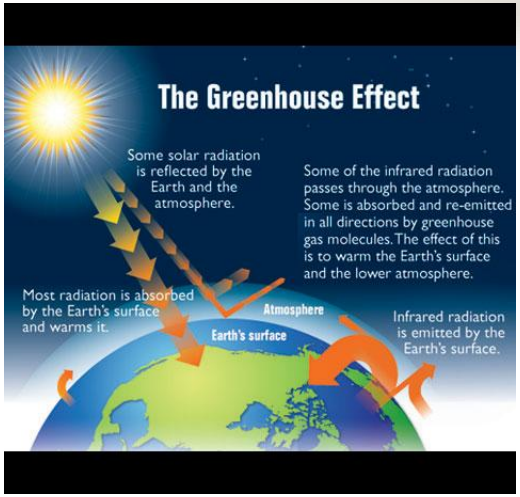
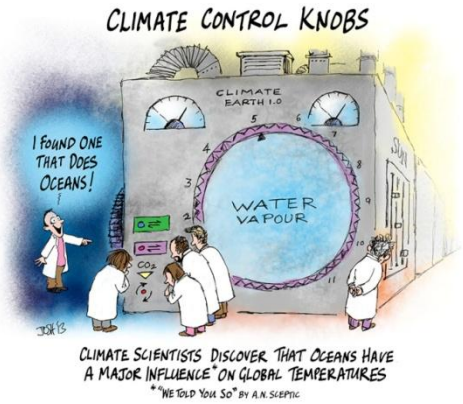
What About Global Warming? Real? Causes? Mitigation?

Dr. Heinz Lycklama

heinz@osta.com

www.heinzlycklama.com/messages





What About Global Warming?

- The Global Warming (**GW**)/**CC** Claims
- Actual Climate Change (**CC**) Facts
- Historical Global Temperature Anomalies
- Greenhouse Effect
- Greenhouse Gases
- **UN IPCC** (**Intergovernmental** Panel on **CC**)
- **NIPCC** (**Nongovernmental** International Panel on **CC**)
- Possible Causes of **GW**
- Paris Climate Agreement
- Comparing Costs of Energy
- Conclusions

IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

WMO UNEP

NIPCC
Nongovernmental International Panel on Climate Change

CO2 SCIENCE THE HEARTLAND INSTITUTE

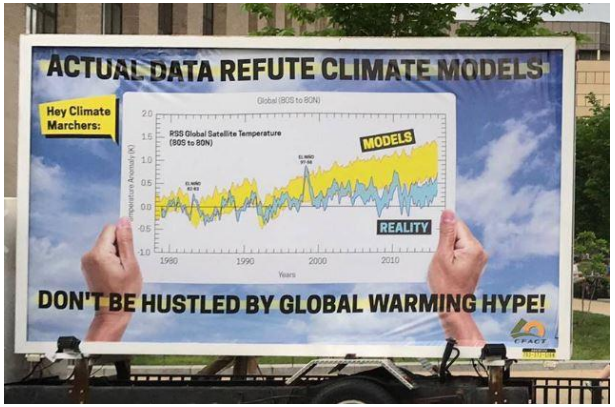
Biblical Mandates

- Be fruitful and multiply and fill the earth and subdue it, and have dominion over the fish of the sea and over the birds of the heavens and over every living thing that moves on the earth. **Gen. 1:28**
- While the earth remains, seedtime and harvest, cold and heat, summer and winter, day and night, shall not cease. **Gen. 8:22**
- But test everything; hold fast what is good. **1 Th. 5:21**

The AGW Claims

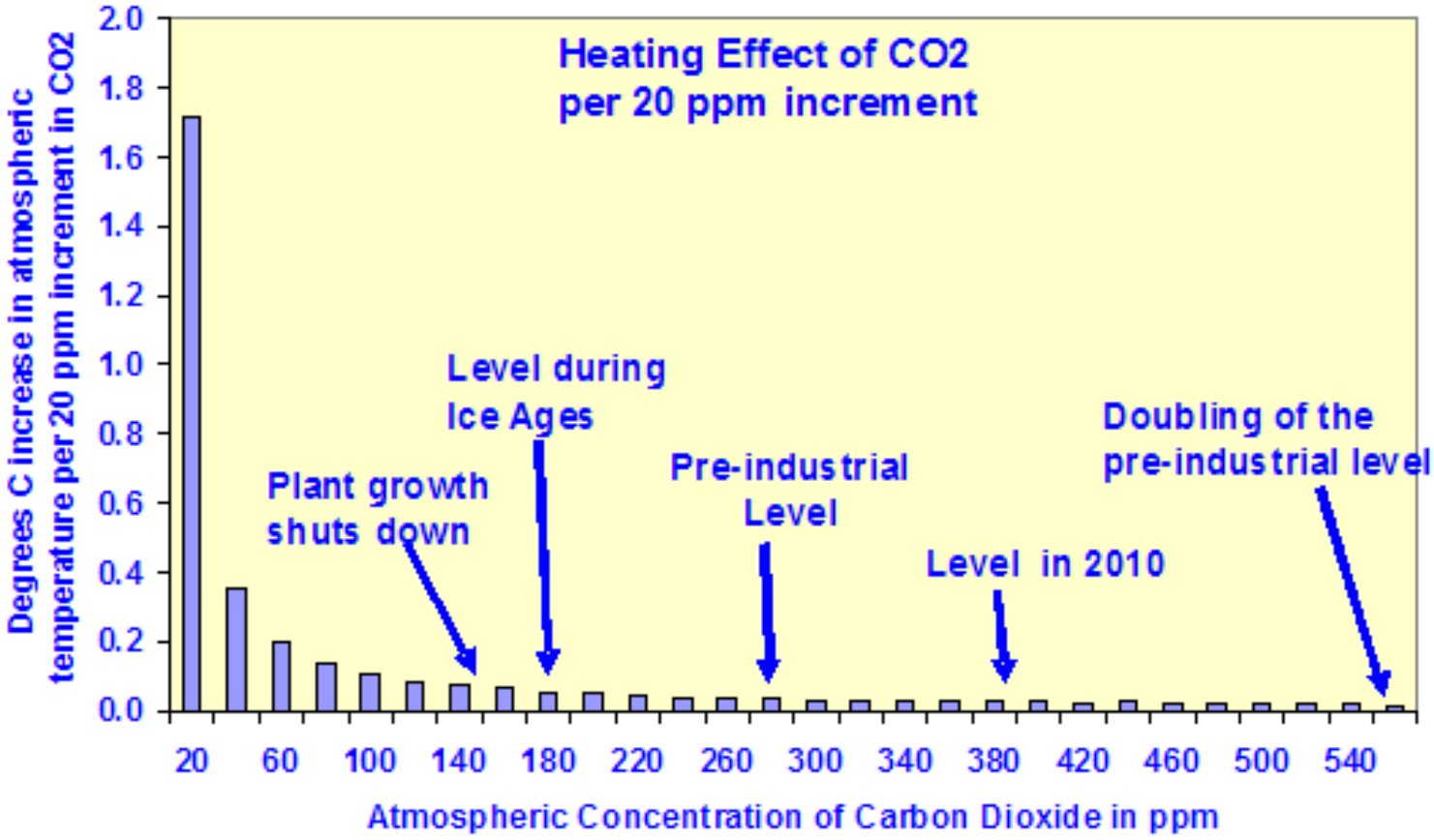
- Predicted by the UN IPCC
  - Real & human-caused
  - +5 degrees C by 2100
  - Artic ice cap disappearing
  - Polar bear population will decline
  - Sea level will rise by 88+ cm in 2100
  - Increased drought, extreme weather, more storms
  - Most significant threat to mankind
  - Must act NOW!
- Refuted by the actual facts

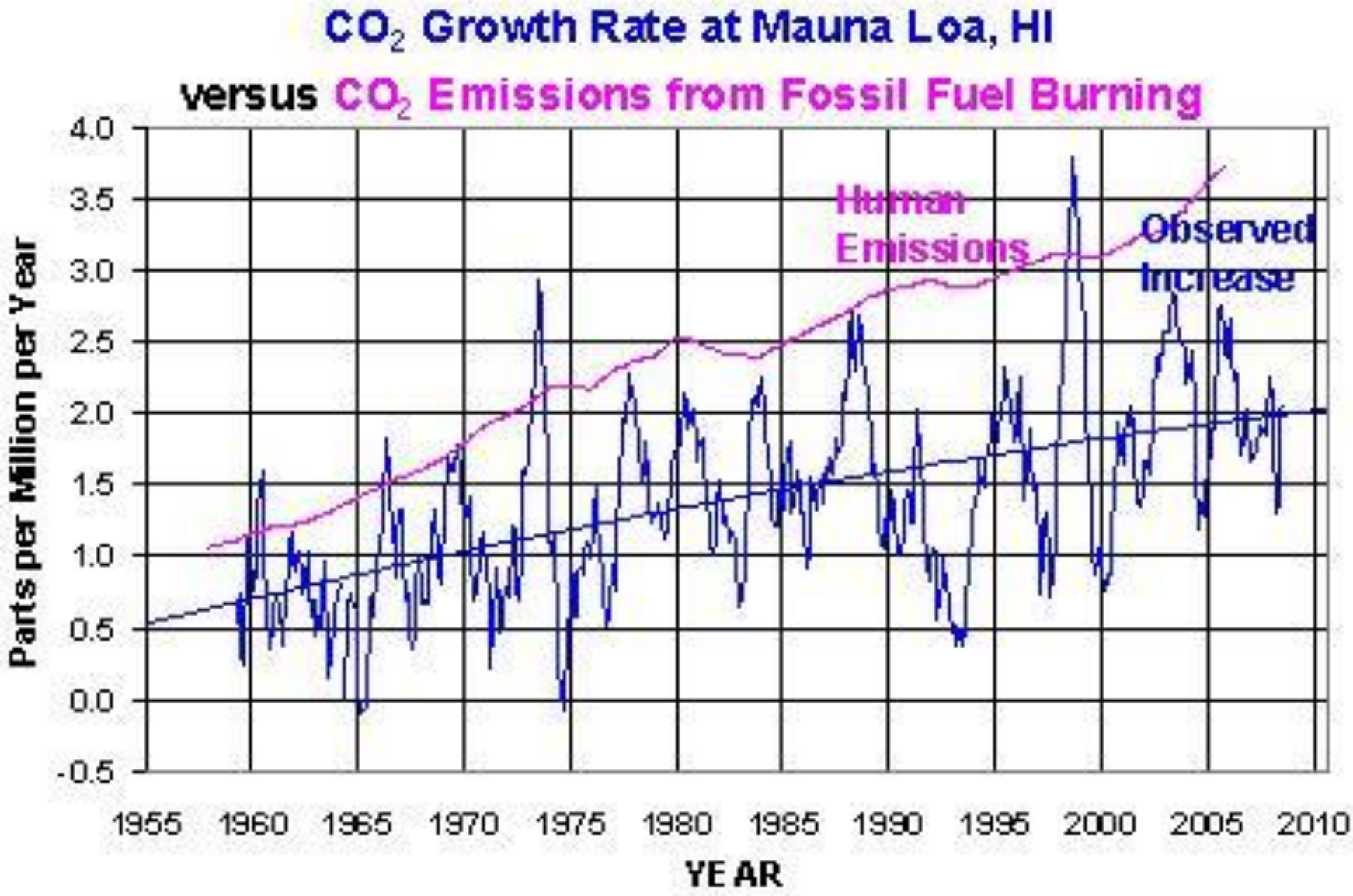
"Before this century is over, billions of us will die …"
James Lovelock, scientist



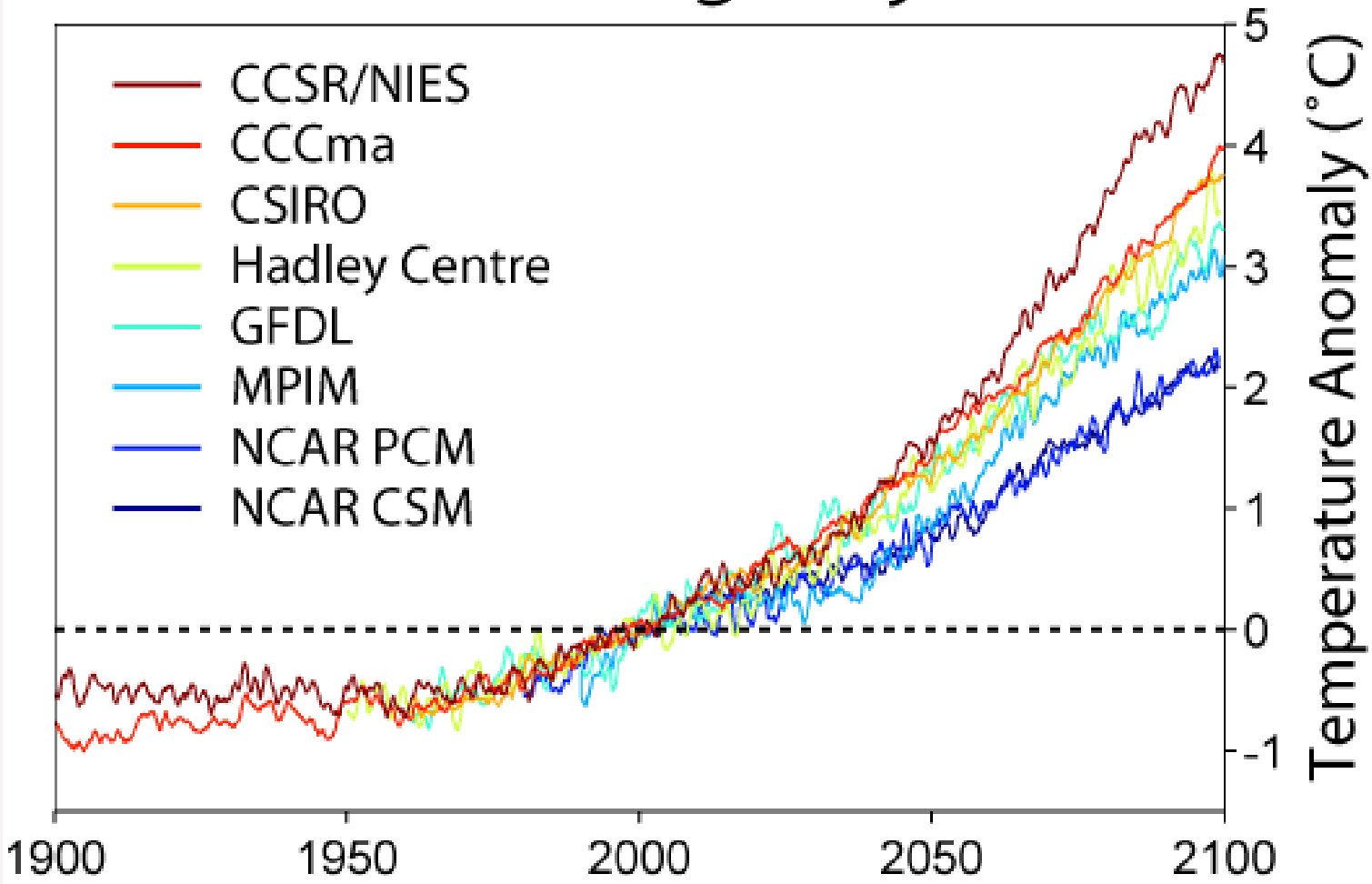
Actual Climate Change Facts

CO2 in Atmosphere Insignificant

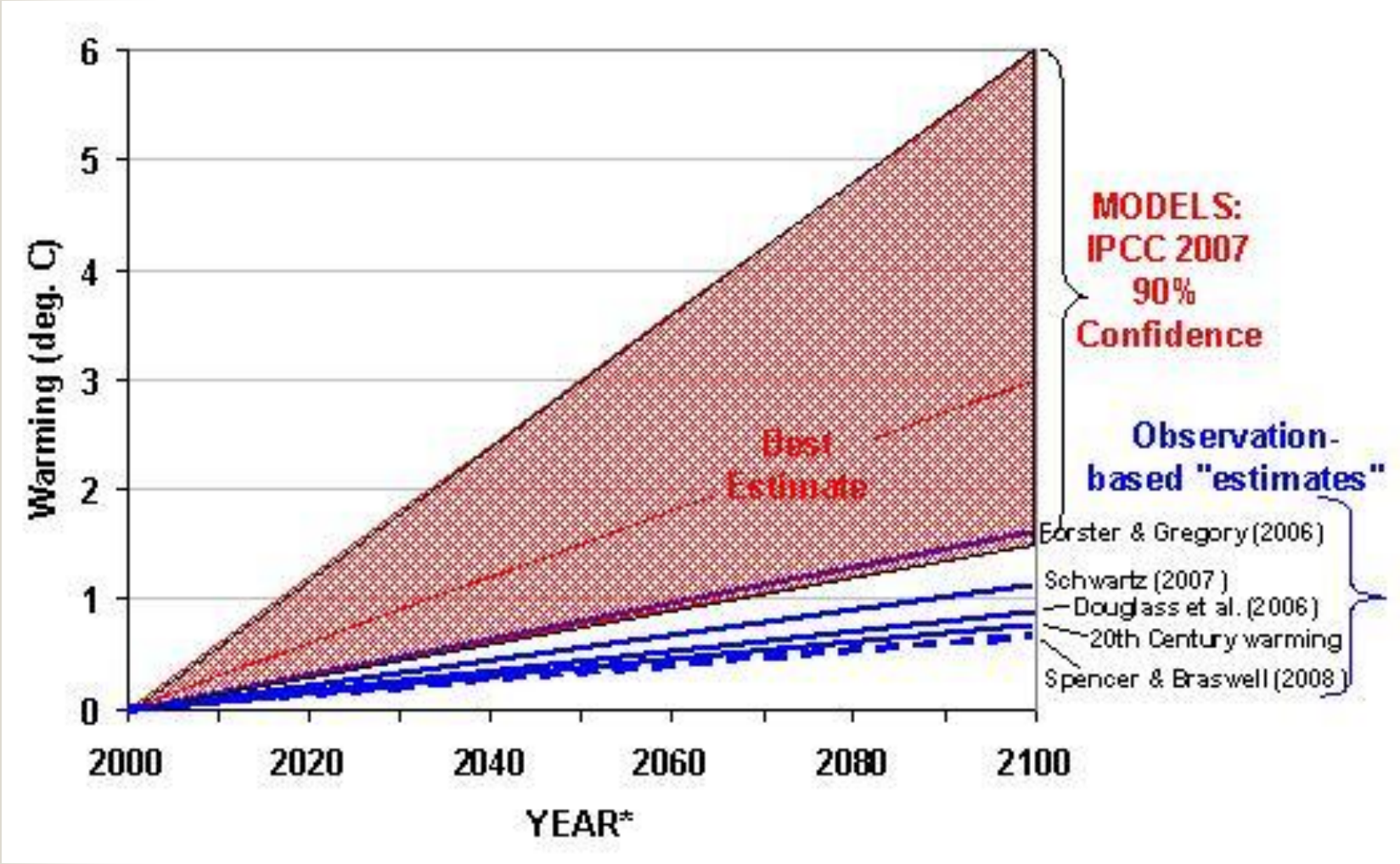



CO2 Growth Rate at Mauna Loa, HI
versus CO2 Emissions from Fossil Fuel Burning
Human Emissions
Observed Increase
Parts per Million per Year
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
YEAR

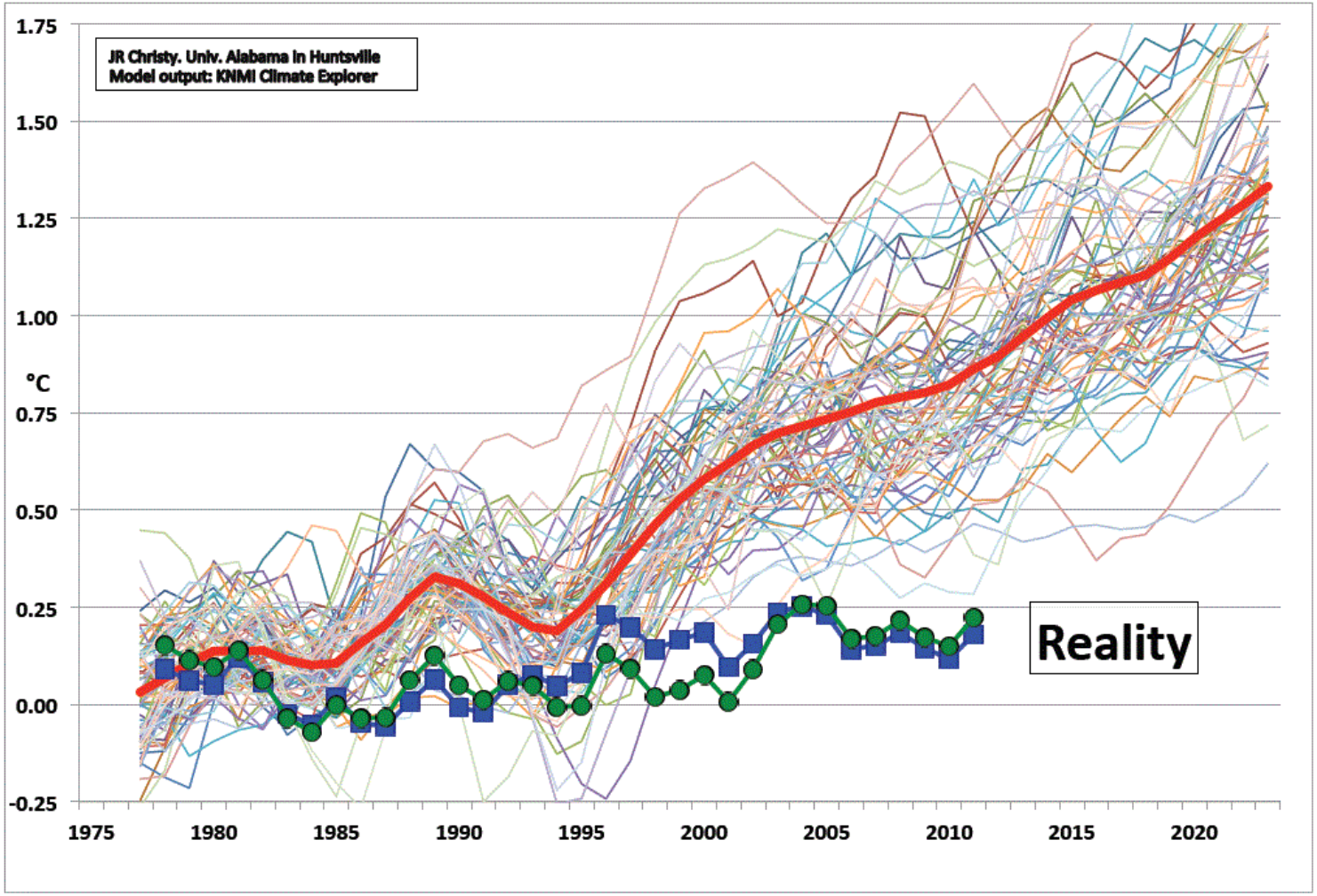
Global Warming Projections



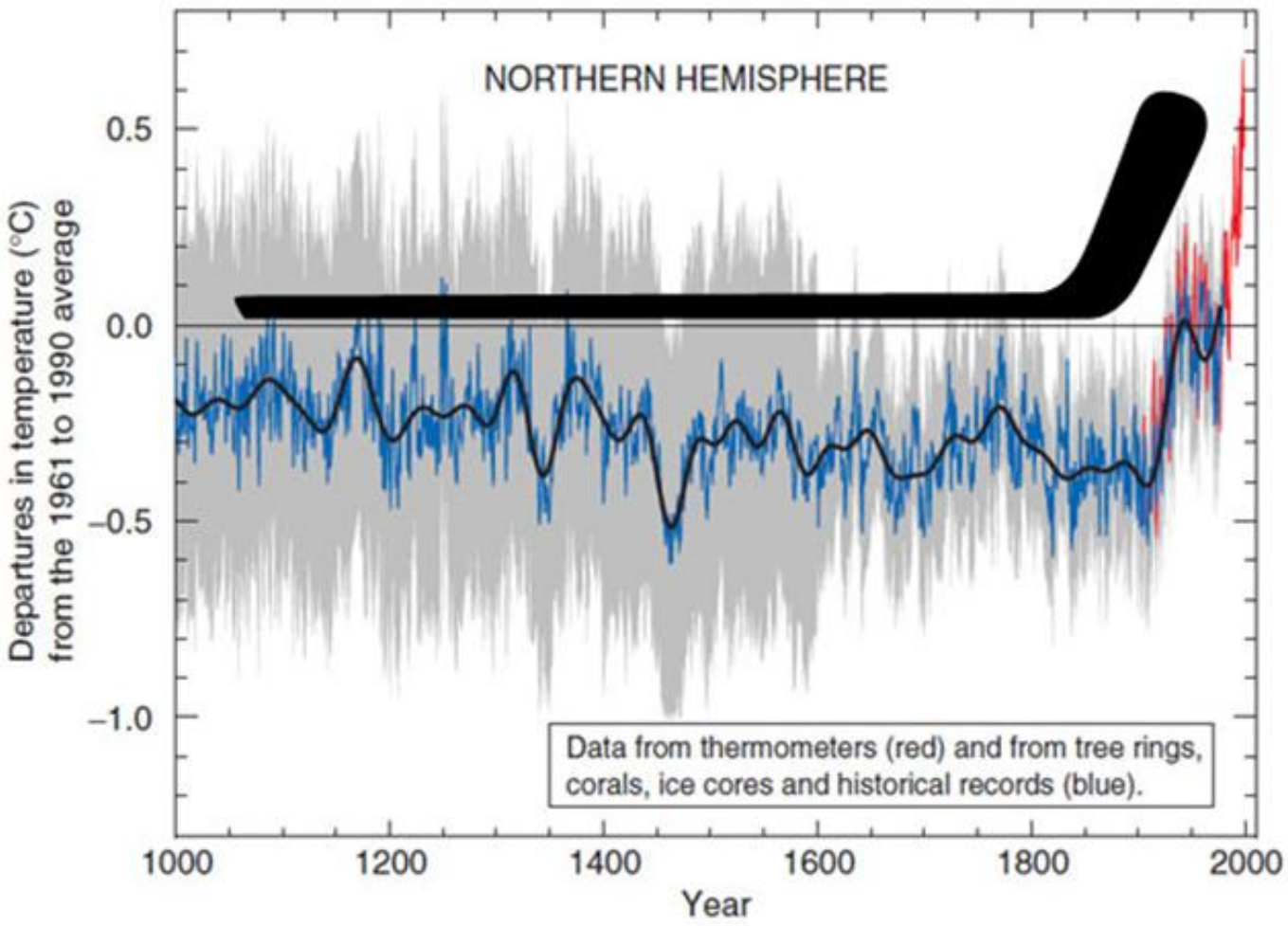
Models & Estimates

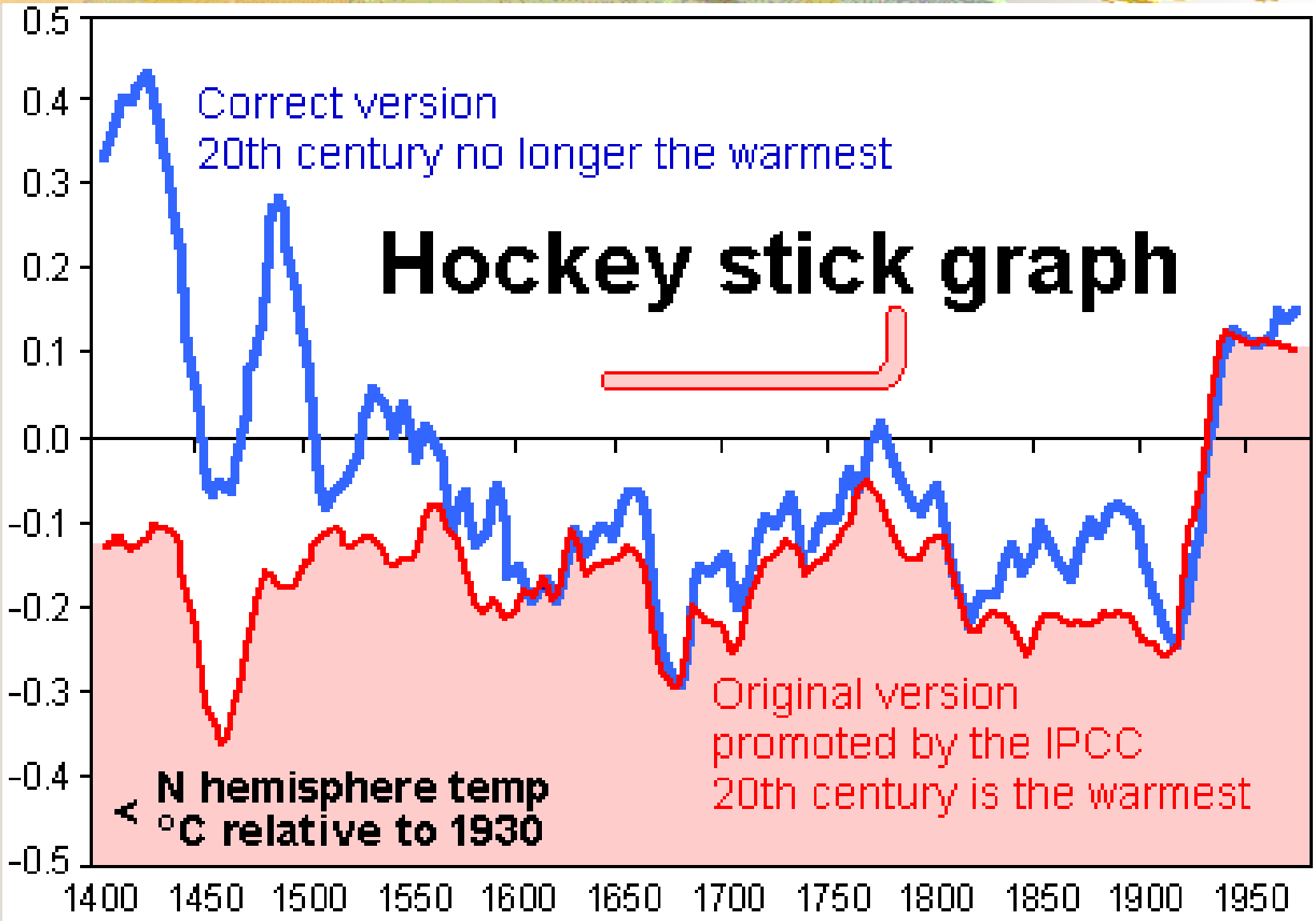


Reality vs. UN IPCC CC Models

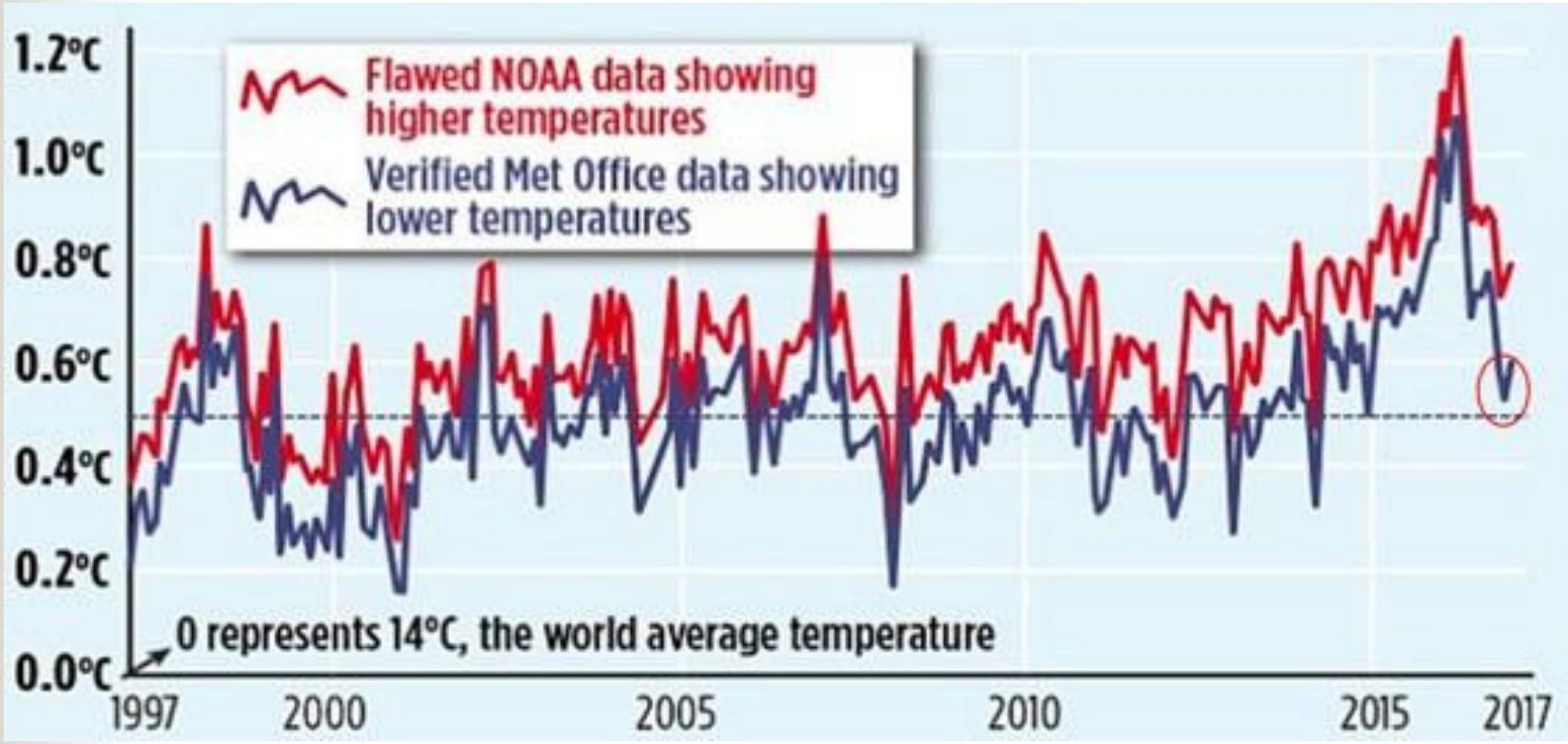


Hockey Stick Chart

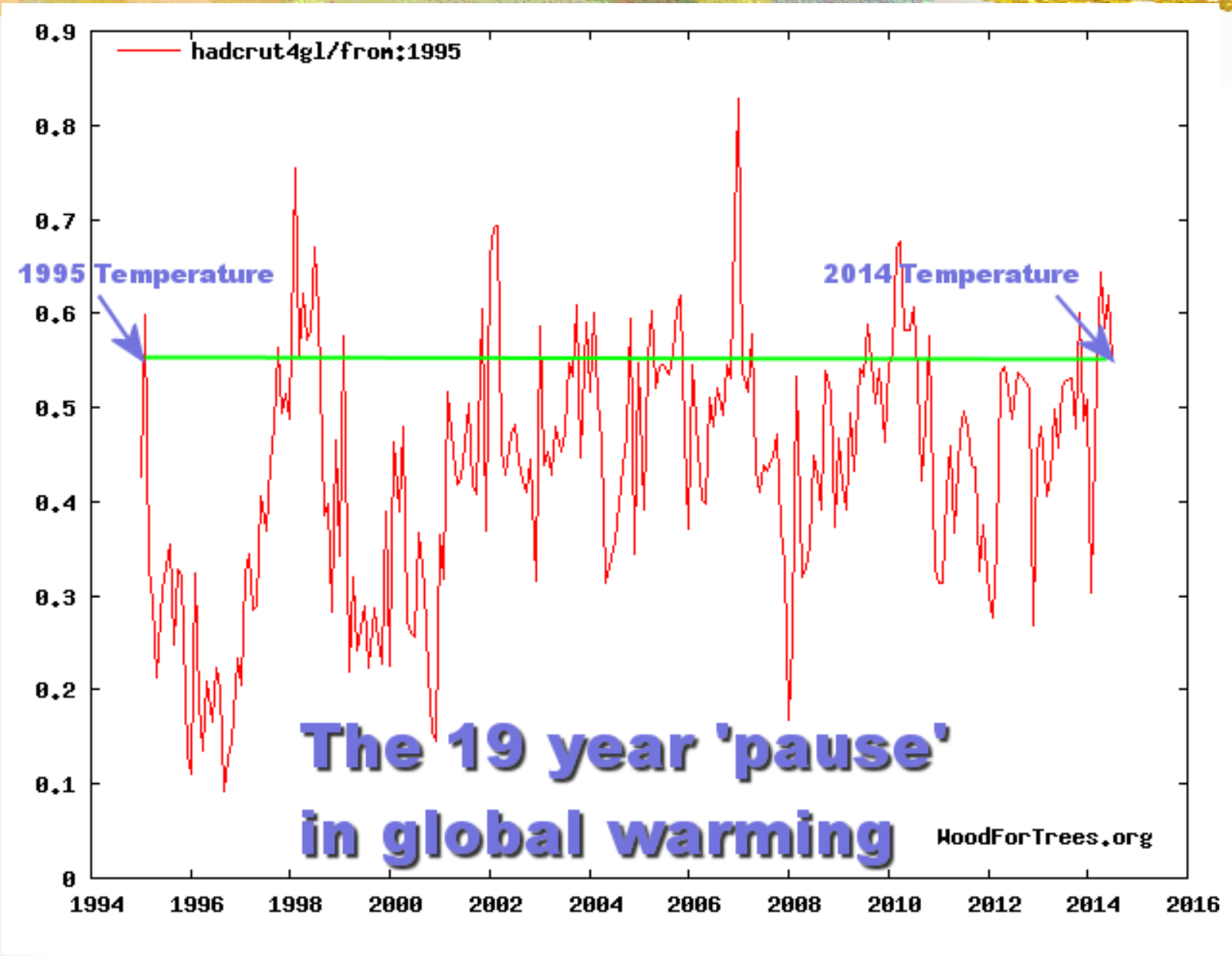



Correct version
20th century no longer the warmest
Hockey stick graph
Original version
promoted by the IPCC
20th century is the warmest
N hemisphere temp
°C relative to 1930
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
1400
1450
1500
1550
1600
1650
1700
1750
1800
1850
1900
1950

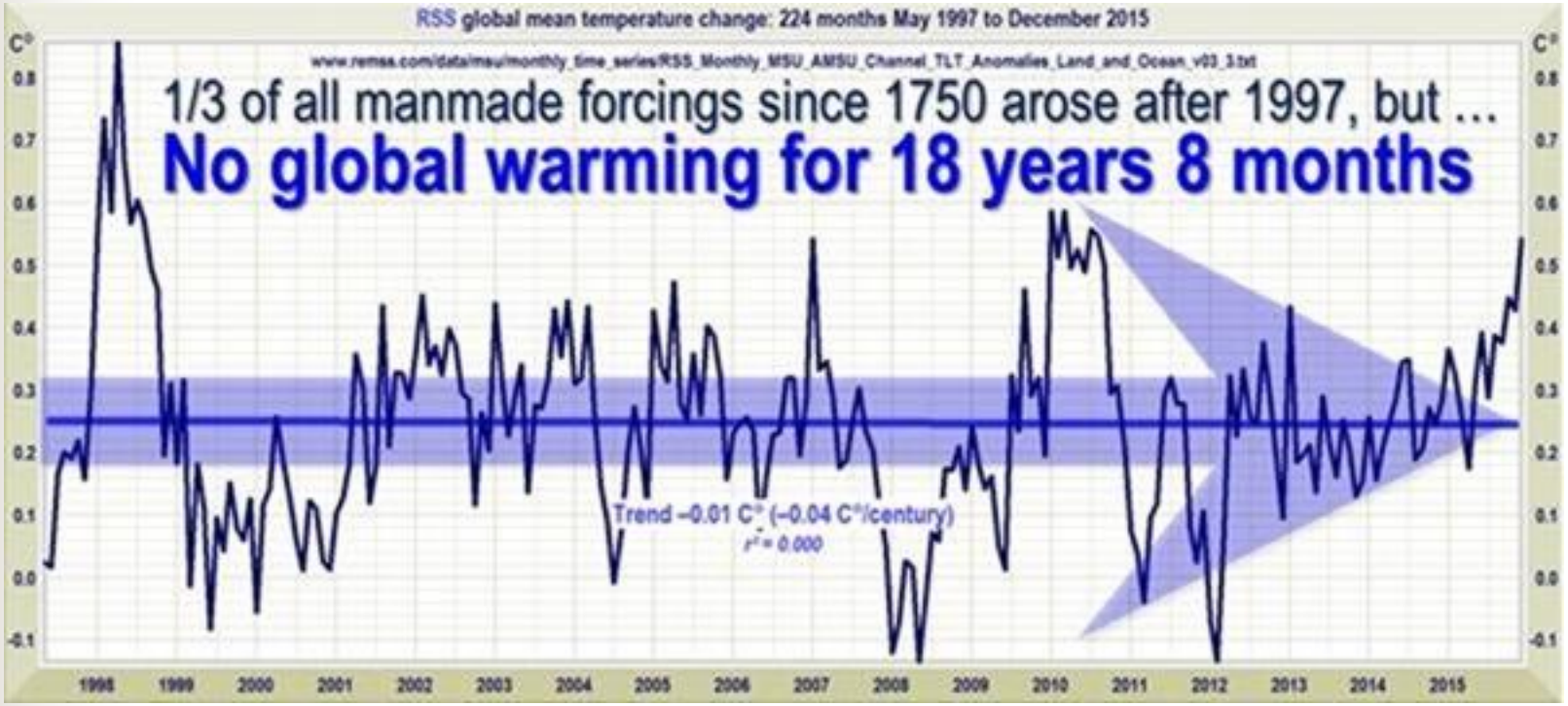
MIT Researchers Slam GW Data

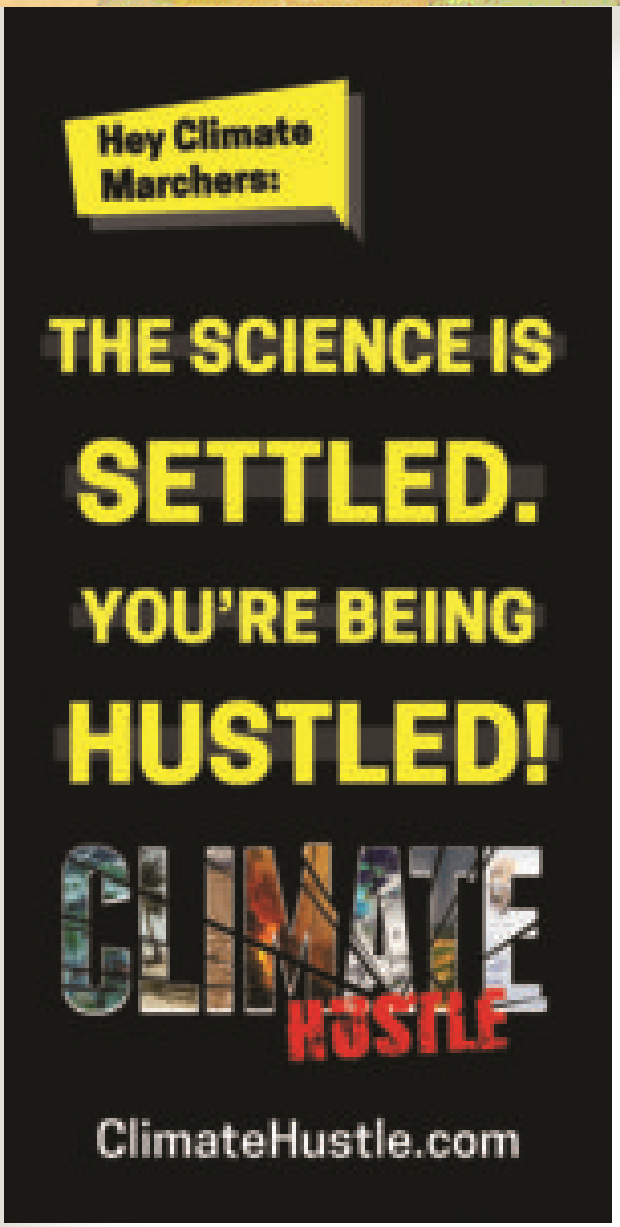


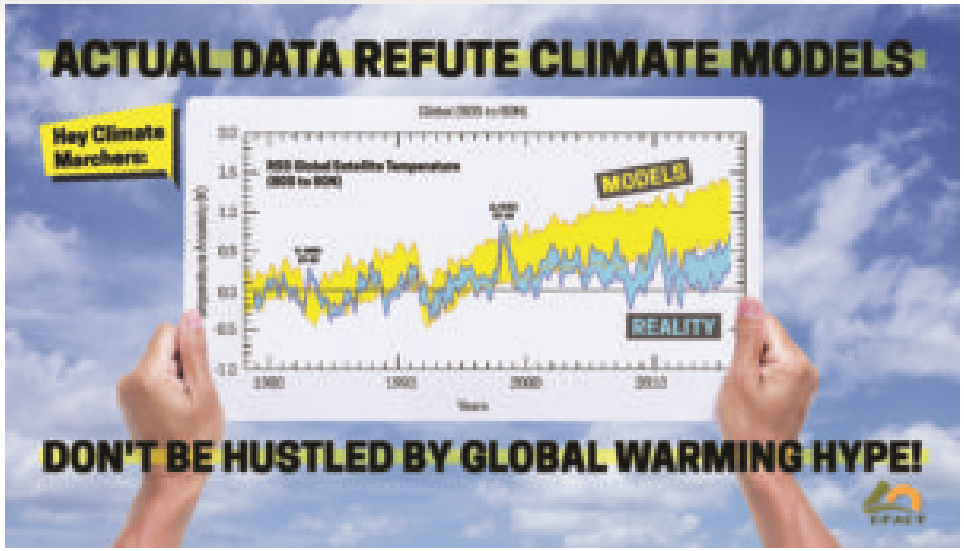
Reported on July 15, 2017


hadcrut4gl/from:1995
1995 Temperature
2014 Temperature
The 19 year 'pause'
in global warming
WoodForTrees.org
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016

No Global Warming For 19 Years

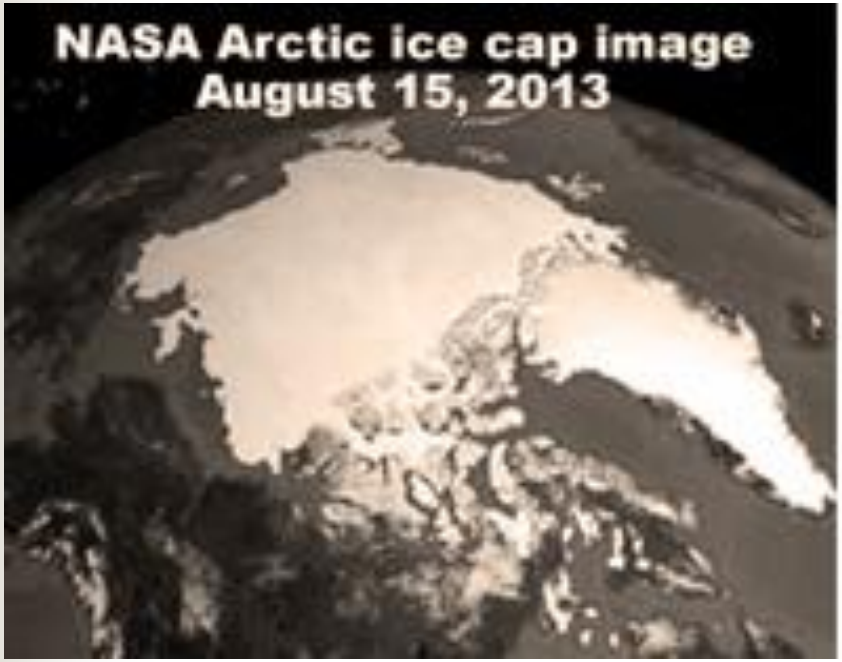



Hey Climate Marchers:
THE SCIENCE IS
SETTLED.
YOU'RE BEING
HUSTLED!
CLIMATE HUSTLE
ClimateHustle.com


ACTUAL DATA REFUTE CLIMATE MODELS
Hey Climate Marchers:
MODELS
REALITY
DON'T BE HUSTLED BY GLOBAL WARMING HYPE!
CFACT

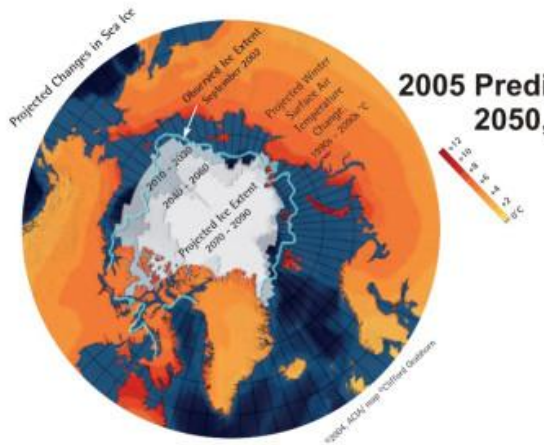

Hey Climate Marchers:
"POLAR BEARS AT
HIGHEST POPULATION LEVELS
IN 50 YRS"
CFACT

Artic Ice Cap Actual vs. Prediction

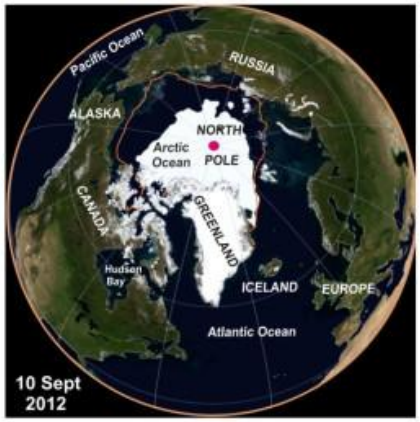


Sea Ice Level & Number of Polar Bears

Massive Polar Bear Decline Expected (67%) was Based on a Sea Ice Reality Bears Have Lived with Since 2007



2005 Prediction for 2020, 2050, and 2080



2012 Reality

Sea Ice 2007-2016 was like 2050 prediction (+/- error)

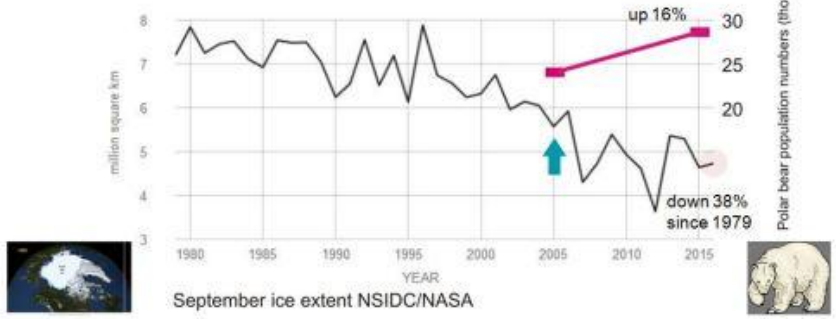
Polar Bear Population Estimates

1950s	5,000
1965-1970	8,000-10,000
1984	25,000
2005	20,000-25,000

Sources: New York Times; Covebear.com; International Bear Association; International Wildlife; IUCN, Polar Bear Study Group.

