

The Scientific Grounds for Reconsidering EPA's Endangerment Finding

change to anthropogenic activities is based on multiple lines of evidence. The first line of evidence arises from our basic physical understanding of the effects of changing concentrations of greenhouse gases, natural factors, and other human impacts on the climate system. The second line of evidence arises from indirect, historical estimates of past climate changes that suggest that the changes in global surface temperature over the last several decades are unusual.²³ The third line of evidence arises from the use of computer-based climate models to

percent) to be the result of internal processes" (Hegerl *et al.*, 2007). As noted in the TSD, the observed warming can only be reproduced with models that contain both natural and anthropogenic forcings, and the warming of the past half century has taken place at a time when known natural forcing factors alone (solar activity and volcanoes) would likely have produced cooling, not warming. United States temperatures also warmed during the 20th and into the 21st century; temperatures are now approximately 0.7 °C (1.3 °F) warmer

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Bob Endlich

bendlich@msn.com

Cruces Atmospheric Sciences Forum

21 April 2018

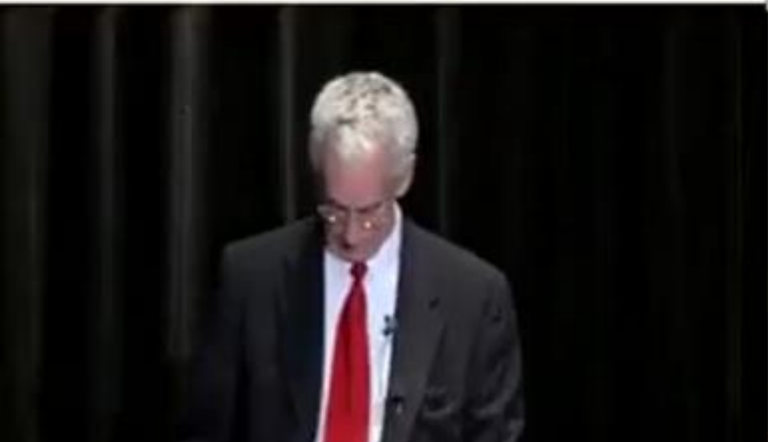
Harry MacDougald, AFEC (Panel 5B: The Endangerment Finding)



ATTRIBUTION IN THE ENDANGERMENT FINDING THREE LINES OF EVIDENCE

1. Physical or Theoretical Understanding of Climate
2. Temperature Records
3. Computer Models

74 C.F.R. at 66518



<https://www.heartland.org/multimedia/videos/harry-macdougald-afec-panel-5b-the-endangerment-finding>

ATTRIBUTION ANALYSIS using the Three Lines of Evidence published in the Code of Federal Regulations

ATTRIBUTION IN THE ENDANGERMENT FINDING THREE LINES OF EVIDENCE

1. Physical or Theoretical Understanding of Climate
2. Temperature Records
3. Computer Models



74 C.F.R. at 66518

“74 C.F.R. at 66518”

Means Volume 74 of the Federal Register,
page 66518



Federal Register

**Tuesday,
December 15, 2009**

Part V

**Environmental
Protection Agency**

**40 CFR Chapter I
Endangerment and Cause or Contribute
Findings for Greenhouse Gases Under
Section 202(a) of the Clean Air Act; Final
Rule**

ENVIRONMENTAL PROTECTION AGENCY**40 CFR Chapter I**

[EPA-HQ-OAR-2009-0171; FRL-9091-8]

RIN 2060-ZA14

Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act**AGENCY:** Environmental Protection Agency (EPA).**ACTION:** Final rule.

SUMMARY: The Administrator finds that six greenhouse gases taken in combination endanger both the public health and the public welfare of current and future generations. The Administrator also finds that the combined emissions of these greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas air pollution that endangers public health and welfare under CAA section 202(a). These Findings are based on careful consideration of the full weight of scientific evidence and a thorough review of numerous public comments received on the Proposed Findings published April 24, 2009.

DATES: These Findings are effective on January 14, 2010.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2009-0171. All documents in the docket are listed on the www.regulations.gov Web site. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are

Ave., NW., Washington, DC 20460; telephone number: (202) 343-9927; fax number: (202) 343-2202; e-mail address: ghgendangerment@epa.gov. For additional information regarding these Findings, please go to the Web site <http://www.epa.gov/climatechange/endangerment.html>.

SUPPLEMENTARY INFORMATION:**Judicial Review**

Under CAA section 307(b)(1), judicial review of this final action is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit by February 16, 2010. Under CAA section 307(d)(7)(B), only an objection to this final action that was raised with reasonable specificity during the period for public comment can be raised during judicial review. This section also provides a mechanism for us to convene a proceeding for reconsideration, " [i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of this rule." Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, Environmental Protection Agency, Room 3000, Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20004, with a copy to the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20004.

Acronyms and Abbreviations. The following acronyms and abbreviations

DOT U.S. Department of Transportation
EO Executive Order
EPA U.S. Environmental Protection Agency
FR Federal Register
GHG greenhouse gas
GWP global warming potential
HadCRUT Hadley Centre/Climate Research Unit (CRU) temperature record
HCFCs hydrochlorofluorocarbons
HFCs hydrofluorocarbons
IA Interim Assessment report
IPCC Intergovernmental Panel on Climate Change
MPG miles per gallon
MWP Medieval Warm Period
N₂O nitrous oxide
NAAQS National Ambient Air Quality Standards
NAICS North American Industry Classification System
NASA National Aeronautics and Space Administration
NF₃ nitrogen trifluoride
NHTSA National Highway Traffic Safety Administration
NOAA National Oceanic and Atmospheric Administration
NOI Notice of Intent
NO_x nitrogen oxides
NRC National Research Council
NSPS new source performance standards
NTTAA National Technology Transfer and Advancement Act of 1995
OMB Office of Management and Budget
PFCs perfluorocarbons
PM particulate matter
PSD Prevention of Significant Deterioration
RFA Regulatory Flexibility Act
SF₆ sulfur hexafluoride
SIP State Implementation Plan
TSD technical support document
U.S. United States
UMRA Unfunded Mandates Reform Act of 1995
UNFCCC United Nations Framework Convention on Climate Change
USGCRP U.S. Global Climate Research Program
VOC volatile organic compound(s)
WCI Western Climate Initiative
WRI World Resources Institute

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I. Introduction
A. Overview
B. Background Information Helpful To Understand These Findings

This is how it starts out,
on page 66496.

Here is page 66518,
the Attribution
Paragraph is highlighted.

Hadley Center record, slowed. However, the NOAA and NASA trends do not show the same marked slowdown for the 1999–2008 period. Year-to-year fluctuations in natural weather and climate patterns can produce a period that does not follow the long-term trend. Thus, each year may not necessarily be warmer than every year before it, though the long-term warming trend continues.²¹

The scientific evidence is compelling that elevated concentrations of heat-trapping greenhouse gases are the root cause of recently observed climate change. The IPCC conclusion from 2007 has been re-confirmed by the June 2009 USGCRP assessment that most of the observed increase in global average temperatures since the mid-20th century is very likely²² due to the observed increase in anthropogenic greenhouse gas concentrations. Climate model simulations suggest natural forcing alone (e.g., changes in solar irradiance) cannot explain the observed warming.

The attribution of observed climate change to anthropogenic activities is based on multiple lines of evidence. The first line of evidence arises from our basic physical understanding of the effects of changing concentrations of greenhouse gases, natural factors, and other human impacts on the climate system. The second line of evidence arises from indirect, historical estimates of past climate changes that suggest that the changes in global surface temperature over the last several decades are unusual.²³ The third line of evidence arises from the use of computer-based climate models to simulate the likely patterns of response of the climate system to different forcing mechanisms (both natural and anthropogenic).