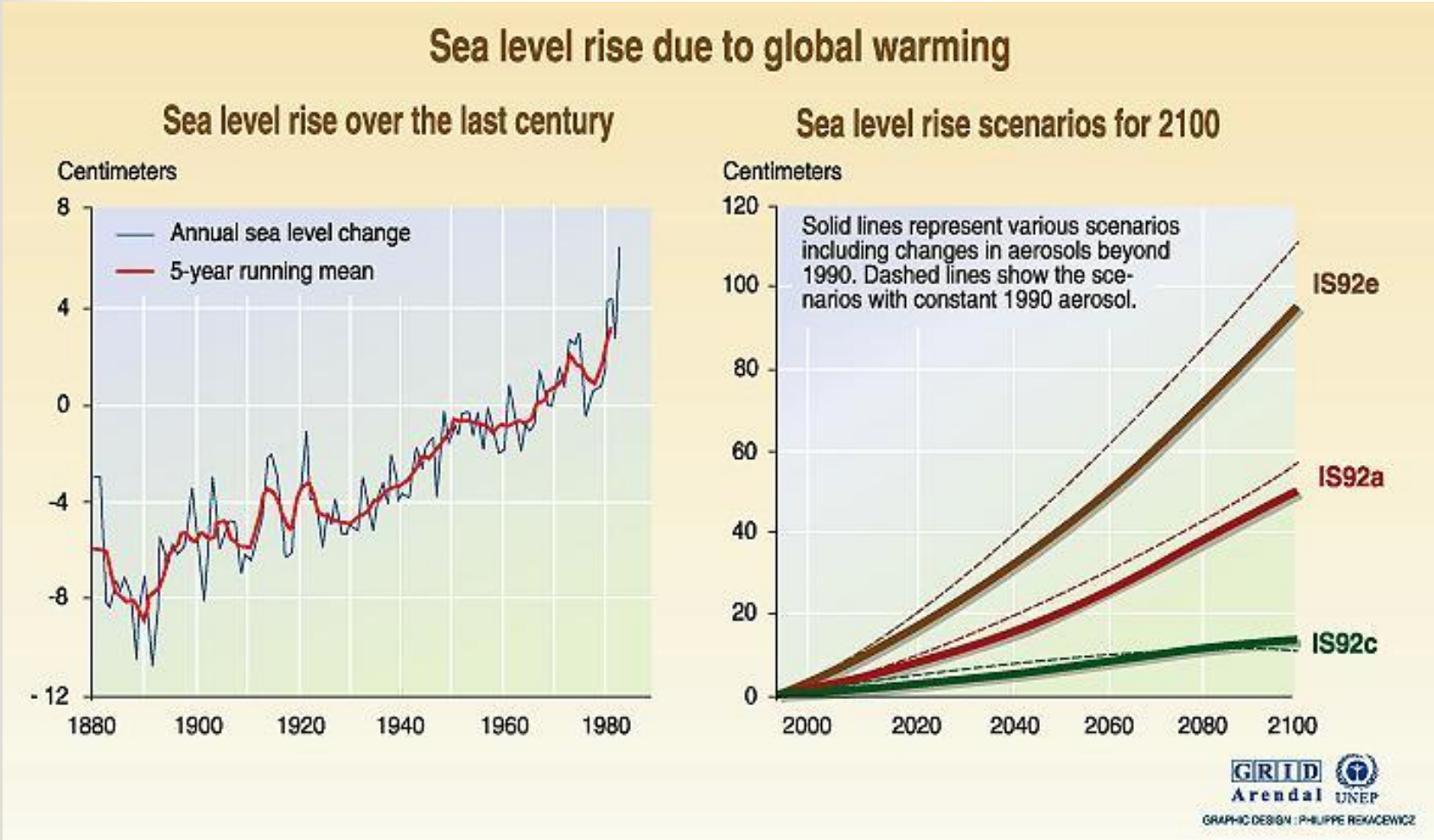
Catastrophe fails to materialize

Summer sea ice vs. polar bear numbers since 2005



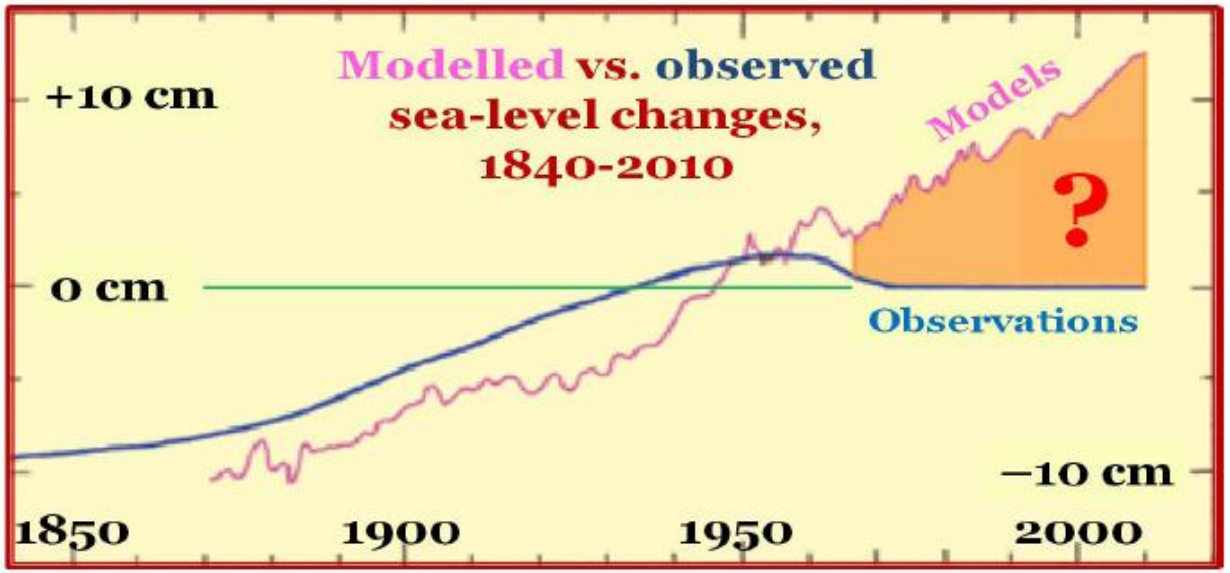
September ice extent NSIDC/NASA

Sea Level Rise Projections

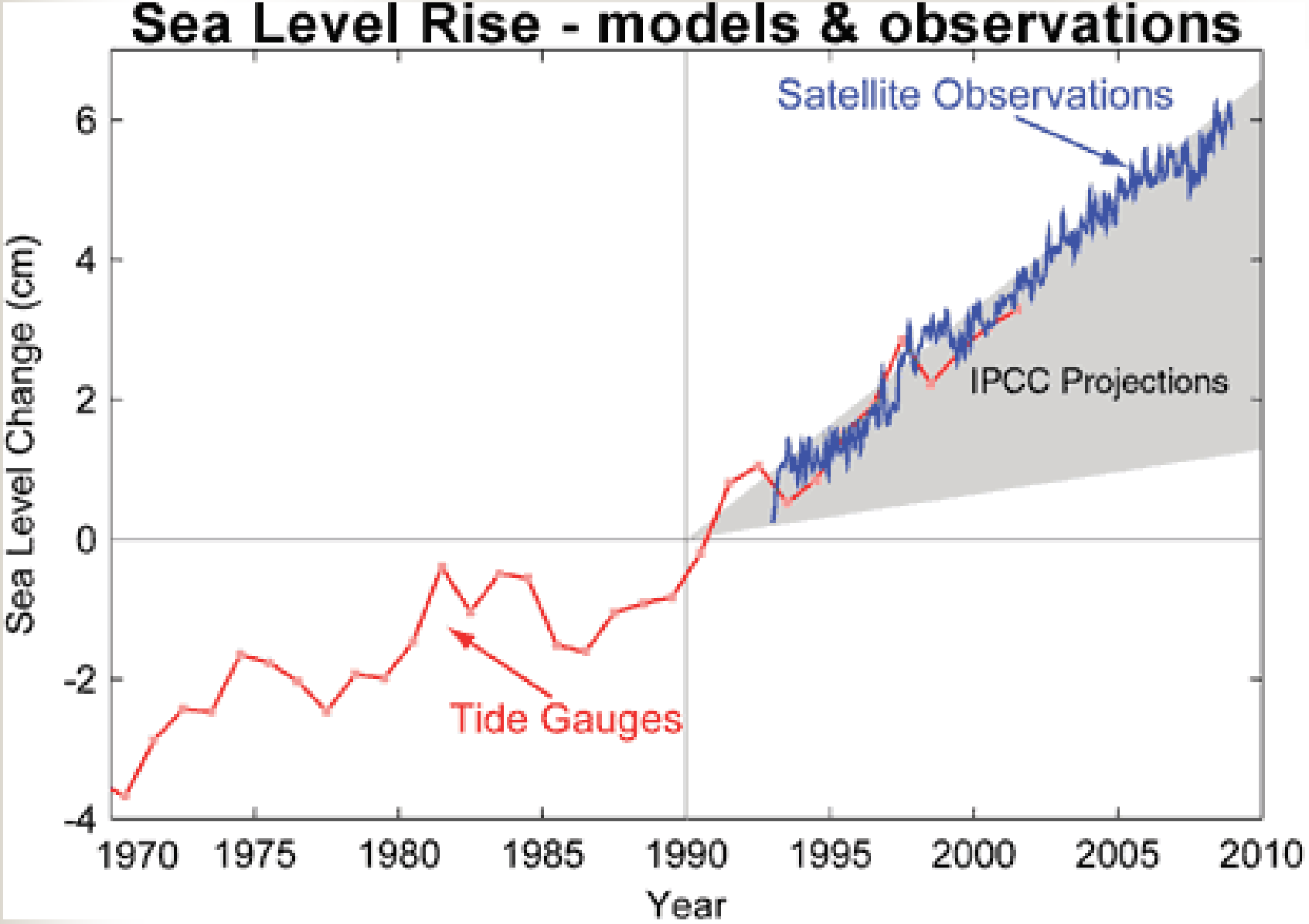


Source: Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996; Sea level rise over the last century, adapted from Gornitz and Lebedeff, 1987.

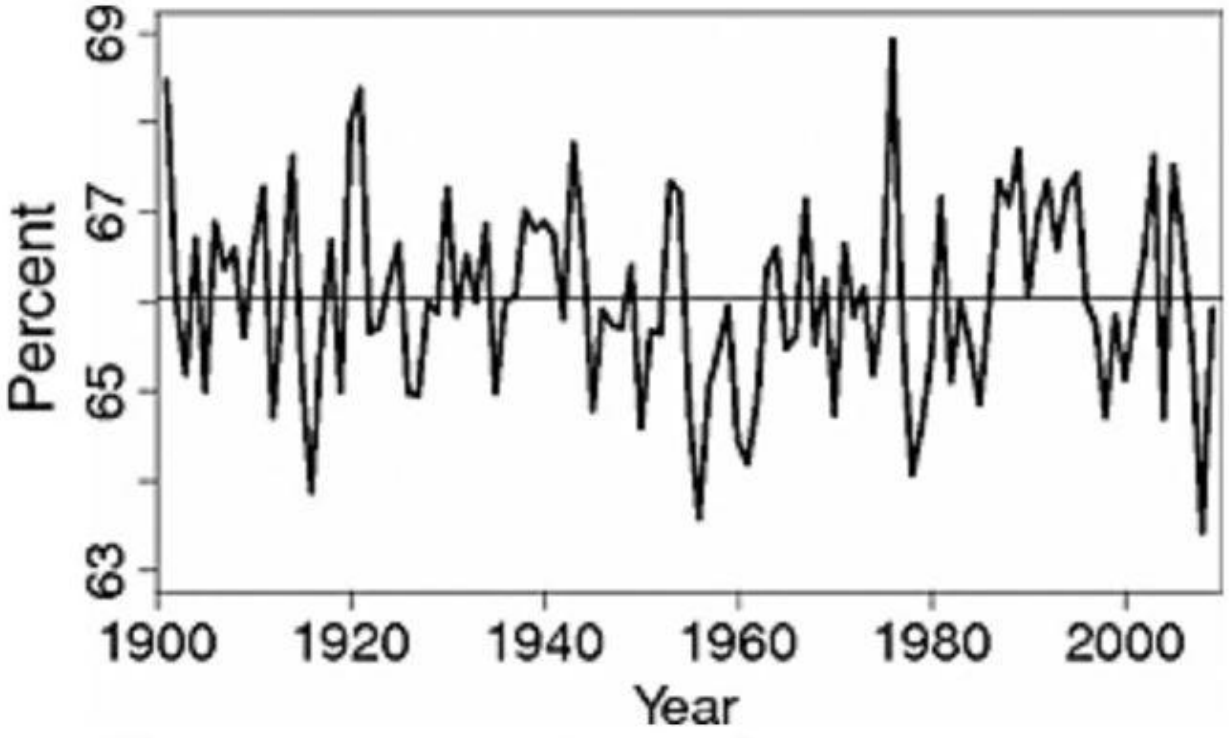
Past Sea Level Changes



Modeled and observed sea-level changes, 1840-2010. *The pink curve,* ***Models****, represents the IPCC's combination of selected tide-gauge records and "corrected" satellite altimetry data. The blue curve,* ***Observations****, represents the observed sea level changes in the field up to 1960 according to Professor Mörner. After 1965, the two curves start to diverge, presenting two totally different views, separated by the orange region. Note the large discrepancy between prediction and reality.*


Sea Level Rise - models & observations
Satellite Observations
IPCC Projections
Tide Gauges
Sea Level Change (cm)
6
4
2
0
-2
-4
1970
1975
1980
1985
1990
1995
2000
2005
2010
Year

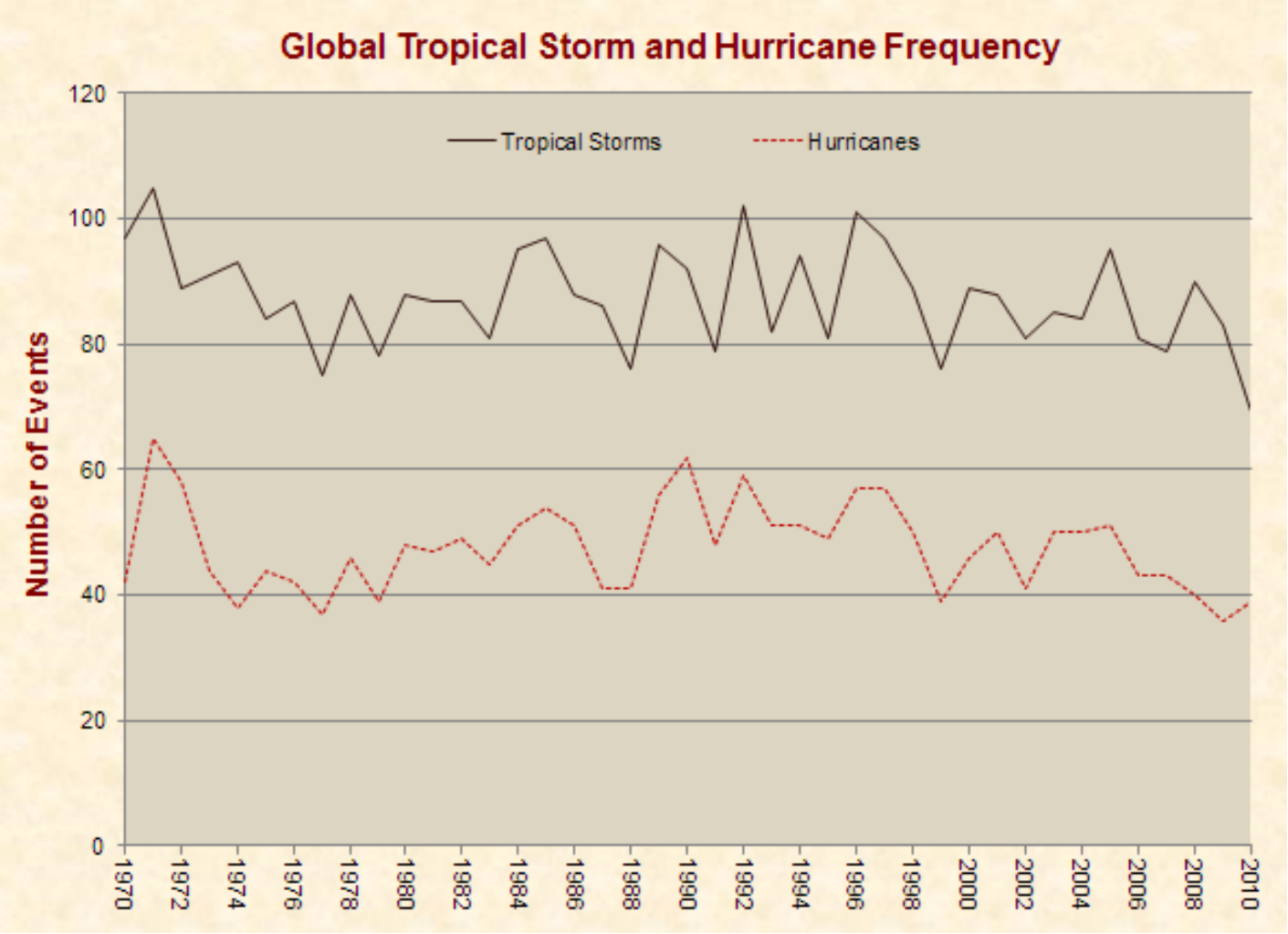
No change in drought percentage since 1901



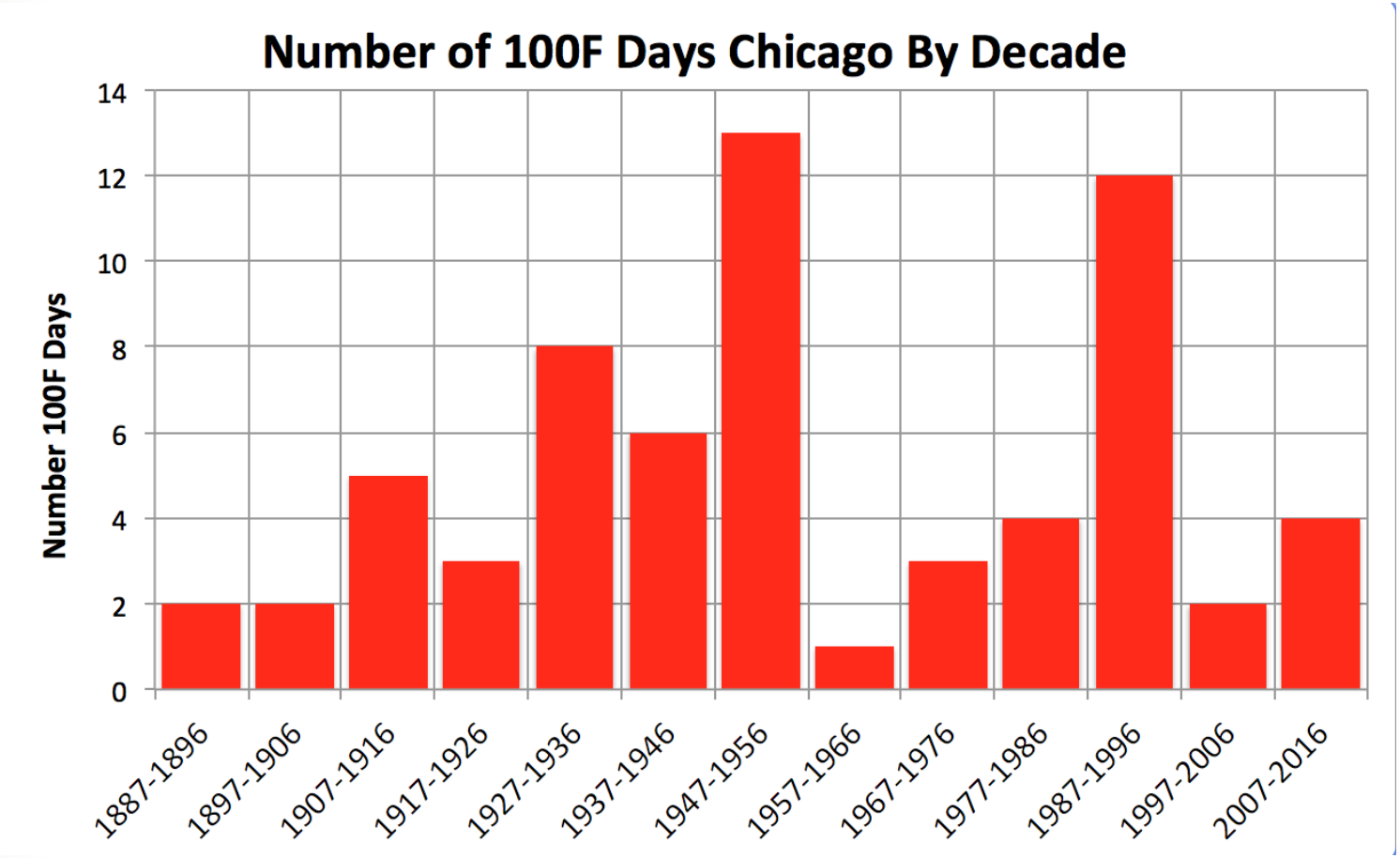
Got warming?

CFACT.org

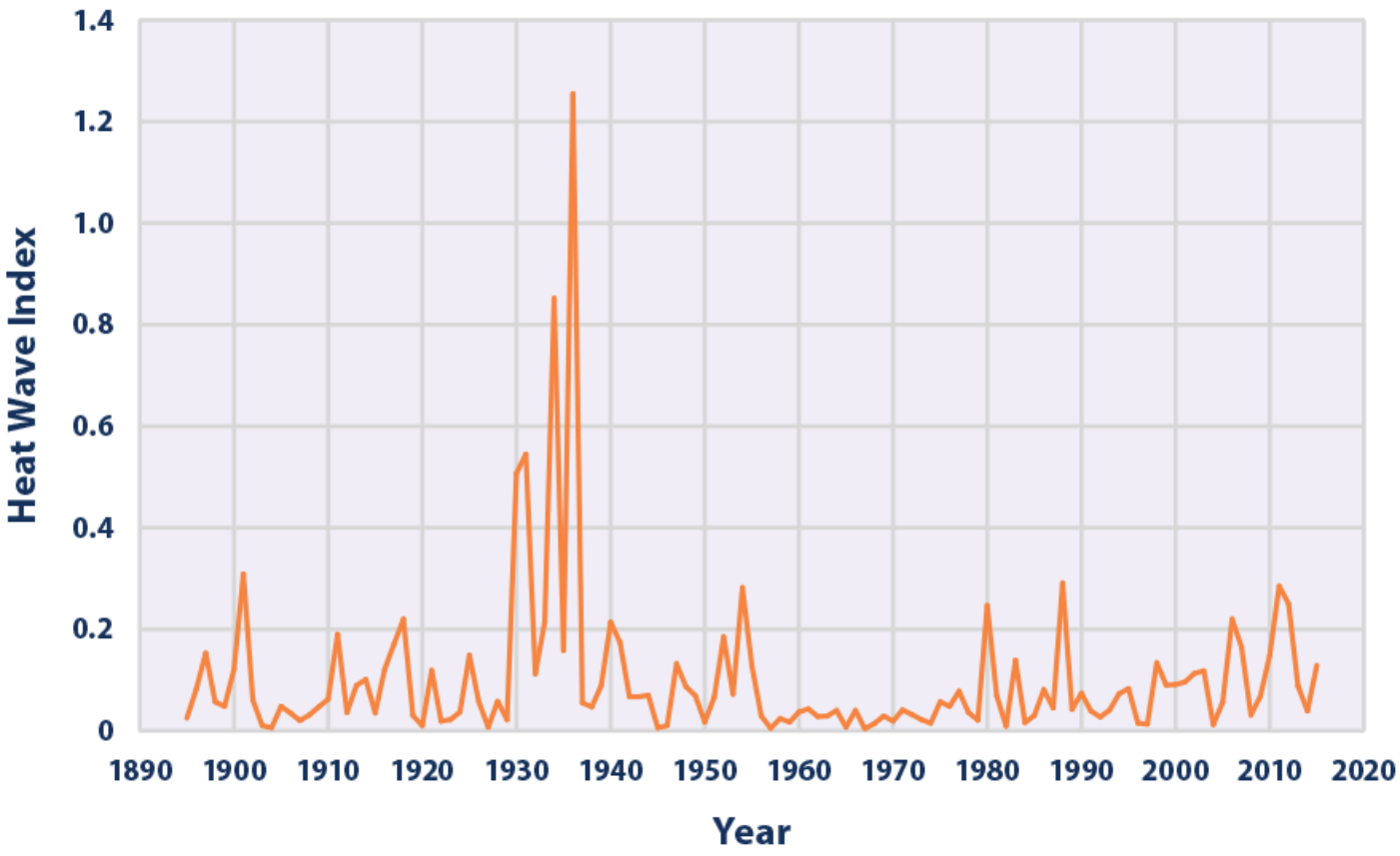
Extreme Weather?



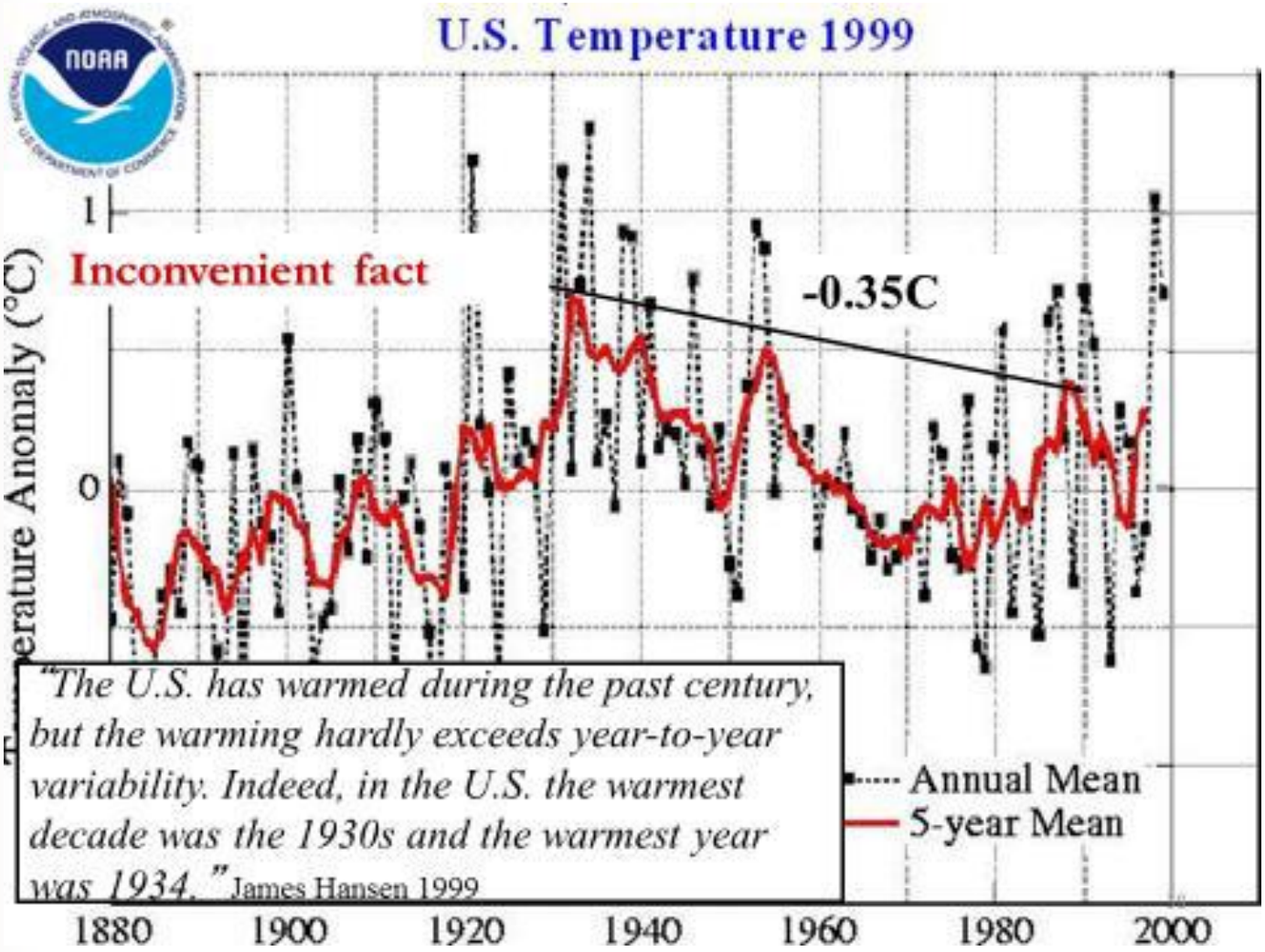
Actual Average Temperature

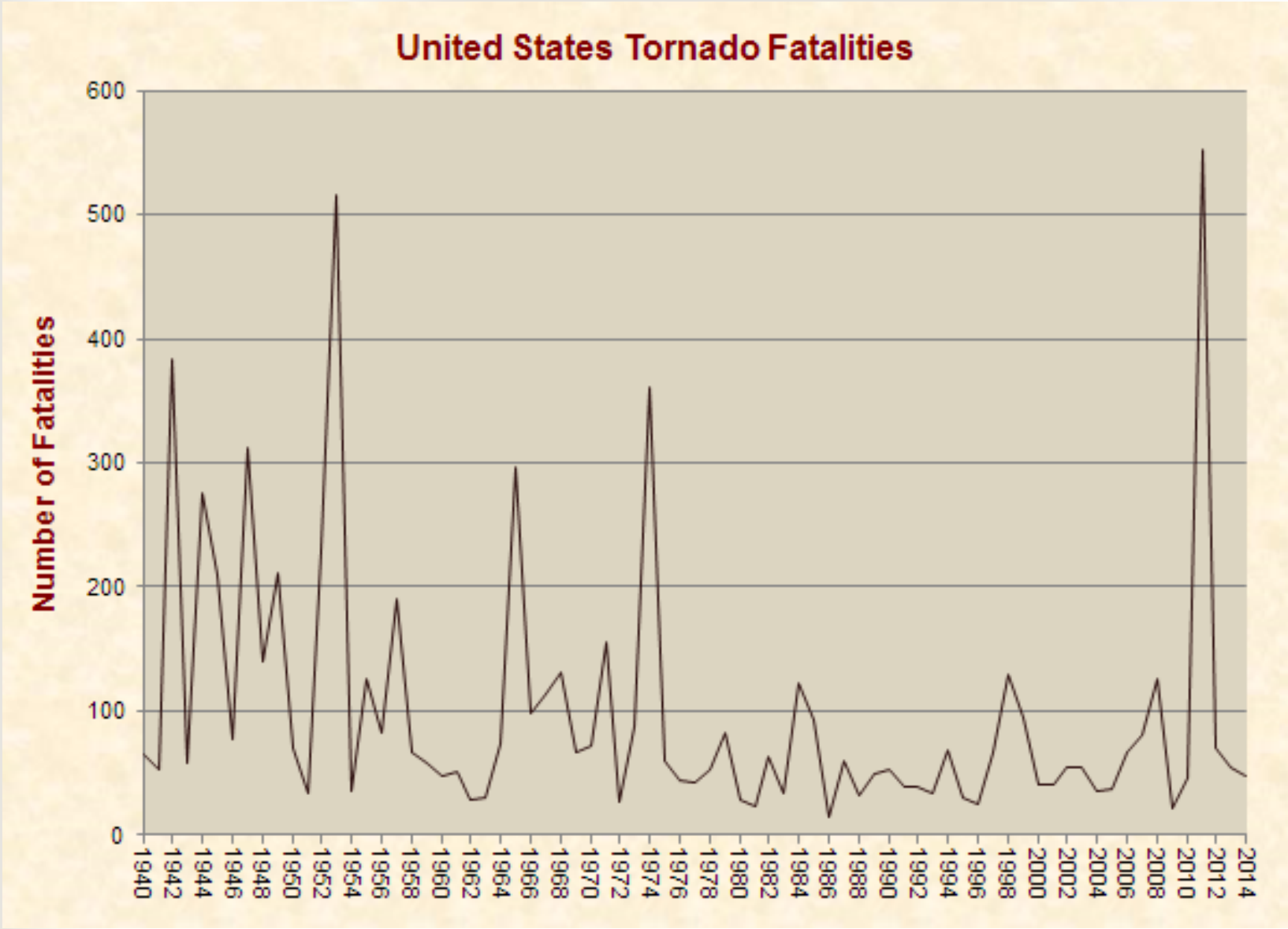


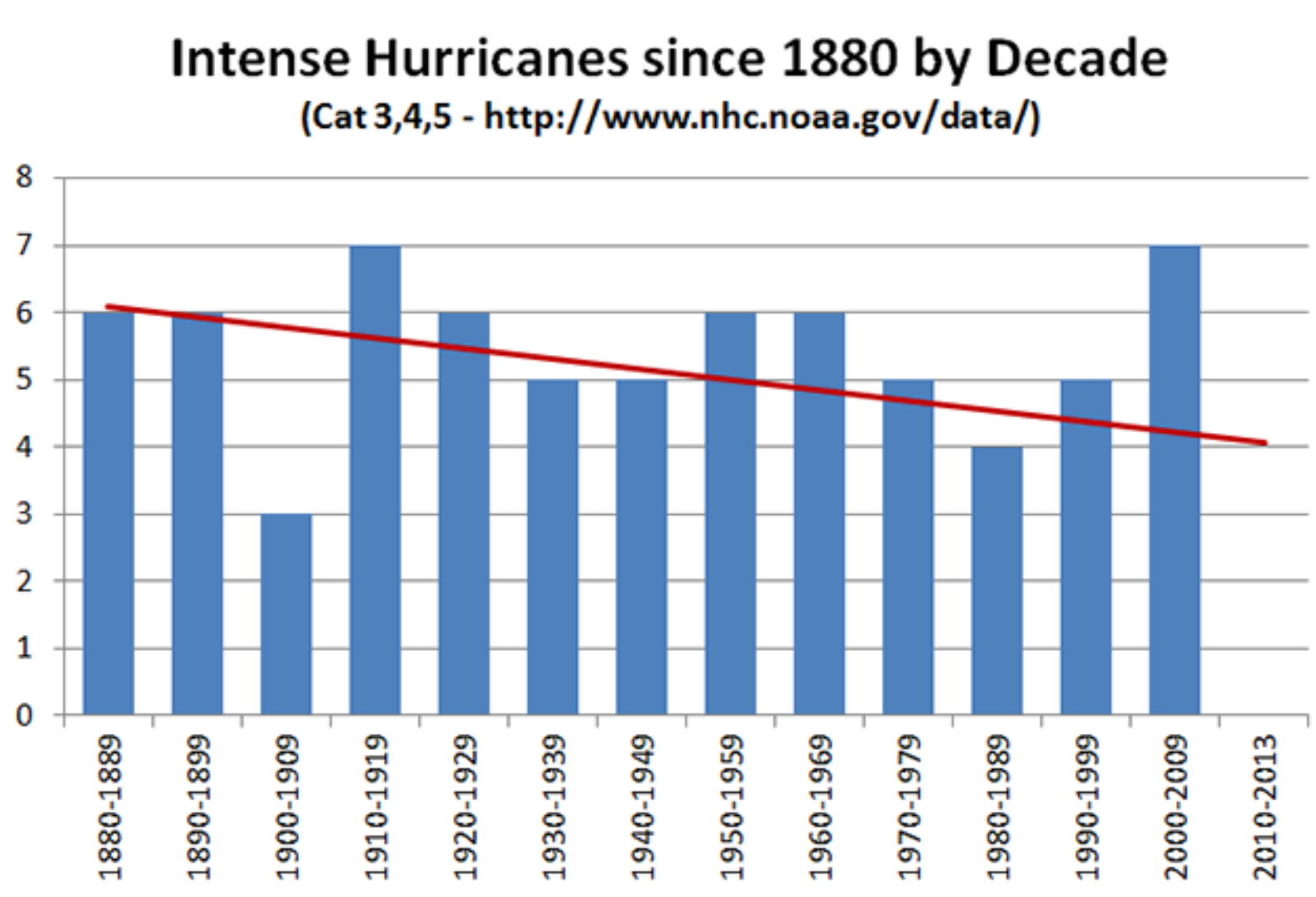
A U.S. Annual Heat Wave Index

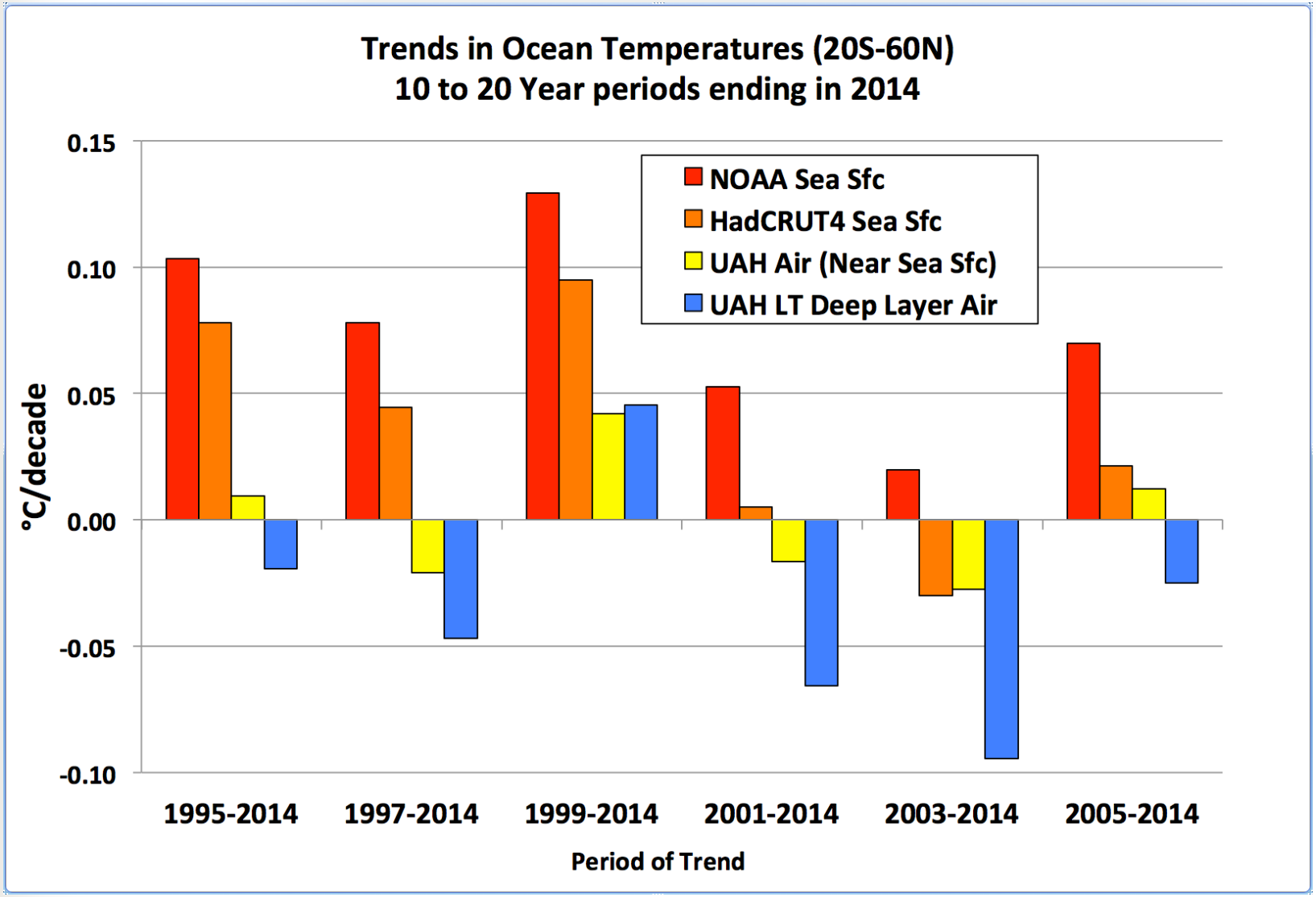


U.S. Temperature, 1880-2000

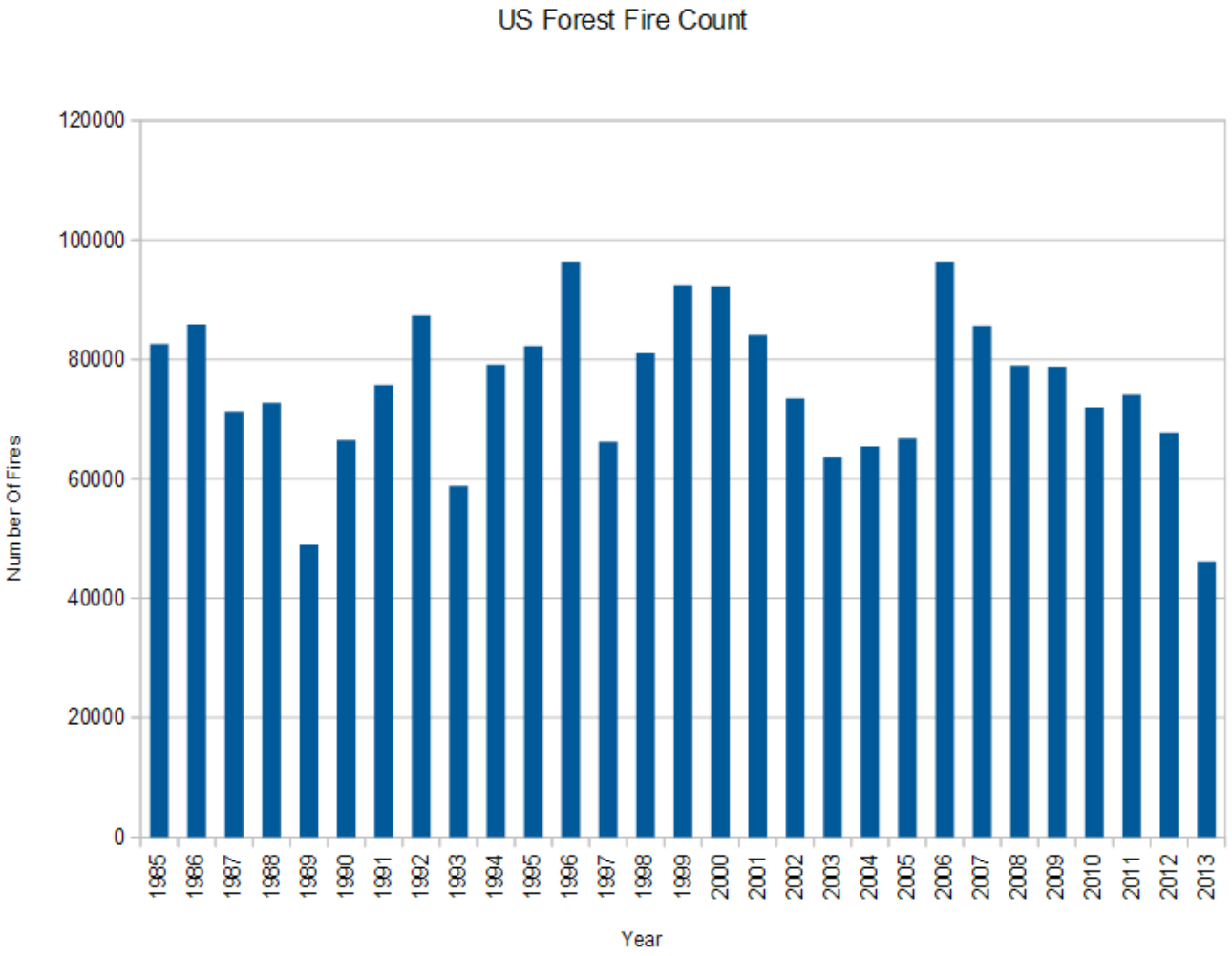



United States Tornado Fatalities
Number of Fatalities
600
500
400
300
200
100
0
1940
1942
1944
1946
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014


Intense Hurricanes since 1880 by Decade
(Cat 3,4,5 - http://www.nhc.noaa.gov/data/)
8
7
6
5
4
3
2
1
0
1880-1889
1890-1899
1900-1909
1910-1919
1920-1929
1930-1939
1940-1949
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2009
2010-2013


Trends in Ocean Temperatures (20S-60N)
10 to 20 Year periods ending in 2014
0.15
0.10
0.05
0.00
-0.05
-0.10
°C/decade
NOAA Sea Sfc
HadCRUT4 Sea Sfc
UAH Air (Near Sea Sfc)
UAH LT Deep Layer Air
1995-2014
1997-2014
1999-2014
2001-2014
2003-2014
2005-2014
Period of Trend

Frequency of U.S. Wildfires



Specific Issues in WA Senate Bill 5802: **Refuted** by Easterbrook (Climate Scientist)

1. Emissions of greenhouse gases from human activities is the principal cause of climate change.
2. Sea level is rising at an increasing rate because of GW
3. The frequency of severe storms is increasing because of GW
4. Reduced winter snow packs and decreased summer streamflows
5. Increasing acidification of the state's marine waters
6. Produce more electricity from renewable energy while phasing out coal-powered electricity generation

Global Cooling (GC) -> Global Warming (GW)?