The claim that natural internal variability or known natural external

forcings can explain most (more than half) of the observed global warming of the past 50 years is inconsistent with the vast majority of the scientific literature, which has been synthesized in several assessment reports. Based on analyses of widespread temperature increases throughout the climate system and changes in other climate variables, the IPCC has reached the following conclusions about external climate forcing: “It is extremely unlikely (<5 percent) that the global pattern of warming during the past half century can be explained without external forcing, and very unlikely that it is due to known natural external causes alone” (Hegerl *et al.*, 2007). With respect to internal variability, the IPCC reports the following: “The simultaneous increase in energy content of all the major components of the climate system as well as the magnitude and pattern of warming within and across the different components supports the conclusion that the cause of the [20th century] warming is extremely unlikely (<5 percent) to be the result of internal processes” (Hegerl *et al.*, 2007). As noted in the TSD, the observed warming can only be reproduced with models that contain both natural and anthropogenic forcings, and the warming of the past half century has taken place at a time when known natural forcing factors alone (solar activity and volcanoes) would likely have produced cooling, not warming.

United States temperatures also warmed during the 20th and into the 21st century; temperatures are now approximately 0.7 °C (1.3 °F) warmer than at the start of the 20th century, with an increased rate of warming over the past 30 years. Both the IPCC and CCSP reports attributed recent North American warming to elevated greenhouse gas concentrations. The CCSP (2008g) report finds that for North America, “more than half of this warming [for the period 1951–2006] is likely the result of human-caused greenhouse gas forcing of climate change.”

Observations show that changes are occurring in the amount, intensity, frequency, and type of precipitation. Over the contiguous United States, total

increased rate. It is very likely that the response to anthropogenic forcing contributed to sea level rise during the latter half of the 20th century. It is not clear whether the increasing rate of sea level rise is a reflection of short-term variability or an increase in the longer-term trend. Nearly all of the Atlantic Ocean shows sea level rise during the last 50 years with the rate of rise reaching a maximum (over 2 mm per year) in a band along the U.S. east coast running east-northeast.

Satellite data since 1979 show that annual average Arctic sea ice extent has shrunk by 4.1 percent per decade. The size and speed of recent Arctic summer sea ice loss is highly anomalous relative to the previous few thousands of years.

Widespread changes in extreme temperatures have been observed in the last 50 years across all world regions including the United States. Cold days, cold nights, and frost have become less frequent, while hot days, hot nights, and heat waves have become more frequent.

Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases. However, directly attributing specific regional changes in climate to emissions of greenhouse gases from human activities is difficult, especially for precipitation.

Ocean carbon dioxide uptake has lowered the average ocean pH (increased the acidity) level by approximately 0.1 since 1750. Consequences for marine ecosystems may include reduced calcification by shell-forming organisms, and in the longer term, the dissolution of carbonate sediments.

Observations show that climate change is currently affecting U.S. physical and biological systems in significant ways. The consistency of these observed changes in physical and biological systems and the observed significant warming likely cannot be explained entirely due to natural variability or other confounding non-climate factors.

b. Key Projections Based Primarily on Future Scenarios of the Six Greenhouse Gases

²¹ Karl T. *et al.*, (2009).

²² The IPCC Fourth Assessment Report uses specific terminology to convey likelihood and confidence. Likelihood refers to a probability that the statement is correct or that something will occur. “Virtually certain” conveys greater than 99 percent probability of occurrence; “very likely” 90 to 99 percent; “likely” 66 to 90 percent. IPCC assigns confidence levels as to the correctness of a statement. “Very high confidence” conveys at least

“The attribution of observed climate change to anthropogenic activities is based on multiple lines of evidence.

The first line of evidence arises from our basic physical understanding of the effects of changing concentrations of greenhouse gases, natural factors, and other human impacts on the climate system.

The second line of evidence arises from indirect, historical estimates of past climate changes that suggest that the changes in global surface temperature over the last several decades are unusual.<23>

The third line of evidence arises from the use of computer-based climate models to simulate the likely patterns of response of the climate system to different forcing mechanisms (both natural and anthropogenic).” <Paragraphing, bolding, added>

1. Physical or Theoretical Understanding of Climate

ATTRIBUTION IN THE ENDANGERMENT FINDING THREE LINES OF EVIDENCE

1. Physical or Theoretical Understanding of Climate

No Tropical Hotspot in millions of balloon measurements going back to 1959 or in Satellite measurements going back to 1979.

2. Temperature Records

2. Temperature Records

- Uncorrupted temperature records are explained by natural factors. No basis for thinking temperatures are outside natural variability.

3. Computer Models

3. Computer Models

All Models show the Hot Spot, which does not exist in nature.

Models fail the explicit criteria for their use in detection & attribution. Not fit for making \$\$ Trillion policy decisions.

Could not satisfy HISA Requirements

ATTRIBUTION IN THE ENDANGERMENT FINDING

THREE LINES OF EVIDENCE

- All three lines of evidence are invalid and cannot be used to support attribution of observed warming to GHG emissions.

1. Physical or Theoretical Understanding of Climate

ATTRIBUTION IN THE ENDANGERMENT FINDING THREE LINES OF EVIDENCE

1. Physical or Theoretical Understanding of Climate

No Tropical Hotspot in millions of balloon measurements going back to 1959 or in Satellite measurements going back to 1979.

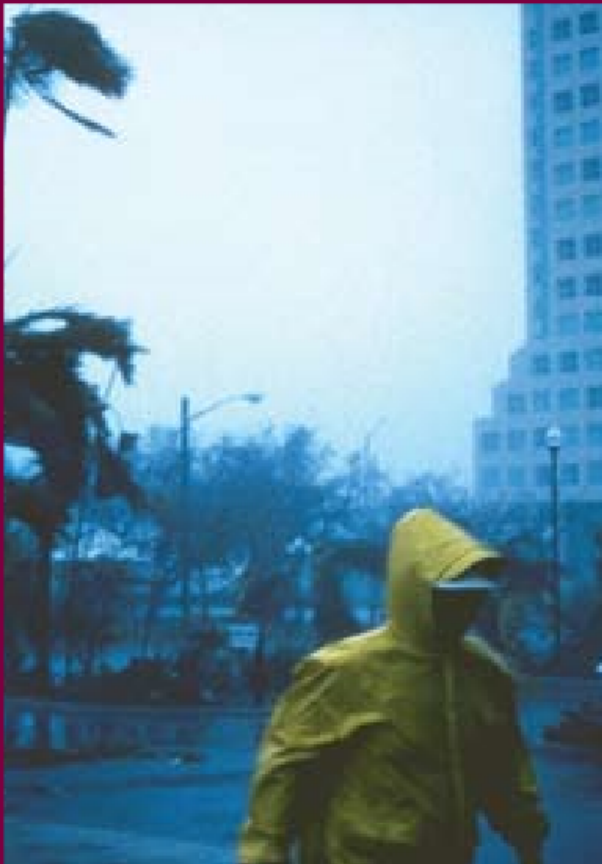
On the Existence of a
“Tropical Hot Spot “

&

The Validity of EPA’s CO₂
Endangerment Finding

Abridged Research Report

CHAPTER 1



Temperature Trends in the Lower Atmosphere - *Understanding and Reconciling Differences*

Why do temperatures vary vertically (from the surface to the stratosphere) and what do we understand about why they might vary and change over time?

Convening Lead Author: V. Ramaswamy, NOAA

Lead Authors: J.W. Hurrell, NSF NCAR; G.A. Meehl, NSF NCAR

Contributing Authors: A. Phillips, NCAR, Boulder;
B.D. Santer, DOE LLNL; M.D. Schwarzkopf, NOAA;
D.J. Seidel, NOAA; S.C. Sherwood, Yale Univ.;
P.W. Thorne, U.K. Met. Office