GC alarmists – Gov. **Brown**, Dr. John **Holdren**, Dr. Paul **Ehrlich**
GW alarmists – Gov. **Brown** Jr., Dr. John **Holdren**, Al **Gore**

Global Cooling? Global Warming?

Gov. Jerry Brown's 1977 Global Cooling BS, Recycled As Gov. Jerry Brown, Jr's 2014 Global Warming BS
Posted on **July 30, 2014**


The New York Times

TUESDAY, MARCH 8, 1977

Brown Warns of Drought Disaster; Says 'Hard Choices' Face California

In **1977**, **Governor Brown** warned that California was facing an unprecedented drought, blamed at the time on **Global Cooling**

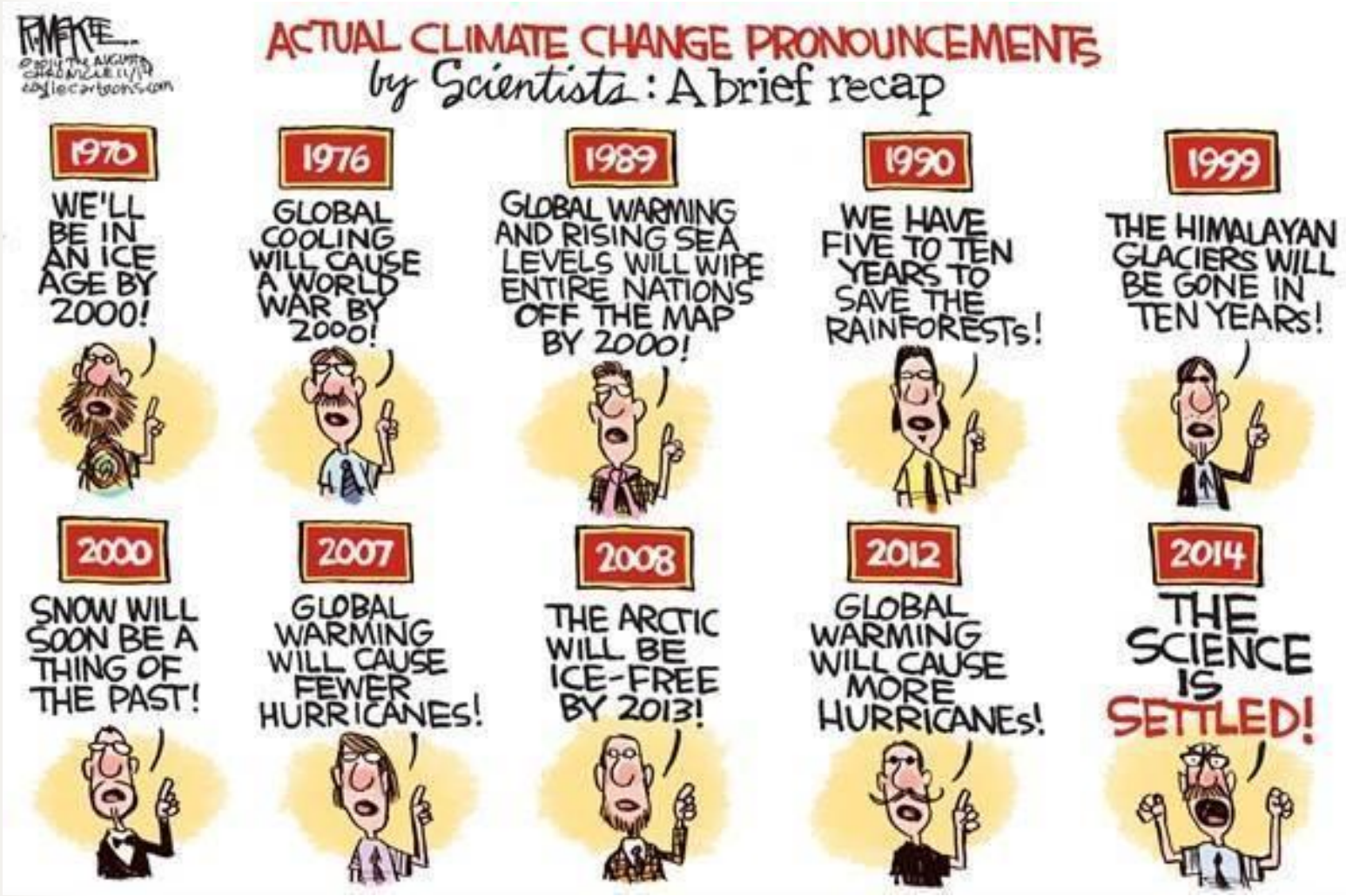

CALIFORNIA GOVERNOR JERRY BROWN:
1977: 'UNPRECEDENTED CALIFORNIA DROUGHT CAUSED BY GLOBAL COOLING'
2015: 'UNPRECEDENTED CALIFORNIA DROUGHT CAUSED BY GLOBAL WARMING'
'HOT, COLD - WHAT'S THE DIFFERENCE?'
DAVIDICKE.COM

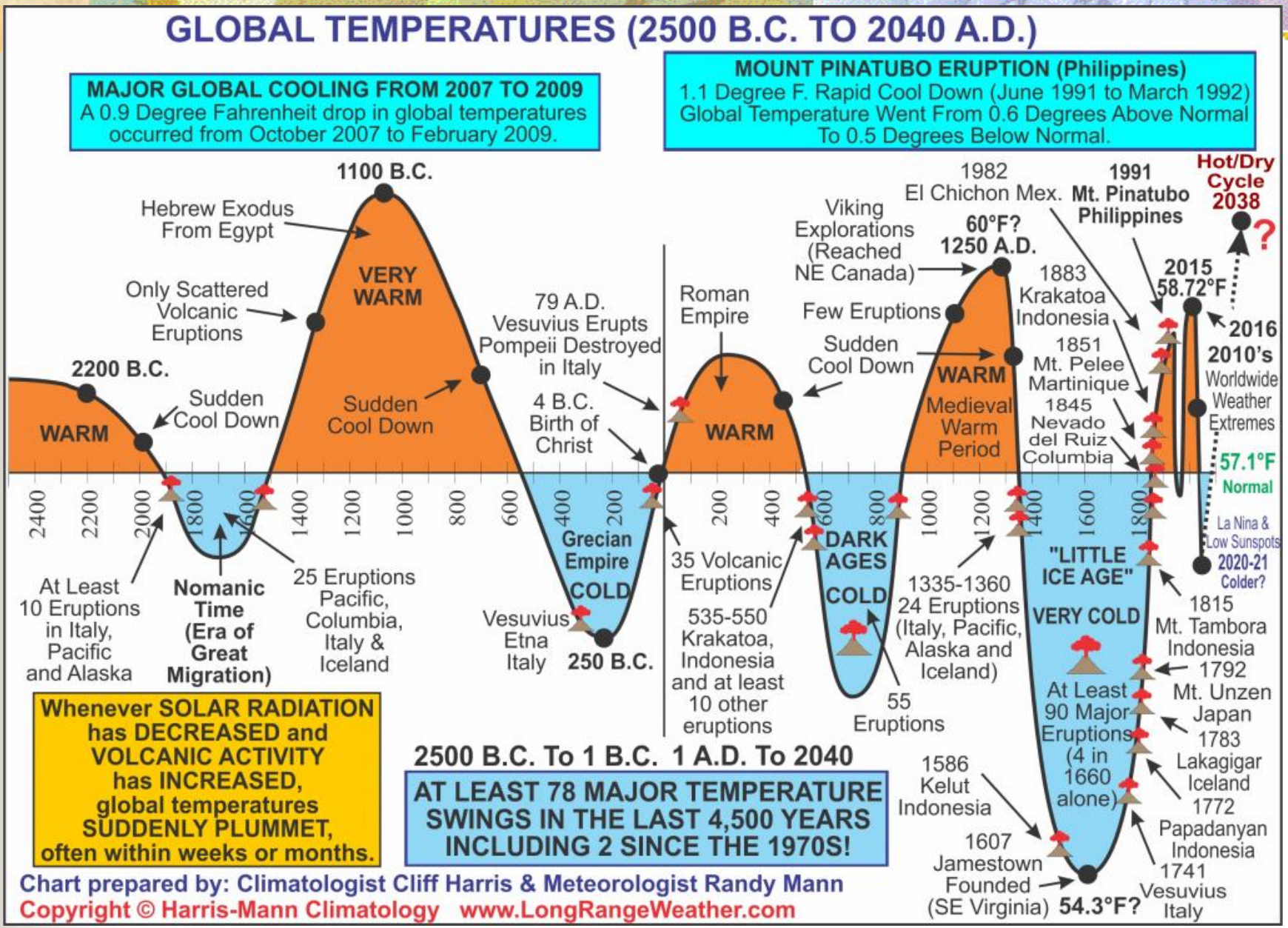

"The entire North
'polarized' cap will
disappear in 5 years."
-Al Gore, 2008
North Pole Ice Cap
August, 2013

Botched Predictions for 2015

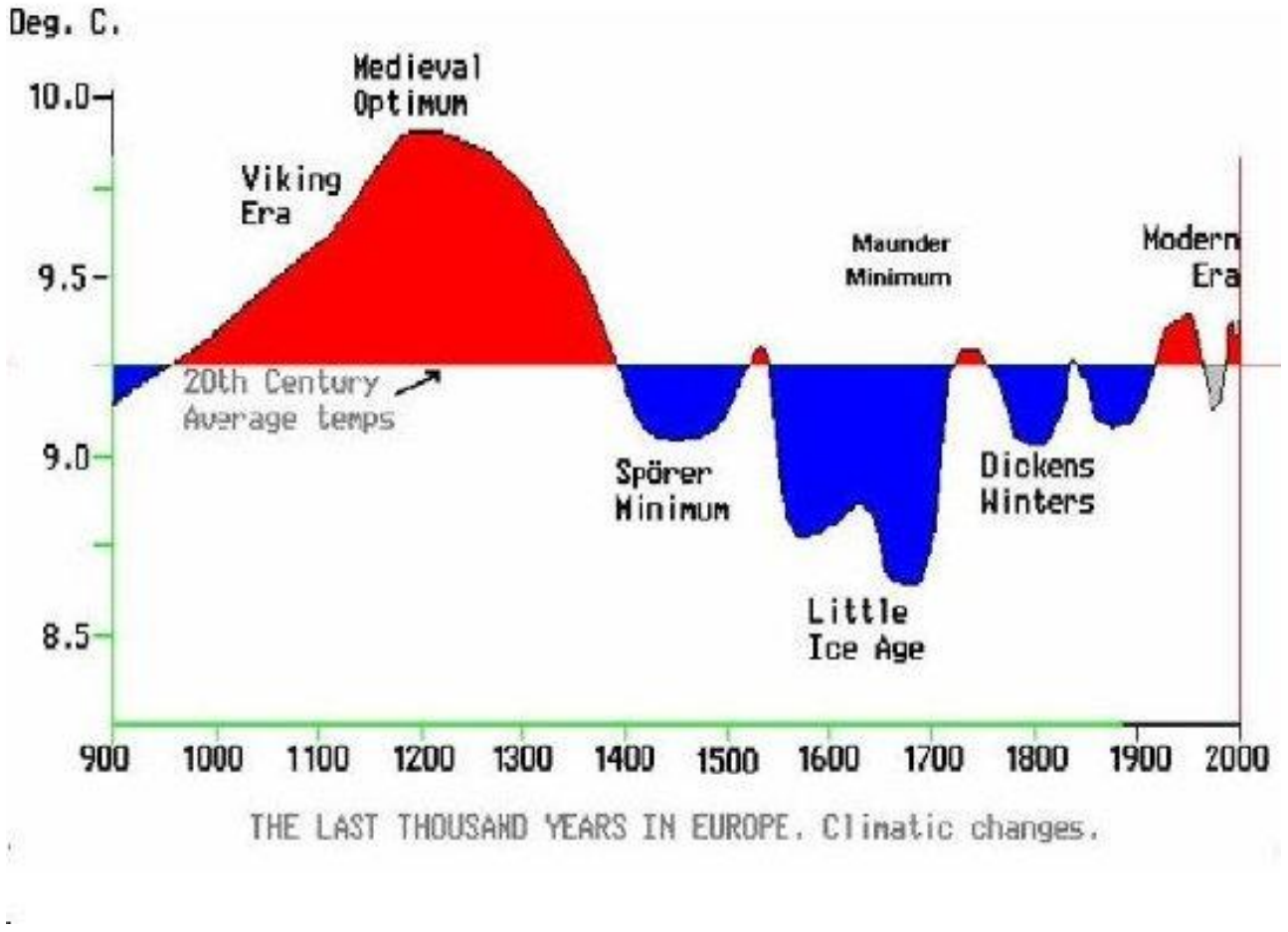
- Predictions by Dr. Paul Ehrlich, **Dr. John Holdren** [Obama's Science Advisor], the UN
  - Made in **1970's** and **1980's** about **Global Cooling**
- All came to naught:
  - UN overestimated GW by 2015
  - All Rainforest Species Will Be Extinct
  - Oil will run out by 2015
  - Arctic sea ice will disappear by 2015
  - Looking to the future: A billion people could die from climate change by 2020
- **Holdren in 1971**: "new ice age likely"

Failed Tipping Points

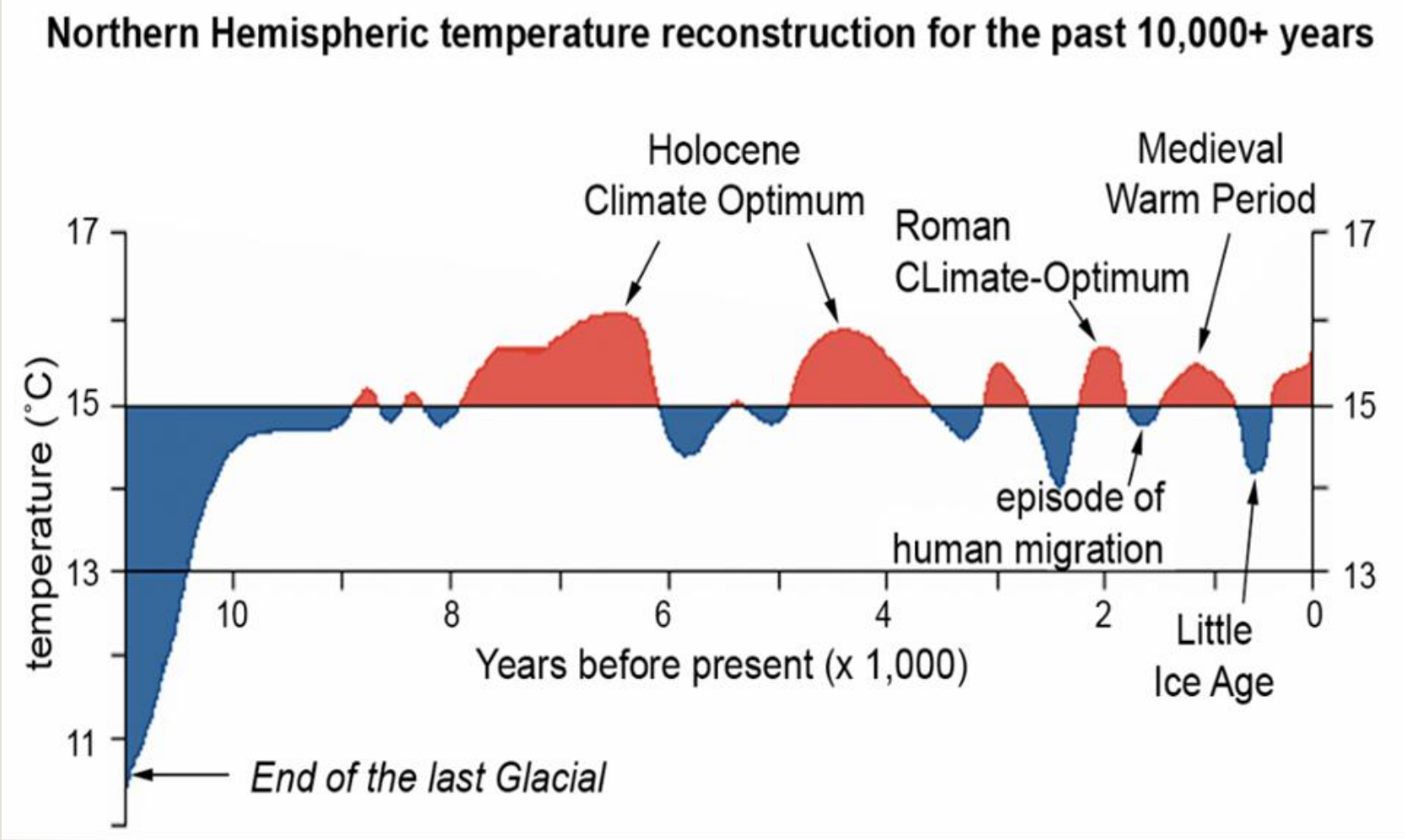


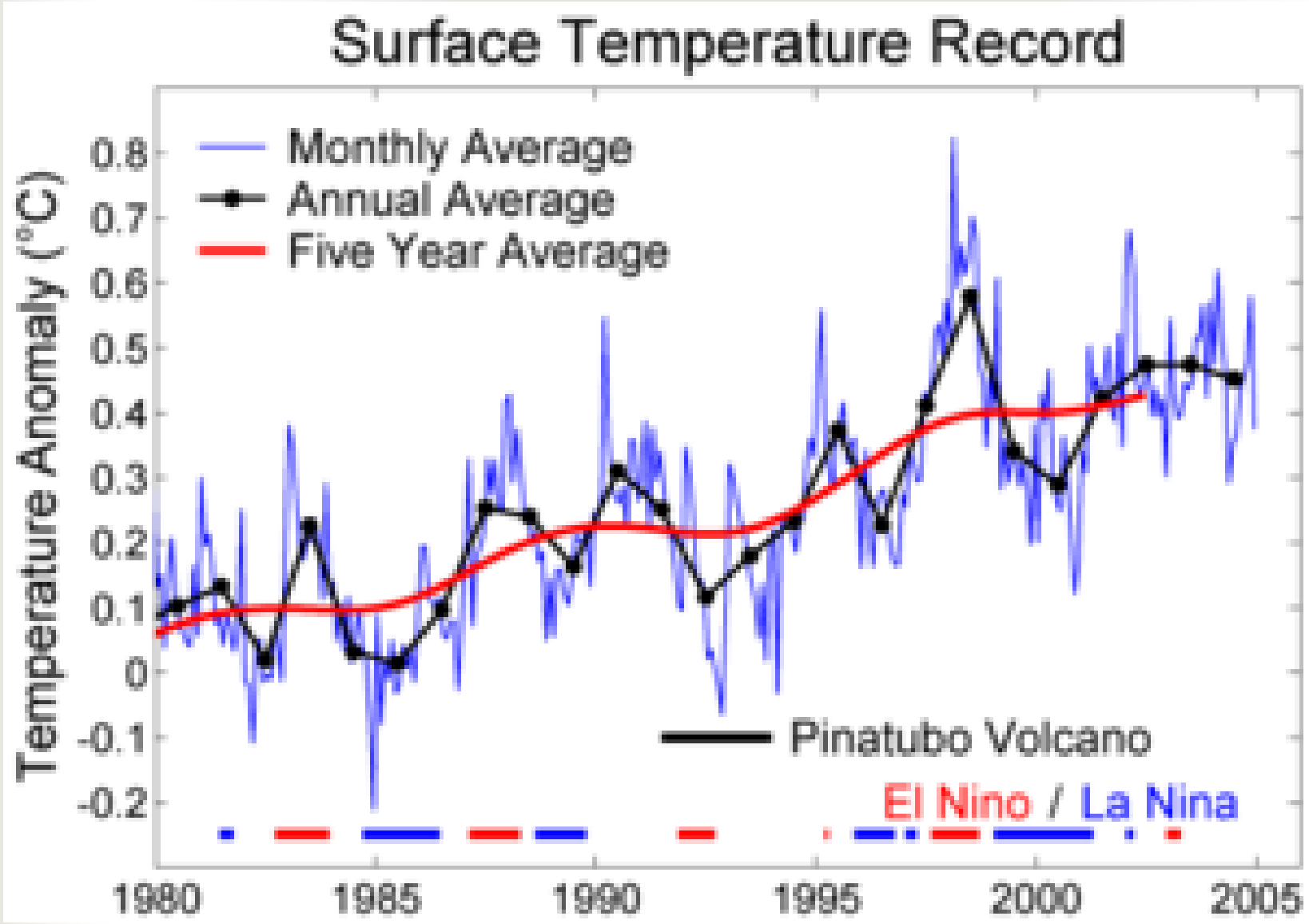

GLOBAL TEMPERATURES (2500 B.C. TO 2040 A.D.)
MAJOR GLOBAL COOLING FROM 2007 TO 2009
A 0.9 Degree Fahrenheit drop in global temperatures occurred from October 2007 to February 2009.
MOUNT PINATUBO ERUPTION (Philippines)
1.1 Degree F. Rapid Cool Down (June 1991 to March 1992)
Global Temperature Went From 0.6 Degrees Above Normal To 0.5 Degrees Below Normal.
1100 B.C.
Hebrew Exodus From Egypt
Only Scattered Volcanic Eruptions
VERY WARM
2200 B.C.
WARM
Sudden Cool Down
Sudden Cool Down
79 A.D. Vesuvius Erupts Pompeii Destroyed in Italy
4 B.C. Birth of Christ
Roman Empire
WARM
Viking Explorations (Reached NE Canada)
60°F? 1250 A.D.
Few Eruptions
Sudden Cool Down
WARM
Medieval Warm Period
1982 El Chichon Mex.
1991 Mt. Pinatubo Philippines
1883 Krakatoa Indonesia
1851 Mt. Pelee Martinique
1845 Nevado del Ruiz Columbia
Hot/Dry Cycle 2038
?
2015 58.72°F
2016
2010's
Worldwide Weather Extremes
57.1°F
Normal
La Nina & Low Sunspots
2020-21
Colder?
2400 2200 2000 1800 1600 1400 1200 1000 800 600 400 200 200 400 600 800 1000 1200 1400 1600 1800
At Least 10 Eruptions in Italy, Pacific and Alaska
Nomanic Time (Era of Great Migration)
25 Eruptions Pacific, Columbia, Italy & Iceland
Grecian Empire
COLD
Vesuvius Etna Italy
250 B.C.
35 Volcanic Eruptions
535-550 Krakatoa, Indonesia and at least 10 other eruptions
DARK AGES
COLD
55 Eruptions
1335-1360 24 Eruptions (Italy, Pacific, Alaska and Iceland)
"LITTLE ICE AGE"
VERY COLD
At Least 90 Major Eruptions (4 in 1660 alone)
1815 Mt. Tambora Indonesia
1792 Mt. Unzen Japan
1783 Lakagigar Iceland
1772 Papadanyan Indonesia
1741 Vesuvius Italy
1586 Kelut Indonesia
1607 Jamestown Founded (SE Virginia)
54.3°F?
Whenever SOLAR RADIATION has DECREASED and VOLCANIC ACTIVITY has INCREASED, global temperatures SUDDENLY PLUMMET, often within weeks or months.
2500 B.C. To 1 B.C. 1 A.D. To 2040
AT LEAST 78 MAJOR TEMPERATURE SWINGS IN THE LAST 4,500 YEARS INCLUDING 2 SINCE THE 1970S!
Chart prepared by: Climatologist Cliff Harris & Meteorologist Randy Mann
Copyright © Harris-Mann Climatology www.LongRangeWeather.com

Last Thousand Years in Europe

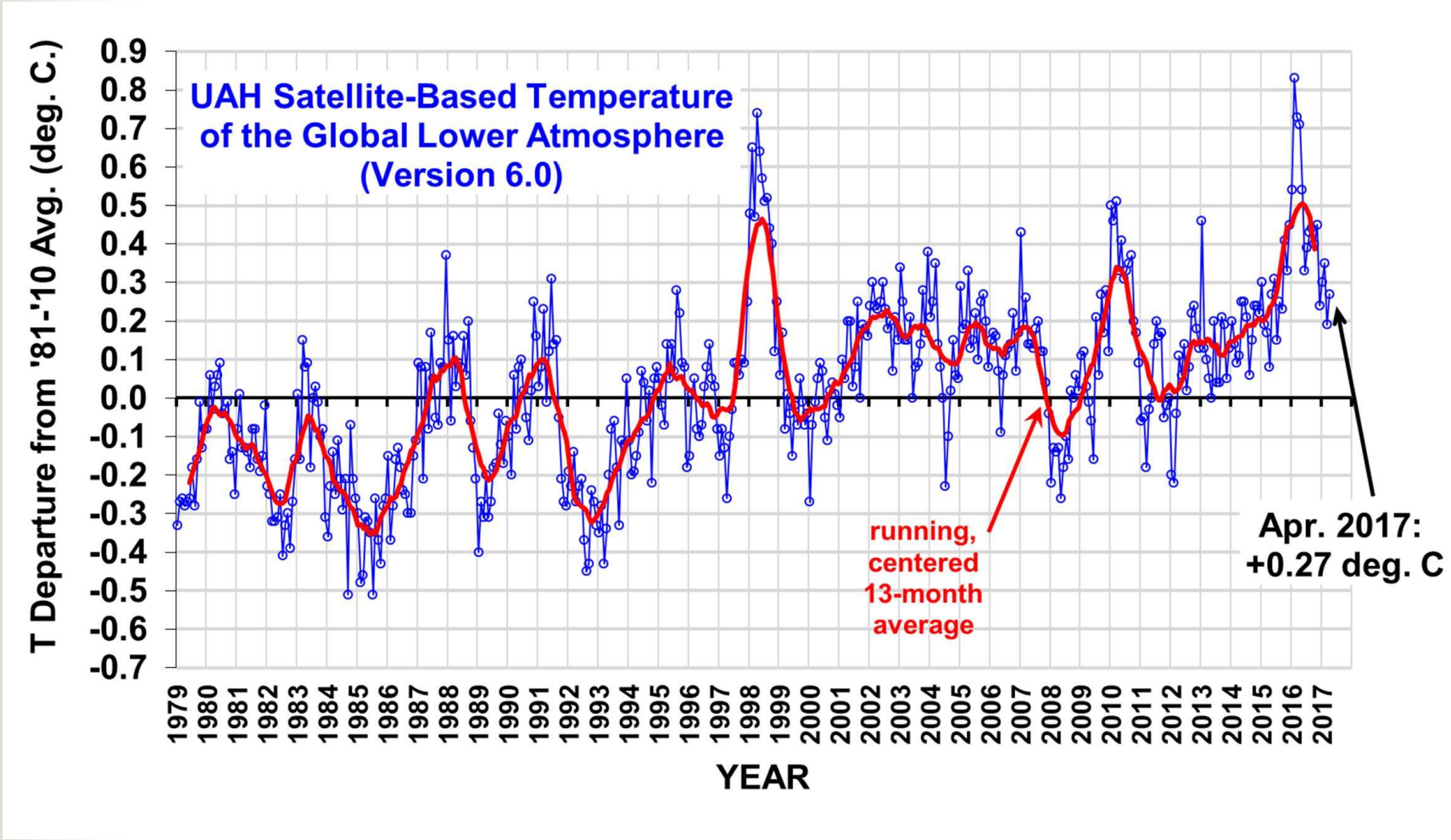


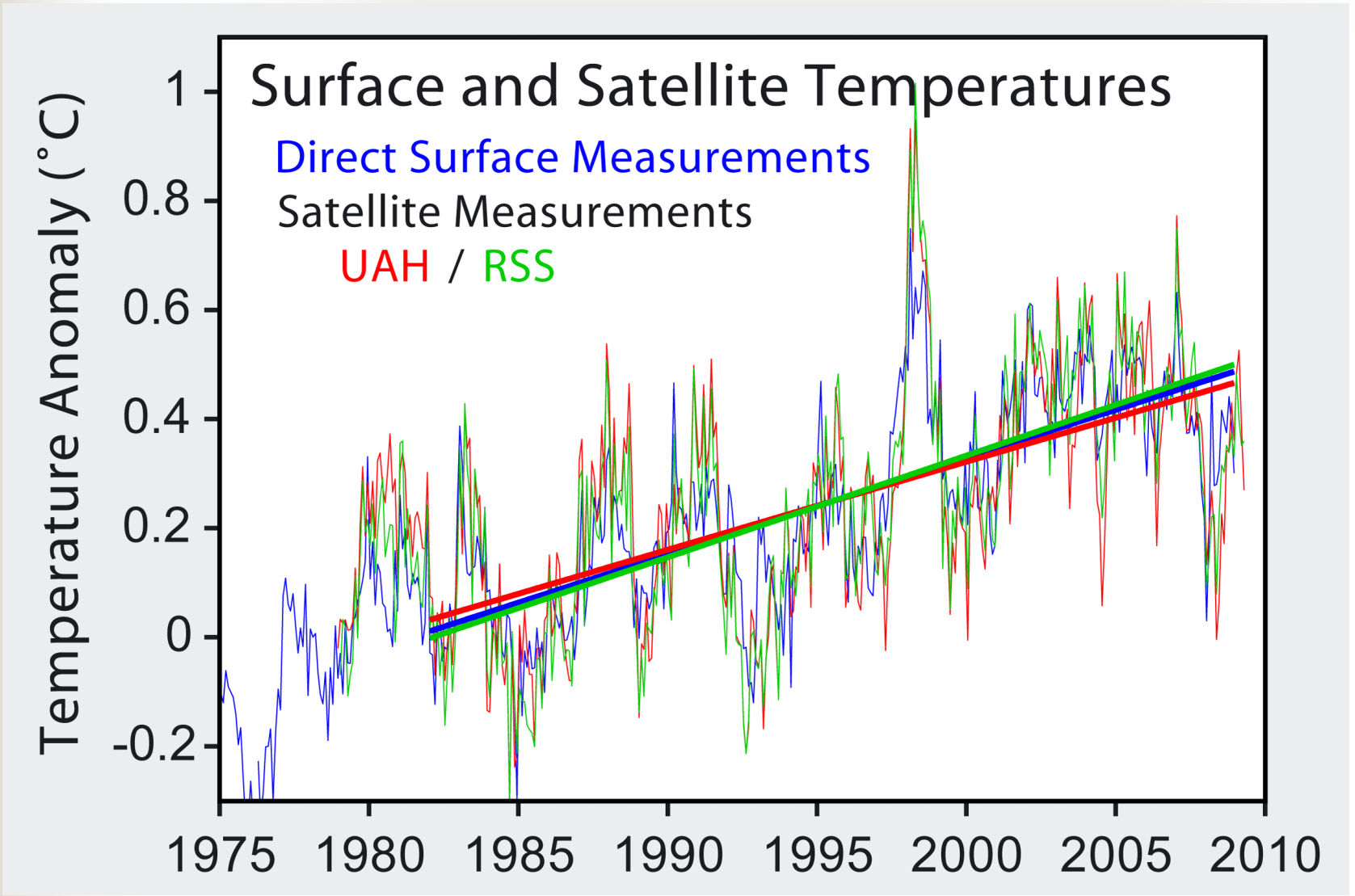
Temperature Reconstruction



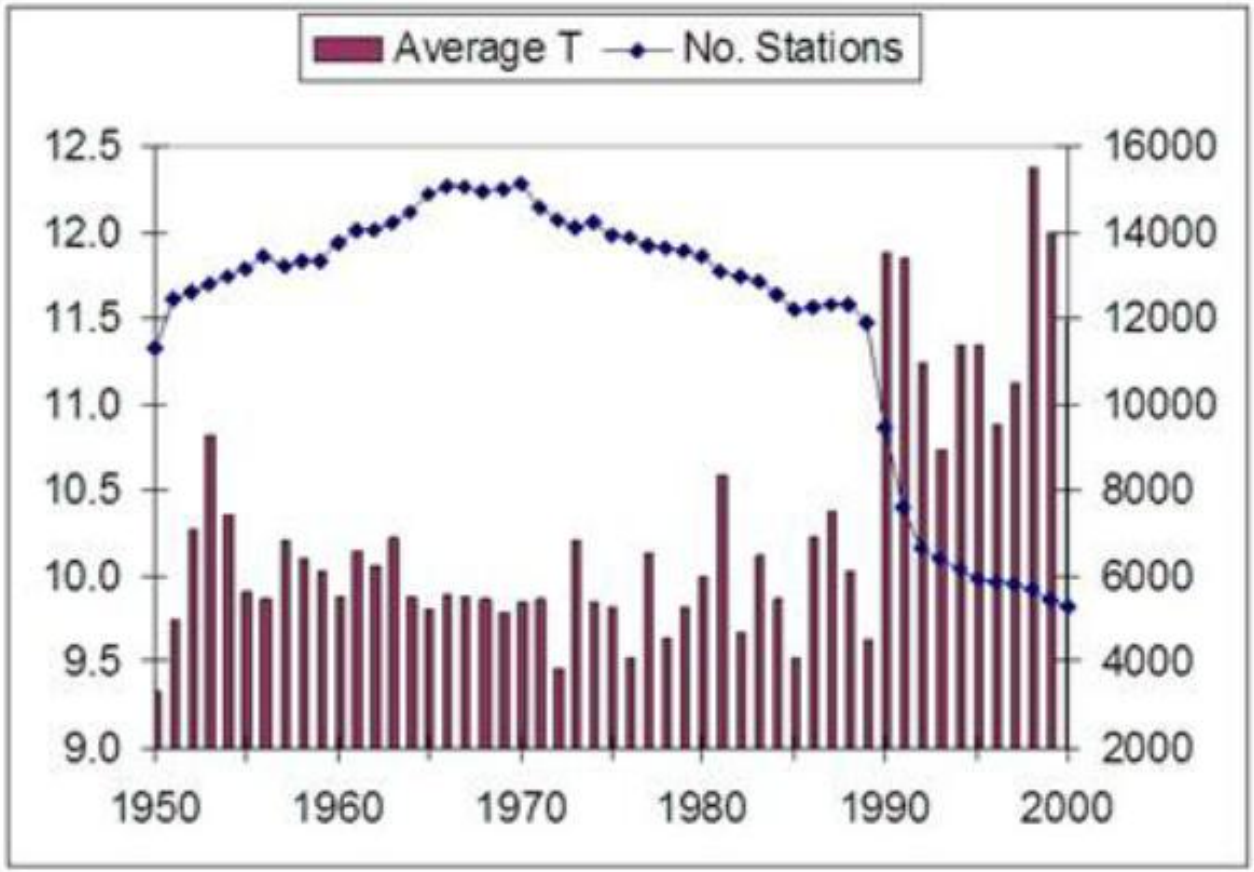

Surface Temperature Record
Monthly Average
Annual Average
Five Year Average
Temperature Anomaly (°C)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
Pinatubo Volcano
El Nino / La Nina
1980
1985
1990
1995
2000
2005

Satellite-Based Temperature



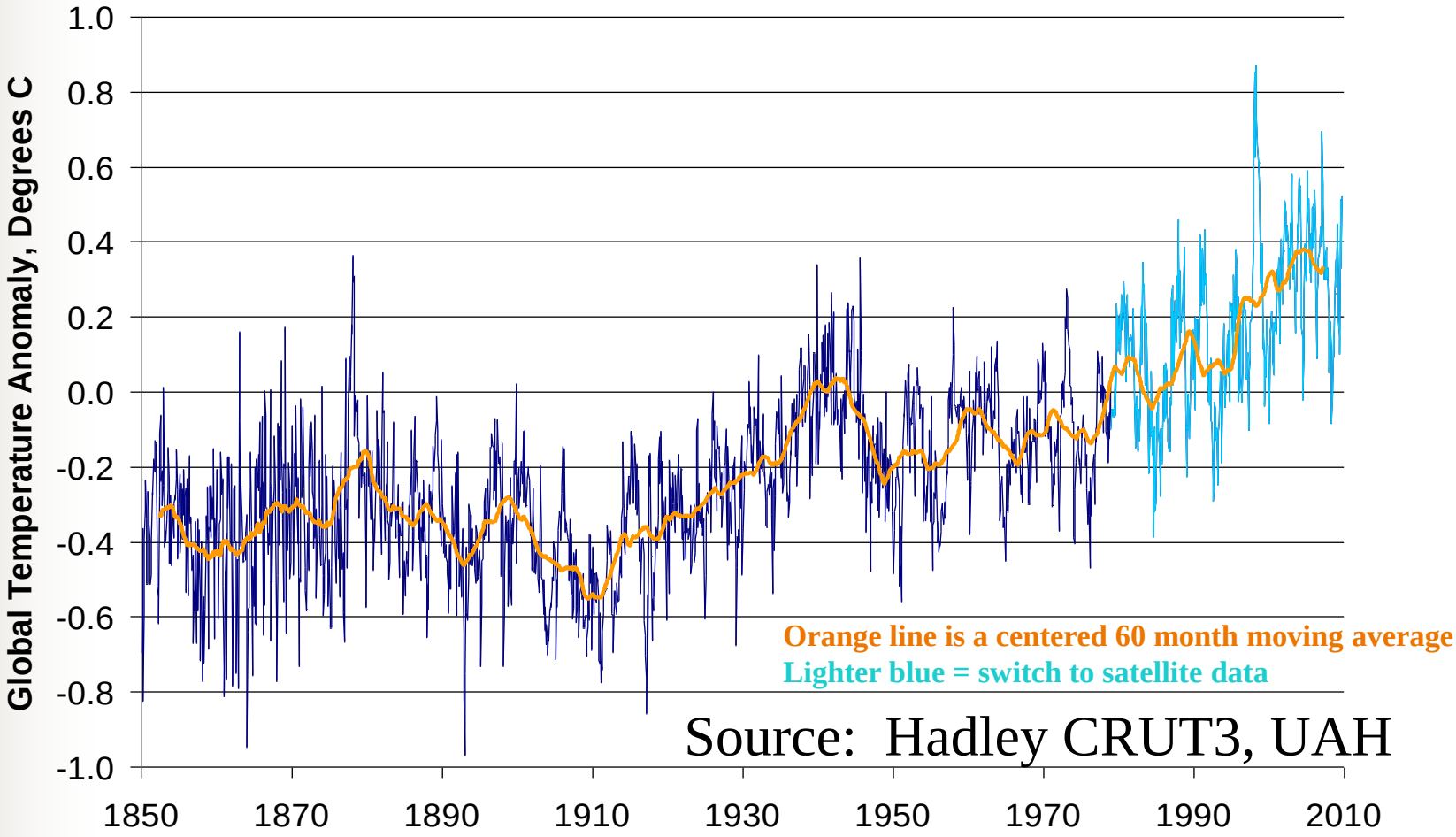

Surface and Satellite Temperatures
Direct Surface Measurements
Satellite Measurements
UAH / RSS
Temperature Anomaly (°C)
1
0.8
0.6
0.4
0.2
0
-0.2
1975
1980
1985
1990
1995
2000
2005
2010

Correlation of Average Temperature and Number of Surface Stations

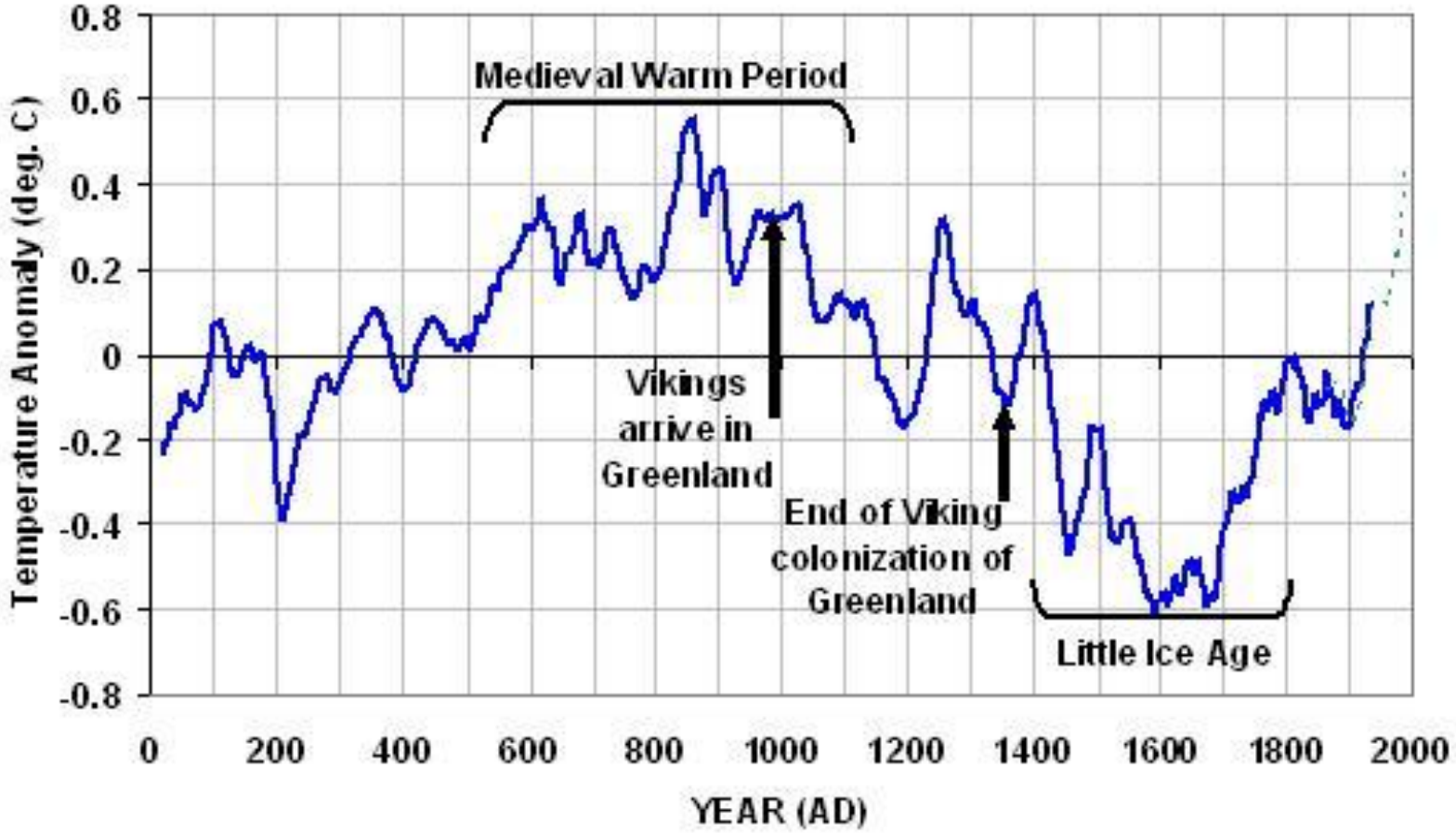


Eliminated data from weather stations likely to show global cooling

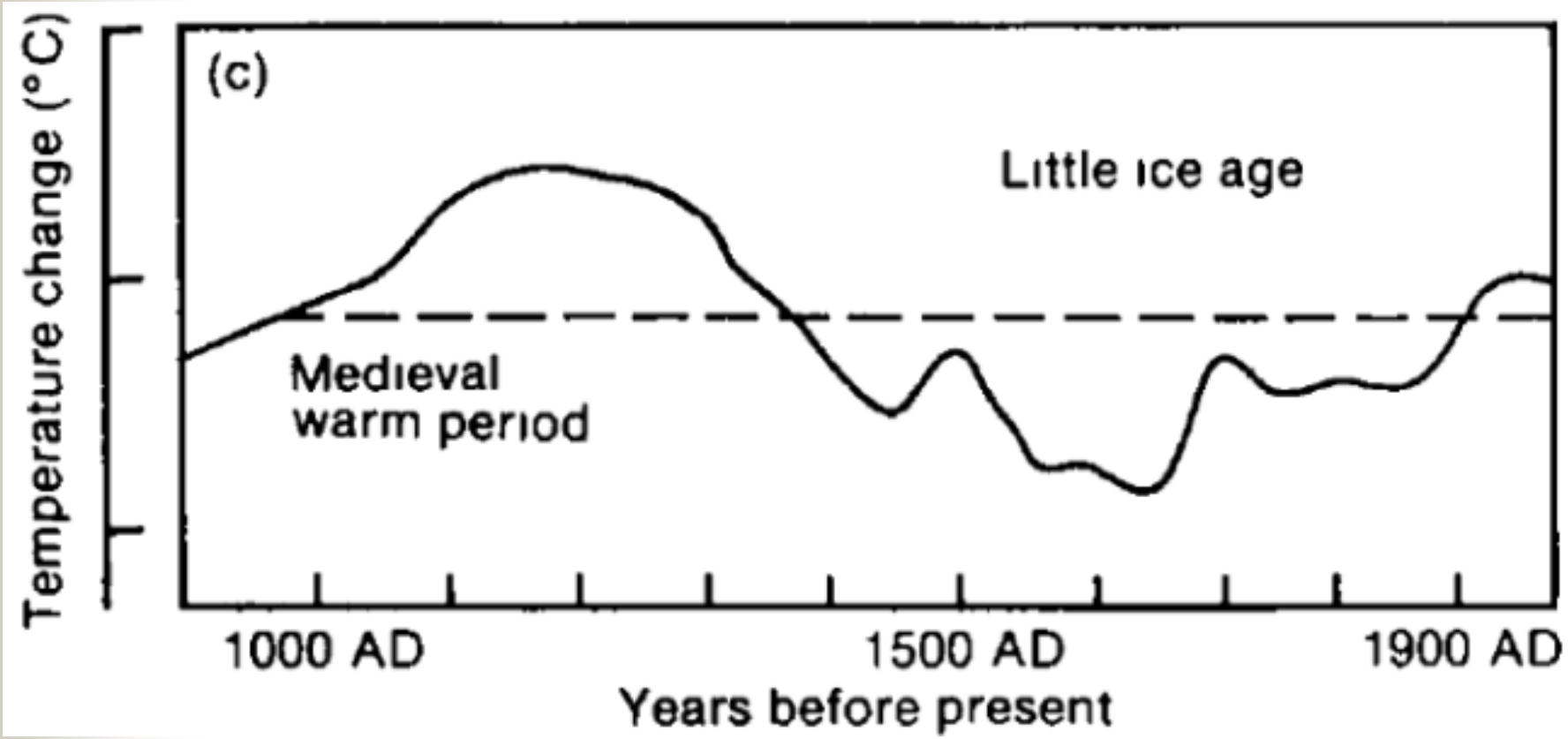
Historic Temperature Record Shows Warming of About 0.6C



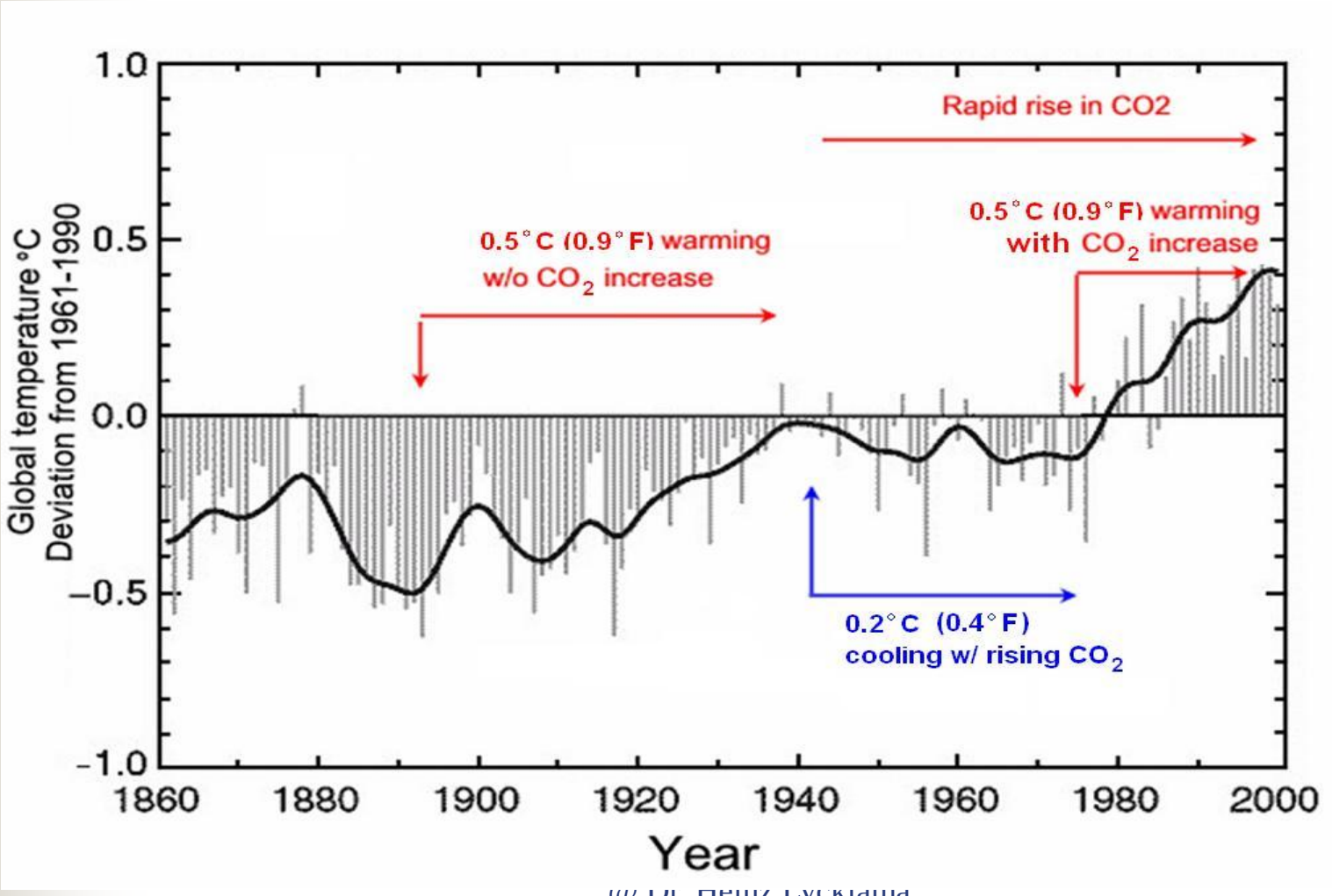
2000 Years of Global Temperatures



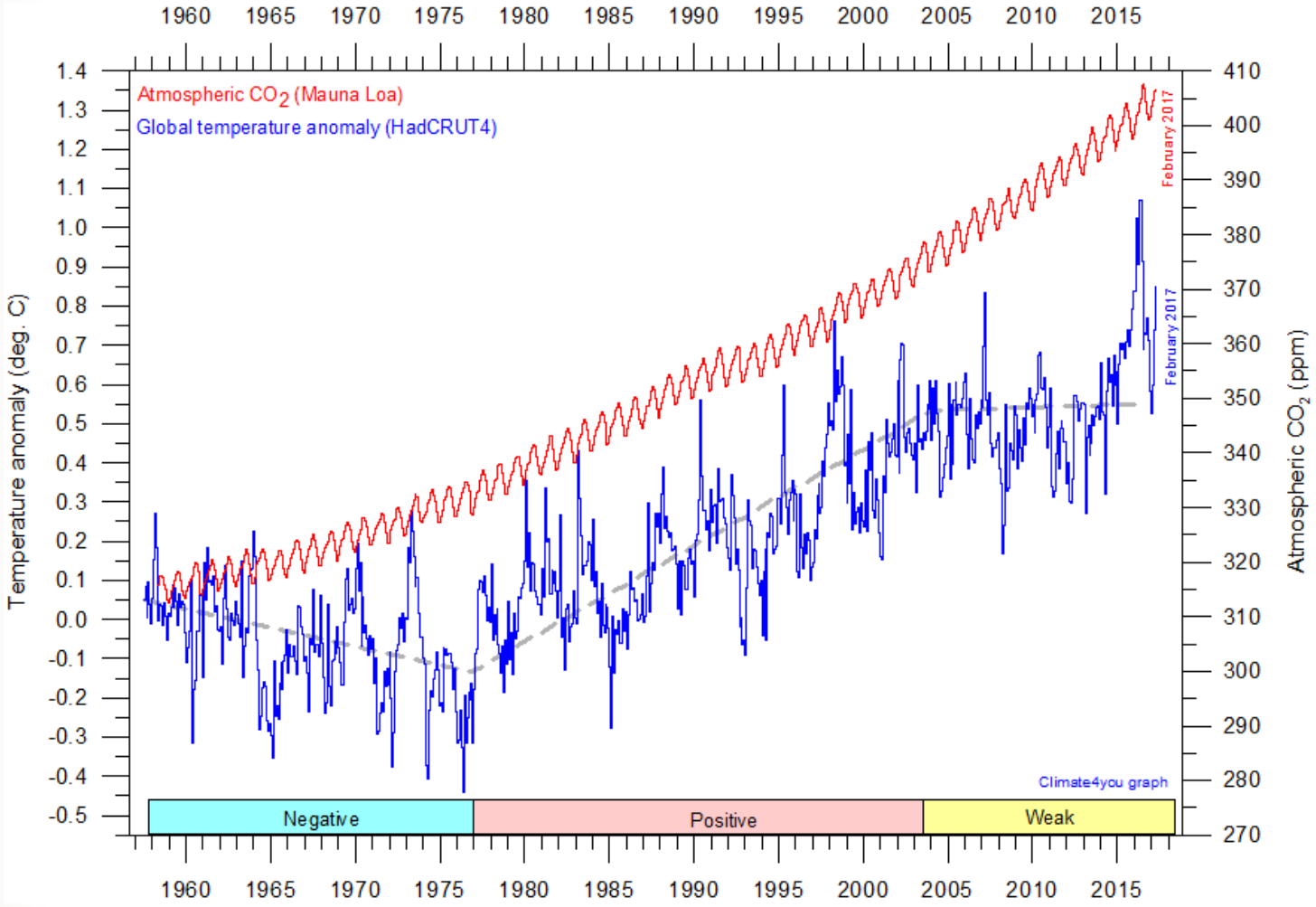
Temperature Change:1000-1900 AD

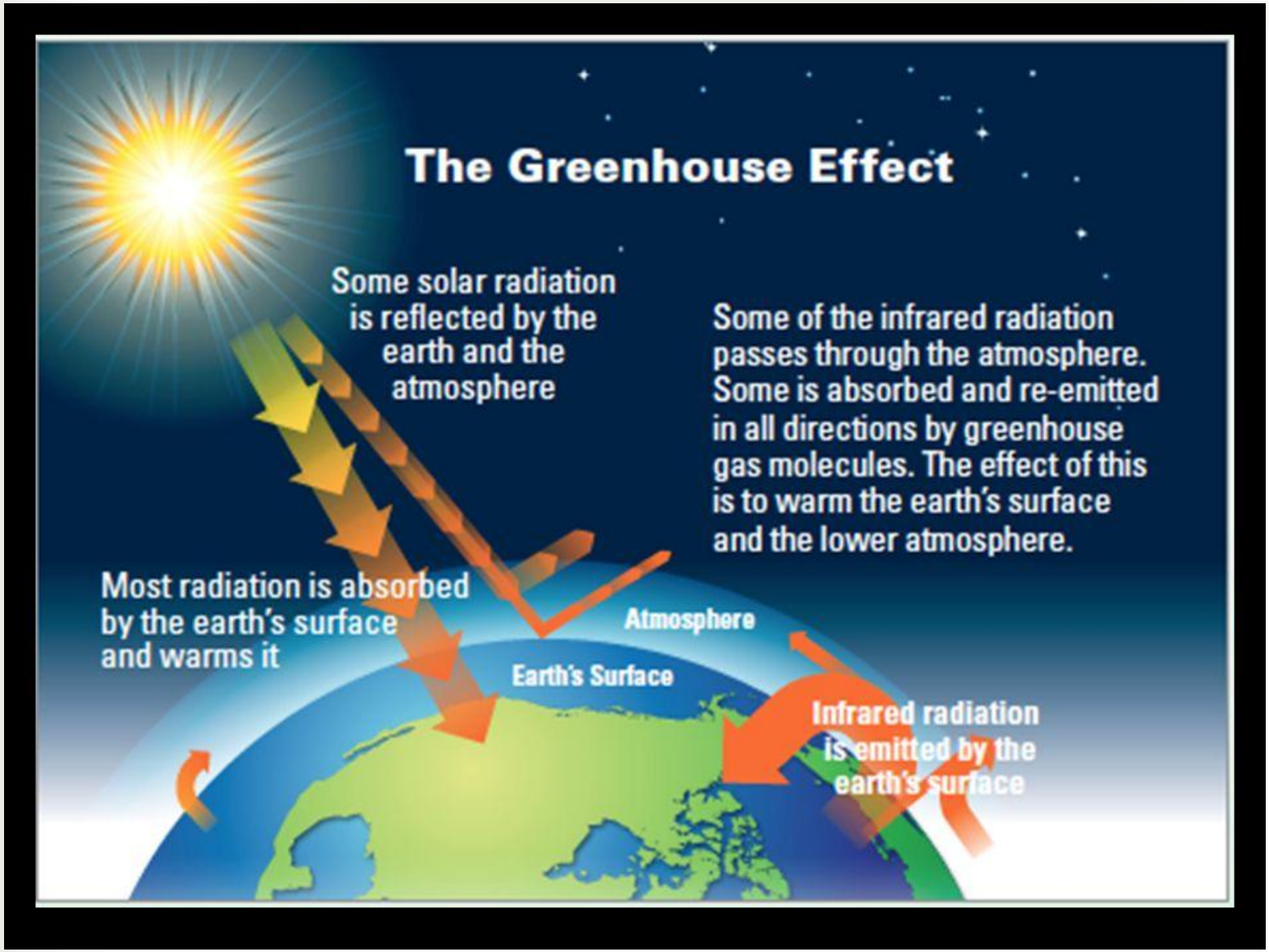


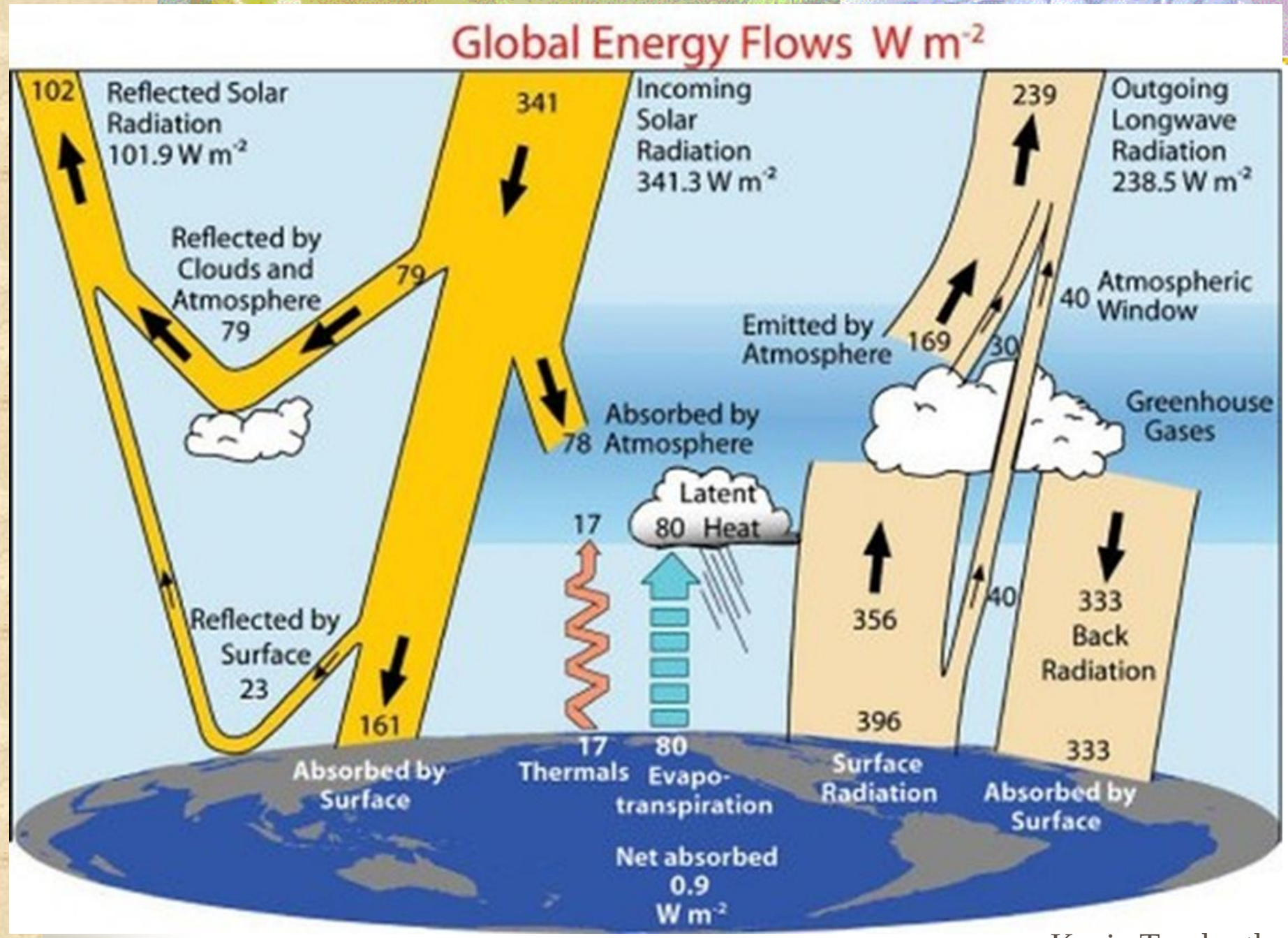
Global Temperature Changes, 1860 - 2000



Global Temperature Anomaly




The Greenhouse Effect
Some solar radiation is reflected by the earth and the atmosphere
Some of the infrared radiation passes through the atmosphere. Some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the earth's surface and the lower atmosphere.
Most radiation is absorbed by the earth's surface and warms it
Atmosphere
Earth's Surface
Infrared radiation is emitted by the earth's surface



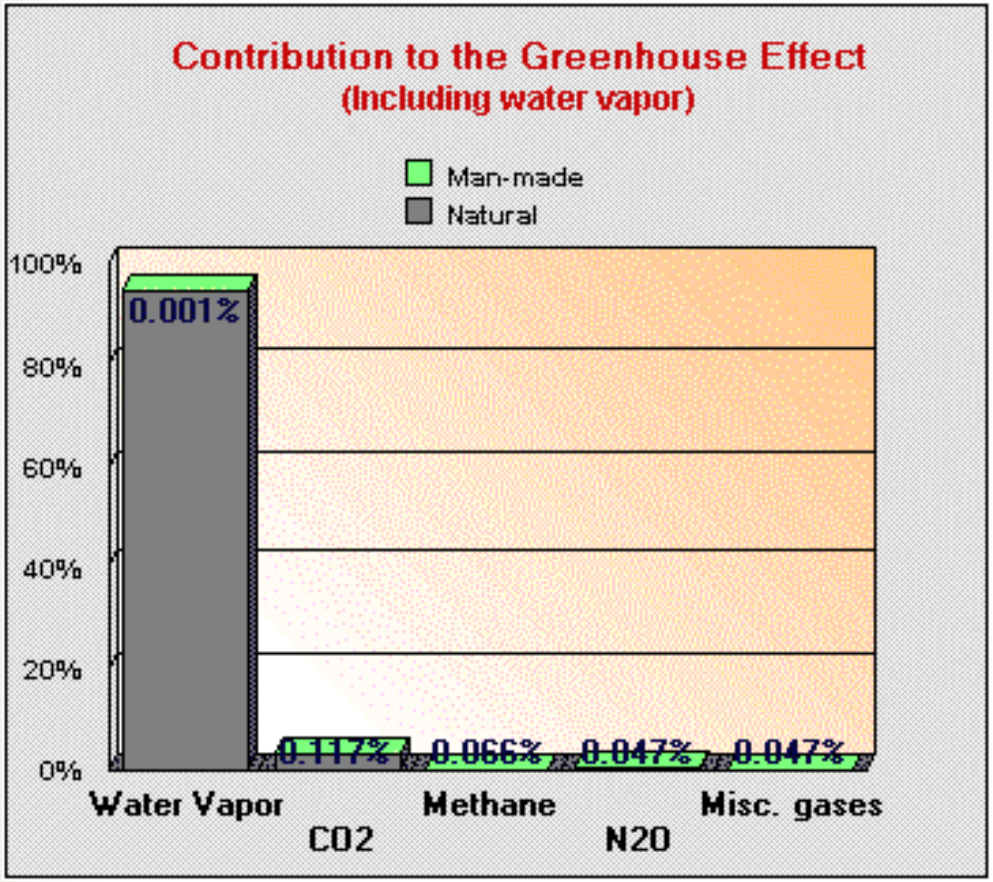
Kevin Trenberth

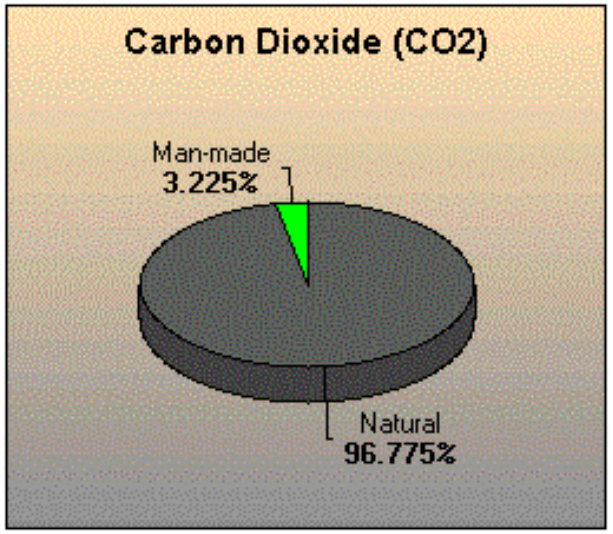
Anthropogenic Contribution

Anthropogenic (man-made) Contribution to the "Greenhouse Effect," expressed as % of Total (water vapor INCLUDED)

Based on concentrations (ppb) adjusted for heat retention characteristics	% of All Greenhouse Gases	% Natural	% Man-made
Water vapor	95.000%	94.999%	**0.001%**
Carbon Dioxide (CO2)	3.618%	3.502%	**0.117%**
Methane (CH4)	0.360%	0.294%	**0.066%**
Nitrous Oxide (N2O)	0.950%	0.903%	**0.047%**
Misc. gases (CFC's, etc.)	0.072%	0.025%	**0.047%**
Total	100.00%	**99.72**	**0.28%**

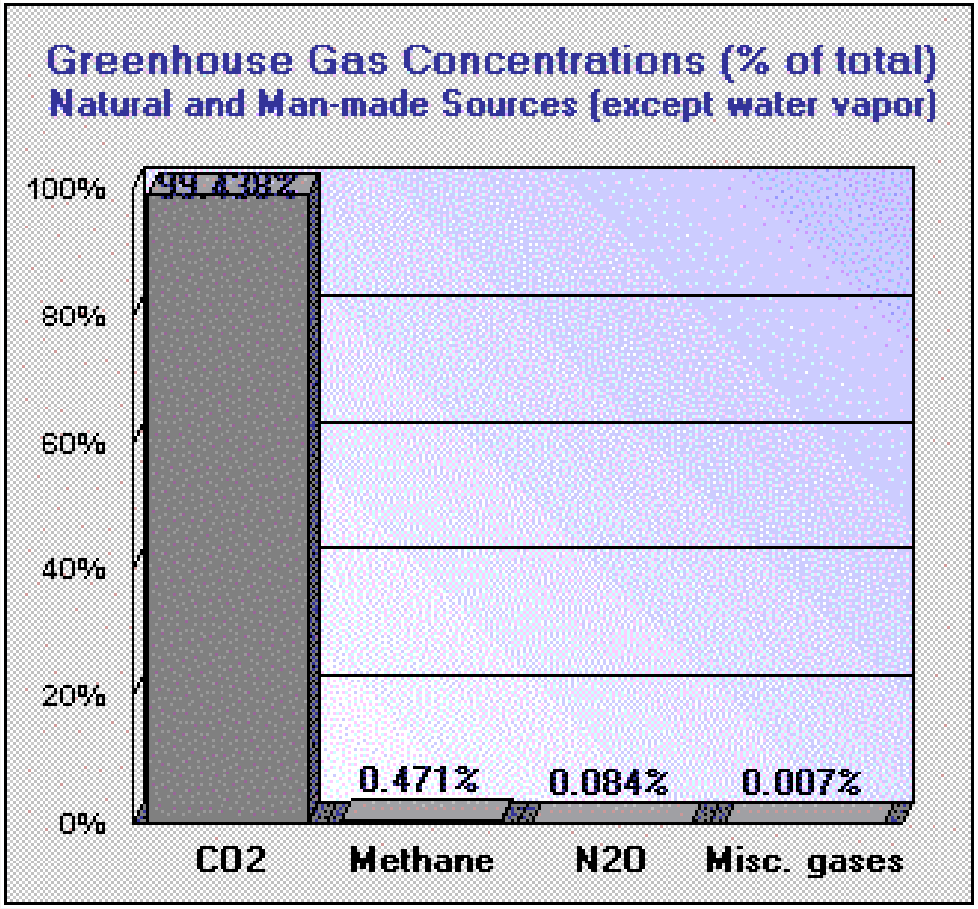
Greenhouse Gases (with Water Vapor)

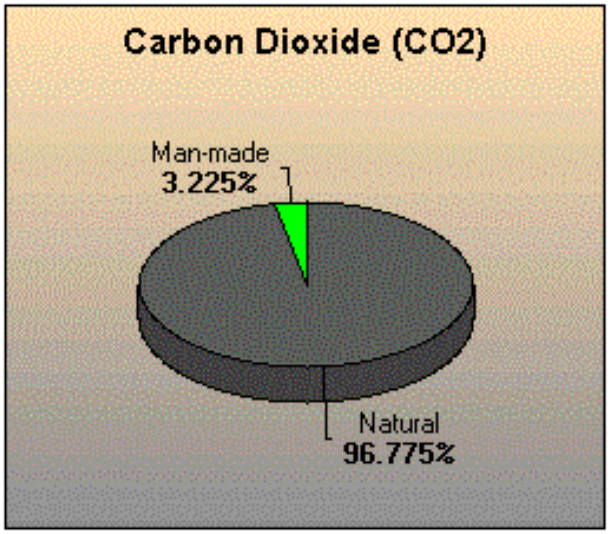




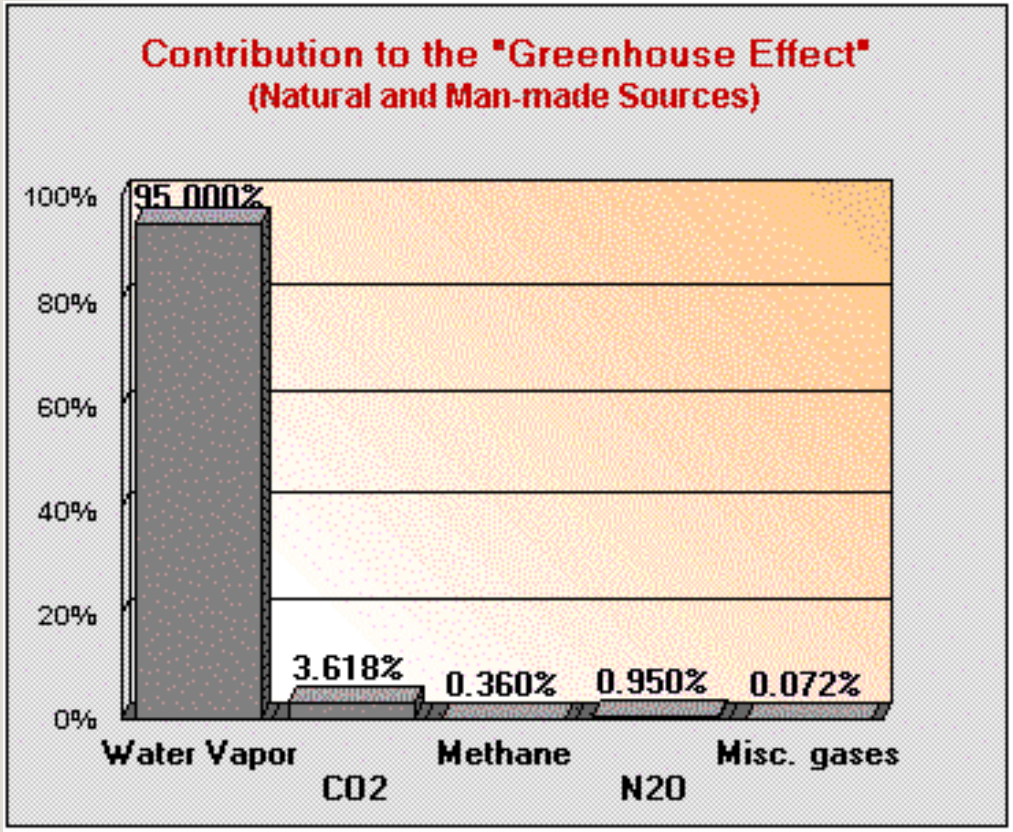
Human contribution to greenhouse effect = 0.28%

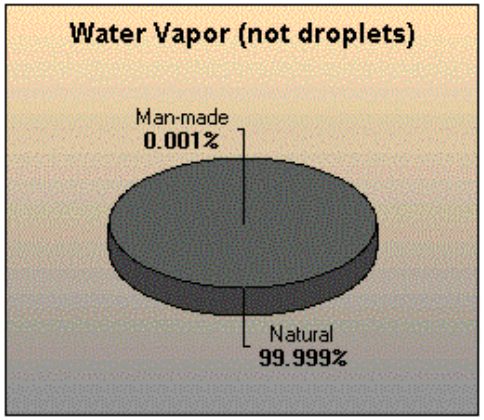
Greenhouse Gases (no Water Vapor)

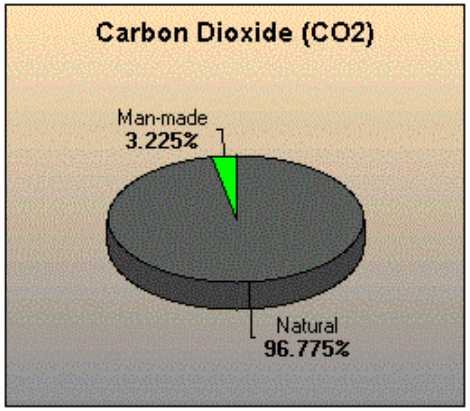




Natural & Manmade Sources



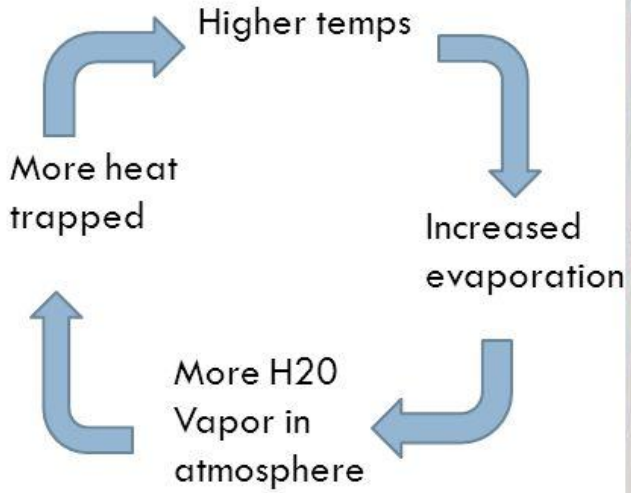


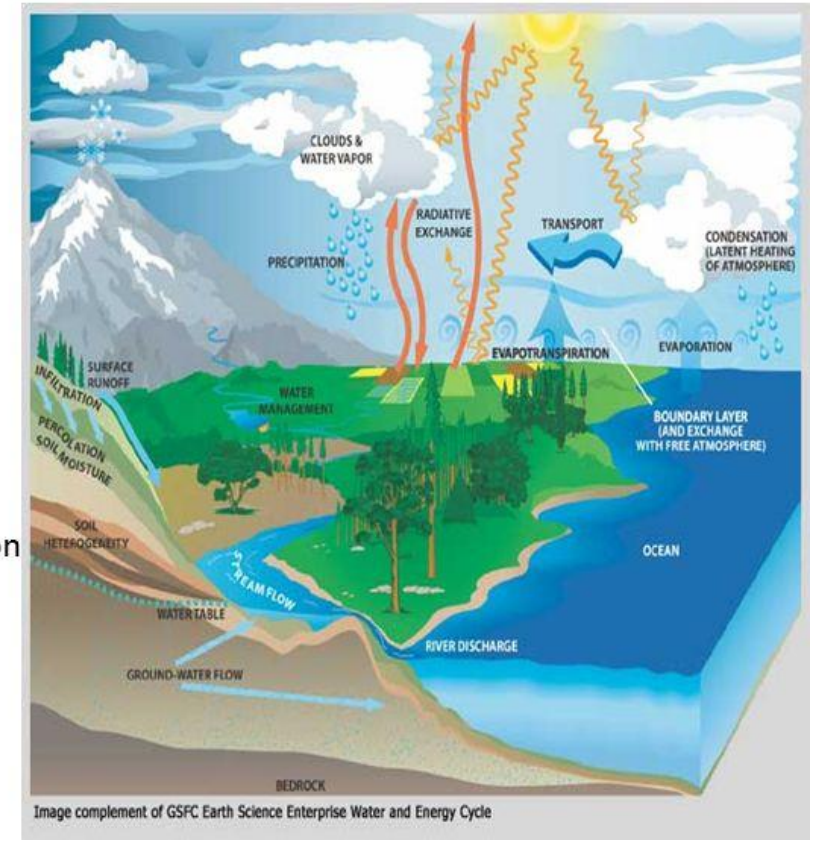


Man-made CO2 contributions cause only about **0.117%** of Earth's **greenhouse effect**, (factoring in **water vapor**). This is insignificant!

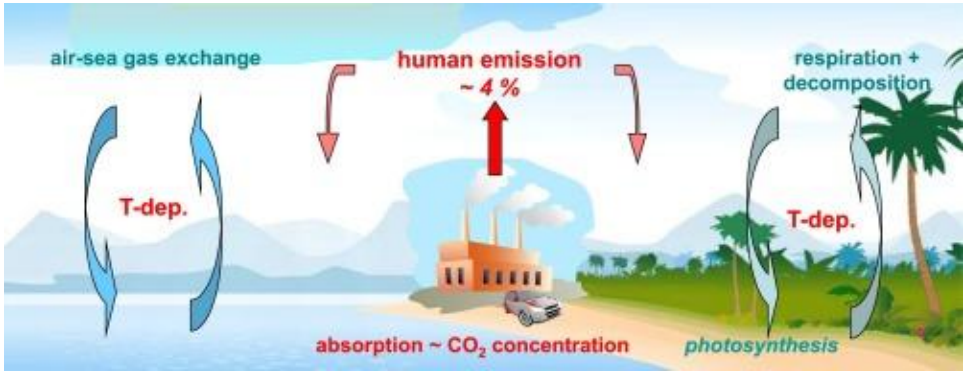
Water Vapor (H_20)

- Most Abundant greenhouse gas
- Positive Feedback Cycle





CO2 Residence Time in Atmosphere



- Carbon cycle with an uptake proportional to the CO_2 concentration.
- Temperature dependent natural emission and absorption rates are considered.
- The average residence time of CO_2 in the atmosphere is found to be 4 years.
- Paleoclimatic CO_2 variations and the actual CO_2 growth rate are well reproduced.
- Human emissions only contribute 15 % to the CO_2 increase over the Industrial Era.

UN IPCC Charter

The [**Intergovernmental Panel on Climate Change**] **IPCC's charter** from the outset has been "to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of **human-induced** climate change, its potential impacts and options for adaptation and mitigation. IPCC reports should be neutral with respect to policy. … may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies."

UN IPCC Reports

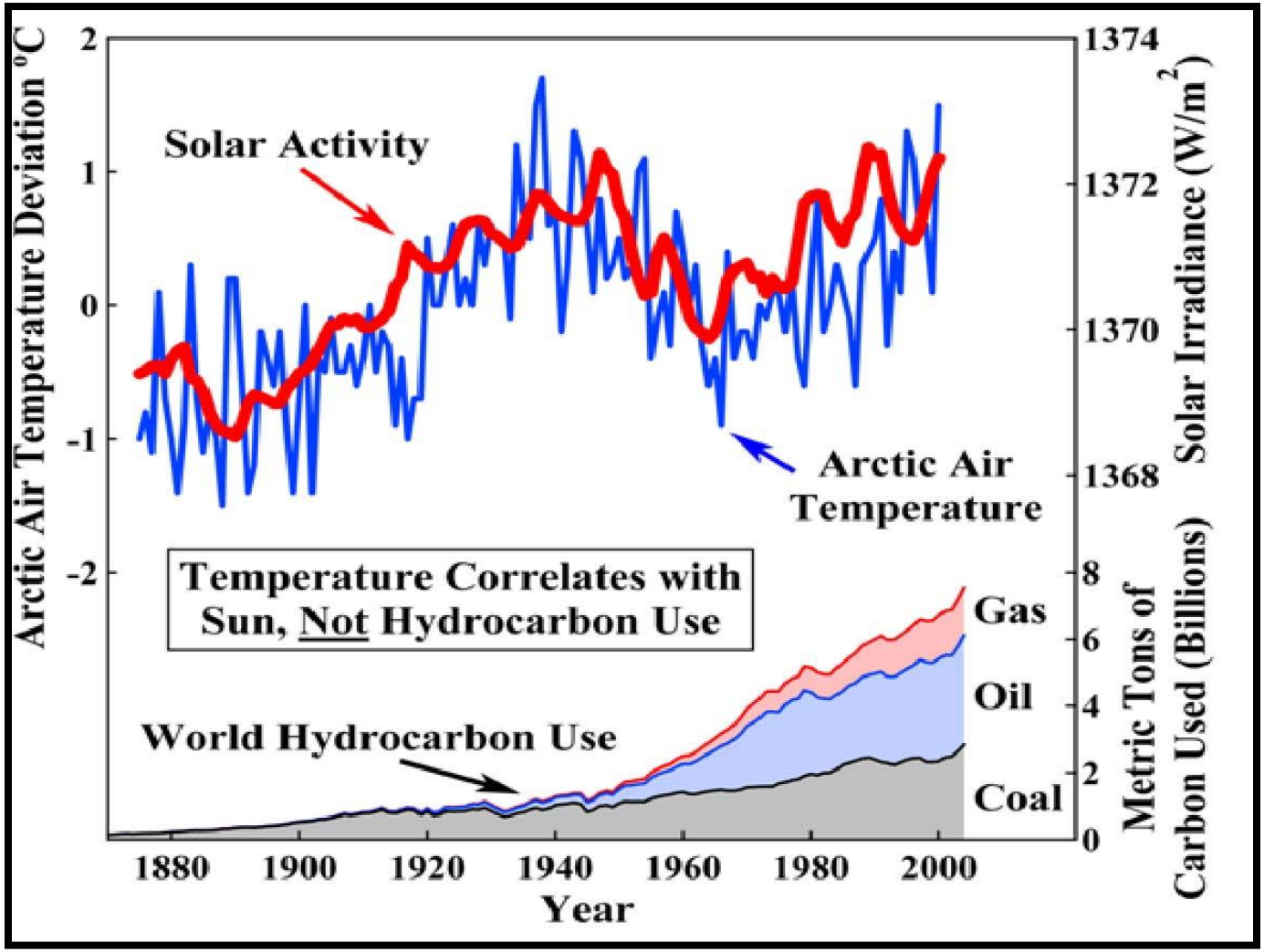
- Report #1 in 1990: Ignored satellite data (showed no warming)
- Report #2 in 1995: Significant alterations after approval by scientists
- Report #3 in 2001: Claimed 20th century showed "unusual warming"
- Report #4 in 2007: Completely devaluated climate changes in solar activity
- Report #5 in 2014: Confidence increased to 90-95% despite no global warming for 15 years

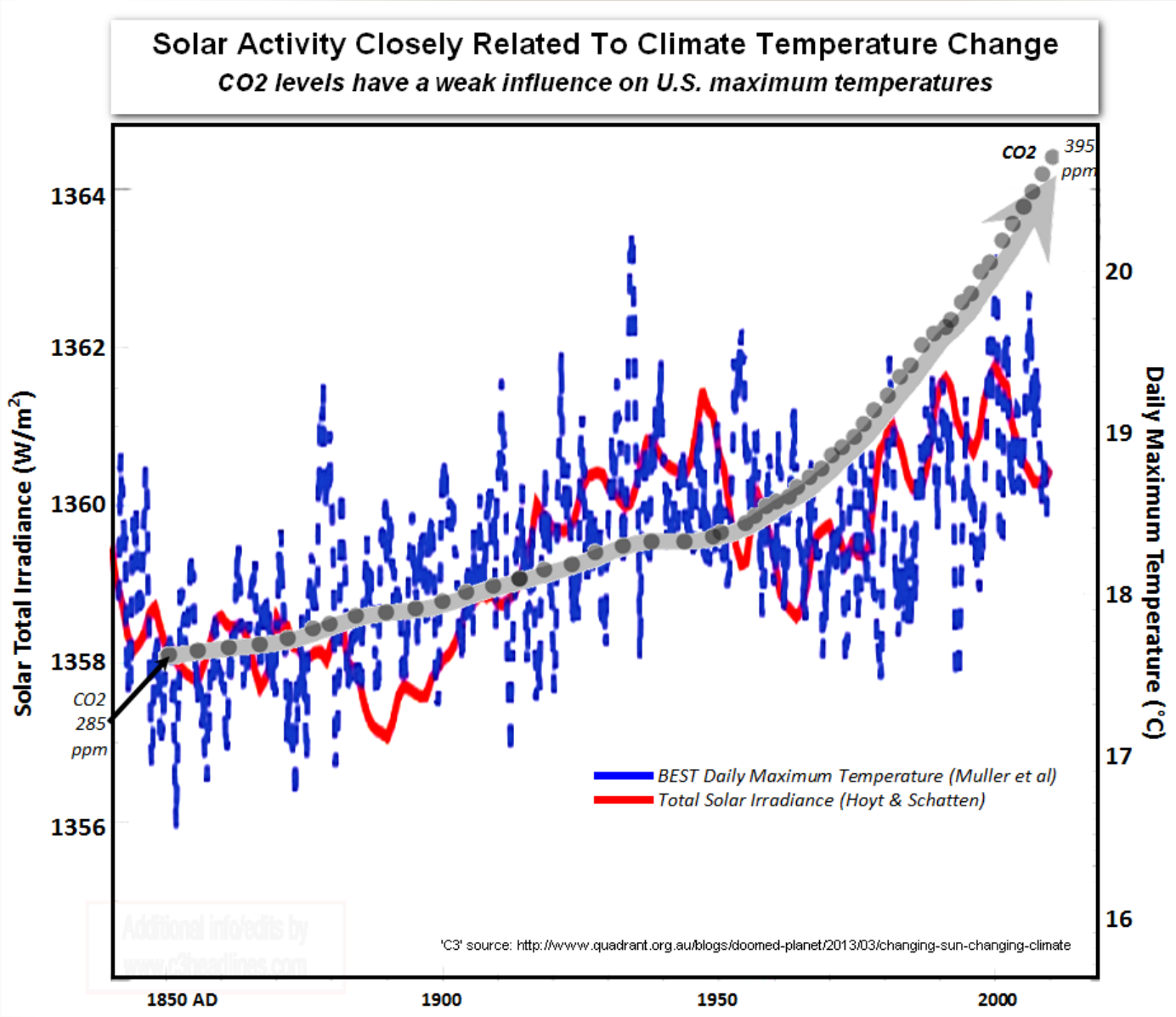
UN IPCC Reality

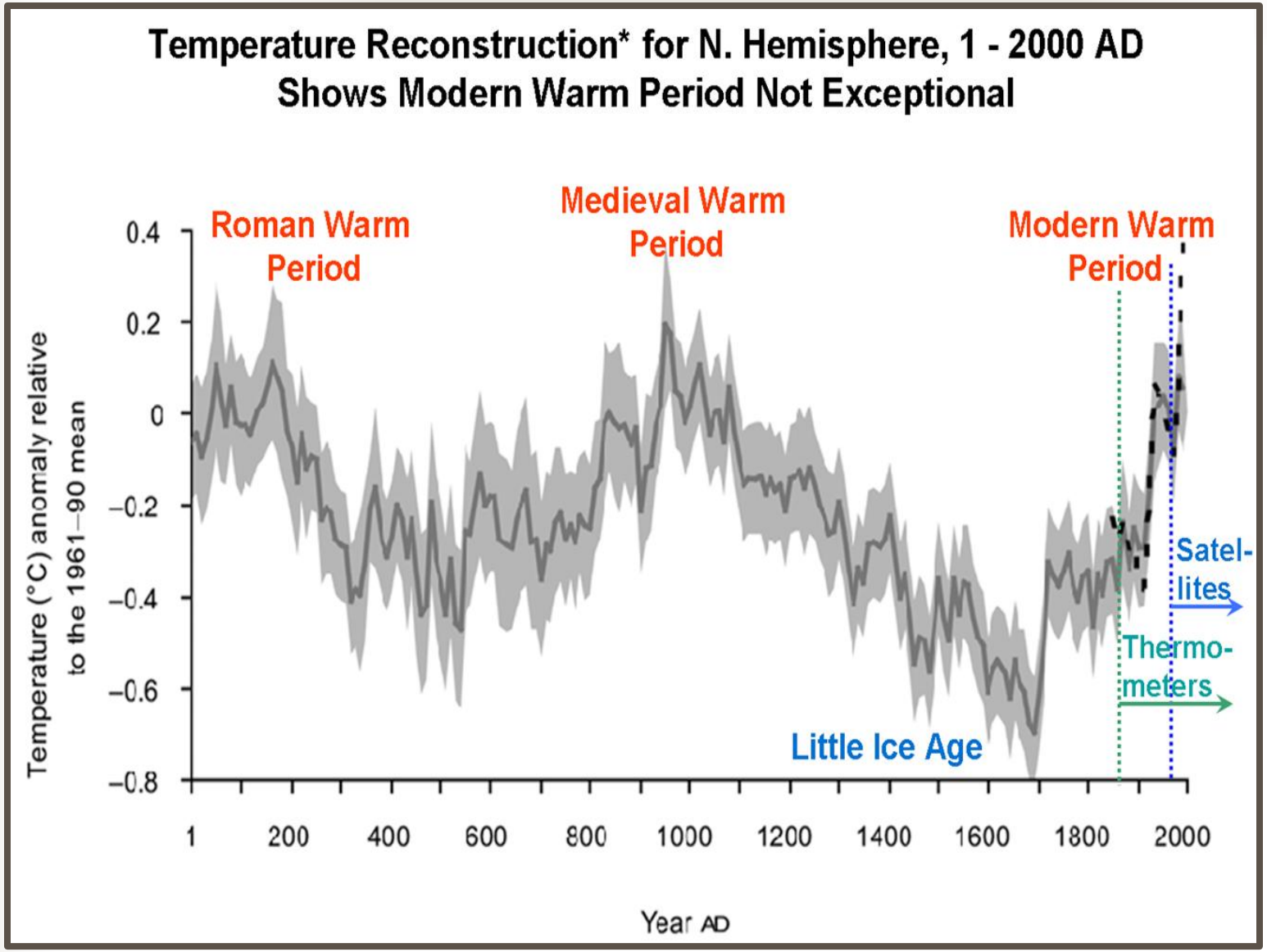
"We (UN-IPCC) redistribute de facto the world's wealth by climate policy…"
"One has to free oneself from the illusion that international climate policy is environmental policy. This has almost nothing to do with environmental policy anymore…"

-Dr. Ottmar Endenhofer, IPCC co-chair of Working Group 3, November 13, 2010 interview [H/t Dr. Charles Battig]

30-Year Cooling in Mid-Century



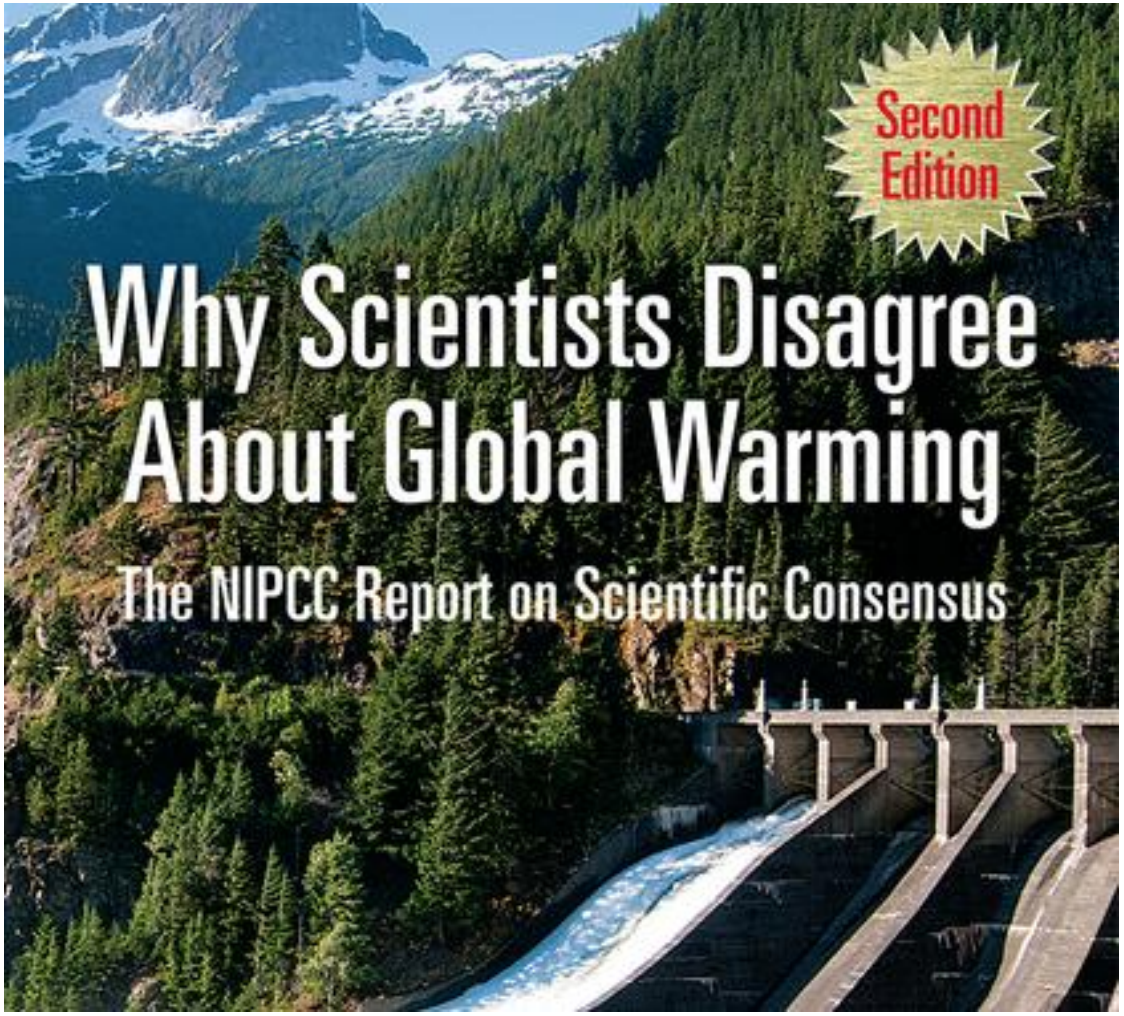

Solar Activity Closely Related To Climate Temperature Change
CO2 levels have a weak influence on U.S. maximum temperatures
Solar Total Irradiance (W/m²)
Daily Maximum Temperature (°C)
1364
1362
1360
1358
1356
20
19
18
17
16
CO2
395
ppm
CO2
285
ppm
BEST Daily Maximum Temperature (Muller et al)
Total Solar Irradiance (Hoyt & Schatten)
'C3' source: http://www.quadrant.org.au/blogs/doomed-planet/2013/03/changing-sun-changing-climate
1850 AD
1900
1950
2000


Temperature Reconstruction* for N. Hemisphere, 1 - 2000 AD
Shows Modern Warm Period Not Exceptional
Roman Warm Period
Medieval Warm Period
Modern Warm Period
Little Ice Age
Satel-lites
Thermo-meters
Temperature (°C) anomaly relative to the 1961–90 mean
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
1
200
400
600
800
1000
1200
1400
1600
1800
2000
Year AD

NIPCC

- **<u>Nongovernmental International Panel on Climate Change</u>**
  - Nongovernment scientists and scholars
  - Peer reviewed technical papers
  - Annual Climate Change conference
- Published reports
  - Nature, Not Human Activity, Rules the Climate
  - Climate Change Reconsidered I and II
  - Scientific Critique of IPCC's 'Summary for Policymakers
  - Why Scientists Disagree About GW (2nd Edition)

Second Edition of NIPCC Book



NIPCC's Findings on Physical Science

- Atmospheric carbon dioxide (CO2) is a mild greenhouse gas that exerts a diminishing warming effect as its concentration increases.
- Doubling the concentration of atmospheric CO2 from its pre-industrial level, in the absence of other forcings and feedbacks, would likely cause a warming of ~0.3°C to 1.1°C, almost 50 percent of which must already have occurred.
- A few tenths of a degree of additional warming, should it occur, would not represent a climate crisis.
- CO2 is a vital nutrient used by plants in photosynthesis. Increasing CO2 in the atmosphere "greens" the planet and helps feed the growing human population.