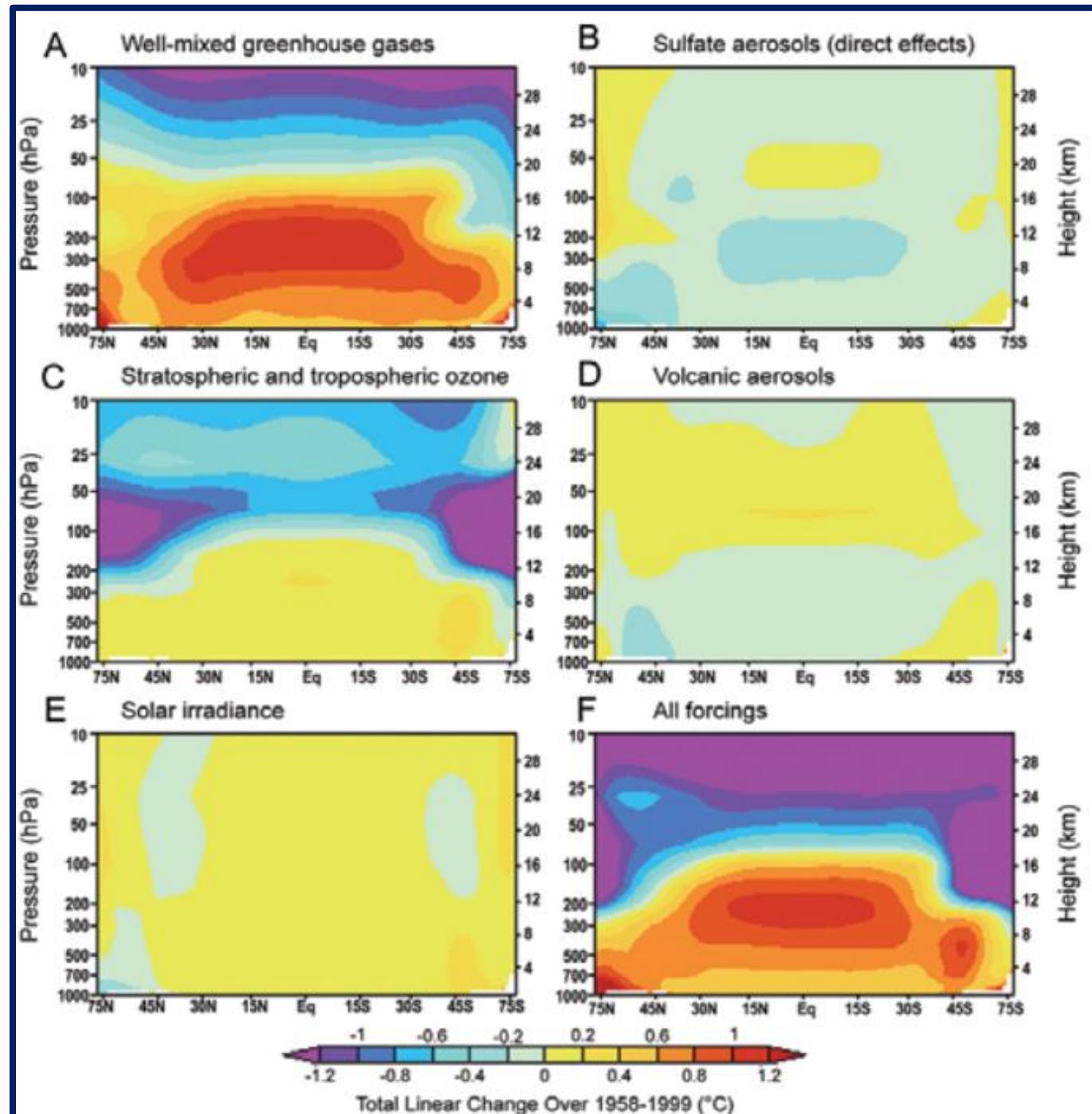
from NOAA's Geophysical Fluid Dynamics Laboratory in Princeton, N.J.



The U.S. Climate Change Science Program

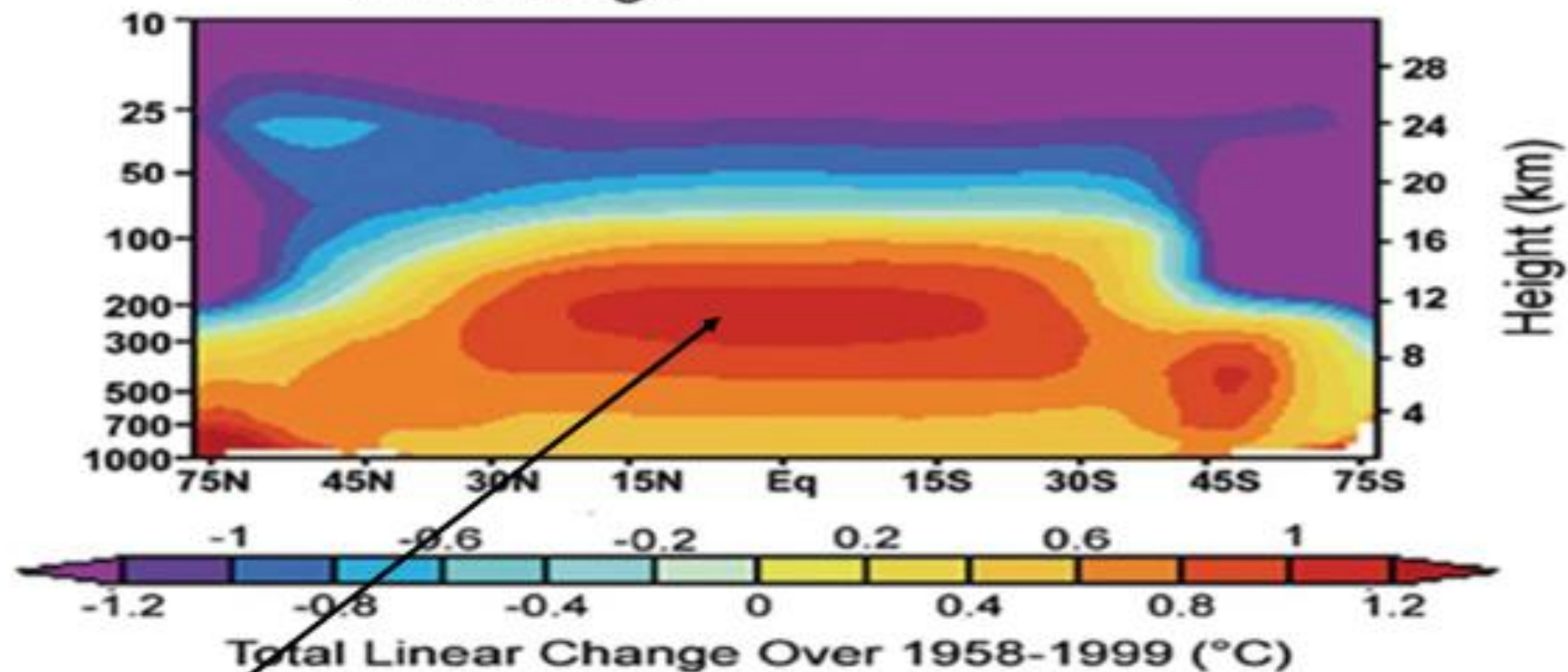
https://www.gfdl.noaa.gov/bibliography/related_files/vr0603.pdf

Figure 1.3.
PCM simulations of the vertical profile of temperature change due to various forcings, and the effect due to all forcings taken together (after Santer et al., 2000)

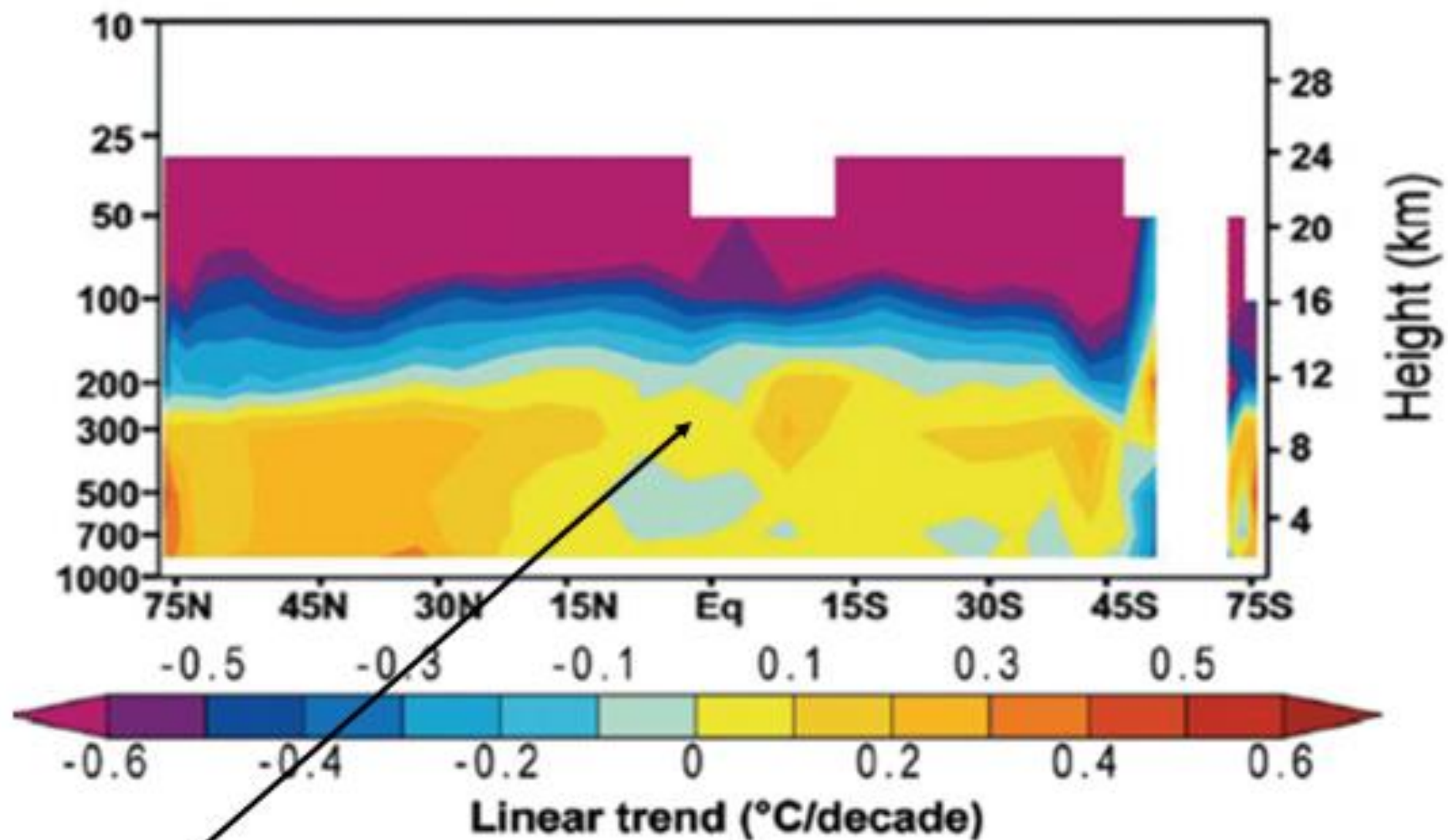


Atmospheric Temperature Change

All forcings



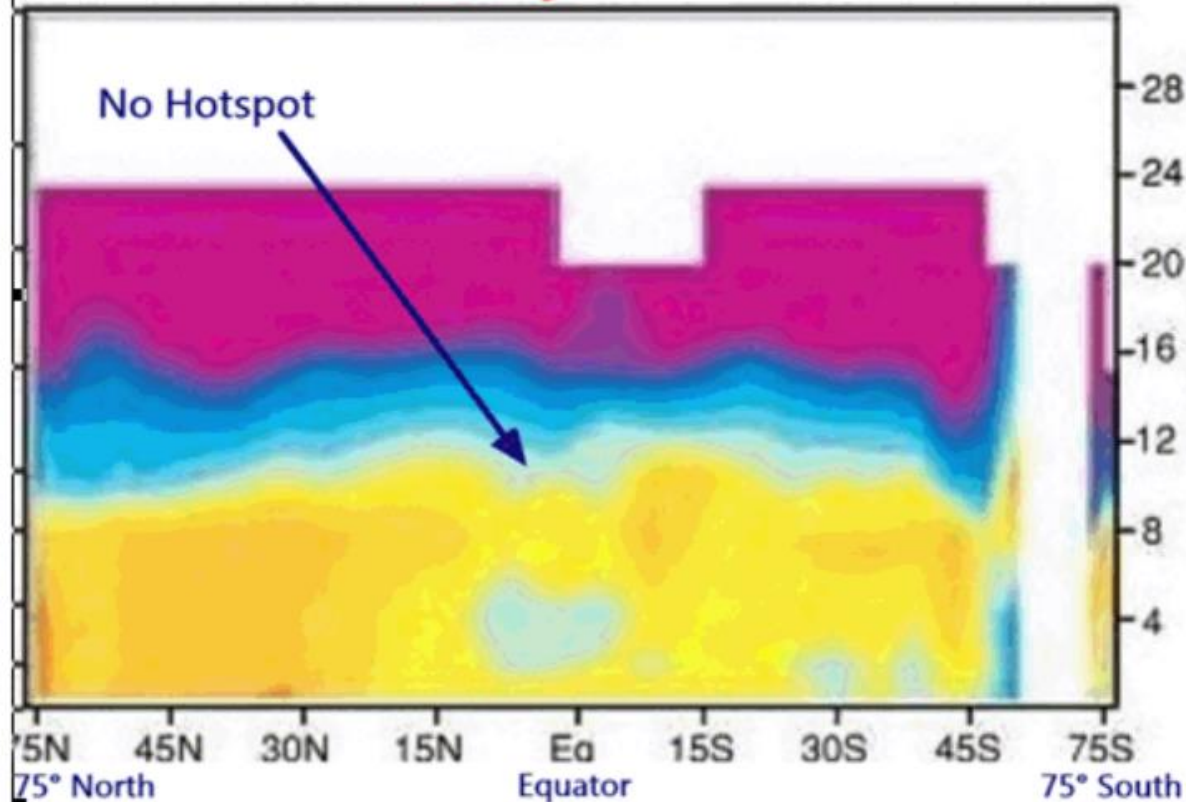
Note the Hot Spot in the Model



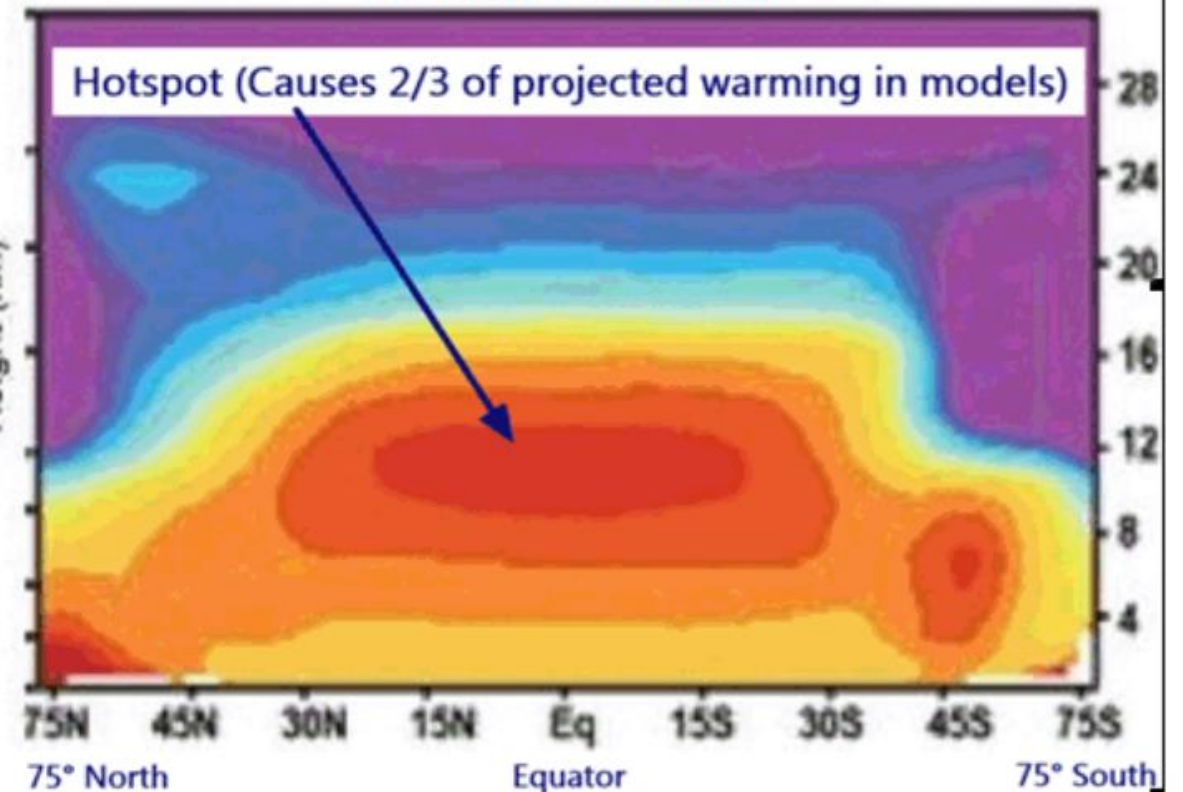
No Hot Spot in the Observed Data

Atmospheric Warming 1979 - 1999

Reality



Climate Models



2. Temperature Records

2. Temperature Records

- Uncorrupted temperature records are explained by natural factors. No basis for thinking temperatures are outside natural variability.