Findings on Physical Science – 2

- Model outputs published in successive IPCC reports since 1990 project a doubling of CO2 could cause warming of up to 6°C by 2100. Instead, global warming ceased around the end of the twentieth century and was followed (since 1997) by 19 years of stable temperature.
- Over recent geological time, Earth's temperature has fluctuated naturally between about +4°C and -6°C with respect to twentieth century temperature. A warming of 2°C above today, should it occur, falls within the bounds of natural variability.
- Though a future warming of 2°C would cause geographically varied ecological responses, no evidence exists that those changes would be net harmful to the global environment or to human well-being.

Findings on Physical Science – 3

- At the current level of ~400 ppm we still live in a CO2-starved world. Atmospheric levels 15 times greater existed during the Cambrian Period (about 550 million years ago) without known adverse effects.
- The overall warming since about 1860 corresponds to a recovery from the Little Ice Age modulated by natural multidecadal cycles driven by ocean-atmosphere oscillations, or by solar variations at the de Vries (~208 year) and Gleissberg (~80 year) and shorter periodicities.
- Earth has not warmed significantly for the past 18 years despite an 8 percent increase in atmospheric CO2, which represents 34 percent of all extra CO2 added to the atmosphere since the start of the industrial revolution.

Findings on Physical Science – 4

- No close correlation exists between temperature variation over the past 150 years and human-related CO2 emissions. The parallelism of temperature and CO2 increase between about 1980 and 2000 AD could be due to chance and does not necessarily indicate causation.
- The causes of historic global warming remain uncertain, but significant correlations exist between climate patterning and multidecadal variation and solar activity over the past few hundred years.
- Forward projections of solar cyclicity imply the next few decades may be marked by global cooling rather than warming, despite continuing CO2 emissions.

NIPCC Key Findings

- No consensus
- Why scientists disagree
- Scientific method vs. political science
- Flawed projects
- False postulates
- Unreliable circumstantial evidence
- Policy implications

The 97% Claim – False!

- "Probably the most widely repeated claim in the debate over global warming is that "**97 percent of scientists agree**" that climate change is man-made and dangerous. This claim is not only false, but its presence in the debate is an insult to science."
  - *Why Scientists Disagree About GW,* pg. 1 [Introduction].

- "In May 2014, Secretary of State **John Kerry** warned graduating students at Boston College of the "crippling consequences" of climate change. "Ninety-seven percent of the world's scientists tell us this is urgent," he added (Kerry, 2014). Three days earlier, President Obama tweeted that "Ninety-seven percent of scientists agree: #climate change is real, man-made and dangerous" (**Obama**, 2014). What is the basis of these claims?"
  - *Why Scientists Disagree About GW, pg. 8.*

Consensus on Consensus – Cook, 2016

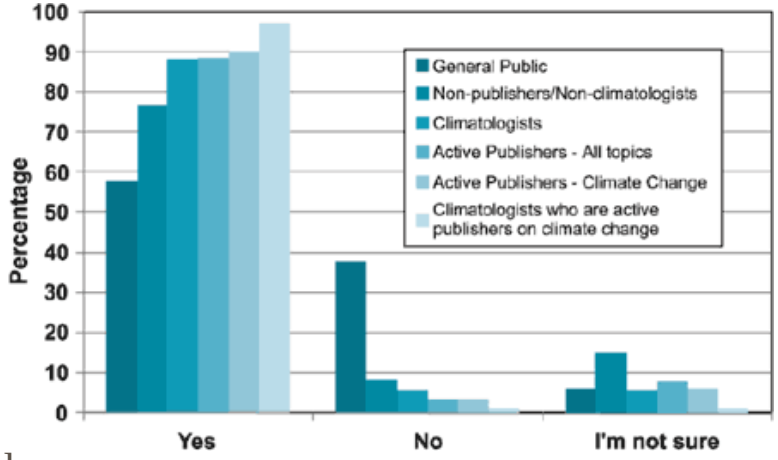
- Seven climate consensus studies
  - Oreskes 2004, Doran 2009, Anderegg 2010, Cook 2013, Verheggen 2014, Stenhouse 2014, Carlton 2015
- Two key conclusions:
  - 1) Depending on exactly how you measure the expert consensus, it's somewhere between 90% and 100% that agree humans are responsible for climate change, with most of our studies finding 97% consensus among publishing climate scientists.
  - 2) The greater the climate expertise among those surveyed, the higher the consensus on human-caused global warming.

Why Scientists Disagree on GW, pg. 8ff

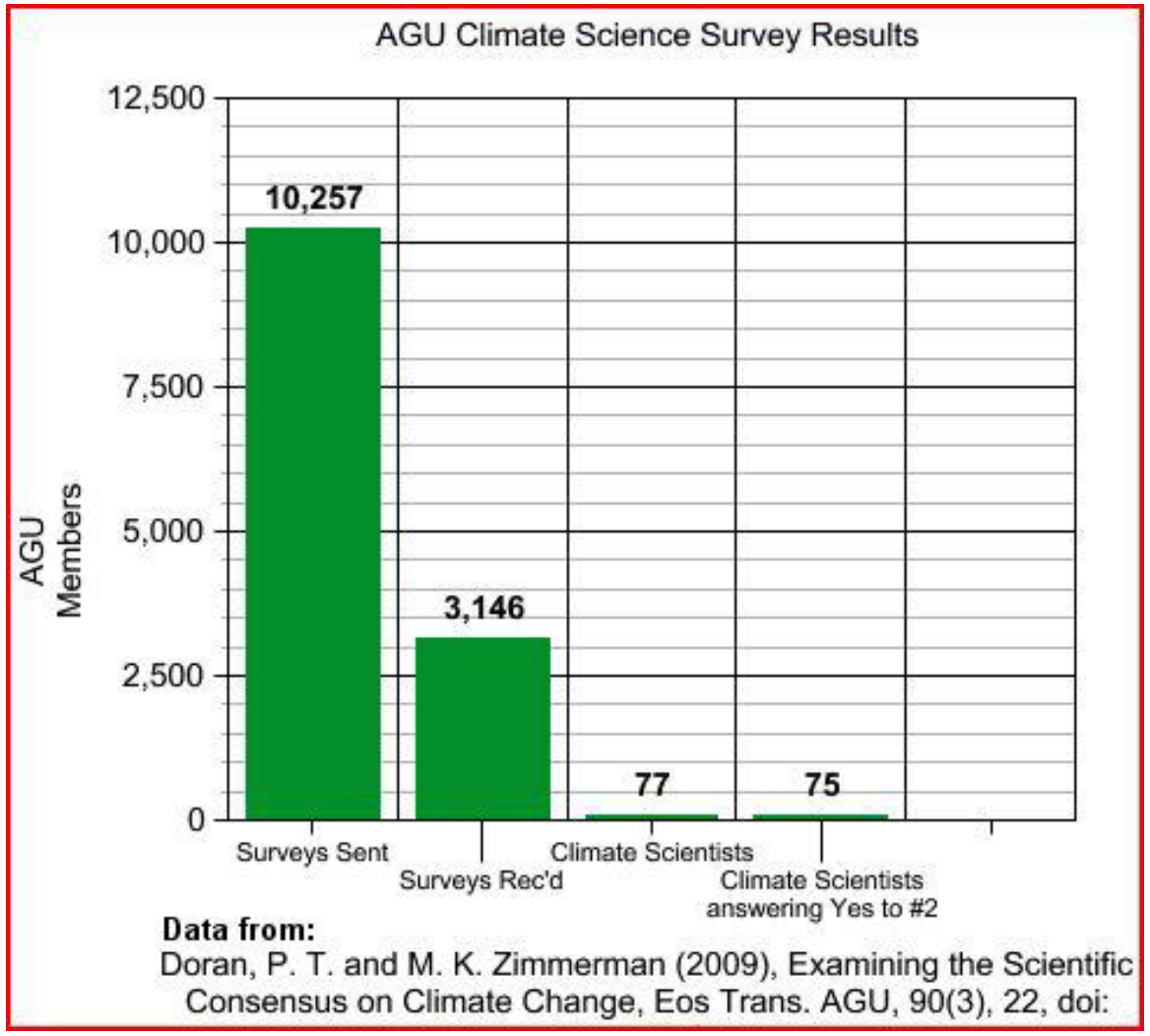
e.g. Doran Survey Bias

- Doran/Zimmerman 2009 two-question survey:
  - "Q1. When compared with pre-1800s levels, do you think that mean global temperatures have generally **risen**, fallen, or remained relatively constant?
  - Q2. Do you think human activity is a **significant** contributing factor in changing mean global temperatures?"
- Survey Sent to 10,257 Earth scientists
  - Limited to academic, government workers
  - Solar scientists & meteorologists excluded
  - Responses from 3,146
  - Q1 – risen 90+
  - Q2 – yes 82
- Survey results considered
  - 79 who listed climate science as their area of expertise, and 50%+ of recent papers on climate science
  - Asked wrong questions of wrong people

Why Scientists Disagree on GW, pg. 13-14



Doran GW Survey Results

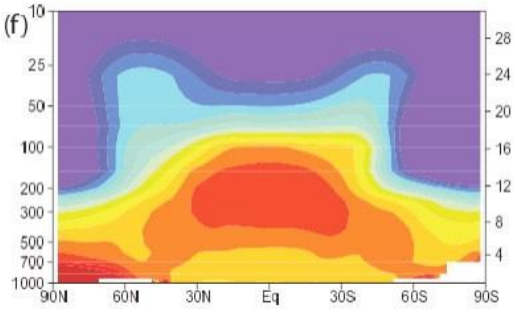


Possible Global Warming Causes

1. Increased **CO2** in atmosphere?
   - Insignificant **GHG**, follows **GW**
2. GW by Sunspots Only?
   - Influence too small by themselves
3. Solar Irradiance? ← Most Likely!
   - Cloud Cover increase -> Cooling
   - Galatial Cosmic Radiation (**GCR**)
4. Pacific Decadal Oscillation (**PDO**)?
   - Occurs every 30 years in North Pacific Ocean

1. Evidence for GW by CO2?

- The greenhouse gas signature missing
  - No **telltale "hotspot"** warming pattern

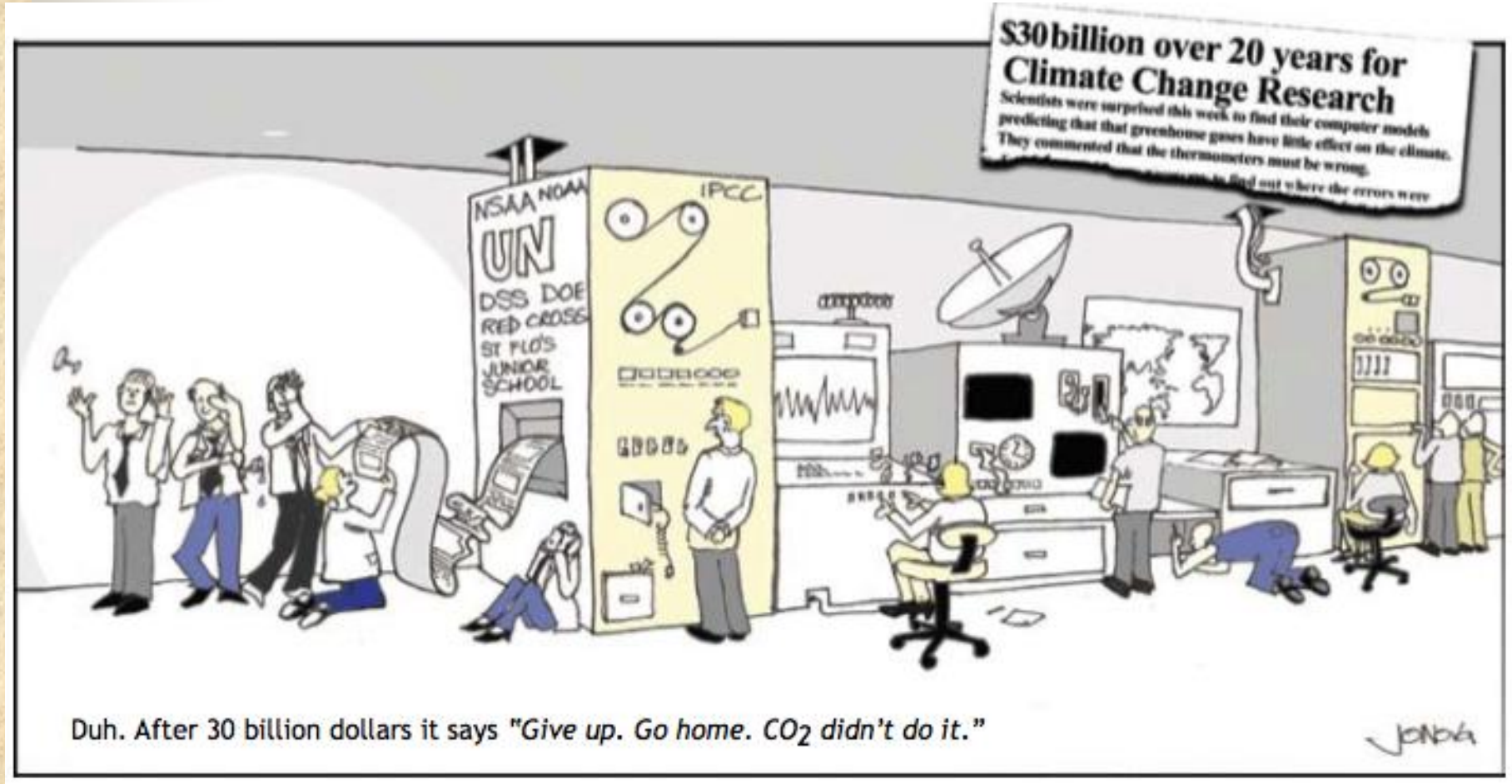


- Vostoc ice cores do not show **CO2** pushing up temperatures
  - Increased temperatures **800 years before CO2**

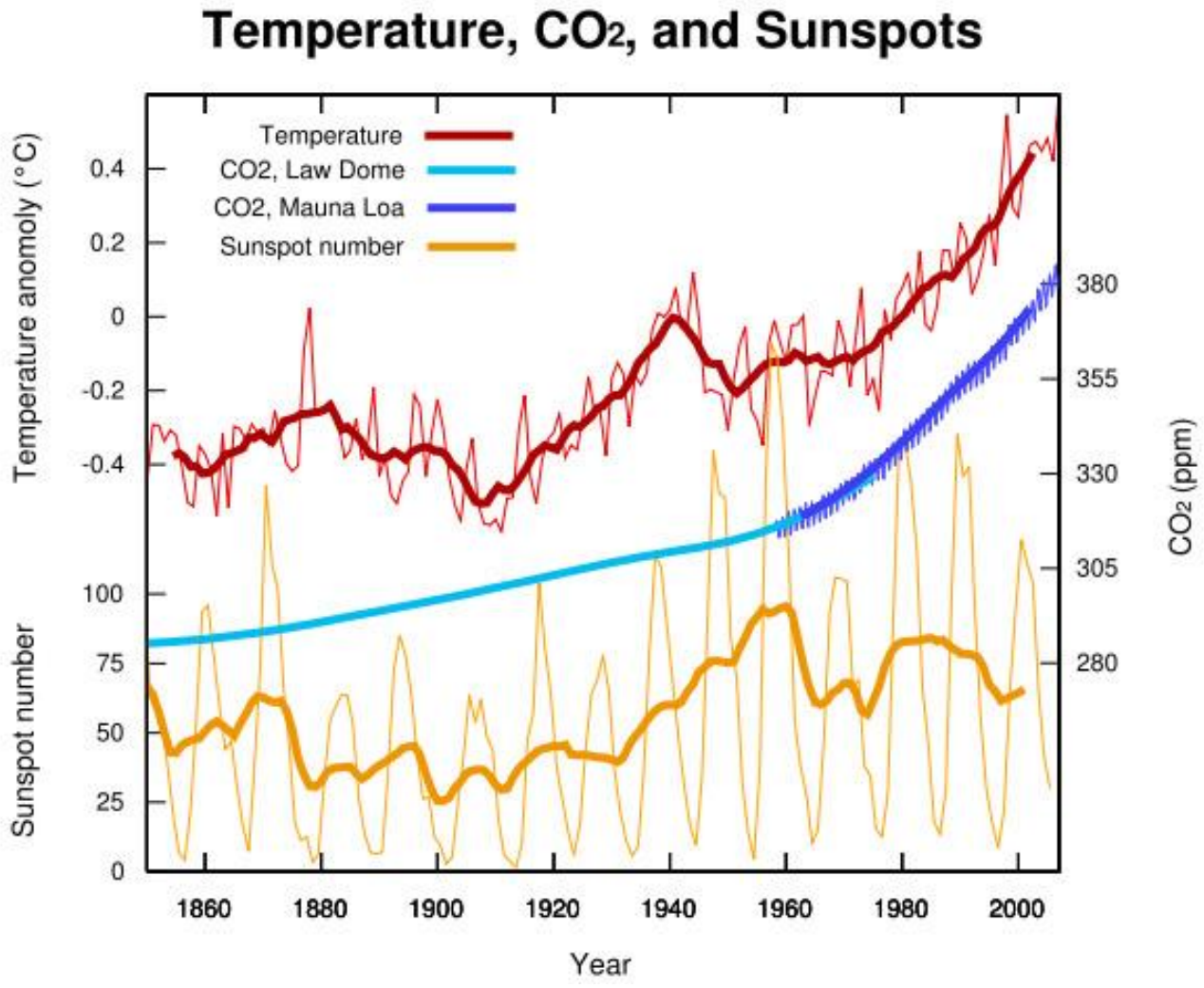
- Temperatures are not rising
  - Since 1999 temperatures have been flat
- CO2 already doing almost all the warming it can do
  - Twice the CO2 does not make twice the difference

The Skeptic's Handbook, Joanne Nova 2009

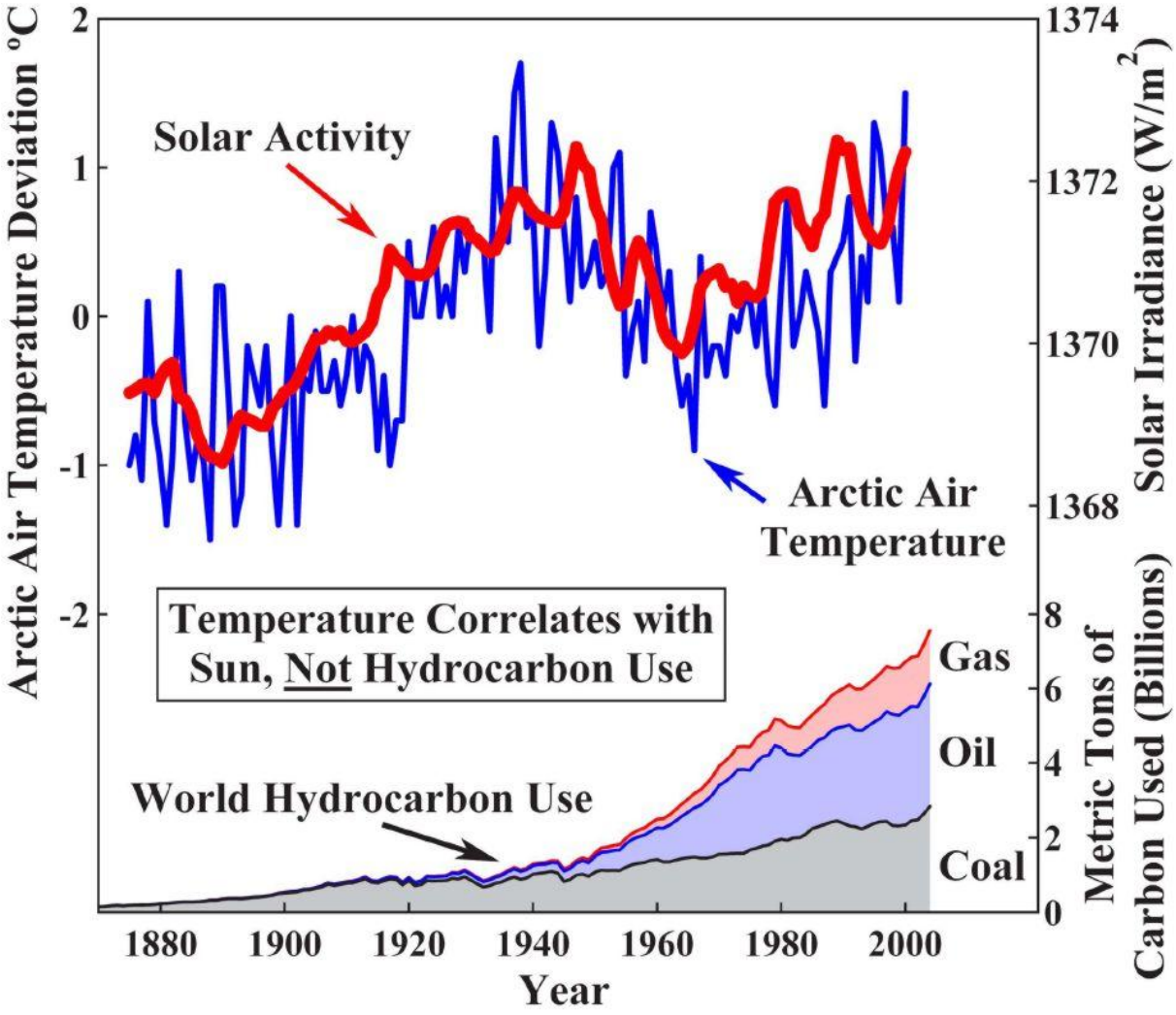
CC Research Results



2. GW by Sunspots Only?

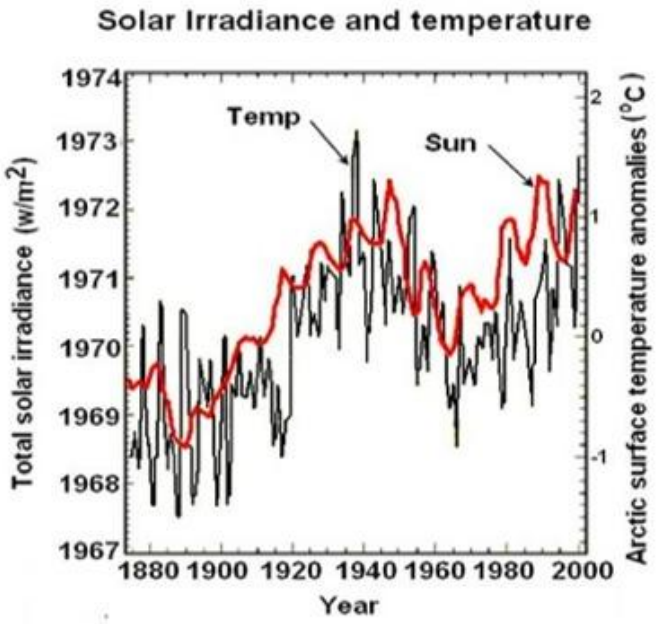


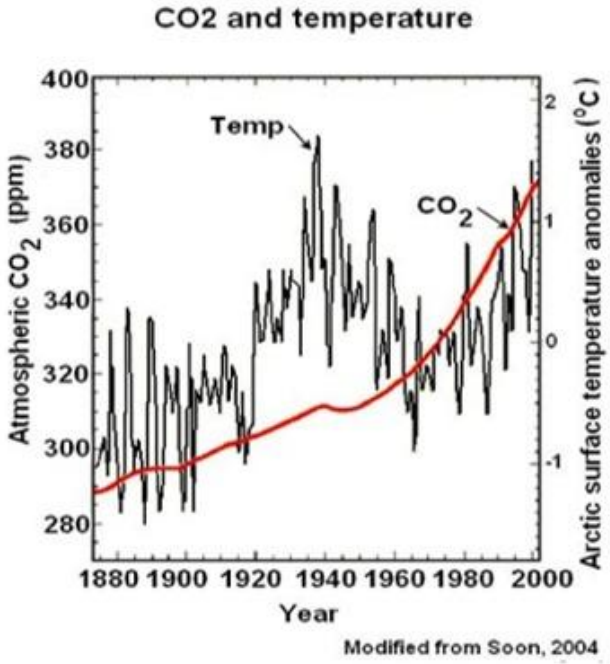
Temperature Correlation With Sun



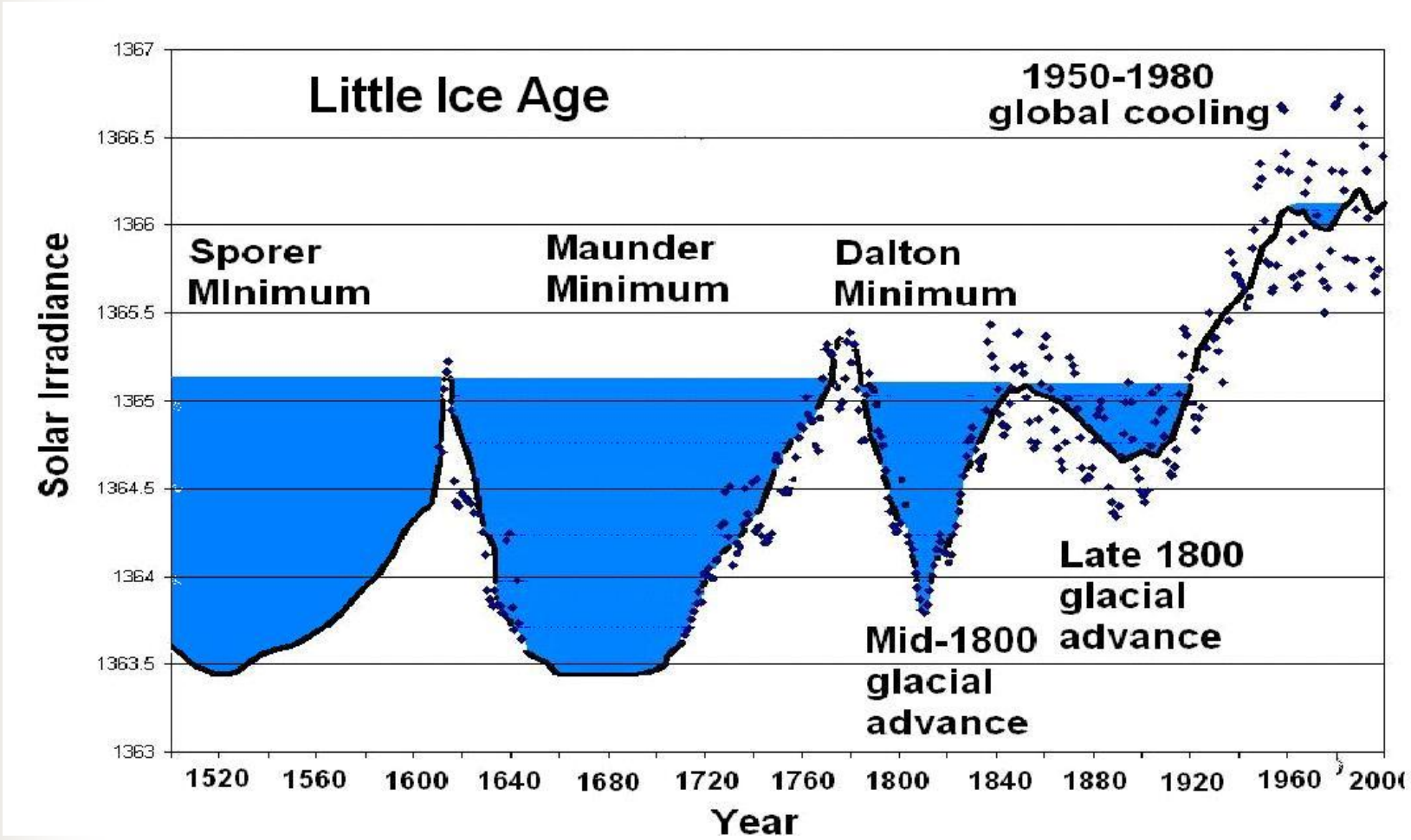
3. Total Solar Irradiance?

The following charts show clearly that climate change seems to be directly correlated to Solar Irradiance, rather than CO_2, as the "Global Warming Crisis" alarmist crowd would have you think.



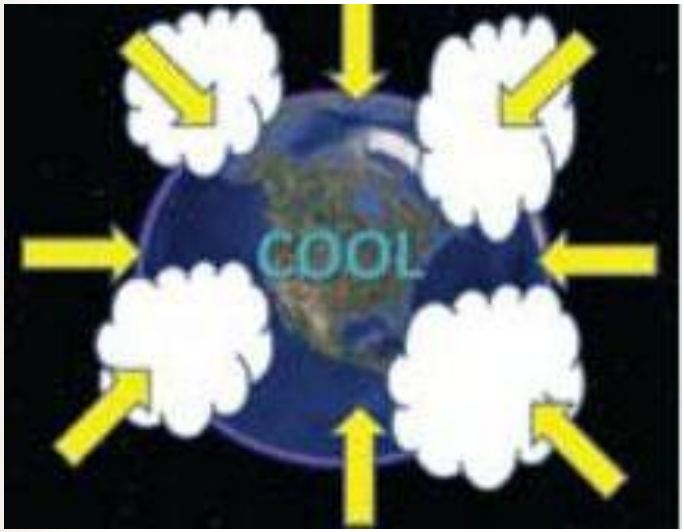


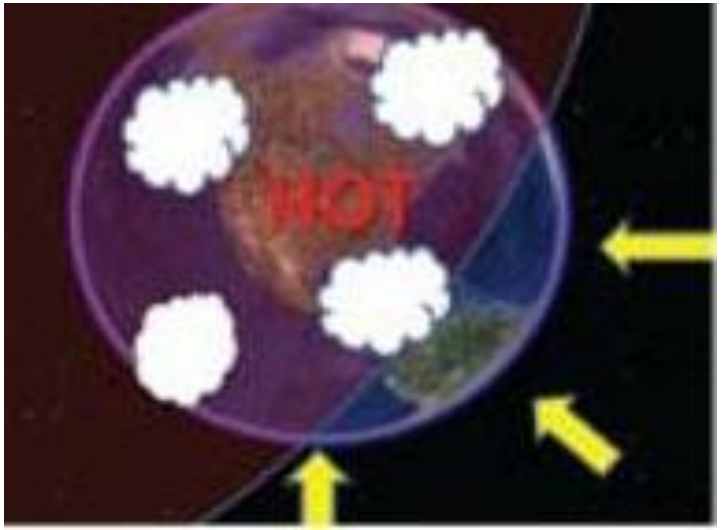
Solar Irradiance/Sunspots & Glaciers



Svensmark's GCR Theory

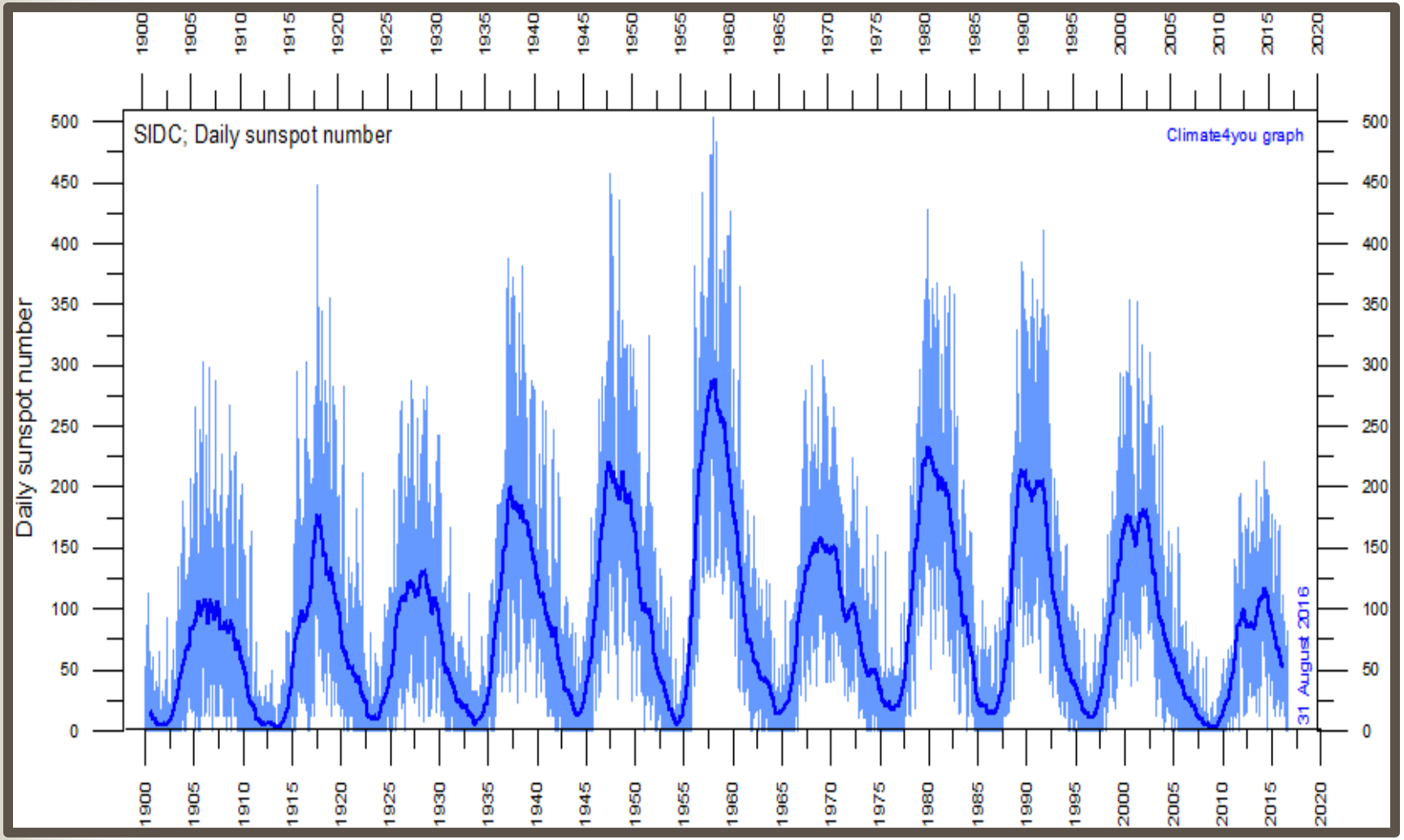
Inactive Sun	Active Sun
High cosmic rays	Low cosmic rays
More clouds	Fewer clouds
Cool earth	Hot earth



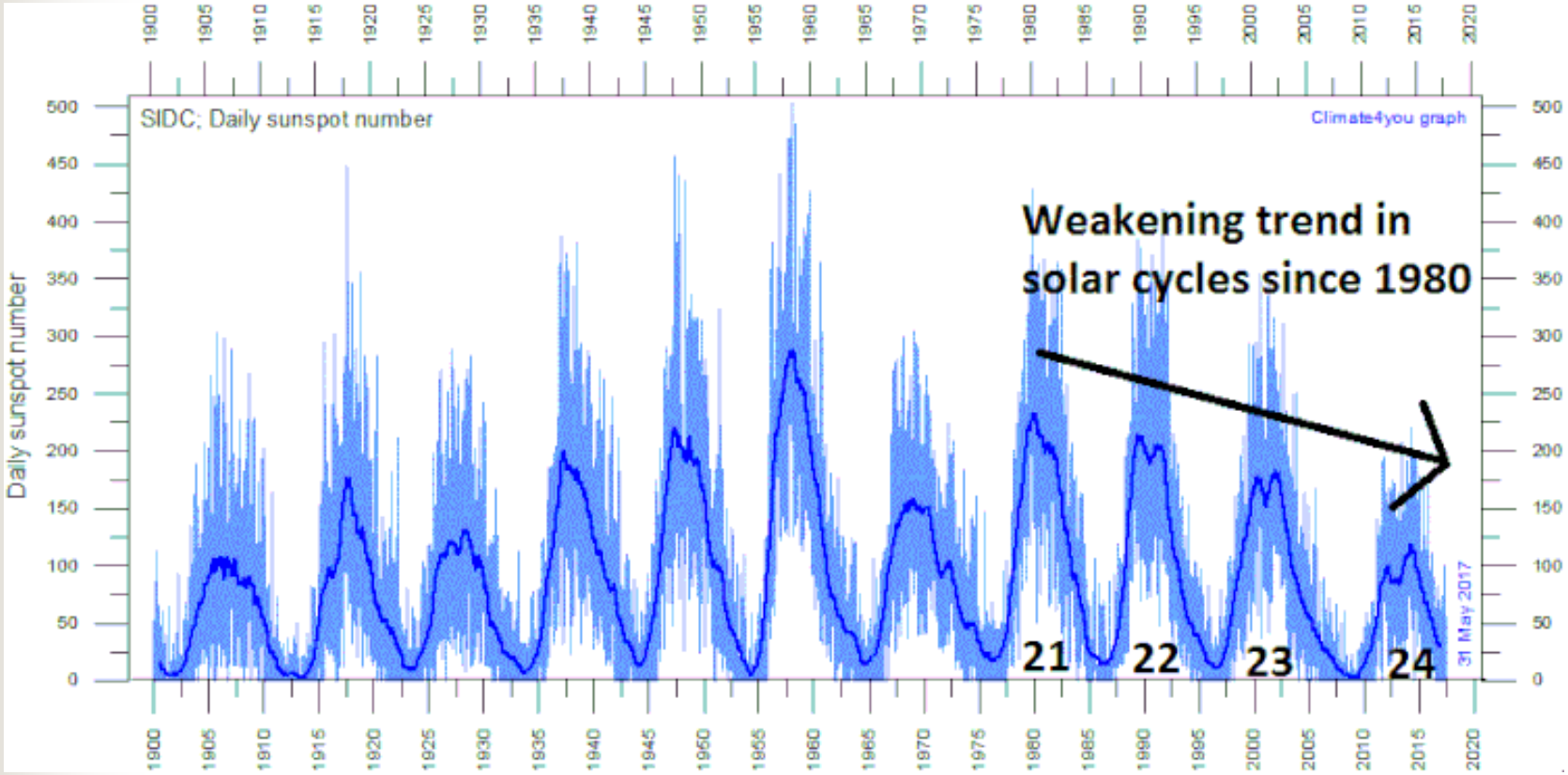


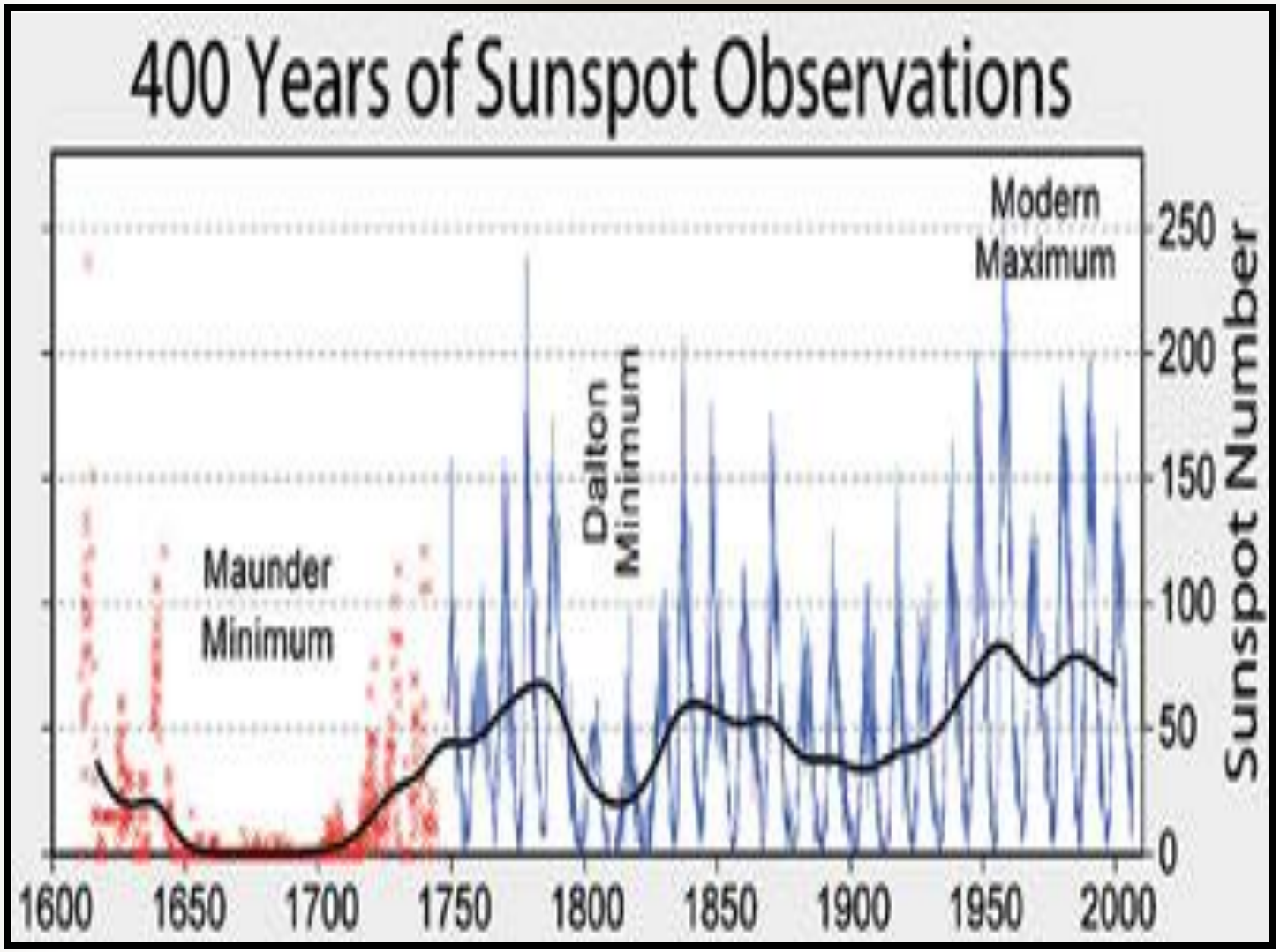
Cloud Experiment Supports GW Theory, Dr. Larry Vardiman