Five references for this section.

“On the validity of NASA, NOAA, and Hadley CRU Global Average Surface Temperature Data & the Validity of EPA’s CO2 Endangerment Finding”
<https://thsresearch.files.wordpress.com/2017/05/ef-gast-data-research-report-062817.pdf>

Humlum, Ole, <http://www.climate4you.com> http://www.climate4you.com/Text/Climate4you_April_2017.pdf

Graphics from Tony Heller’s blog, <https://realclimatescience.com/>

“A Critical Look at Surface Temperature Records,” Joe D’Aleo,
<https://thsresearch.files.wordpress.com/2017/05/chap3-published-in-elsevier.pdf>

“Surface Temperature Records: Policy-based Deception?”, Joe D’Aleo and Anthony Watts,
http://scienceandpublicpolicy.org/images/stories/papers/originals/surface_temp.pdf

On the Validity of NOAA, NASA and Hadley CRU Global Average Surface Temperature Data & The Validity of EPA's CO₂ Endangerment Finding

Abridged Research Report

The report shows that the surface temperature records have been adjusted so much, the records are not valid. Therefore, the Endangerment Finding which uses these data is not valid.

Notes:

The acronym “GAST” is shorthand for “Global Average Surface Temperature.”

Unadjusted Northern Hemisphere surface temperatures contain natural cycles.

<likely artifacts of the 60-year cycles we often mention>

The adjustments destroyed this cyclicity, invalidating the adjusted surface temperature records.

Quotes are edited for display clarity

<https://thsresearch.files.wordpress.com/2017/05/ef-gast-data-research-report-062817.pdf>

“In this research report, the most important surface data adjustment issues are identified and past changes in the previously reported historical data are quantified.

It was found that each new version of GAST has nearly always exhibited a steeper warming linear trend over its entire history.

And, it was nearly always accomplished by systematically removing the previously existing cyclical temperature pattern.

This was true for all three entities providing GAST data measurement, NOAA, NASA and Hadley CRU.”

Temperature Record
containing natural
cycles

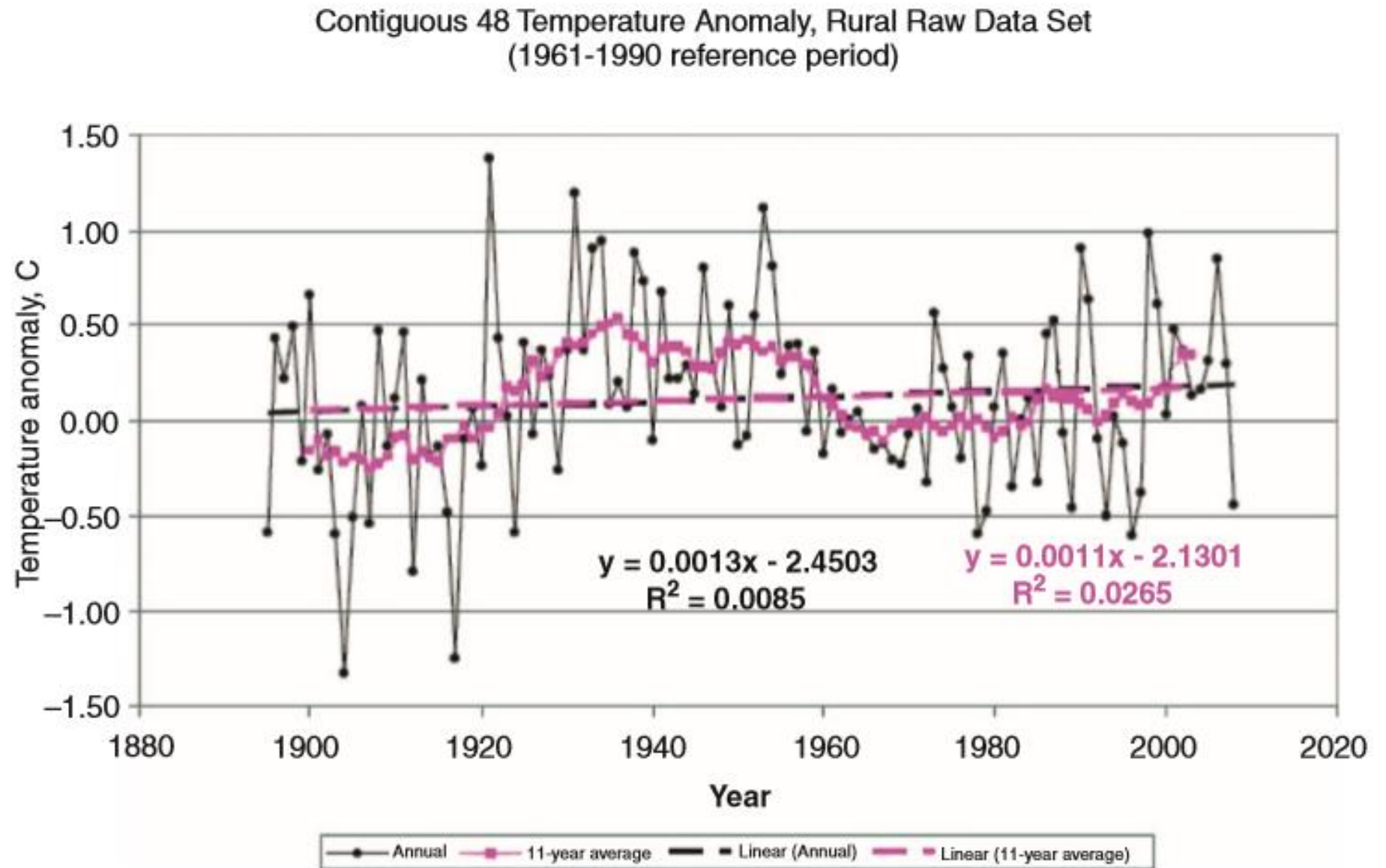


FIGURE 28 Edward long analysis of rural raw stations for the lower 48 states, USHCN version 2. Note the very small trend 0.12 °C/century in this data set and at the significant peak in the 1930s.

In this report, the focus is on the changes that the three entities actually made to their previously reported historical data.

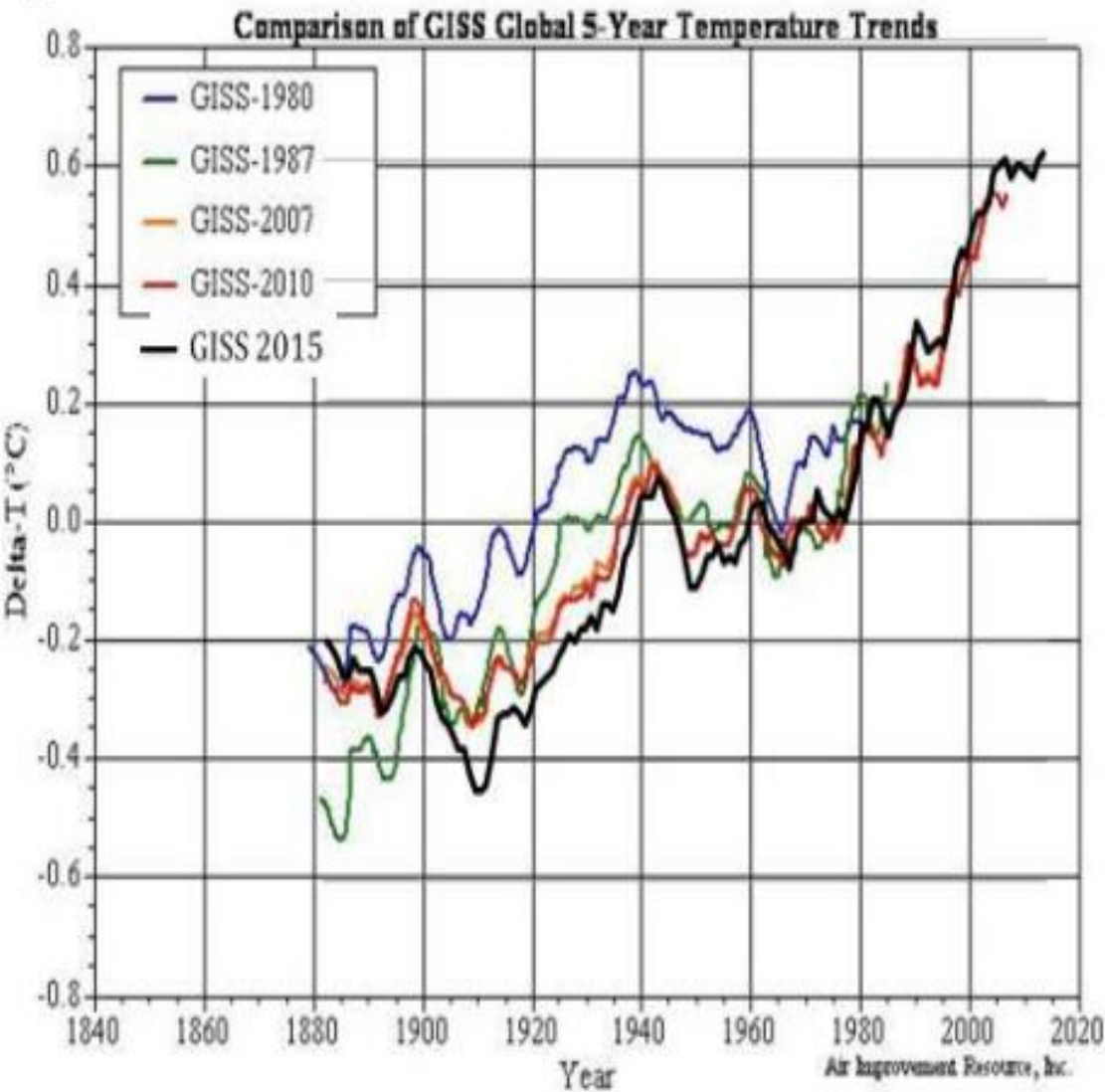
The notion that some adjustments to historical data may have been needed is not challenged here.

The basic question addressed is whether or not the current depictions of the trend cycle patterns of GAST data by NOAA, NASA and Hadley CRU are valid in light of other highly credible counter indications.

IV. ADJUSTMENTS TO HISTORICAL GAST DATA...

Figure IV-1 below shows NASA's GAST depictions over time. Focusing solely here on the period through 1980, the shift from a cyclical pattern to a more aggressive upward sloping linear trend pattern is obvious...

Figure IV-1



Source: GISS, and Air Improvement Resource, Inc.

<https://realclimatescience.com/2018/01/my-climate-forecast-from-three-years-ago/>

Over thirty-five years, the NASA GISS adjustments have cooled the past, warmed the present, and destroyed most of the original cyclicity.

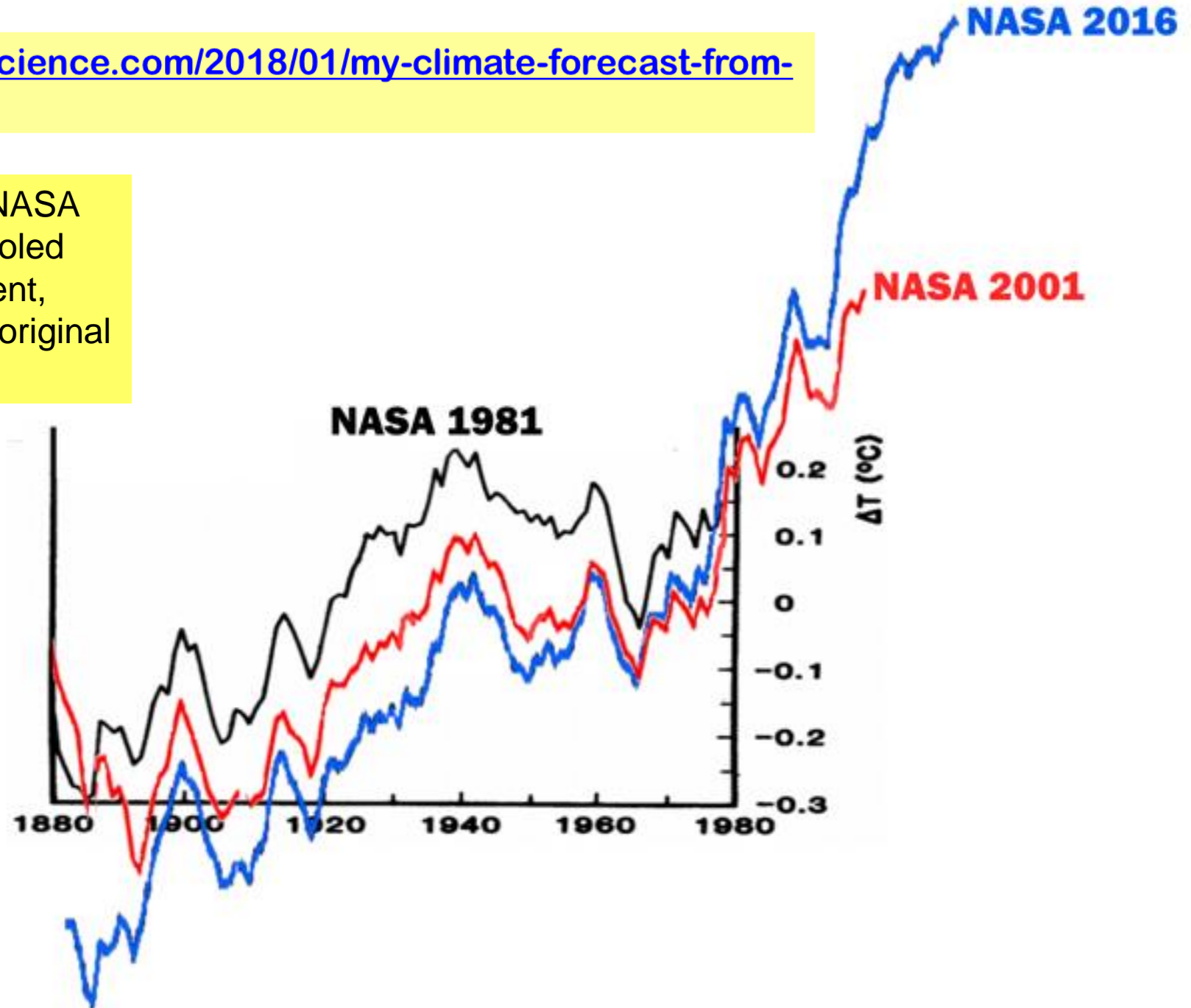
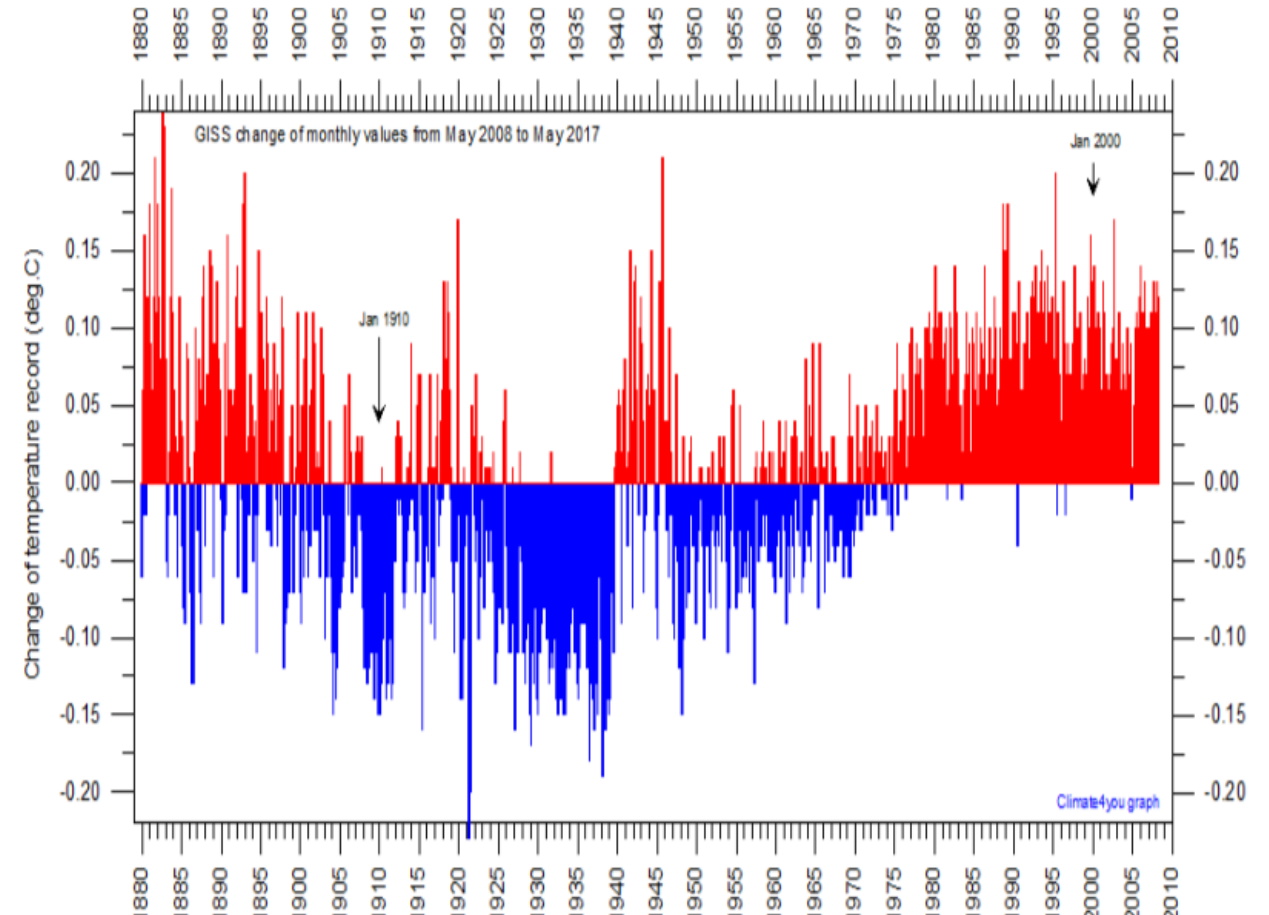