Daily Sunspot Number



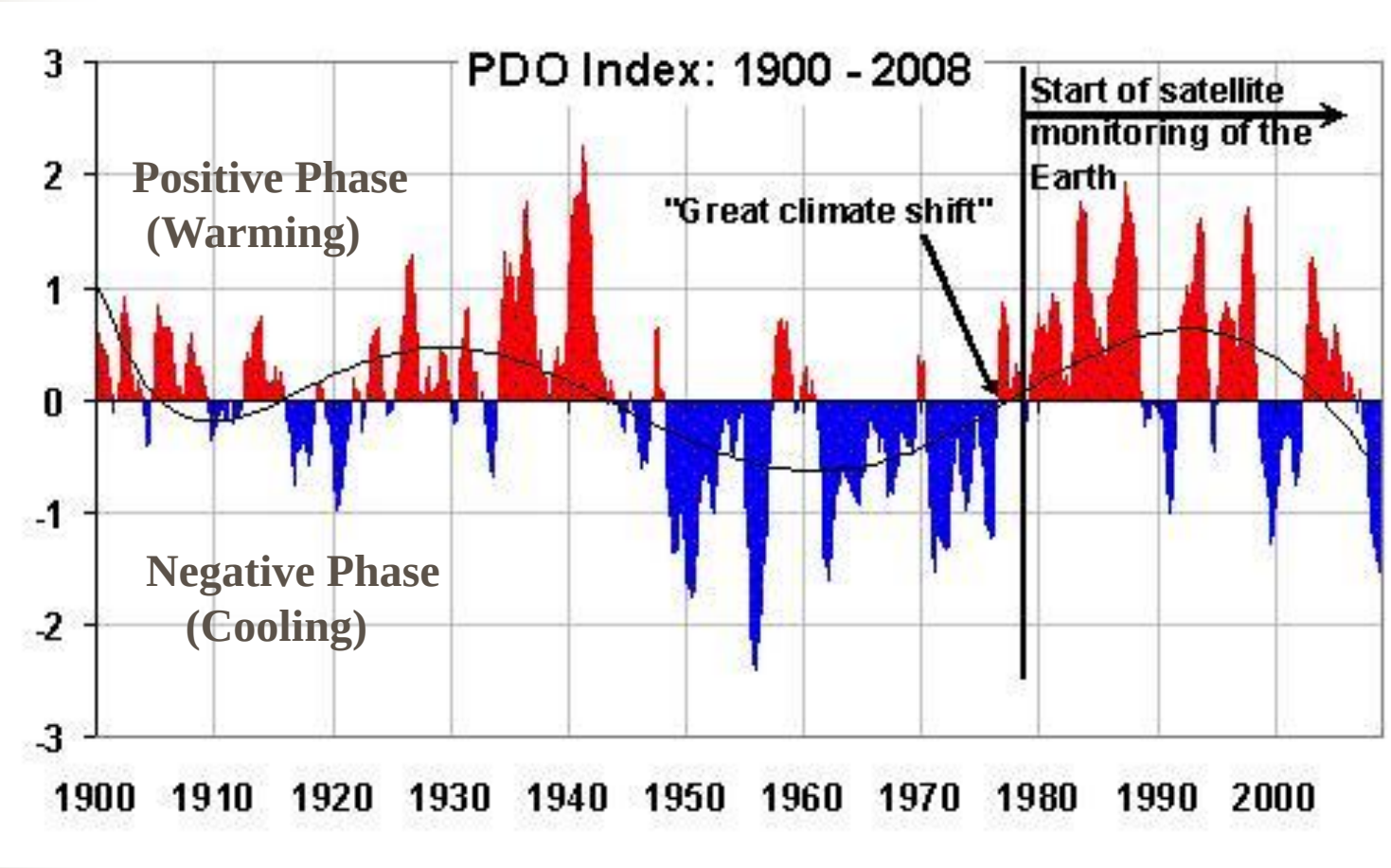
Sunspots Decreasing in Strength





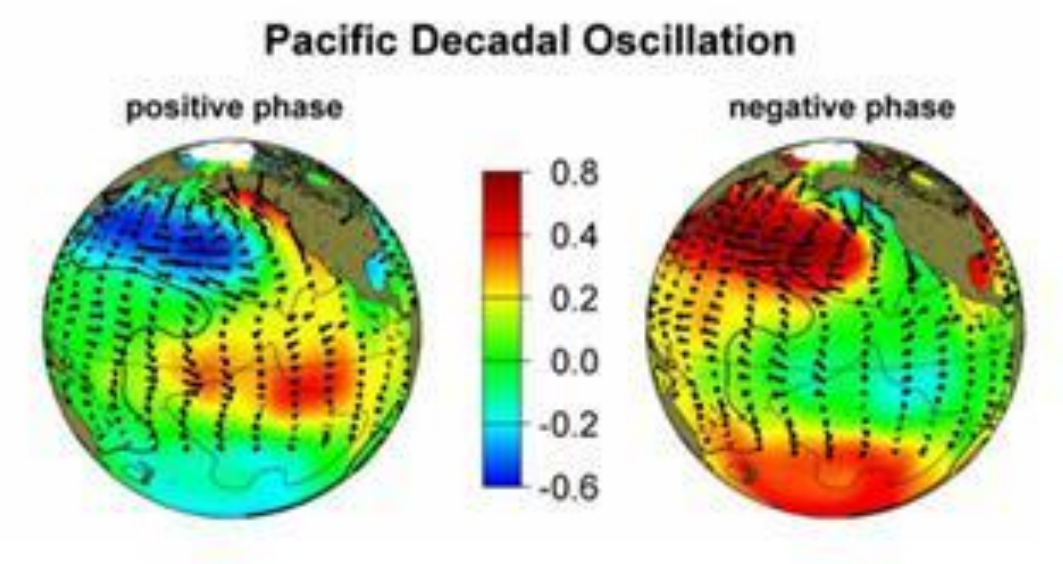
Monthly solar sunspot number

4. Pacific Decadal Oscillation (PDO)



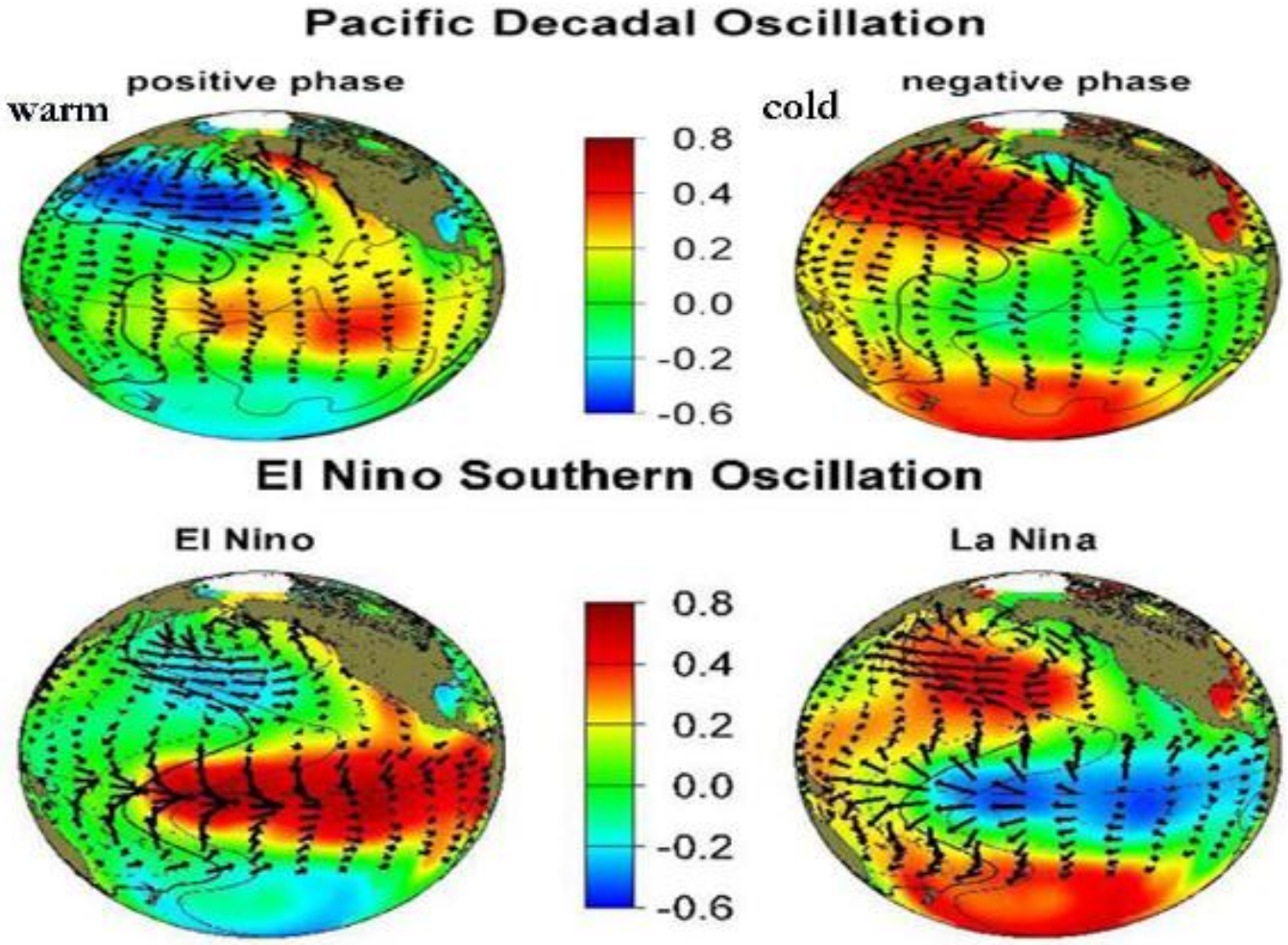
Preferred by Dr. Roy Spencer (Climate Scientist)

PDO – Key to the GW Debate?



- Switch between two circulation patterns every 30 years in North Pacific Ocean
- ENSO – El Nino Southern Oscillation every few years of tropical Pacific Ocean

Pacific Ocean Oscillations



Paris Climate Agreement

- Work of the UN Framework Convention on CC
- Deals with Green House Gas emissions mitigation, adaptation and finance
- Adopted on December 12, 2015
- Start planned for 2020
- Signed by 195 nations, ratified by 144
- Implementation implications
  - Prevent 0.306 degrees Fahrenheit of GW by 2100
  - At a cost of $65 to $132 Trillion, 2030 to 2100

COP21 final deal: Key points...

- COP21 President Laurent Fabius says text is "differentiated, balanced, durable and "legally-binding"
- Text "emphasises" need to keep warming "well below 2C"
- ... And "Pursuing" efforts to keep warming "below 1.5C"
- 5-year 'stocktake' of how countries are doing on their climate plans
- Issues of 'Differentiation' and 'Loss & Damage' included
- No clear timescale of when fossil fuels must be phased out

SIX KEY POINTS OF THE PARIS CLIMATE AGREEMENT

The 31-page document that details a landmark agreement reached in Paris on 12 December 2015 could be a turning point in the struggle to contain global warming. The historic pact, approved by 195 countries, will take effect from 2020.

To keep global **temperature** increase below 2C (3.6F) and to pursue efforts to limit it to 1.5C.

186 countries submitted plans detailing how they reduce their **greenhouse gas pollution** through 2025 or 2030.

Overall assessment of how countries are doing in cutting their emissions compared to their **national plans** – starting in 2023, every five years.

$100 billion a year in climate finance for developing countries by 2020, with a commitment to further finance in the future.

Rich countries to engage in absolute reductions in emissions, developing ones to continue enhancing their mitigation efforts.

Countries should reach global peaking of **greenhouse gas emissions** as soon as possible.

Source: UNEP, Global Trends in Renewable Energy Investment 2015

Emissions Targets for USA & China

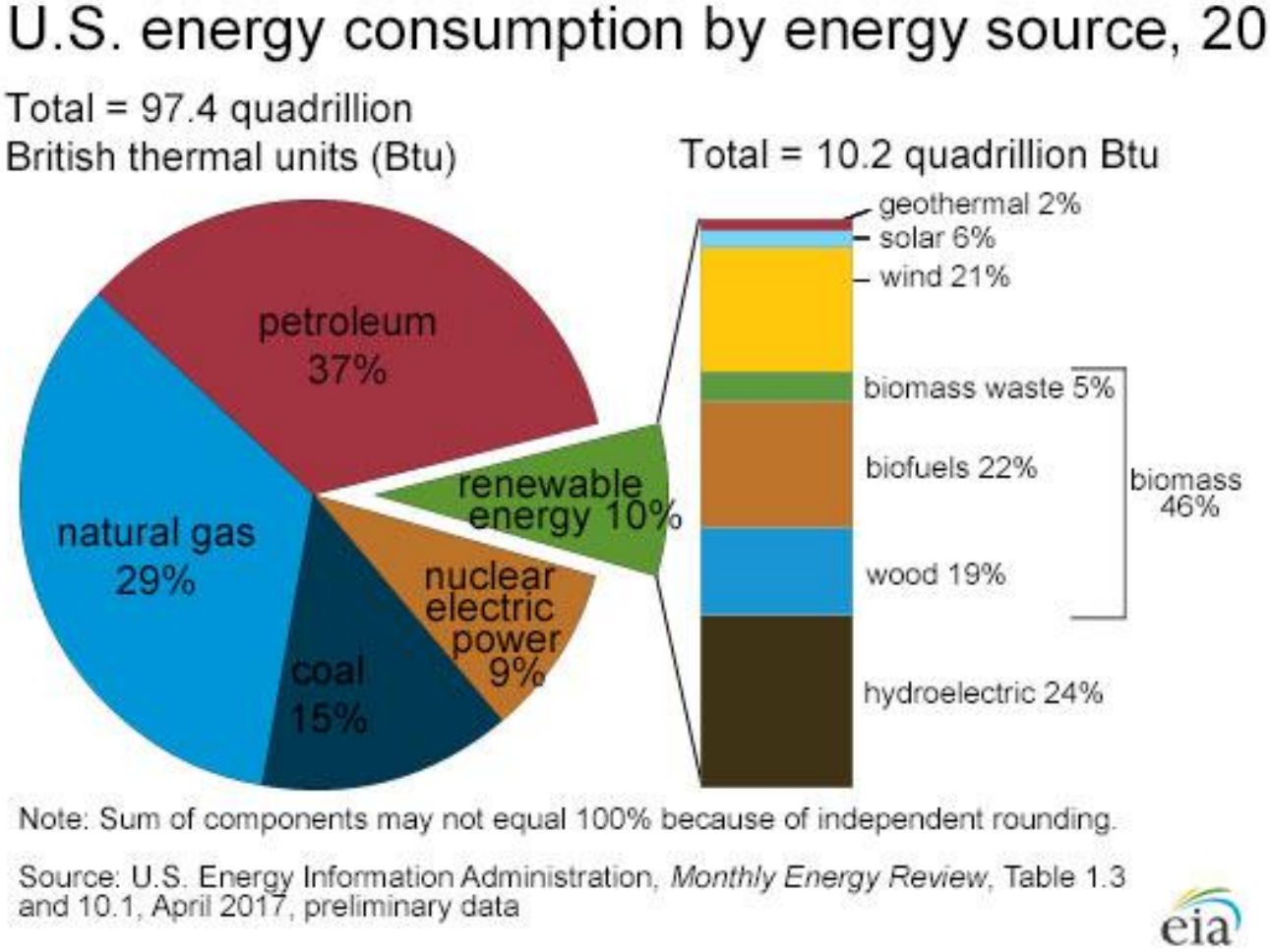
- The Obama administration agreed to an economy-wide target of reducing U.S. greenhouse gas (82% of which is carbon dioxide (CO_2)) emissions by 26%-28% below its 2005 level in 2025.
- China agreed "to achieve the peaking of CO_2 emissions around 2030" and to other measures such as those designed to increase the share of non-fossil fuels in primary energy consumption. Taking into consideration expected economic growth in China and other factors, their target translates into about a 70% *increase* above its 2005 level in 2025.

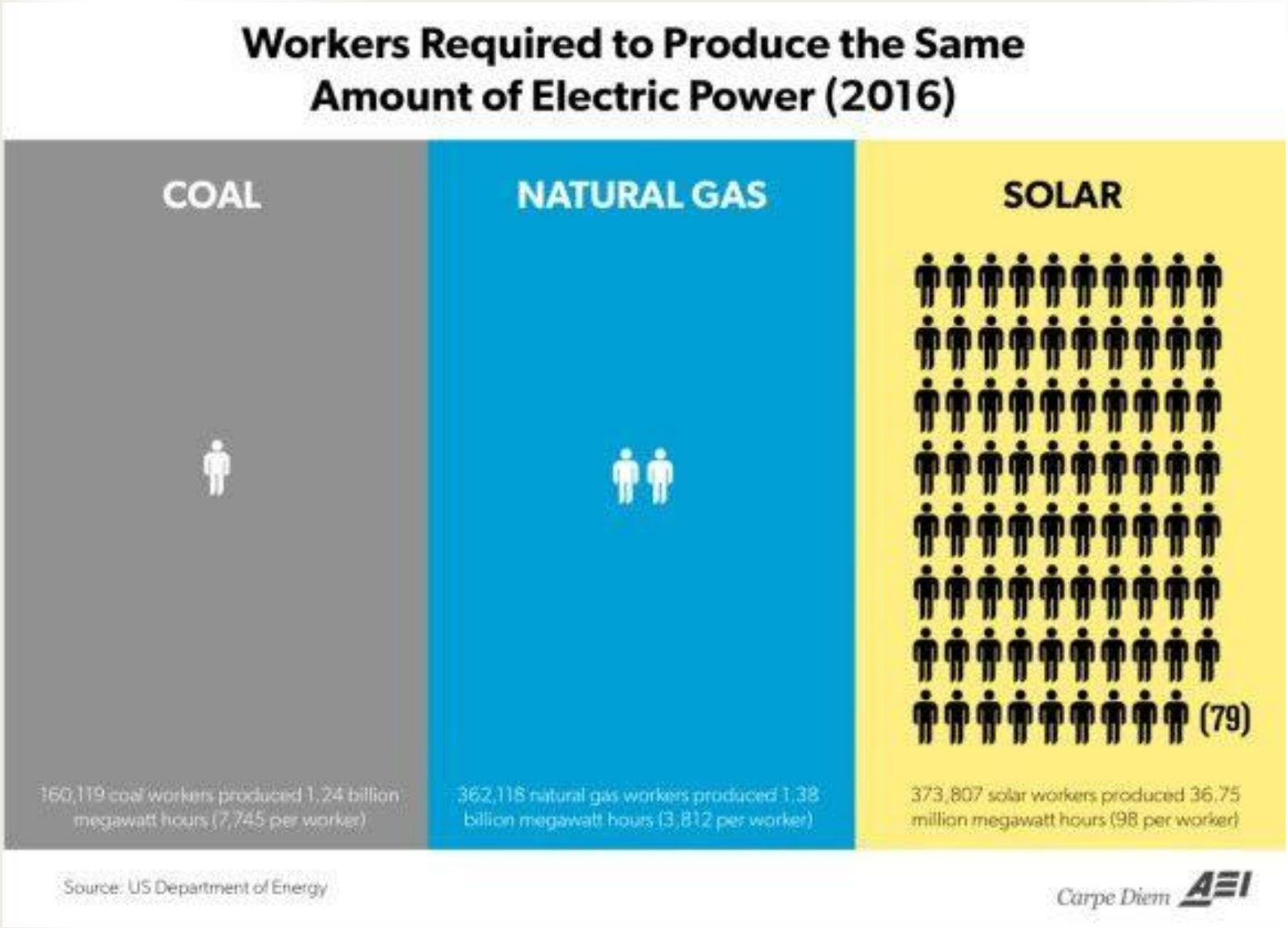
Comparing Costs of Energy

- More Solar Jobs is a curse, not a blessing - NYT article, 5/9/17
- Drawbacks to wind/solar energy: land, backup power, transmission, raw material, high electricity costs, environmental impact, no CC benefits

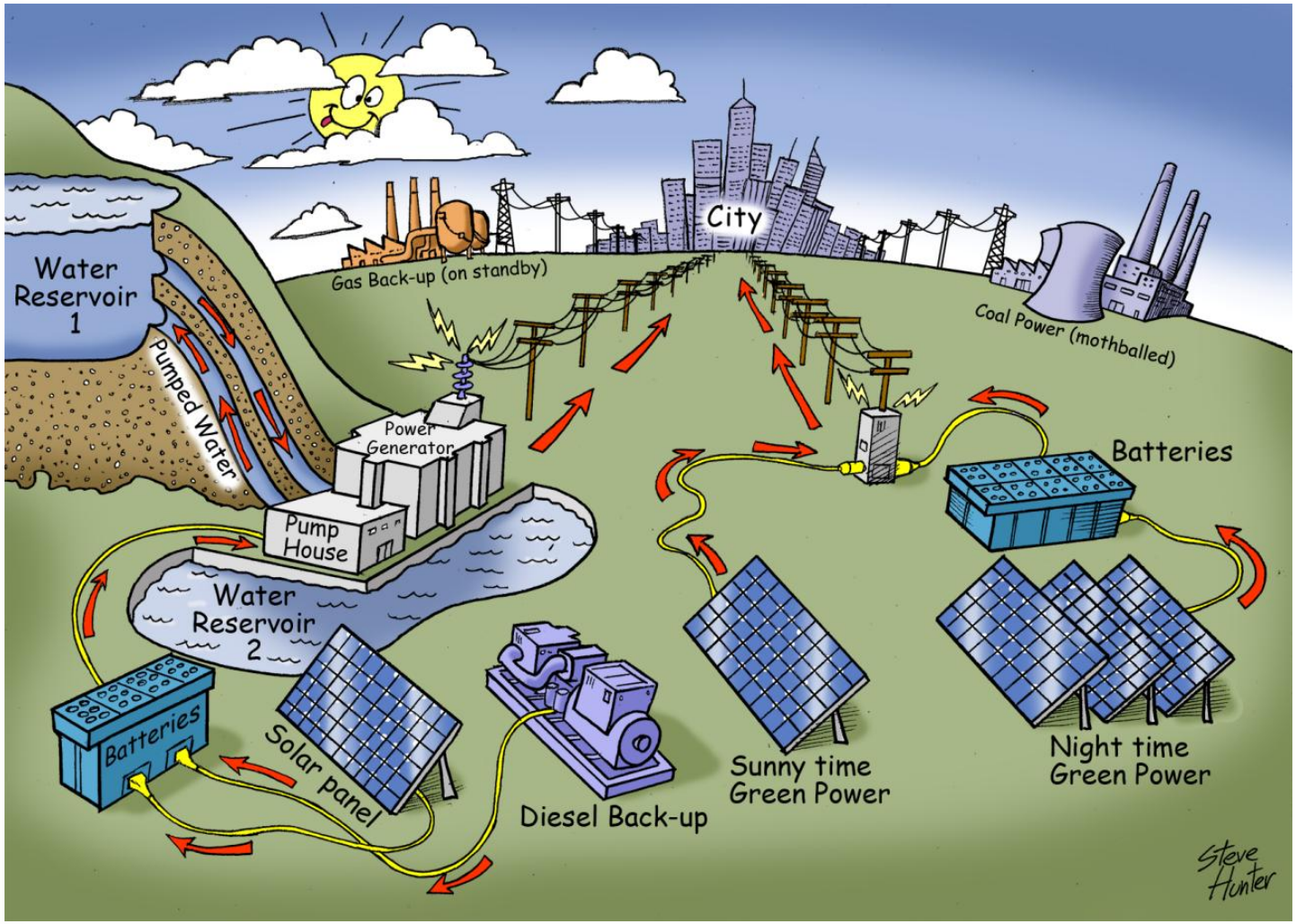
Electricity Source	Workers	Percent Produced	MWH per worker	Workers per 7745
Coal	160K	30.4	7745	1
Natural Gas	398K	33.8	3812	2
Wind	100K	5.6	836	12
Solar	374K	0.9	98	79
Other		29.3		

Solar vs. Coal Energy Employment




Workers Required to Produce the Same Amount of Electric Power (2016)
COAL
NATURAL GAS
SOLAR
(79)
160,119 coal workers produced 1.24 billion megawatt hours (7,745 per worker)
362,118 natural gas workers produced 1.38 billion megawatt hours (3,812 per worker)
373,807 solar workers produced 36.75 million megawatt hours (98 per worker)
Source: US Department of Energy
Carpe Diem AEI

Backup Battery Requirements



What News Media Isn't Telling You

- There has been **NO** Global Warming in 19 years
- Global Warming from 1978 to 1998 has been replaced by Global Cooling
- The Antarctic ice sheet is growing, not melting
- Sea level is rising 7" per century, not 20 ft.
- 4 of the past 5 years have set snowfall records
- CO2 cannot cause global warming
- Severe storms are not more frequent than normal
- The oceans are not acidic

In Conclusion

- UN IPCC CC models have failed miserably
- No significant GW for the last 19 years
- Sea levels only increased 1.5 mm per decade
- **Man-made causes** are insufficient
  - CO2 component of atmosphere insufficient
- **Natural causes** of CC are more credible
  - Sun energy alone is insufficient
  - Cosmo radiance with sunspots can explain CC
  - Pacific Decadal Oscillation may explain CC
- Paris Climate Agreement **NOT** a solution for a **non-existent problem**

References

- Easterbrook/280.ppt
- Easterbrook/WAStateSenatePPT-032613.ppt
- PhoenixClimatePresentation.ppt
- History of CC in Greenland (DVD)
- The Great GW Debate by Michael Oard (DVD)
- Global Warming by Coral Ridge (DVD)
- Articles by Dr. Larry Vardiman, Climate Scientist at ICR
  - Does CO2 Drive Global Warming?
  - A New Theory of Climate Change

More References

- The Great Global Warming Blunder, Dr. Roy Spencer
- The Skeptic's Handbook, Joanne Nova 2009
- Climate Change Reconsidered II Series (NIPCC)
  - **Physical Science** - Full Report.
  - **Physical Science** - Summary for Policymakers
  - **Biological Impacts** - Full Report.
  - **Biological Impacts** - Summary for Policymakers
- Nature, Not Human Activity, Rules the Climate (SEPP)
- Why Scientists Disagree About GW (NIPCC)

Global Warming is **NOT** a Crisis
Let's not panic!

Thank you for your attention!