Figure IV-2 below shows the net changes made to historical data between 17 May 2008 and 15 May 2017. The changes made by NASA clearly removed the bulk of cyclical pattern from 1900 to 1980 in the original 1980 depiction of GAST (shown in blue) in Figure IV-1 above.

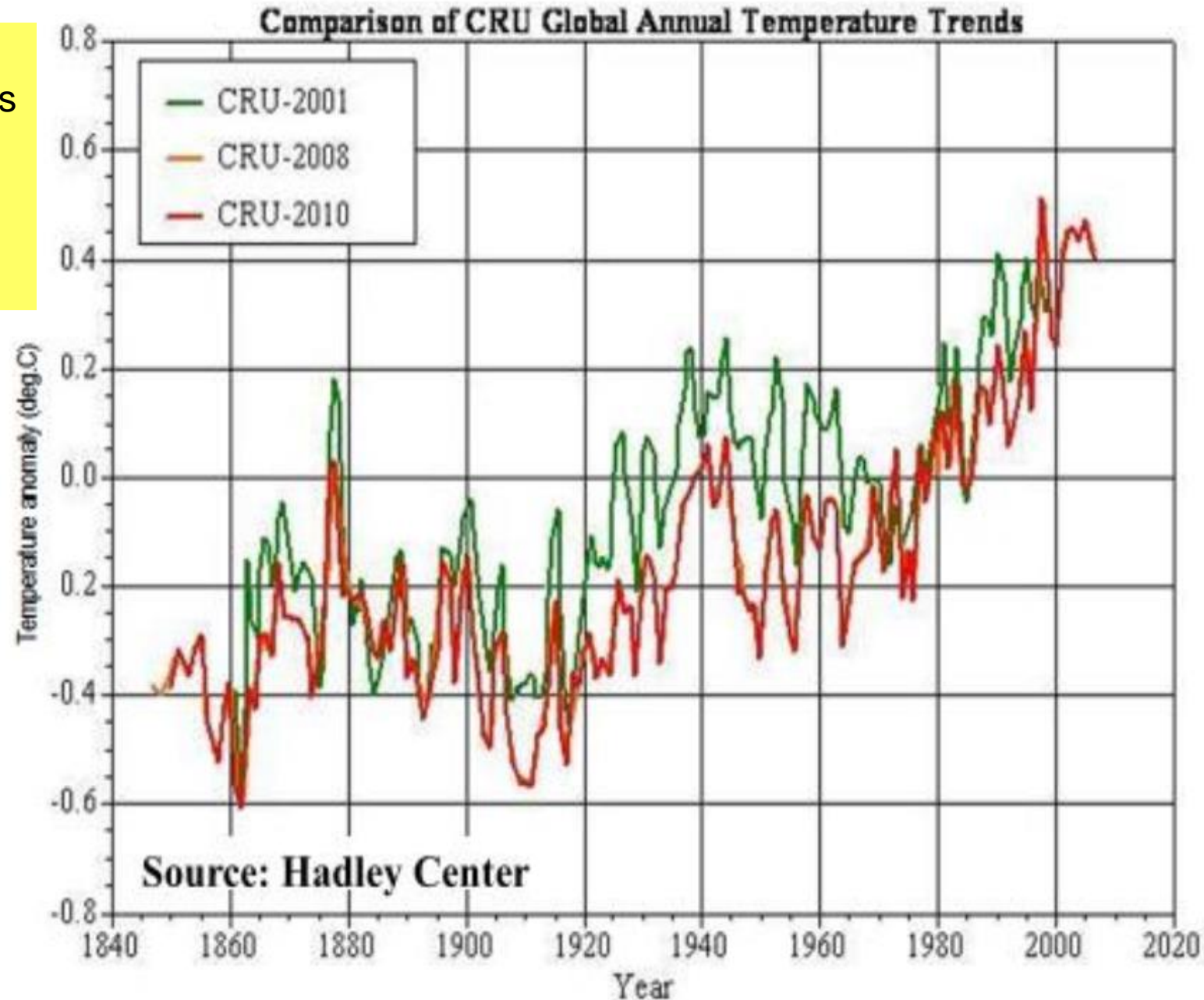
Figure IV-2



Maturity diagram showing net change since 17 May 2008 in the global monthly surface air temperature record prepared by the Goddard Institute for Space Studies (GISS), at Columbia University, New York City, USA. This temperature estimate extends back to January 1880. Last diagram update 15 May 2017.