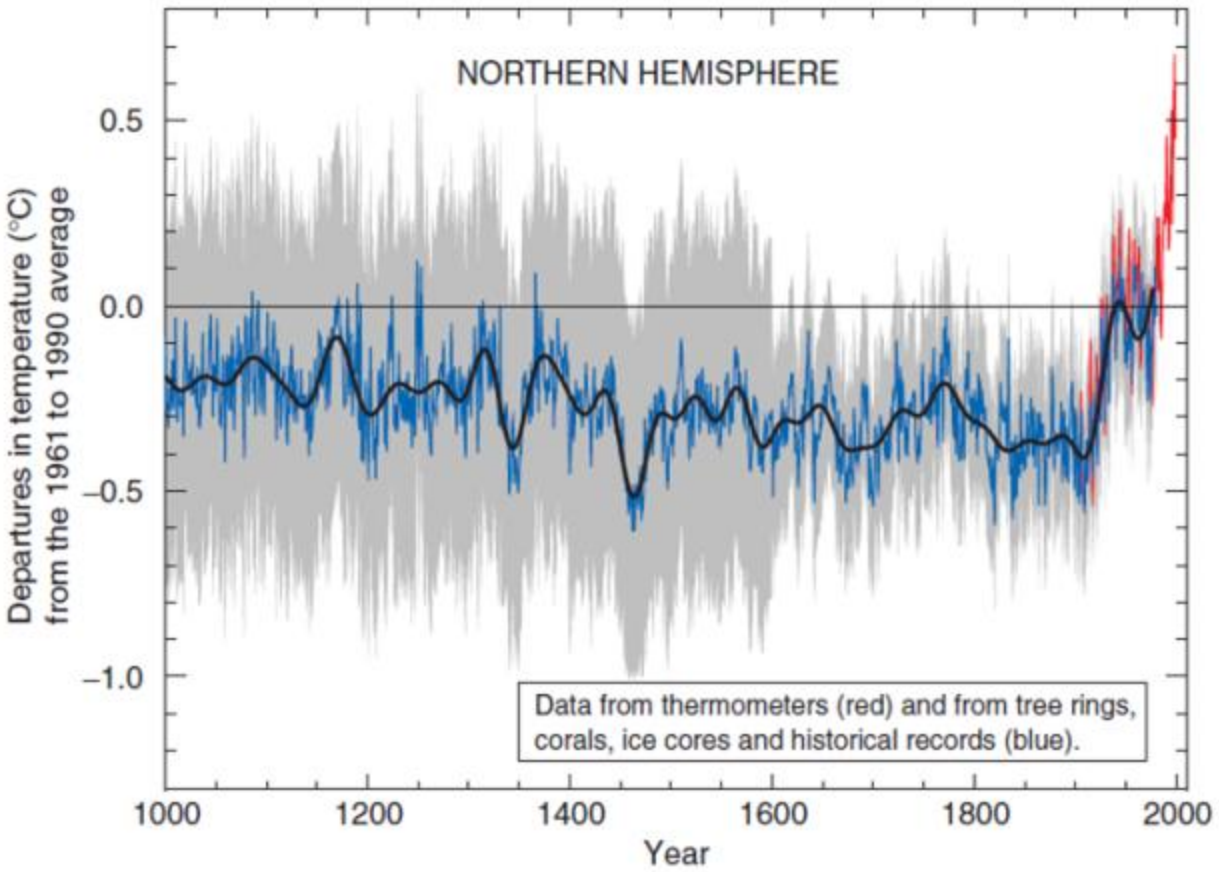
Dr. Heinz Lycklama

heinz@osta.com

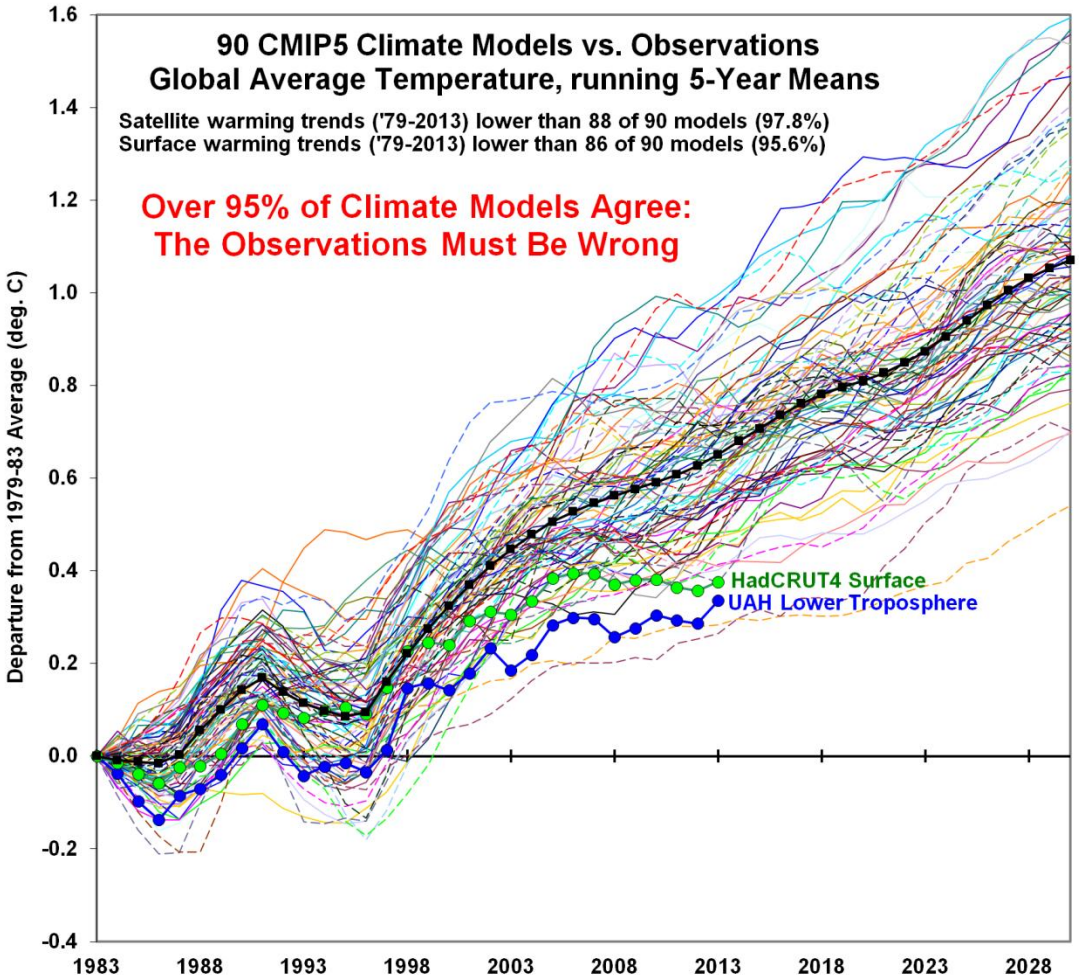
www.heinzlycklama.com

www.heinzlycklama.com/messages

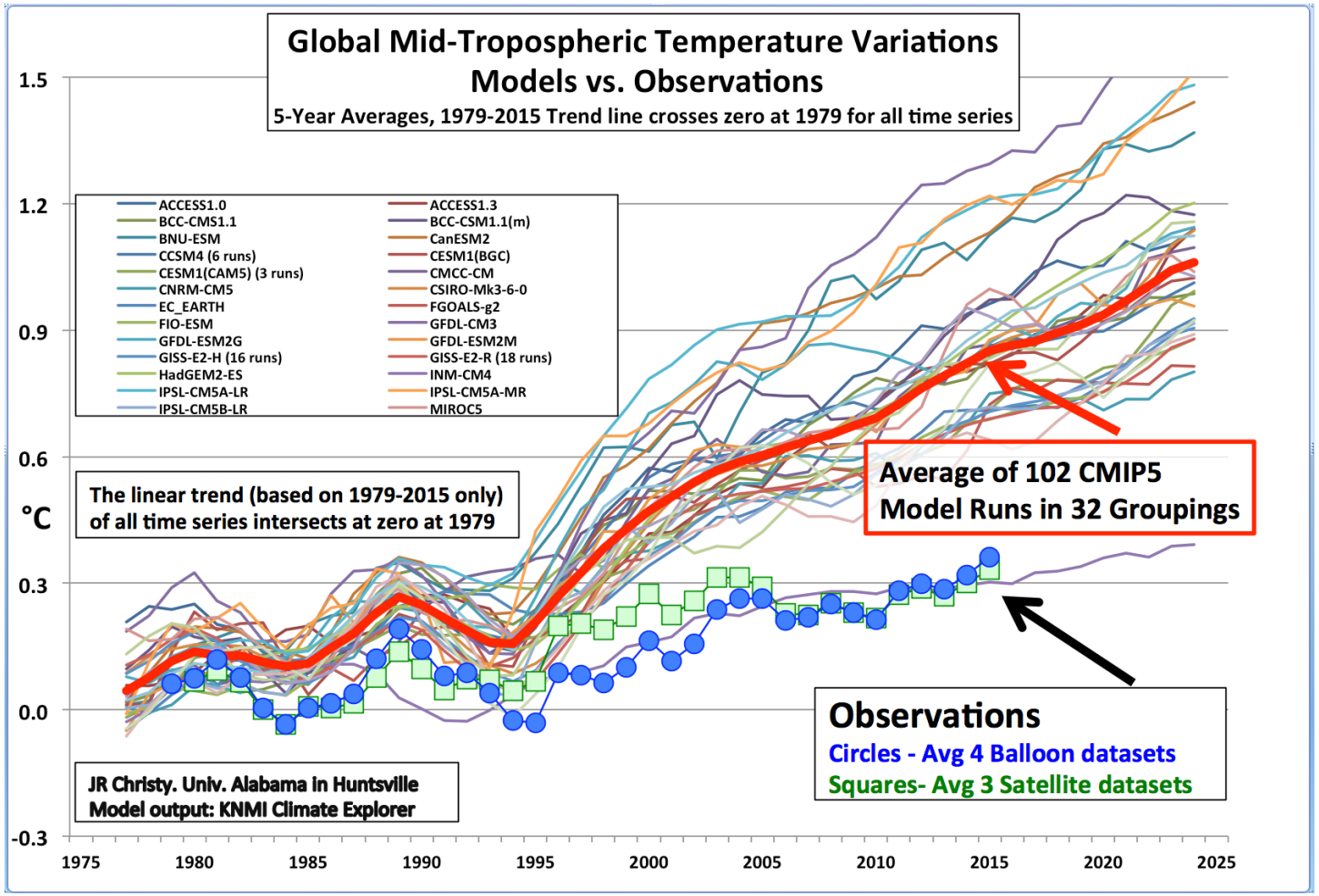
Hockey Stick Graph



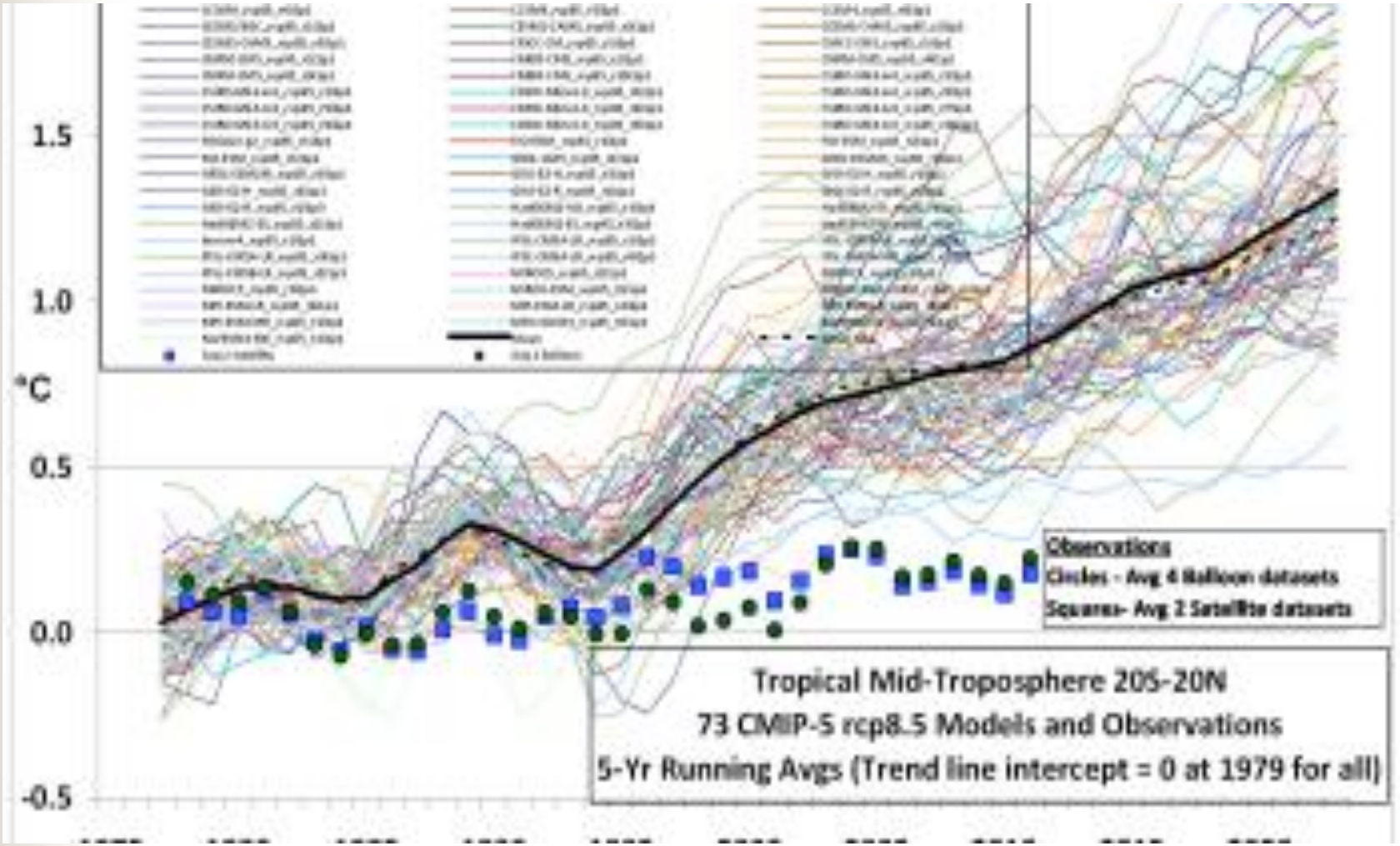
Climate Models vs. Observations



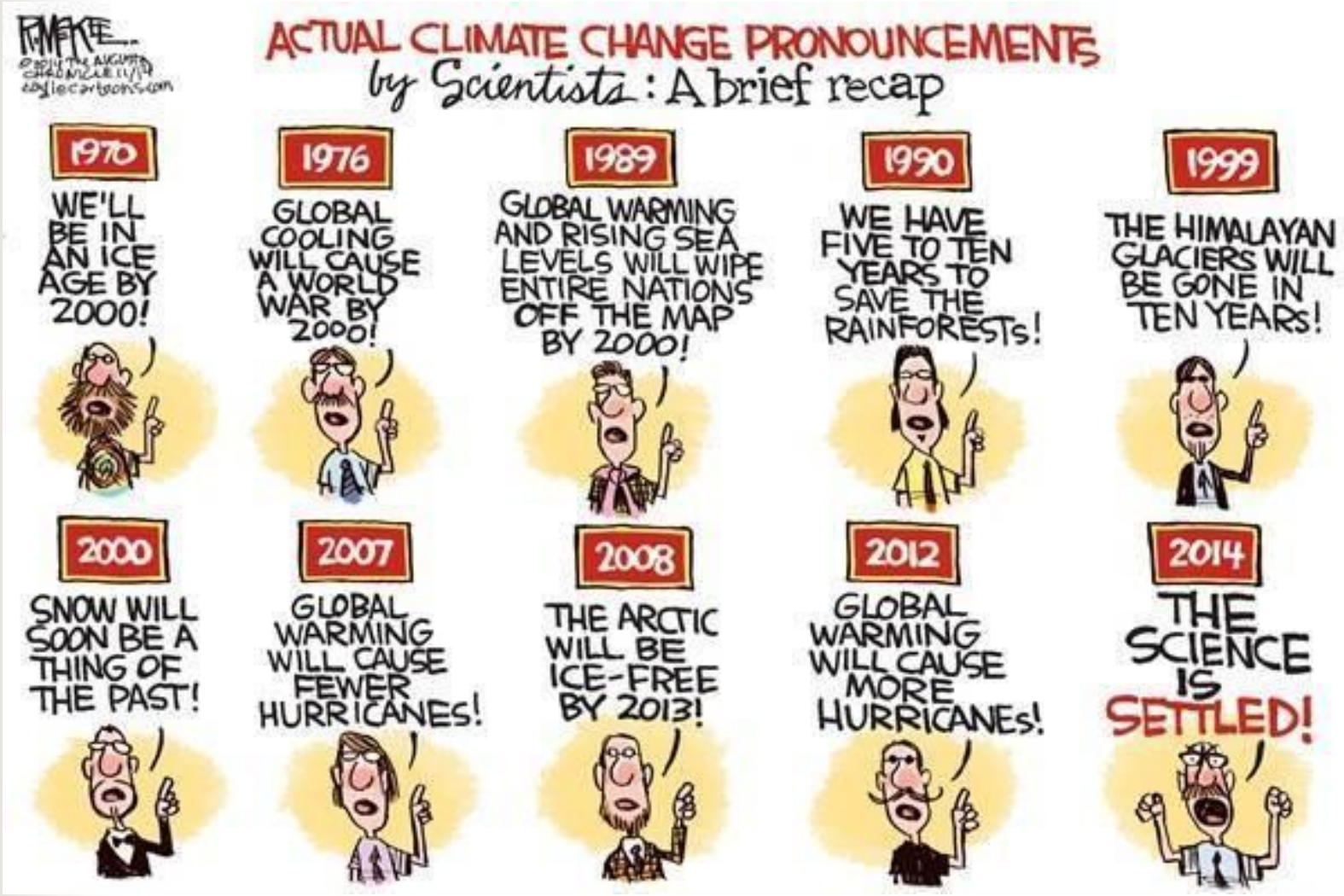
Models vs. Observations



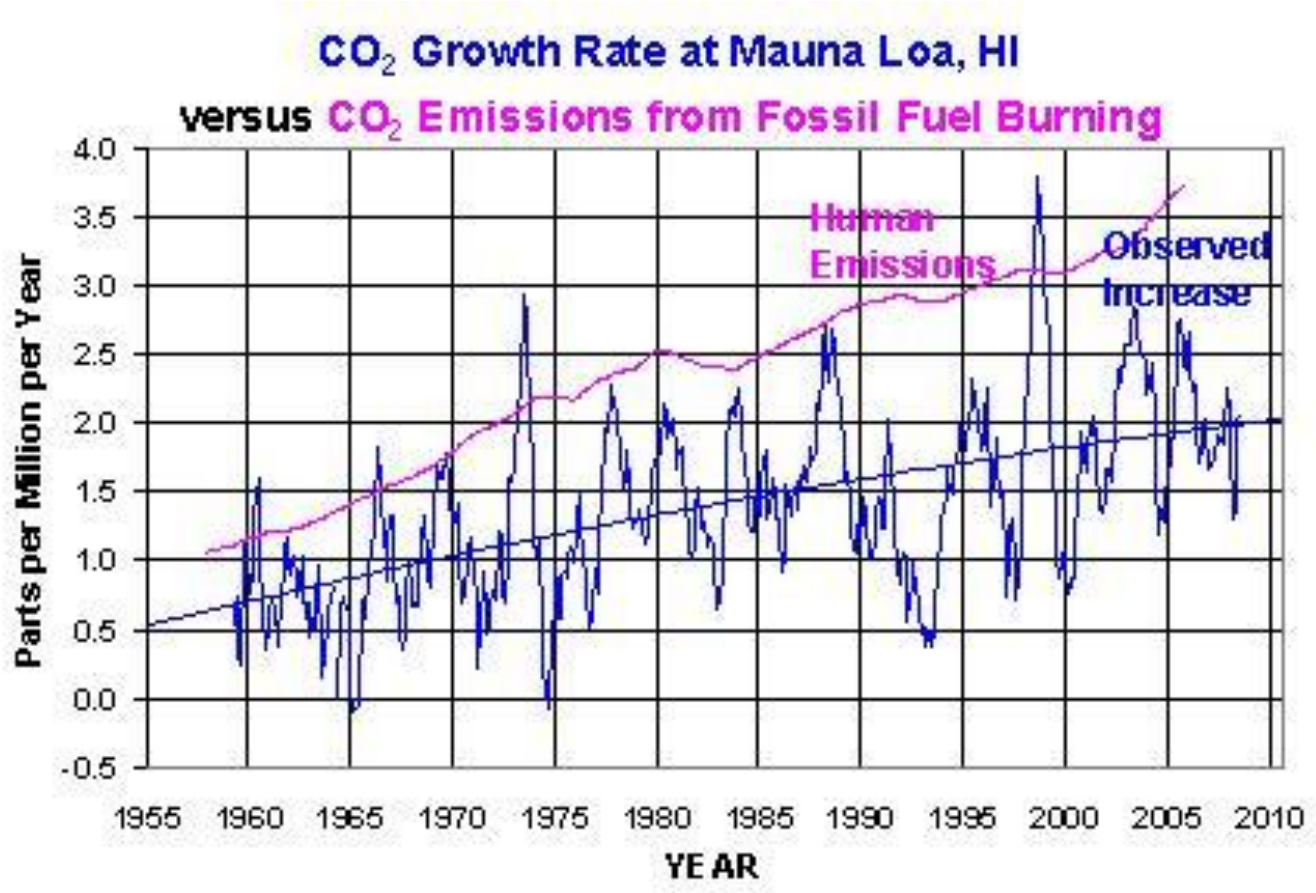
UN IPCC Climate Models



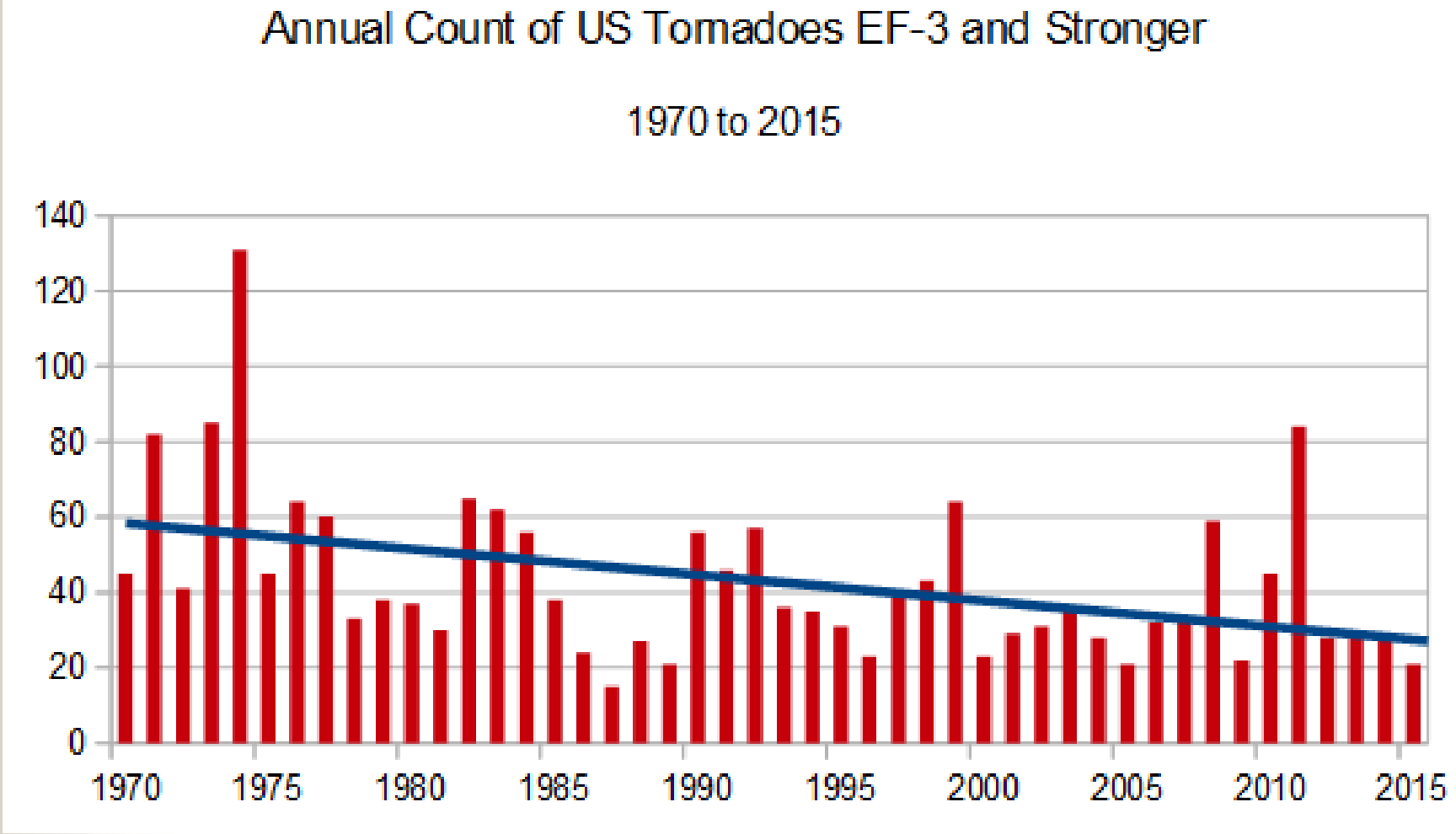
Actual CC Pronouncements



CO2 Growth Rate at Mauna Loa



US Tornadoes

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Dynamics
Laboratory
EVENTS
RESEARCH
MODELS
MODEL DATA
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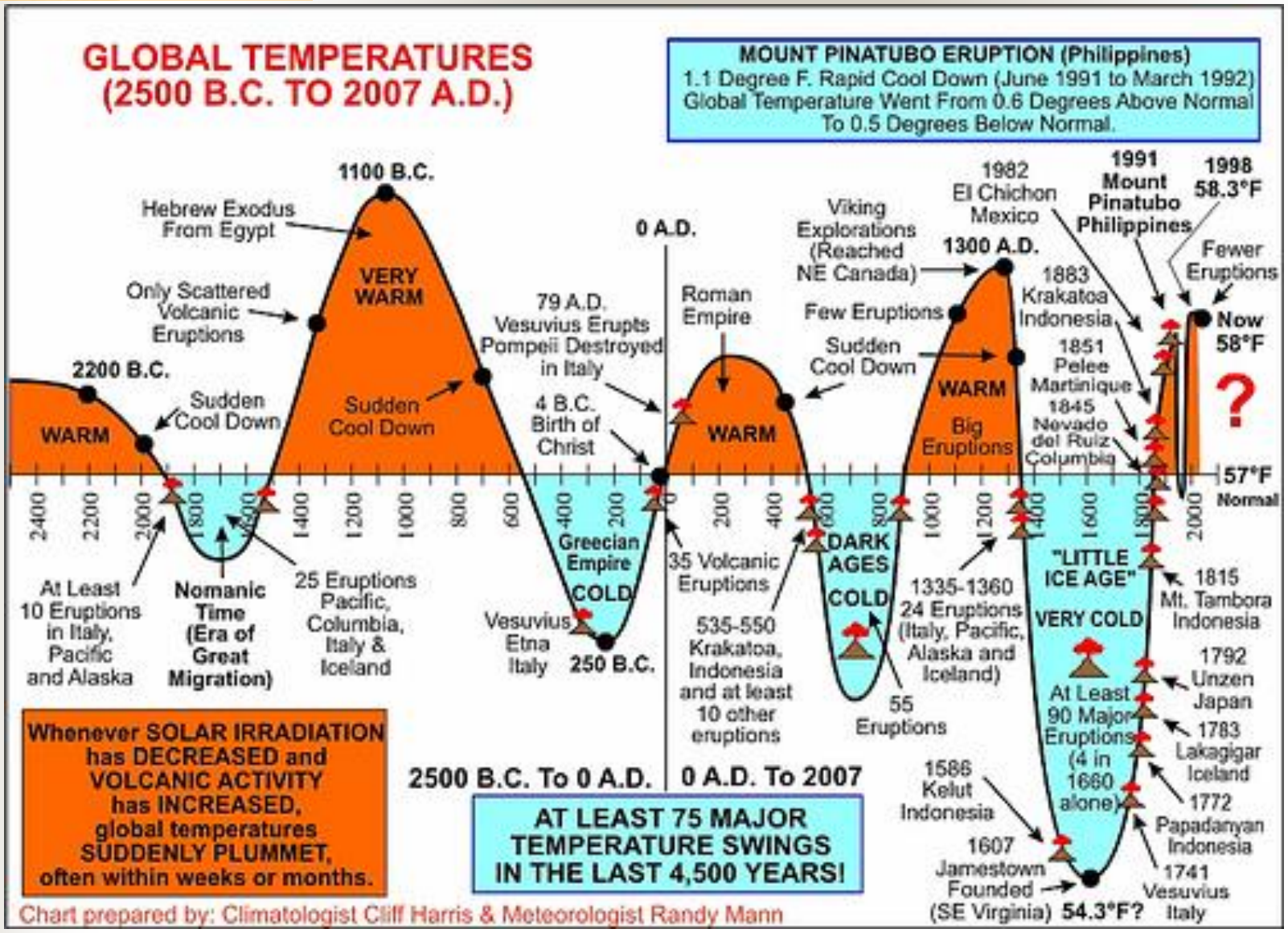
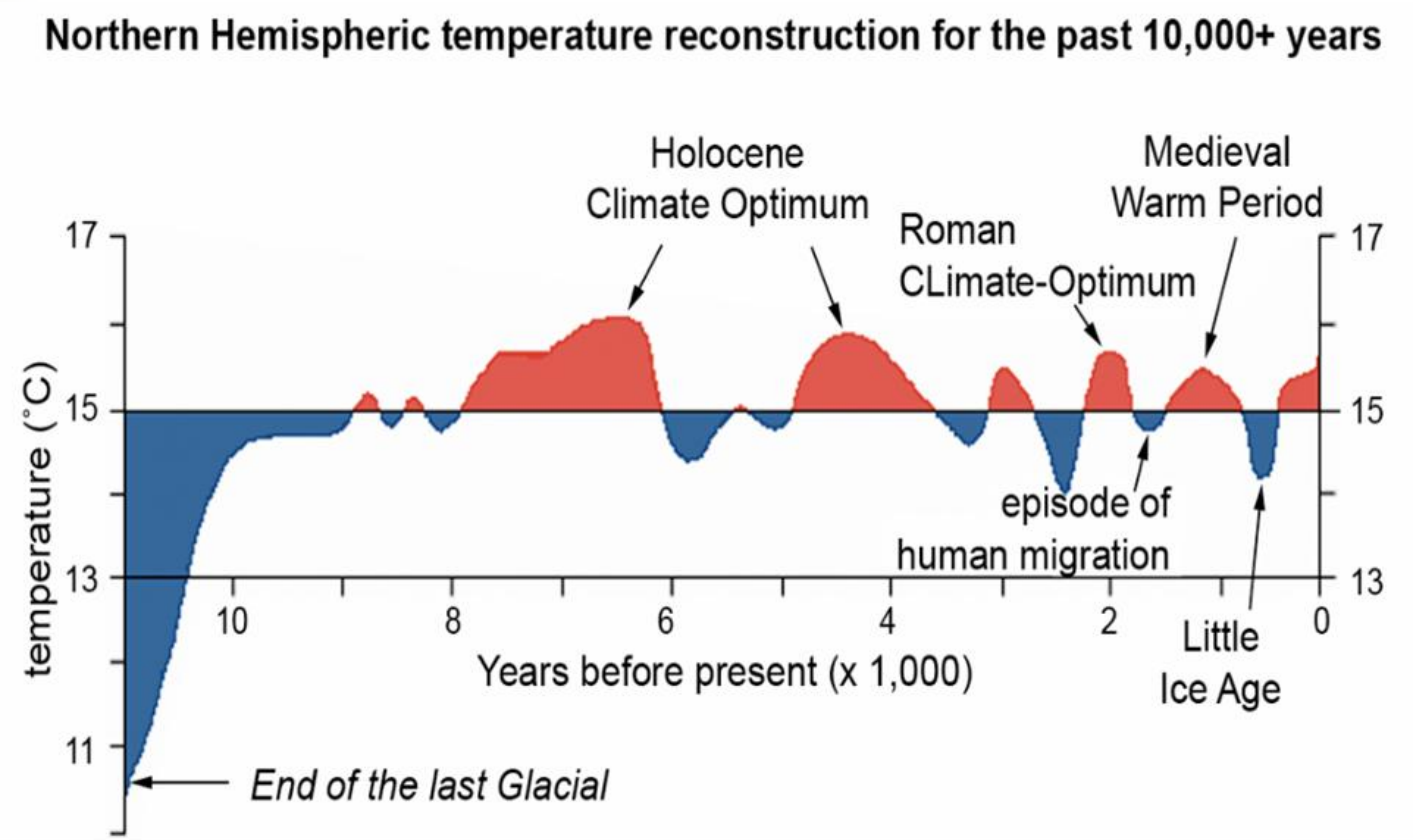
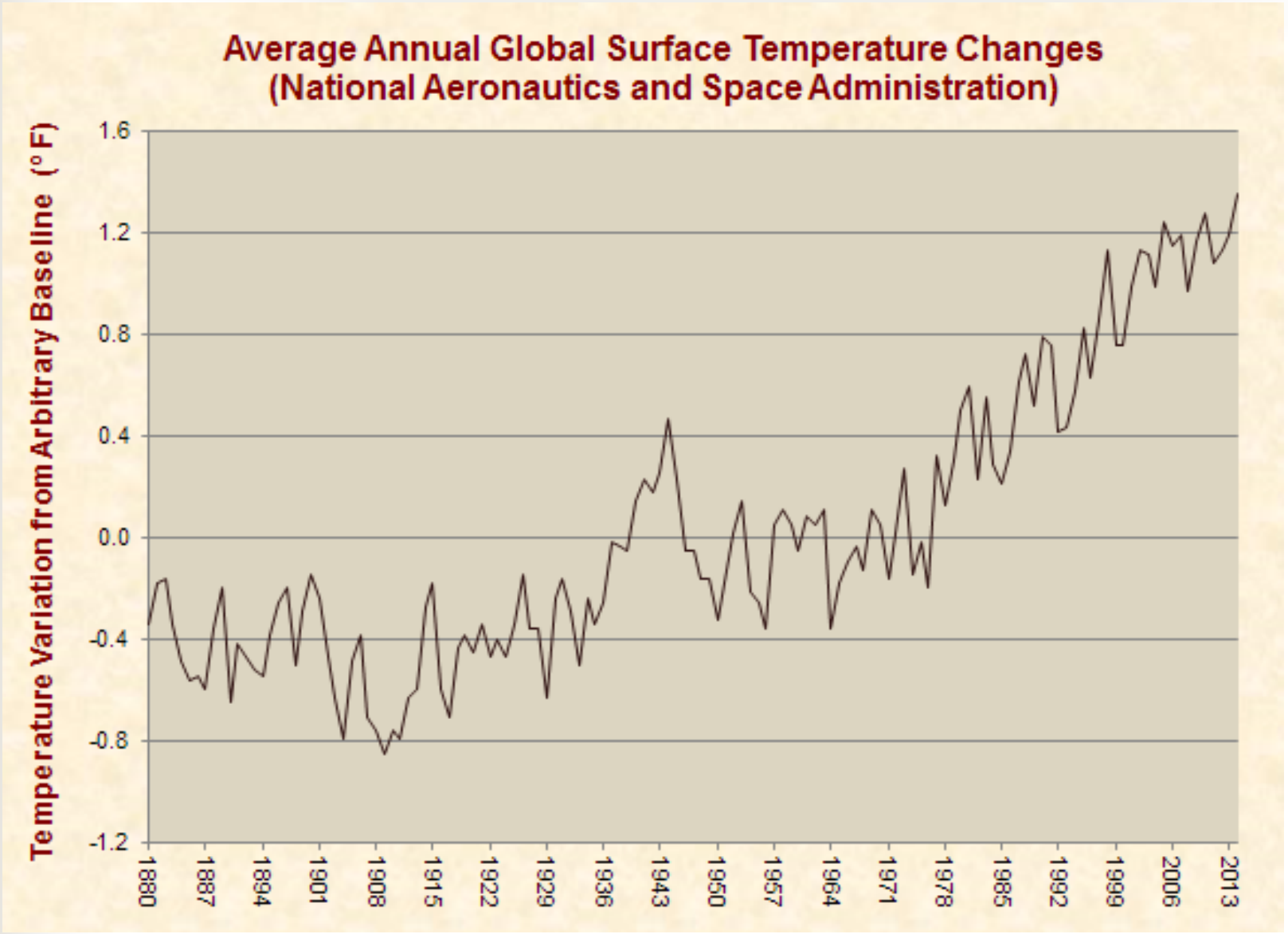
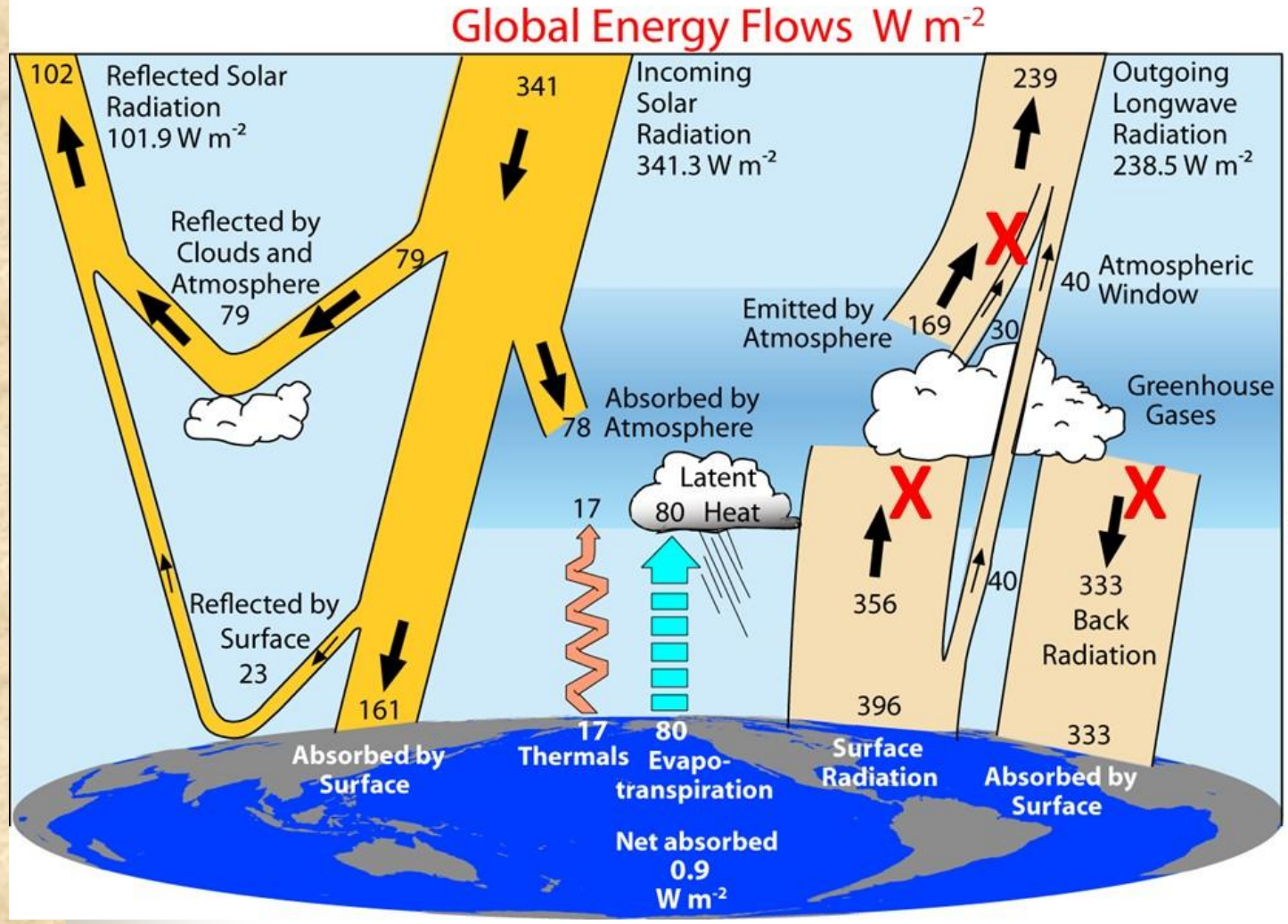
PUBLICATIONS
ABOUT GFDL
Global Warming and Hurricanes
An Overview of Current Research Results
1. Has Global Warming Affected Hurricane or Tropical Cyclone Activity?
Geophysical Fluid Dynamics Laboratory/NOAA
Last Revised: Mar. 17, 2017
A. Summary Statement
Two frequently asked questions on global warming and hurricanes are the following:
Have humans already caused a detectable increase in Atlantic hurricane activity or global tropical cyclone activity?
What changes in hurricane activity are expected for the late 21st century, given the pronounced global warming scenarios from current IPCC models?
In this review, we address these questions in the context of published research findings. We will first present the main conclusions and then follow with some background discussion of the research that leads to these conclusions. The main conclusions are:
It is premature to conclude that human activities–and particularly greenhouse gas emissions that cause global warming–have already had a detectable impact on Atlantic hurricane or global tropical cyclone activity. That said, human activities may have already caused changes that are not yet detectable due to the small magnitude of the changes or observational limitations, or are not yet confidently modeled (e.g., aerosol effects on regional climate).
Anthropogenic warming by the end of the 21st century will likely cause tropical cyclones globally to be more intense on average (by 2 to 11% according to model projections for an IPCC A1B scenario). This change would imply an even larger percentage increase in the destructive potential per storm, assuming no reduction in storm size.
There are better than even odds that anthropogenic warming over the next century will lead to an increase in the occurrence of very intense tropical cyclone in some basins–an increase that would be substantially larger in percentage terms than the 2-11% increase in the average storm intensity. This increase in intense storm occurrence is projected despite a likely decrease (or little change) in the global numbers of all tropical cyclones.
Anthropogenic warming by the end of the 21st century will likely cause tropical cyclones to have substantially higher rainfall rates than present-day ones, with a model-projected increase of about 10-15% for rainfall rates averaged within about 100 km of the storm center.
Related Links:
For more information and related research see:
"Tropical Cyclones and Climate Change", an assessment by a World Meteorological Organization Expert Team on Climate Change Impacts on Tropical Cyclones. For more information on the expert team, see this WMO web page.
Future projections of global tropical cyclone activity (J. Climate 2015).
Future projections of intense Atlantic hurricanes (J. Climate 2013).
Global models of hurricane frequency developed at GFDL.
Historical changes in Atlantic hurricanes and tropical storms.
GFDL's Hurricane Portal
GFDL Hurricane simulations–animations
GFDL Climate Research Highlights web page.
Hurricanes: Science and Society web page
NOAA State of the Science Fact Sheet on "Atlantic Hurricanes, Climate Variability, and Global Warming" (May 2012)


GLOBAL TEMPERATURES
(2500 B.C. TO 2007 A.D.)
MOUNT PINATUBO ERUPTION (Philippines)
1.1 Degree F. Rapid Cool Down (June 1991 to March 1992)
Global Temperature Went From 0.6 Degrees Above Normal
To 0.5 Degrees Below Normal.
1100 B.C.
Hebrew Exodus From Egypt
VERY WARM
Only Scattered Volcanic Eruptions
2200 B.C.
WARM
Sudden Cool Down
Sudden Cool Down
79 A.D. Vesuvius Erupts Pompeii Destroyed in Italy
4 B.C. Birth of Christ
0 A.D.
Roman Empire
WARM
Viking Explorations (Reached NE Canada)
1300 A.D.
Few Eruptions
Sudden Cool Down
WARM
Big Eruptions
1982 El Chichon Mexico
1991 Mount Pinatubo Philippines
1998 58.3°F
Fewer Eruptions
Now 58°F
?
1883 Krakatoa Indonesia
1851 Pelee Martinique
1845 Nevado del Ruiz Columbia
57°F Normal
2400 2200 2000 1800 1600 1400 1200 1000 800 600 400 200 0 200 400 600 800 1000 1200 1400 1600 1800 2000
At Least 10 Eruptions in Italy, Pacific and Alaska
Nomanic Time (Era of Great Migration)
25 Eruptions Pacific, Columbia, Italy & Iceland
Greecian Empire
COLD
Vesuvius Etna Italy
250 B.C.
35 Volcanic Eruptions
535-550 Krakatoa, Indonesia and at least 10 other eruptions
DARK AGES
COLD
55 Eruptions
1335-1360 24 Eruptions (Italy, Pacific, Alaska and Iceland)
"LITTLE ICE AGE"
VERY COLD
At Least 90 Major Eruptions (4 in 1660 alone)
1815 Mt. Tambora Indonesia
1792 Unzen Japan
1783 Lakagigar Iceland
1772 Papadanyan Indonesia
1741 Vesuvius Italy
1586 Kelut Indonesia
1607 Jamestown Founded (SE Virginia)
54.3°F?
Whenever SOLAR IRRADIATION has DECREASED and VOLCANIC ACTIVITY has INCREASED, global temperatures SUDDENLY PLUMMET, often within weeks or months.
2500 B.C. To 0 A.D.
0 A.D. To 2007
AT LEAST 75 MAJOR TEMPERATURE SWINGS IN THE LAST 4,500 YEARS!
Chart prepared by: Climatologist Cliff Harris & Meteorologist Randy Mann

Global Temperature Anomaly

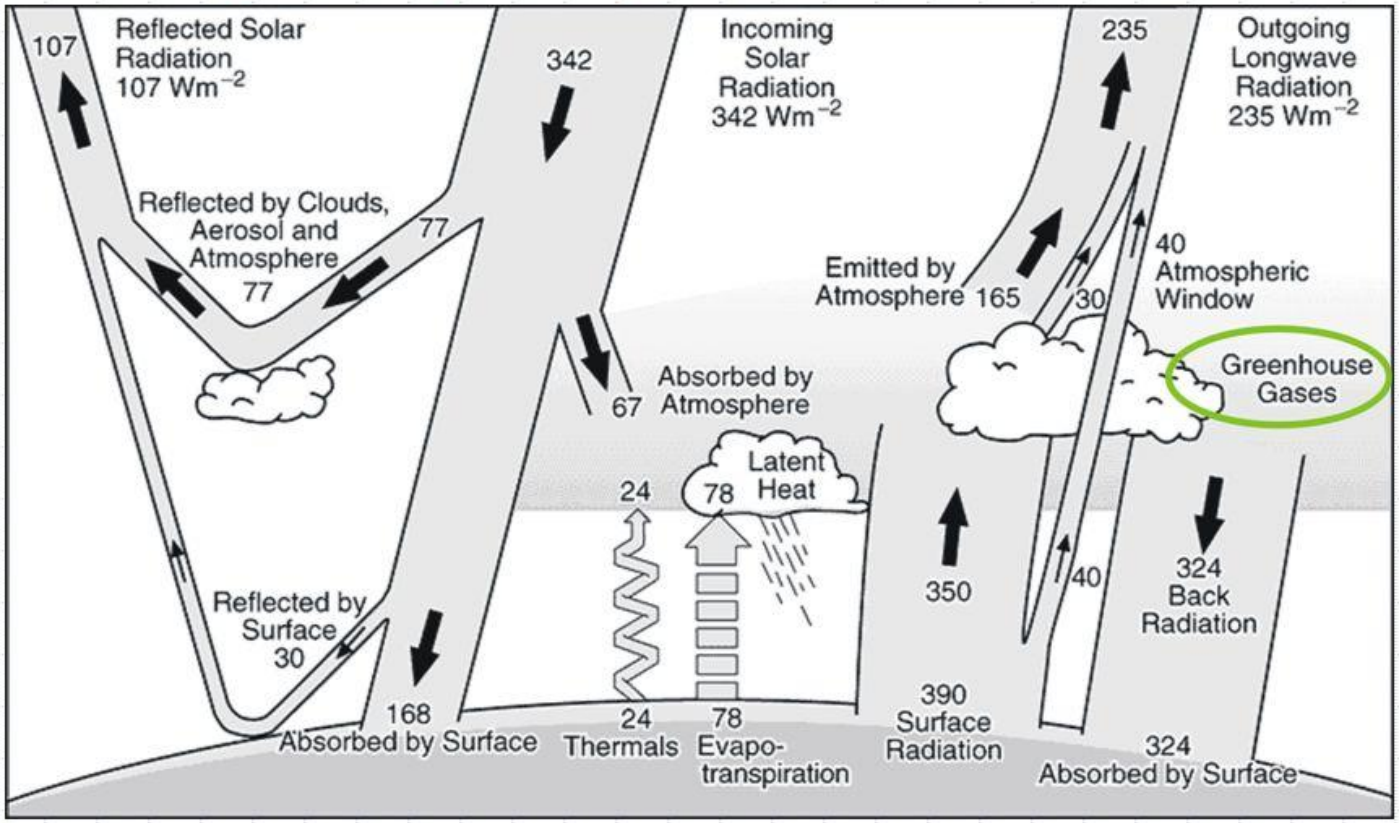



Average Annual Global Surface Temperature Changes
(National Aeronautics and Space Administration)
Temperature Variation from Arbitrary Baseline (° F)
1.6
1.2
0.8
0.4
0.0
-0.4
-0.8
-1.2
1880
1887
1894
1901
1908
1915
1922
1929
1936
1943
1950
1957
1964
1971
1978
1985
1992
1999
2006
2013



Infrared energy flows marked "X" would not exist without greenhouse gases

The (Atmospheric) Greenhouse Effect

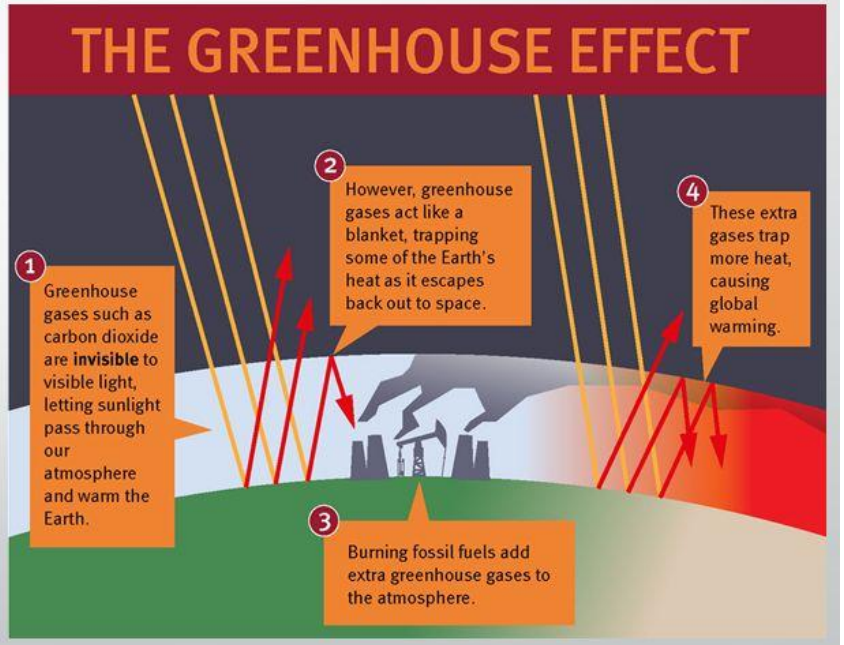


- GHGs can absorb terrestrial radiation (peaking at infrared wavelength) and re-radiate in all directions. Part of the re-radiation is sent back to the surface.

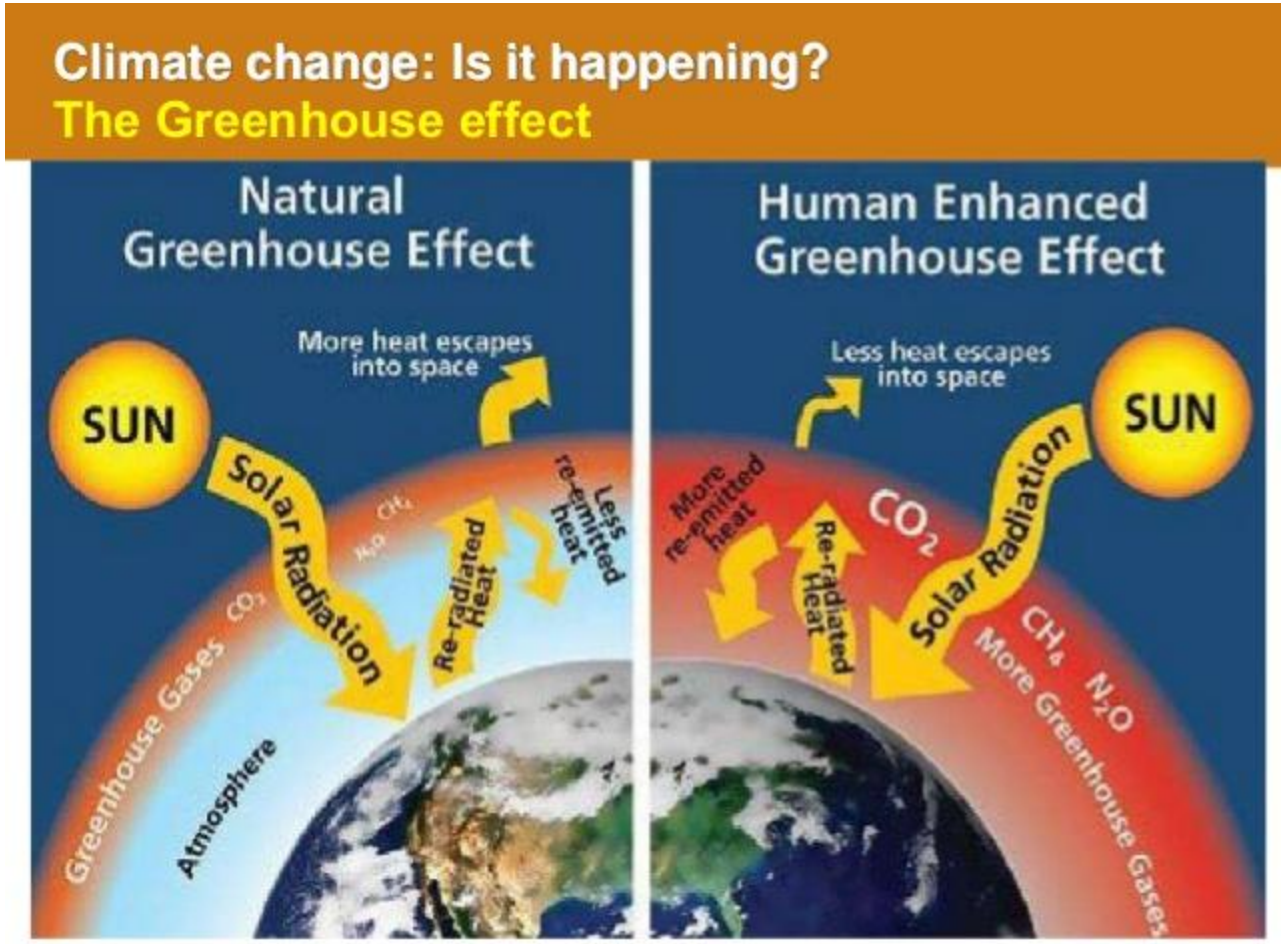
The Greenhouse Effect

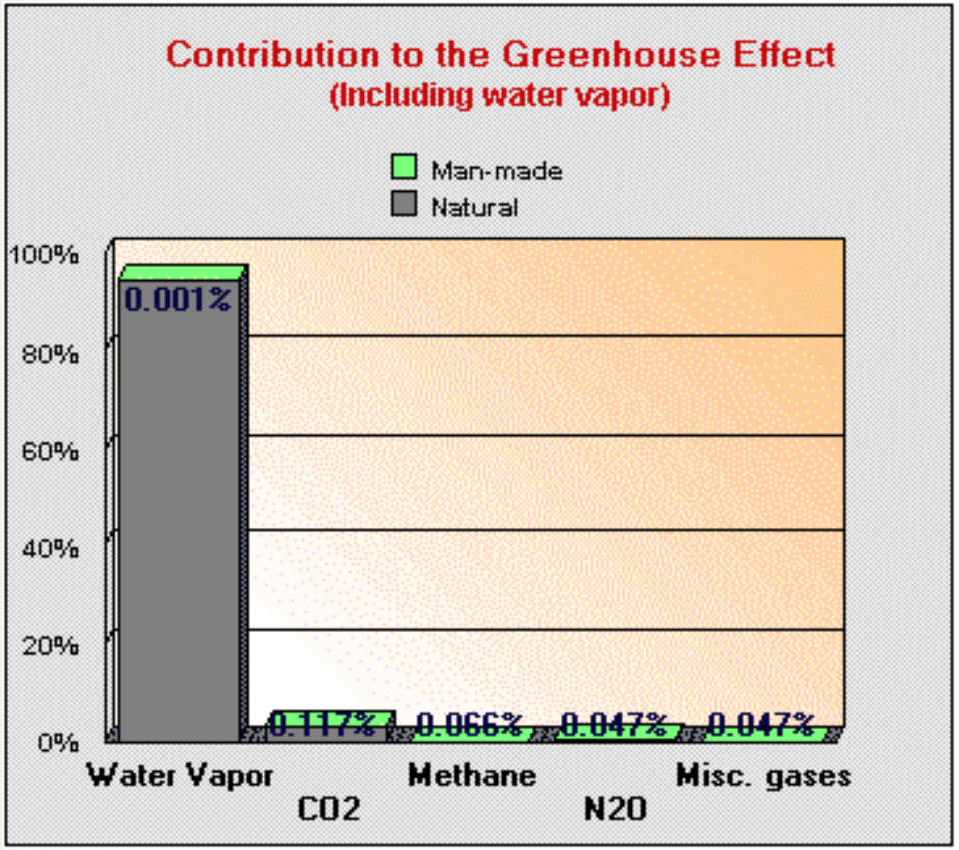
What if there are no greenhouse gases?

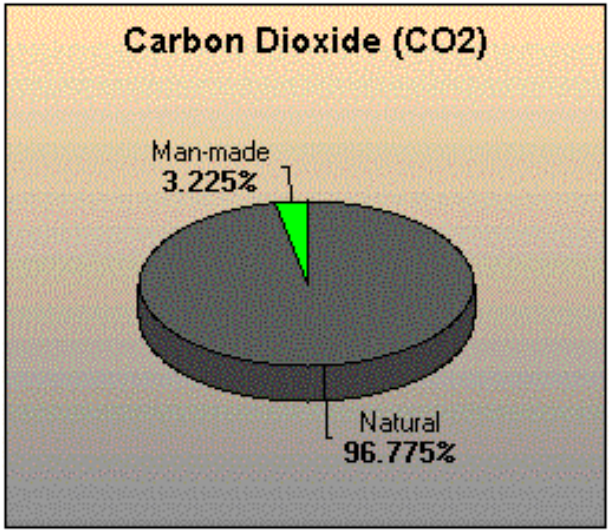
- Infrared radiation would go straight back into outer space.
- Why is this bad?
- The Earth would be too cold, water would freeze and there would be no life.
- Greenhouse effect keeps Earth's temp around 59 degrees.
- In time, the gases all end up back in outer space.



Greenhouse Effect

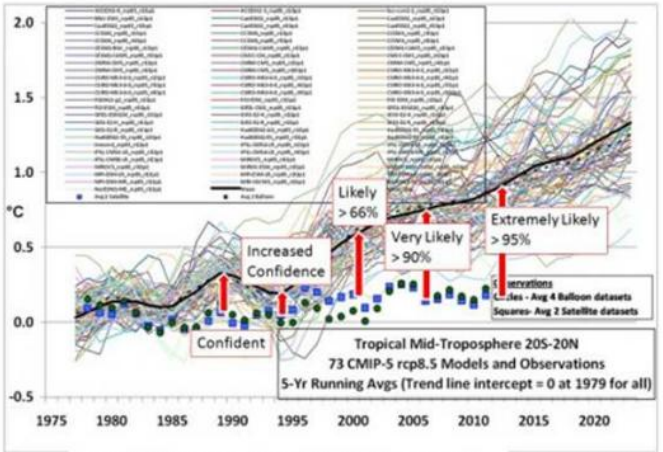






Human contribution to greenhouse effect = 0.28%

Rather than 'tell a thousand words', this picture (graph) poses a simple question...



Arrows & CON statements (from IPCC) by H. Hayden; graph by Roy Spencer, 6/6/13

Correlation between the average (solid black line) of UN IPCC's global temperature predictions progressively decreases relative to real-world observations that increasingly diverge from 'Confidence Level' statements in past IPCC Assessment Reports (red arrows - 1989, 1995, 2000, 2007 & 2013).

'Certainty' increases whilst correlation 'decreases'!

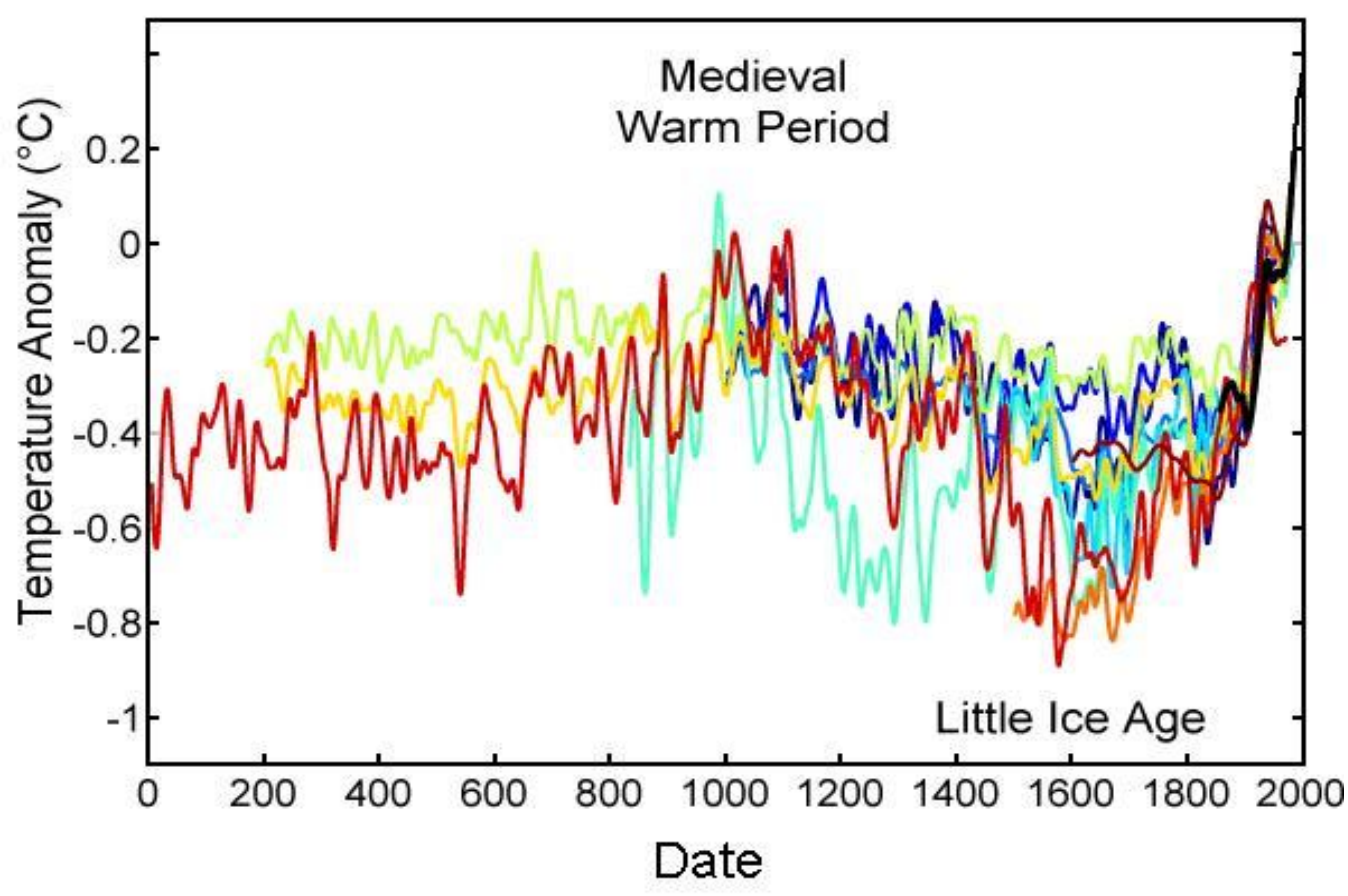
Really?

How does that work?

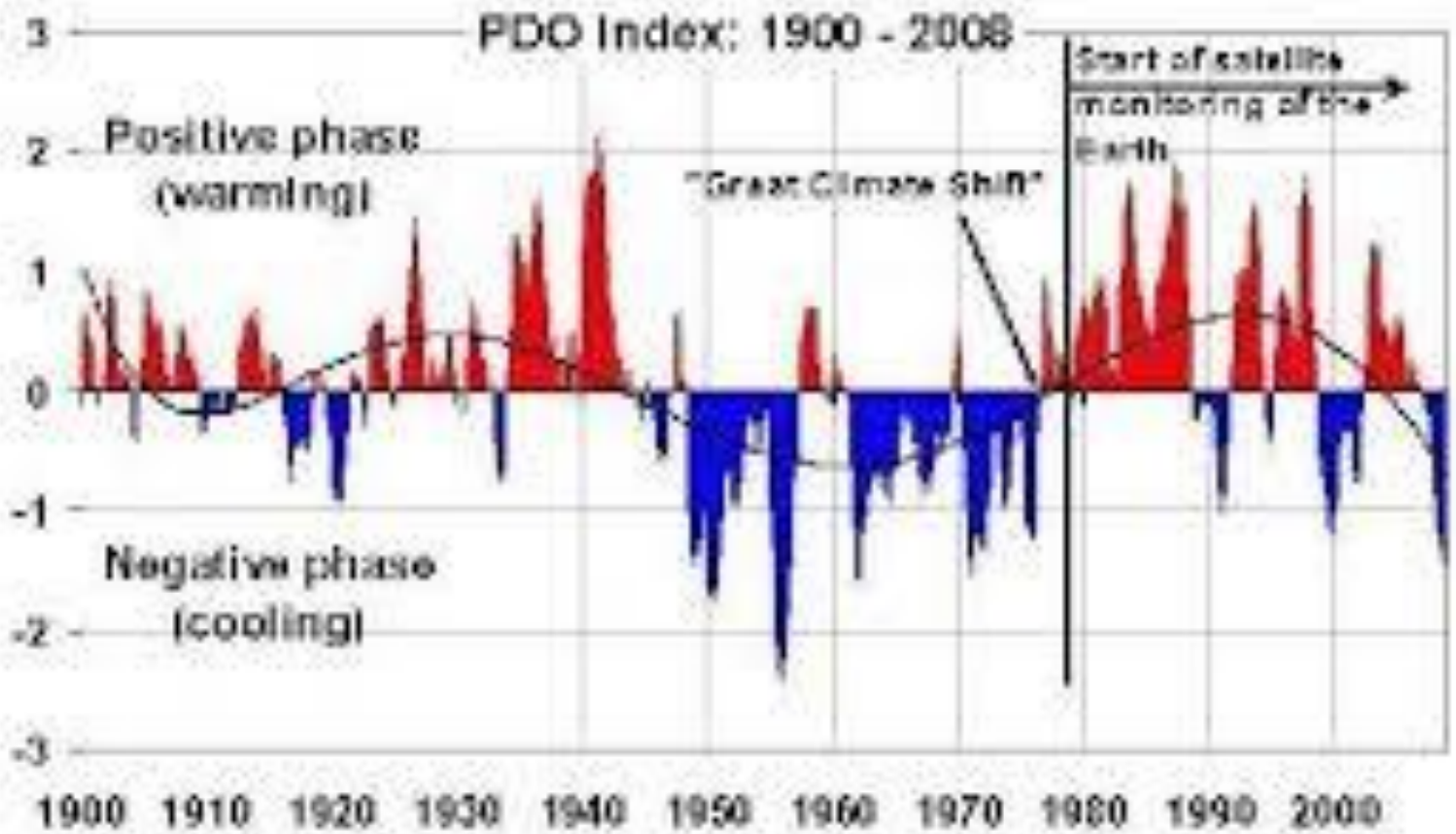
For more information about the failure of Climate Models, follow this Link:
http://bit.ly/failureofclimatemodels

A Picture tells a thousand words – Roy Spencer Graph.Doc

2000 Years of Global Temperatures



4. Pacific Decadal Oscillation (PDO)



The Pacific Decadal Oscillation, an index of weather patterns over the North Pacific Ocean, has coincided with periods of warming and cooling over the last century (JISAO, 2008).

Sulfuric Acid Concentration

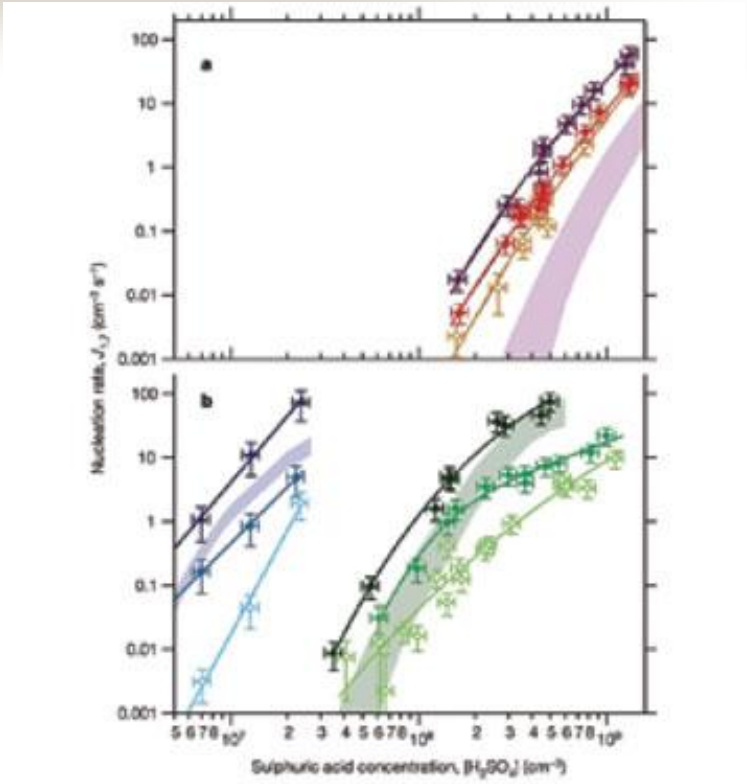


Figure 4. Nucleation rate for 1.7 nm (6.7 x 10^{-8} inch) diameter cloud droplets as a function of sulfuric acid concentration, 38 percent relative humidity, and a pressure of 1 atmosphere. The chamber was maintained at a temperature of 292K (33.9°F) for the red curves, 278K (8.7°F) for the green curves, and 248K (-45.3°F) for the blue curves. The NH_3 mixing ratio corresponded to the contaminant level (<35 ppt$_v$ at 278 and 292K and <50 ppt$_v$ at 248K). Triangles are for charged nucleation rates (J_{ch}), filled circles for galactic cosmic radiation rates (J_{GCR}), and open circles for neutral rates (J_n). The error bars indicate the estimated total statistical and systematic 1σ measurement uncertainties. The colored bands show the predictions from the PARNUC model for binary H_2SO_4—H_2O charged nucleation rates J_{ch}. (From Kirkby et al.[7] Copyright 2011 Nature Publishing Group. Usage does not imply endorsement.)

The Paris climate agreement: key points

COP21

The historic pact, approved by 195 countries, will take effect from 2020

Temperatures

2100

- Keep warming **"well below 2 degrees Celsius".** Continue all efforts to limit the rise in temperatures **to 1.5 degrees Celsius"**

Finance

2020-2025

- Rich countries must provide **100 billion dollars** from 2020, as a "floor"
- Amount to be updated by 2025

Differenciation

- Developed countries **must continue to "take the lead"** in the reduction of greenhouse gases
- Developing nations are encouraged to "enhance their efforts" and move over time to cuts

Emissions objectives

2050

- Aim for greenhouse gases emissions to peak **"as soon as possible"**
- From 2050: **rapid reductions to achieve a balance between emissions** from human activity and the amount that can be captured by "sinks"

Burden-sharing

- **Developed countries** must provide financial resources to help developing countries
- Other countries are invited to provide support **on a voluntary basis**

Review mechanism

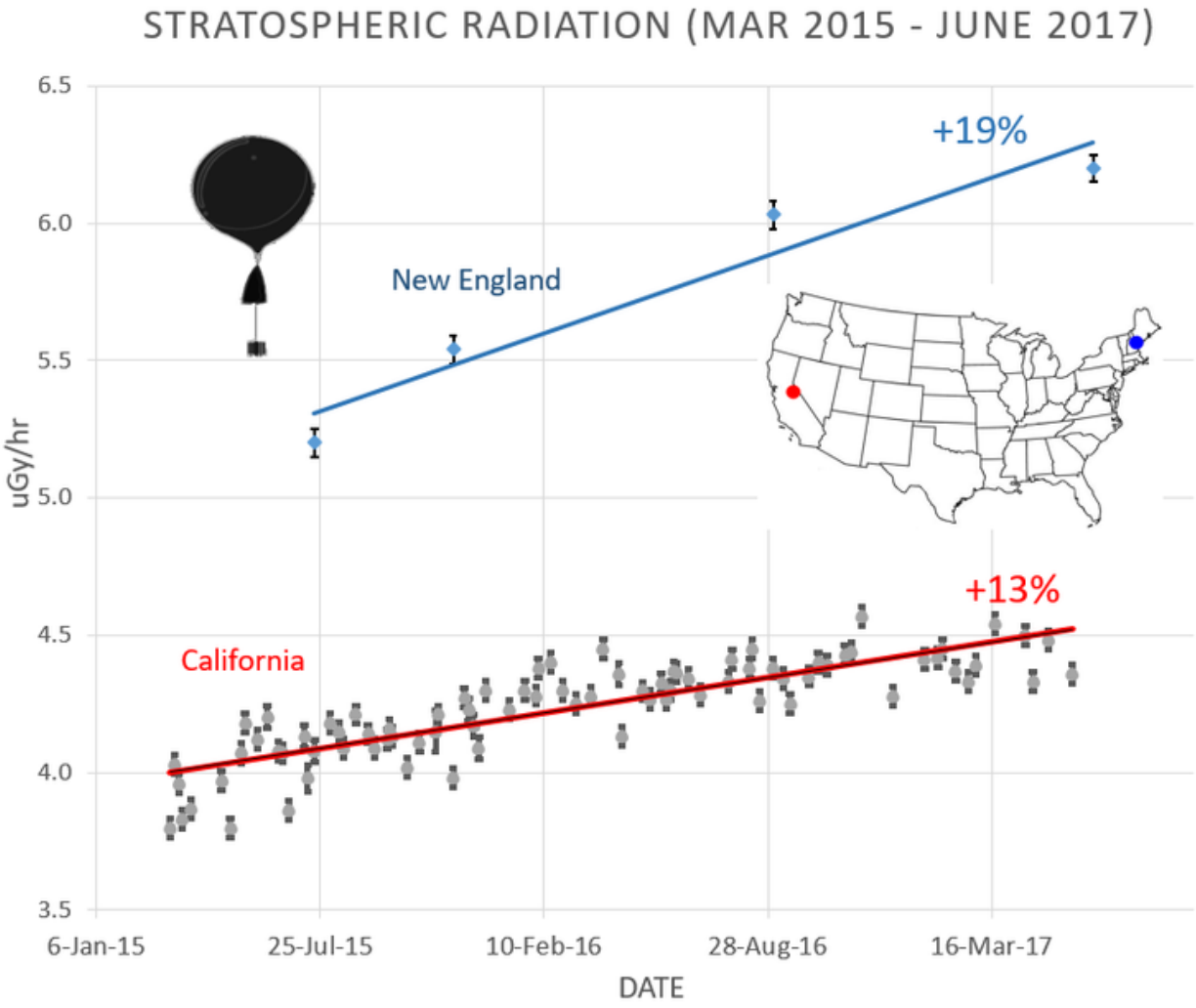
2023

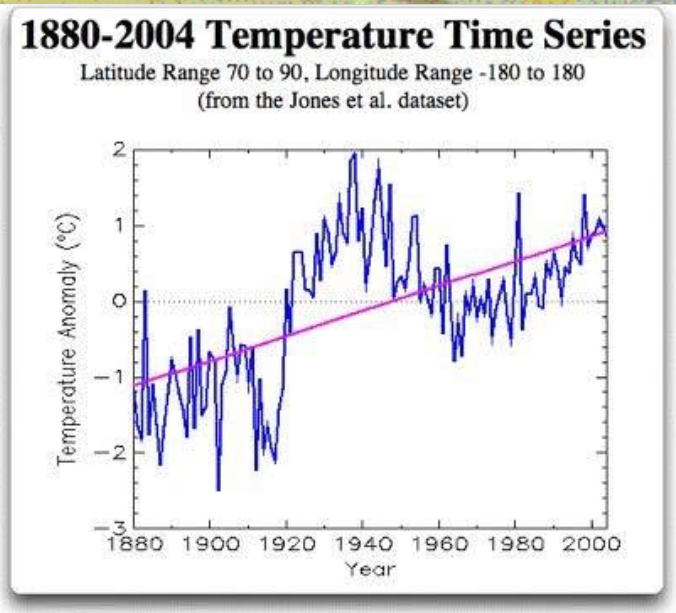
- **A review every five years** First world review: **2023**
- Each review will inform countries in "updating and enhancing" their pledges

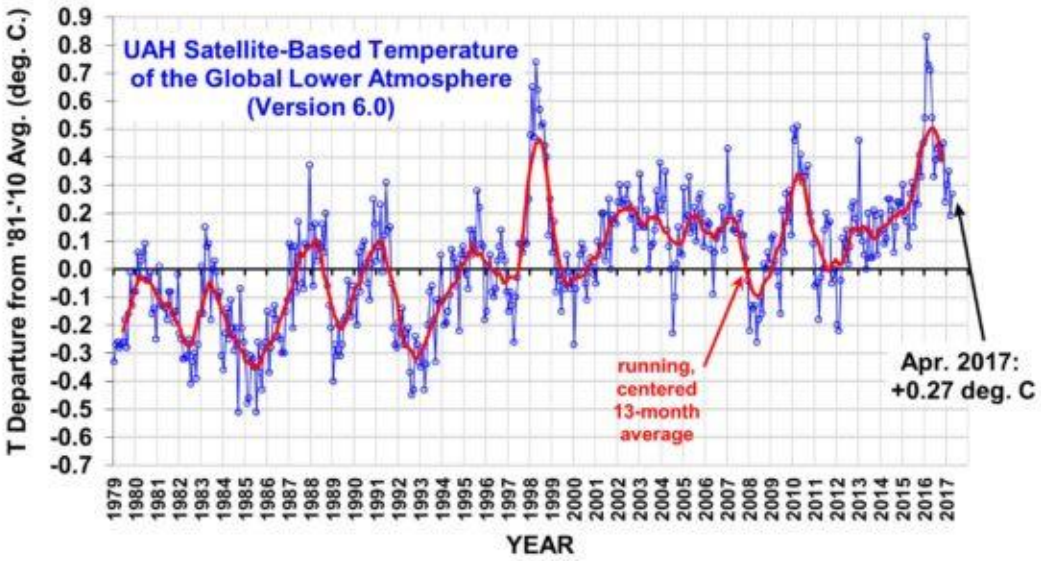
Climate damage

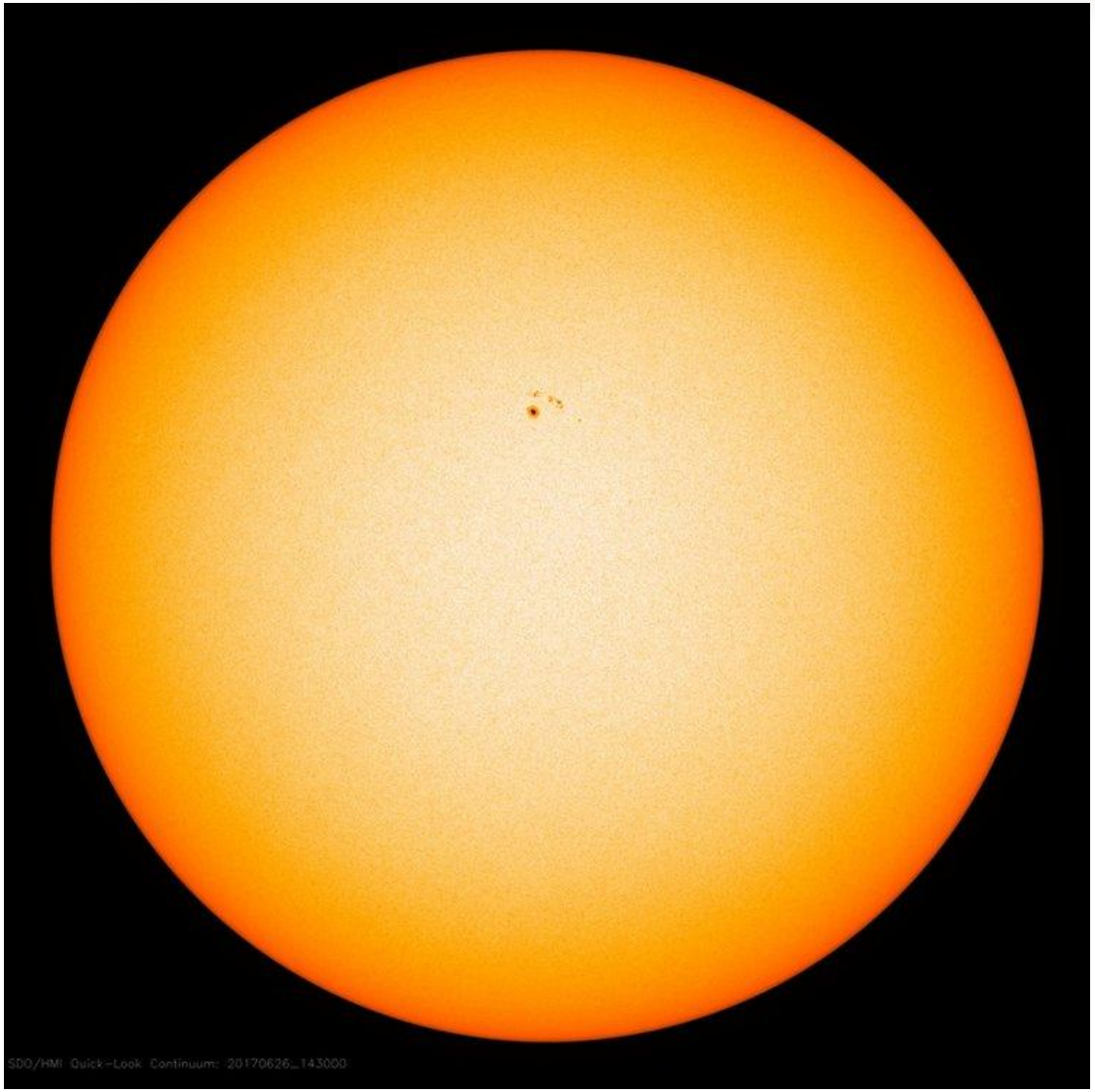
- Vulnerable countries have won recognition of the need for "averting, minimising and addressing" losses suffered due to climate change

AFP


STRATOSPHERIC RADIATION (MAR 2015 - JUNE 2017)
6.5
6.0
5.5
5.0
4.5
4.0
3.5
uGy/hr
+19%
New England
+13%
California
6-Jan-15
25-Jul-15
10-Feb-16
28-Aug-16
16-Mar-17
DATE


1880-2004 Temperature Time Series
Latitude Range 70 to 90, Longitude Range -180 to 180
(from the Jones et al. dataset)
Temperature Anomaly (°C)
2
1
0
−1
−2
−3
1880 1900 1920 1940 1960 1980 2000
Year


UAH Satellite-Based Temperature
of the Global Lower Atmosphere
(Version 6.0)
T Departure from '81-'10 Avg. (deg. C.)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
YEAR
running,
centered
13-month
average
Apr. 2017:
+0.27 deg. C

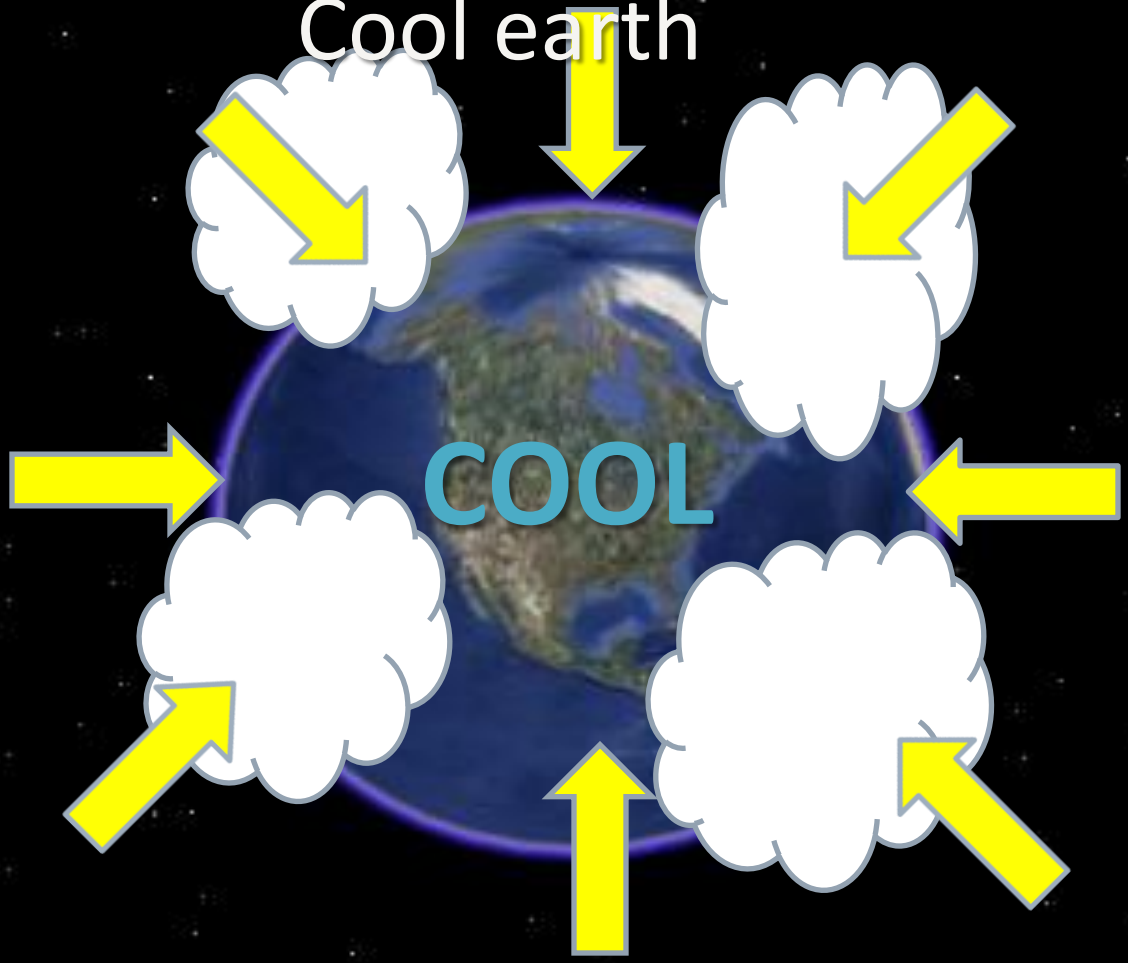

SDO/HMI Quick-Look Continuum: 20170626_143000

INACTIVE SUN

High cosmic rays

More clouds

Cool earth

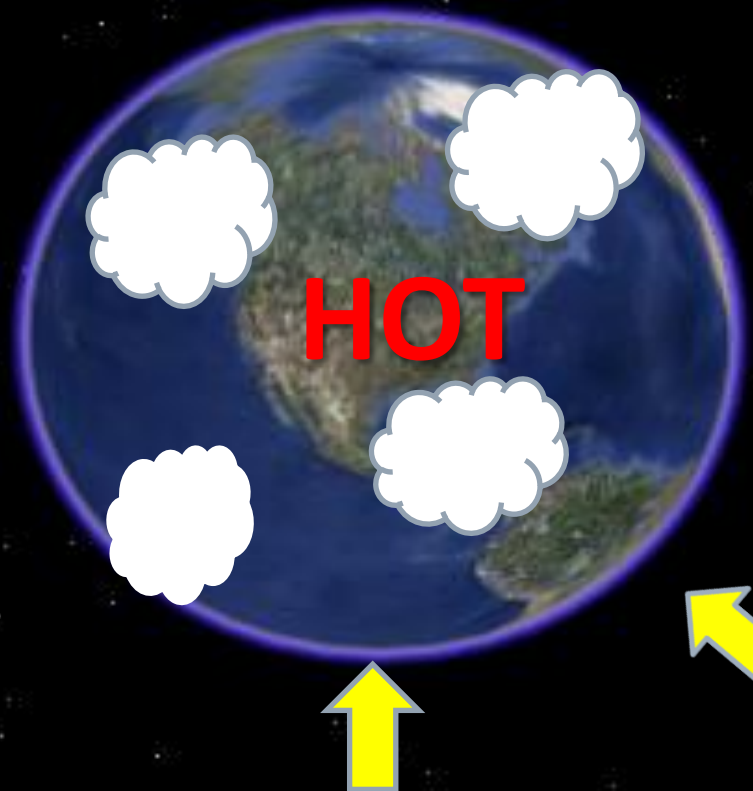


ACTIVE SUN

Low cosmic rays

Fewer clouds

Hot earth



Svensmark's GCR Theory

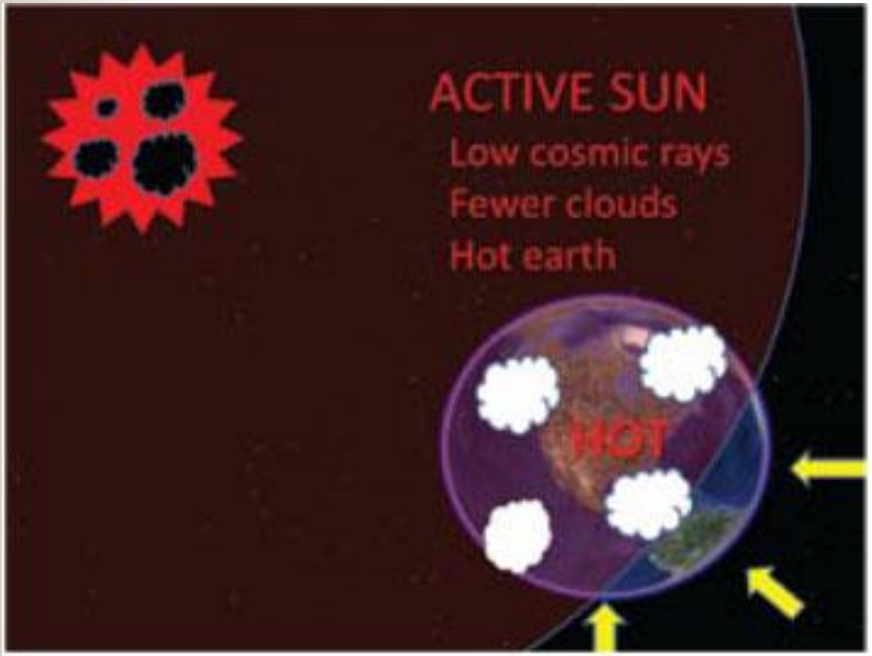


Figure 1. Cartoon showing effects of an active sun on the temperature of the earth.

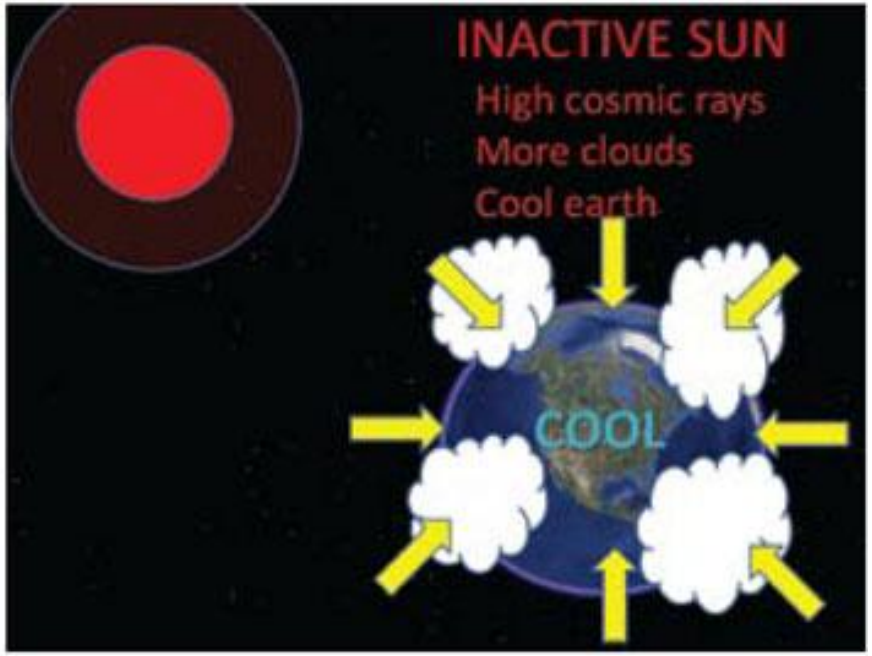


Figure 2. Cartoon showing effects of an inactive sun on the temperature of the earth.

Cloud Experiment Supports GW Theory, Dr. Larry Vardiman

Conclusions

- Global warming has been occurring for over 150 years, even before industrialization.
- It's probably due mostly to natural causes.
- Humans may contribute a small part, but the main cause of global warming is still not understood.
- One theory shows great promise: Increased solar activity modulates galactic cosmic radiation(GCR), decreases low-level cloud cover, and warms the atmosphere.
- Global warming may be beneficial.

Conclusions

- Global warming has been occurring for over 100 years.
- The warming may only be short-term.
- The warming is probably due to natural causes.
- Man probably contributes a small part.
- The cause still needs to be identified.
- One theory shows great promise: Solar activity modulates galactic cosmic radiation, decreases low-level cloud cover, and warms the atmosphere.
- The insertion of even large amounts of CO_2 causes minimal warming

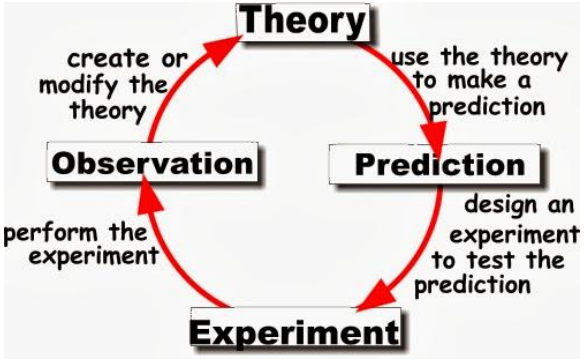
No Consensus

- The most important fact about climate science, often overlooked, is that scientists disagree about the environmental impacts of the combustion of fossil fuels on the global climate.
- The articles and surveys most commonly cited as showing support for a “scientific consensus” in favor of the catastrophic man-made global warming hypothesis are without exception methodologically flawed and often deliberately misleading.
- There is no survey or study showing “consensus” on the most important scientific issues in the climate change debate.
- Extensive survey data show deep disagreement among scientists on scientific issues that must be resolved before the man-made global warming hypothesis can be validated. Many prominent experts and probably most working scientists disagree with the claims made by the United Nations’ Intergovernmental Panel on Climate Change (IPCC).

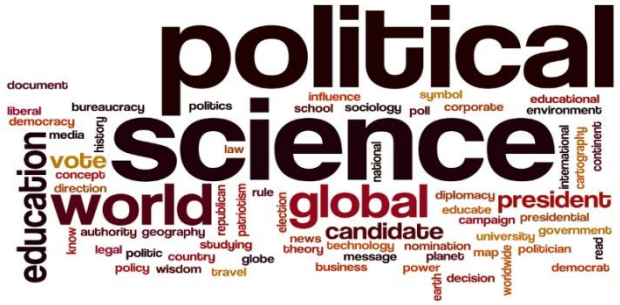
Why Scientists Disagree

- Climate is an interdisciplinary subject requiring insights from many fields of study. Very few scholars have mastery of more than one or two of these disciplines.
- Fundamental uncertainties arise from insufficient observational evidence, disagreements over how to interpret data, and how to set the parameters of models.
- IPCC, created to find and disseminate research finding a human impact on global climate, is not a credible source. It is agenda-driven, a political rather than scientific body, and some allege it is corrupt.
- Climate scientists, like all humans, can be biased. Origins of bias include careerism, grant-seeking, political views, and confirmation bias.

Scientific Method vs. Political Science



- The hypothesis implicit in all IPCC writings, though rarely explicitly stated, is that dangerousglobal warming is resulting, or will result, from human-related greenhouse gas emissions.
- The null hypothesis is that currently observed changes in global climate indices and the physical environment, as well as current changes in animal and plant characteristics, are the result of natural variability.
- In contradiction of the scientific method, IPCC assumes its implicit hypothesis is correct and that its only duty is to collect evidence and make plausible arguments in the hypothesis's favor.



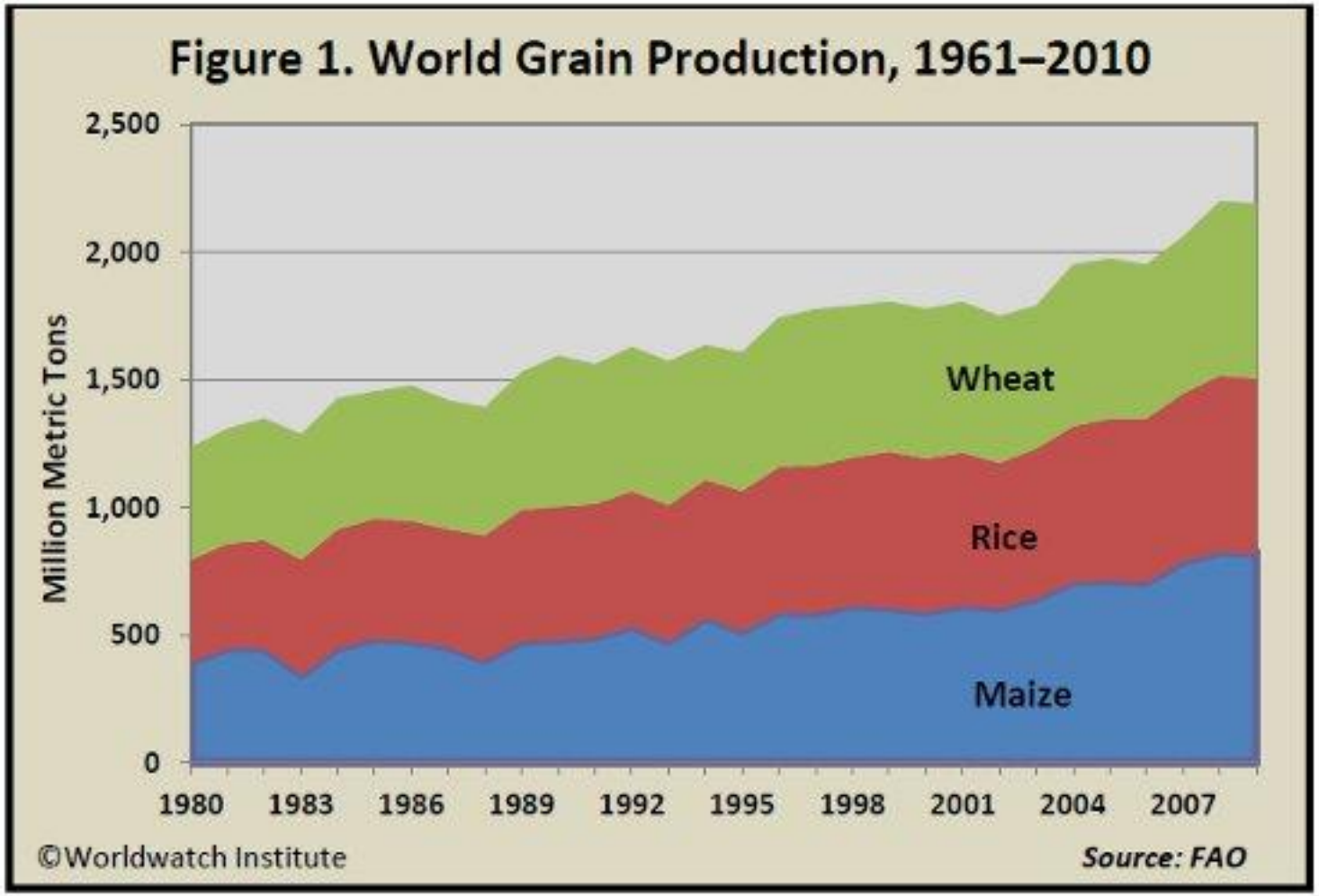
Flawed Projections

- IPCC and virtually all the governments of the world depend on global climate models (GCMs) to forecast the effects of human-related greenhouse gas emissions on the climate.
- GCMs systematically over-estimate the sensitivity of climate to carbon dioxide (CO2), many known forcings and feedbacks are poorly modeled, and modelers exclude forcings and feedbacks that run counter to their mission to find a human influence on climate.
- NIPCC estimates a doubling of CO2 from pre-industrial levels (from 280 to 560 ppm) would likely produce a temperature forcing of 3.7 Wm-2 in the lower atmosphere, for about ~1°C of *prima facie warming.*
- Four specific forecasts made by GCMs have been falsified by real-world data from a wide variety of sources. In particular, there has been no global warming for some 18 years.

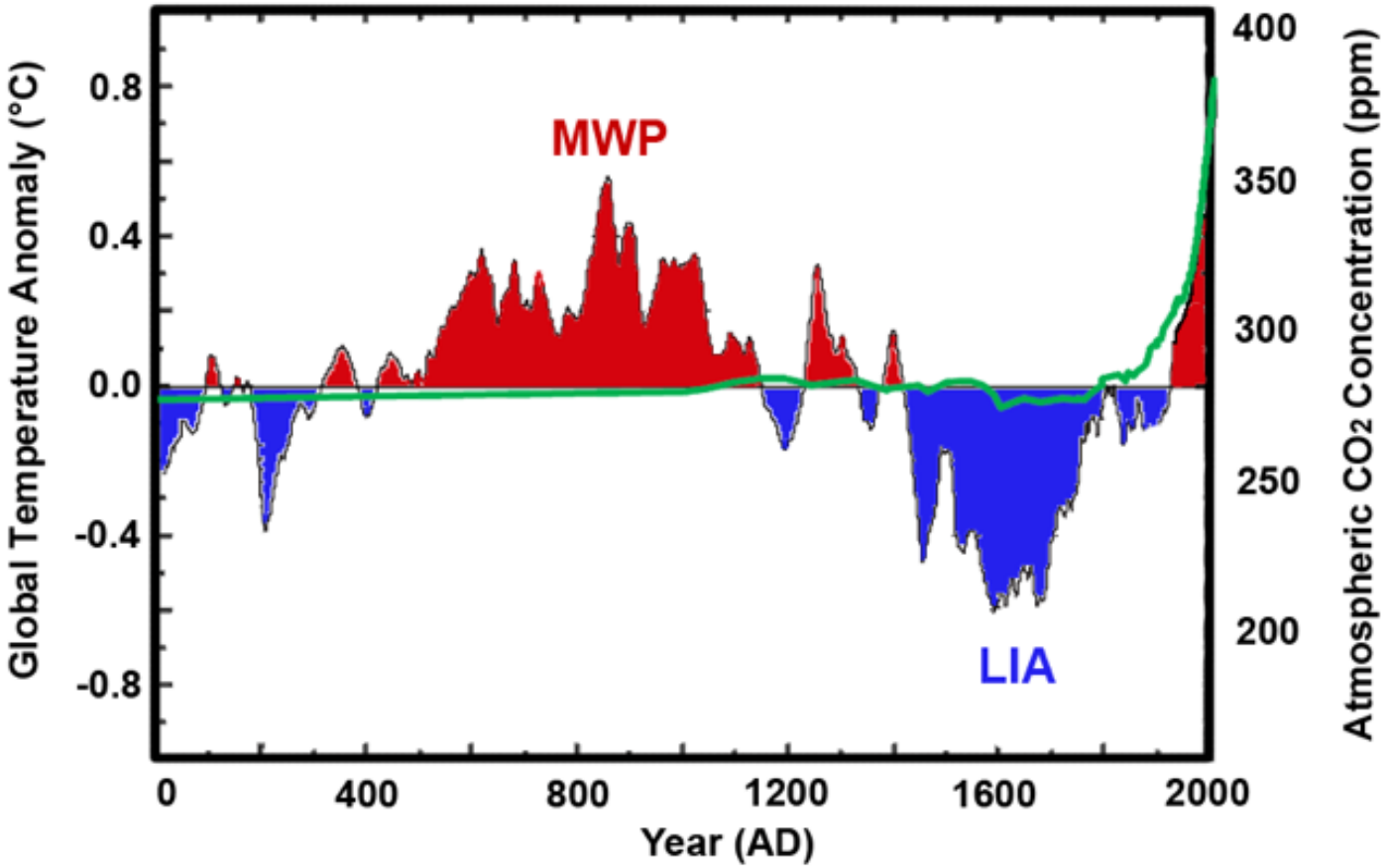
False Postulates

- Neither the rate nor the magnitude of the reported late twentieth century surface warming (1979–2000) lay outside normal natural variability.
- The late twentieth century warm peak was of no greater magnitude than previous peaks caused entirely by natural forcings and feedbacks.
- Historically, increases in atmospheric CO2 followed increases in temperature, they did not precede them. Therefore, CO2 levels could not have forced temperatures to rise.
- Solar forcings are not too small to explain twentieth century warming. In fact, their effect could be equal to or greater than the effect of CO2 in the atmosphere.
- A warming of 2°C or more during the twenty-first century would probably not be harmful, on balance, because many areas of the world would benefit from or adjust to climate change.

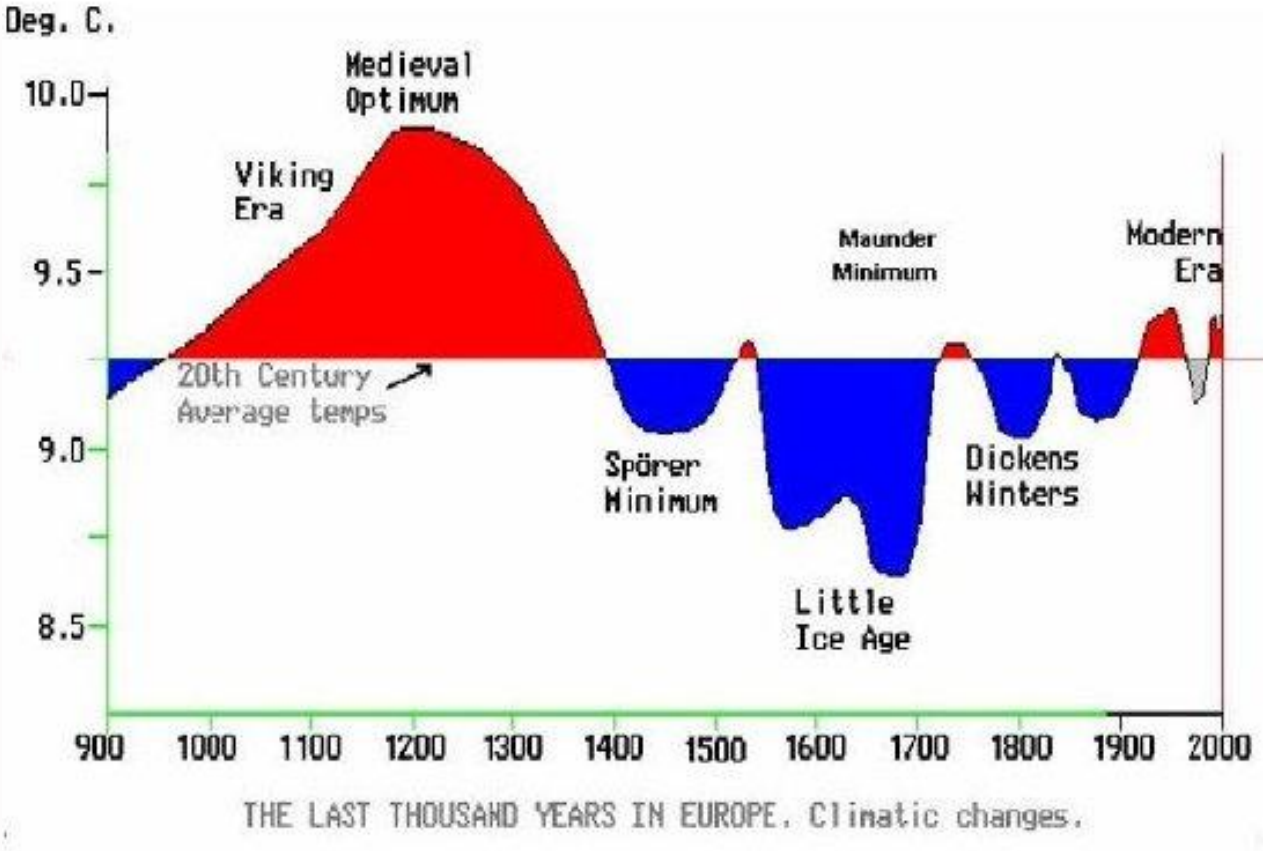
Growth and Increased CO2



Mean Relative Temperature History

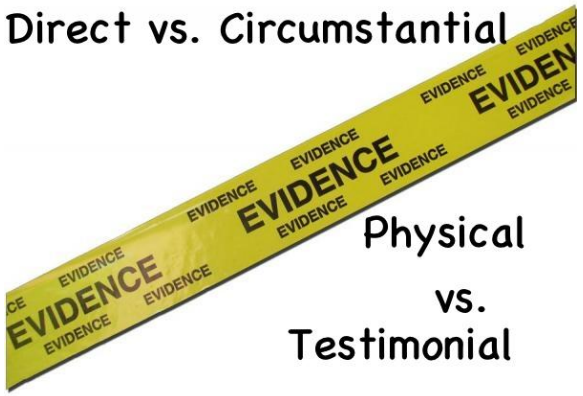


Climate Changes in Europe

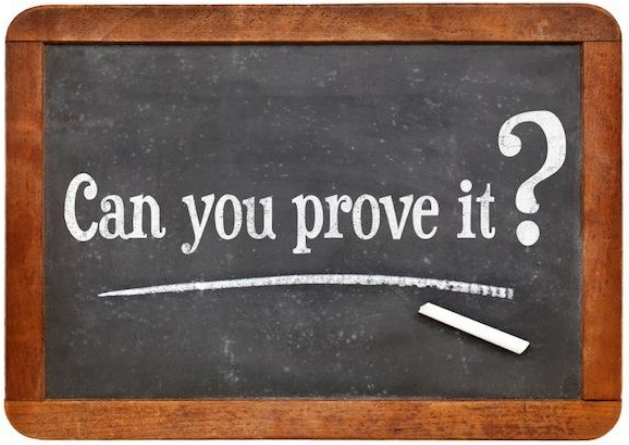


Unreliable Circumstantial Evidence

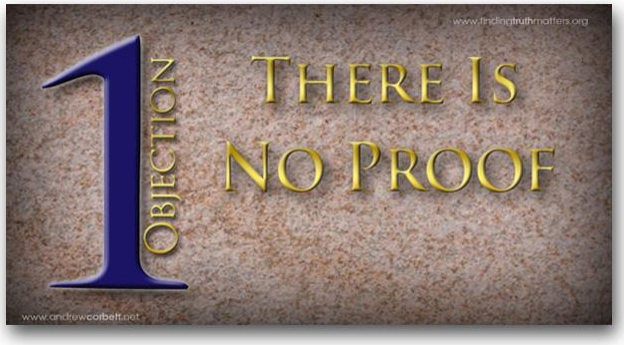
- Melting of Arctic sea ice and polar icecaps is not occurring at “unnatural” rates and does not constitute evidence of a human impact on the climate.
- Best available data show sea-level rise is not accelerating. Local and regional sea levels continue to exhibit typical natural variability – in some places rising and in others falling.
- The link between warming and drought is weak, and by some measures drought decreased over the twentieth century. Changes in the hydrosphere of this type are regionally highly variable and show a closer correlation with multidecadal climate rhythmicity than they do with global temperature.



Unreliable Circumstantial Evidence (2)



- No convincing relationship has been established between warming over the past 100 years and increases in extreme weather events. Meteorological science suggests just the opposite: A warmer world will see milder weather patterns.
- No evidence exists that current changes in Arctic permafrost are other than natural or are likely to cause a climate catastrophe by releasing methane into the atmosphere.



Policy Implications

- Rather than rely exclusively on IPCC for scientific advice, policymakers should seek out advice from independent, nongovernment organizations and scientists who are free of financial and political conflicts of interest.
- Individual nations should take charge of setting their own climate policies based upon the hazards that apply to their particular geography, geology, weather, and culture.
- Rather than invest scarce world resources in a quixotic campaign based on politicized and unreliable science, world leaders would do well to turn their attention to the real problems their people and their planet face.

Five Key Climate Questions

- Is the world warming?
  - *Yes, but historic record likely overstated, and there has been no warming in last 10 years*
- Is that warming due to man's CO_2?
  - *Likely "some," but probably not "most"*
- *Will future man-made warming be substantial*?
  - *Perhaps a degree, at most, over the next century*
- Will we see catastrophic effects from warming?
  - *Likely not – we have not seen them so far*
- Do CO_2 abatement laws like cap-and-trade make sense?
  - *Costs far more than it helps. Many more important priorities. Carbon tax better than cap-and-trade.*

What GW Advocates Must Prove

- Global warming actually exists
- Global warming is causing climate change
- Global warming is caused mainly by CO_2
- Burning fossil fuels is the primary cause of CO_2 increasing
- Global warming will absolutely cause serious harm
- Proposed solutions are effective, fair and economic

What Should the Church Do About GW?

- Commit to viewing the world from God's perspective
- Understand and rely on Scripture as a foundation for life
- Use the Bible to understand the world and evaluate all problems
- Help inform other believers
- Promote the truth and oppose false beliefs with gentleness and respect

Gen. 8:22, *While the earth remains, seedtime and harvest, cold and heat, summer and winter, day and night, shall not cease.*

Why There Is No Reason For Alarm

- O_2 and CO_2 in the atmosphere were created, they did not evolve
- Today's atmosphere likely contains significantly less CO_2 than before the Flood
- CO_2 is necessary for life, and was created prior to plants and animals
- CO_2 is not a pollutant
- Increasing levels of CO_2 are beneficial for plants
- Decreasing levels of CO_2 could be a serious problem
- Burning fossil fuels simply returns CO_2 to the air,
- The present levels of oxygen in the air are adequate
- Plants were created as food for humans and animals

No Reason For Alarm - 2

- Glaciers have been retreating for thousands of years since the Flood
- Ice age glaciers melted due to cooling seas, not warming seas
- Climates have been constantly changing since the Flood
- Plants, animals and mankind have been adapting to climate for thousands of years
- Recent global temperature histories are insufficient for developing reliable conclusions about trends or impending catastrophes
- Increasing the concentration of CO_2 in the atmosphere will continue to improve crop production around the world, benefiting mankind
- Neither melting glaciers, increasing CO_2, changing climates, nor earth's surface temperature history are proof of global warming
- God is in control of history and the earth's climates, not man