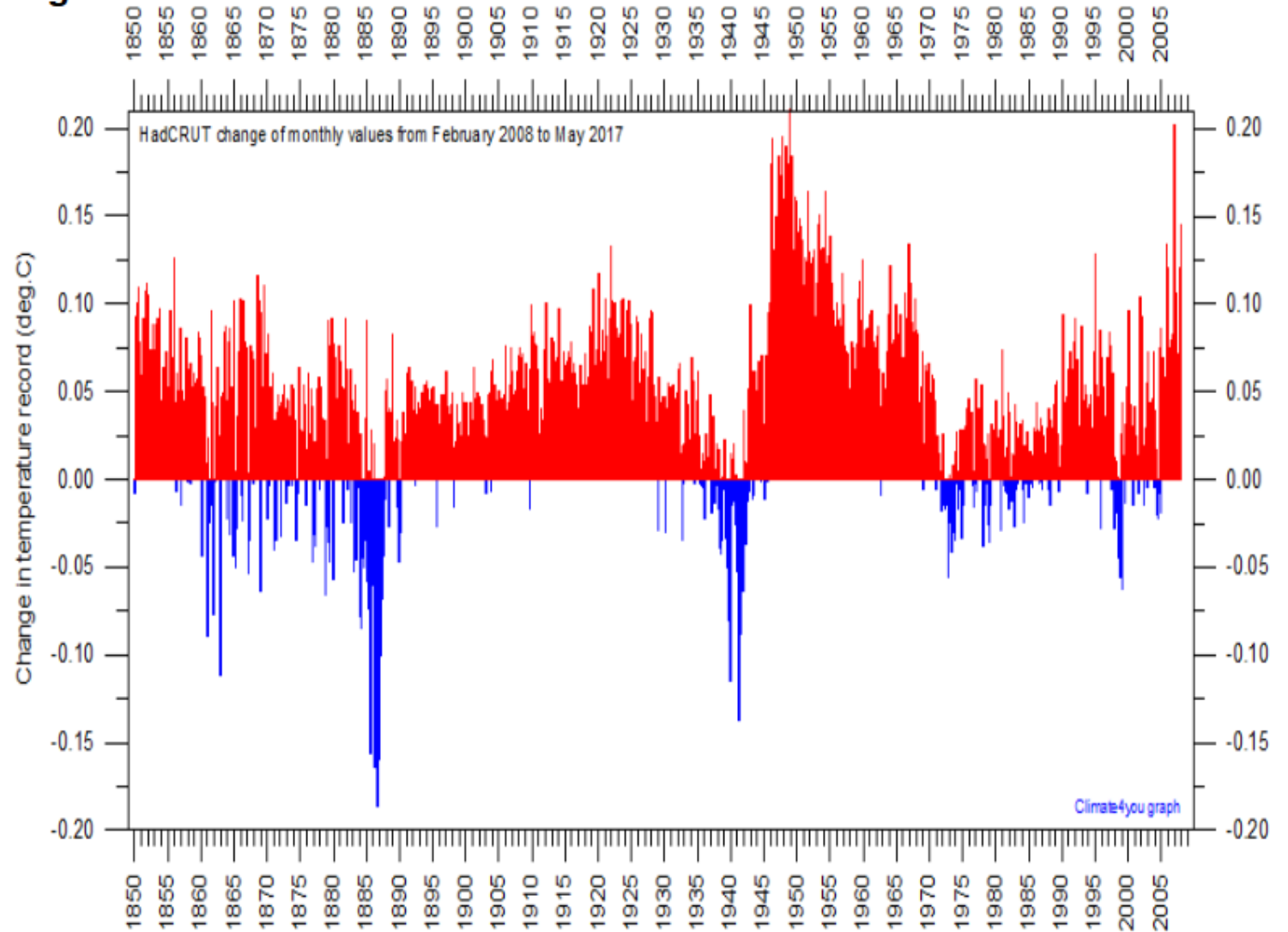
Figure IV-3 IV. ADJUSTMENTS TO HISTORICAL GAST DATA

Temperature Adjustments
made by the Climate
Research Unit of the
University of East Anglia



University of East Anglia adjustments

Figure IV-4

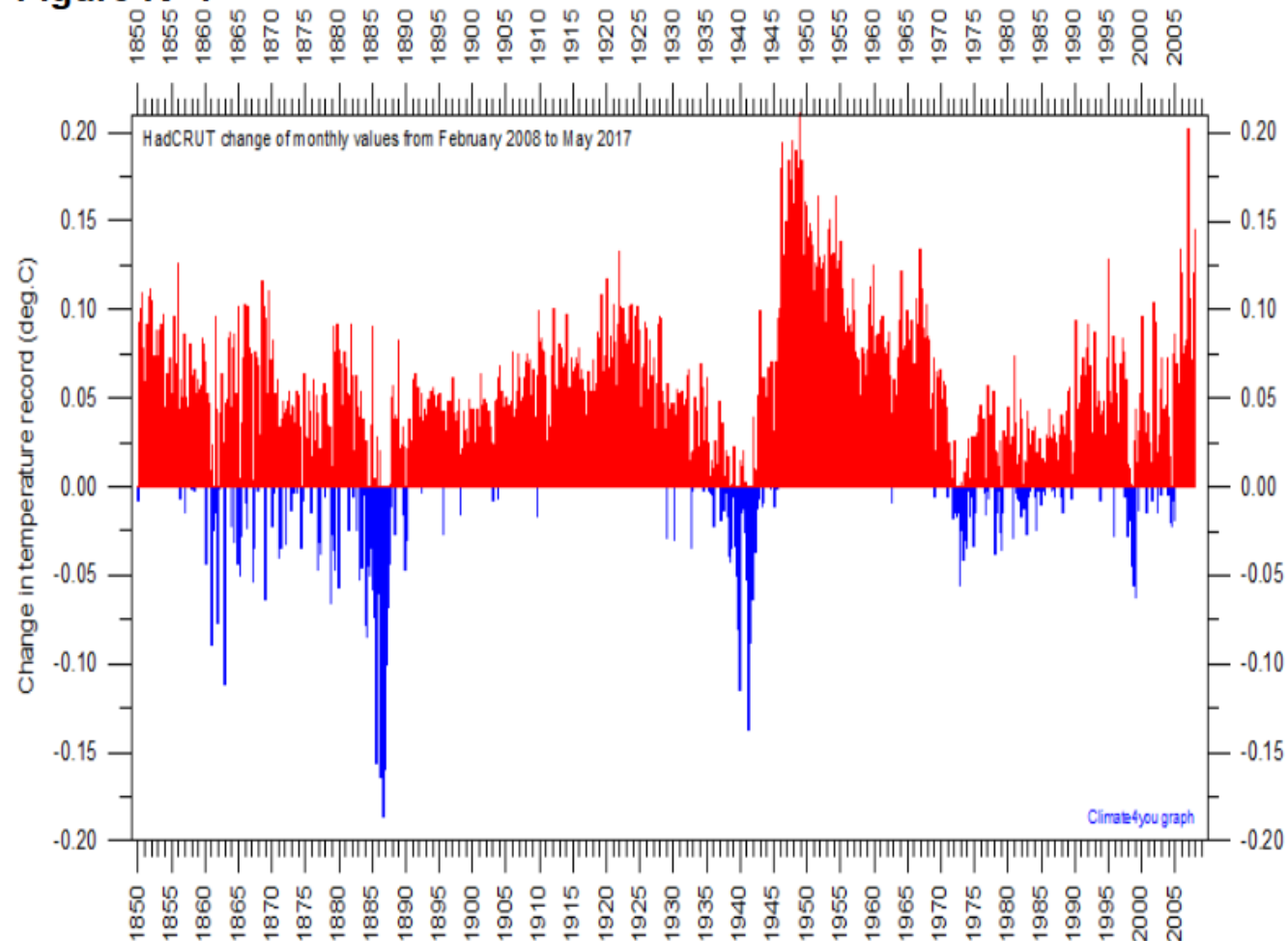


Maturity diagram showing net change since 25 February 2008 in the global monthly surface air temperature record prepared by the [Hadley Centre for Climate Prediction and Research](#) and the [University of East Anglia's Climatic Research Unit \(CRU\)](#), UK. This temperature estimate extends back to January 1850. Last diagram update: 3 May 2017.

in Figure IV-4, between February 2008 and May 2017, the vast bulk of the changes have served to raise temperatures, with particular emphasis on the 1950s and 60s, as compared to the February 2008 reported Hadley GAST data

University of East Anglia
adjustments

Figure IV-4



Maturity diagram showing net change since 25 February 2008 in the global monthly surface air temperature record prepared by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's Climatic Research Unit (CRU), UK. This temperature estimate extends back to January 1850. Last diagram update: 3 May 2017.

V. GAST DATA VALIDATION

Clearly the historical GAST data adjustments that have been made have been dramatic and invariably have been favorable to Climate Alarmists' views regarding Global Warming. The question now is whether the latest versions of GAST data by NOAA, NASA and Hadley are credible for policy analysis, or even climate modeling, purposes.

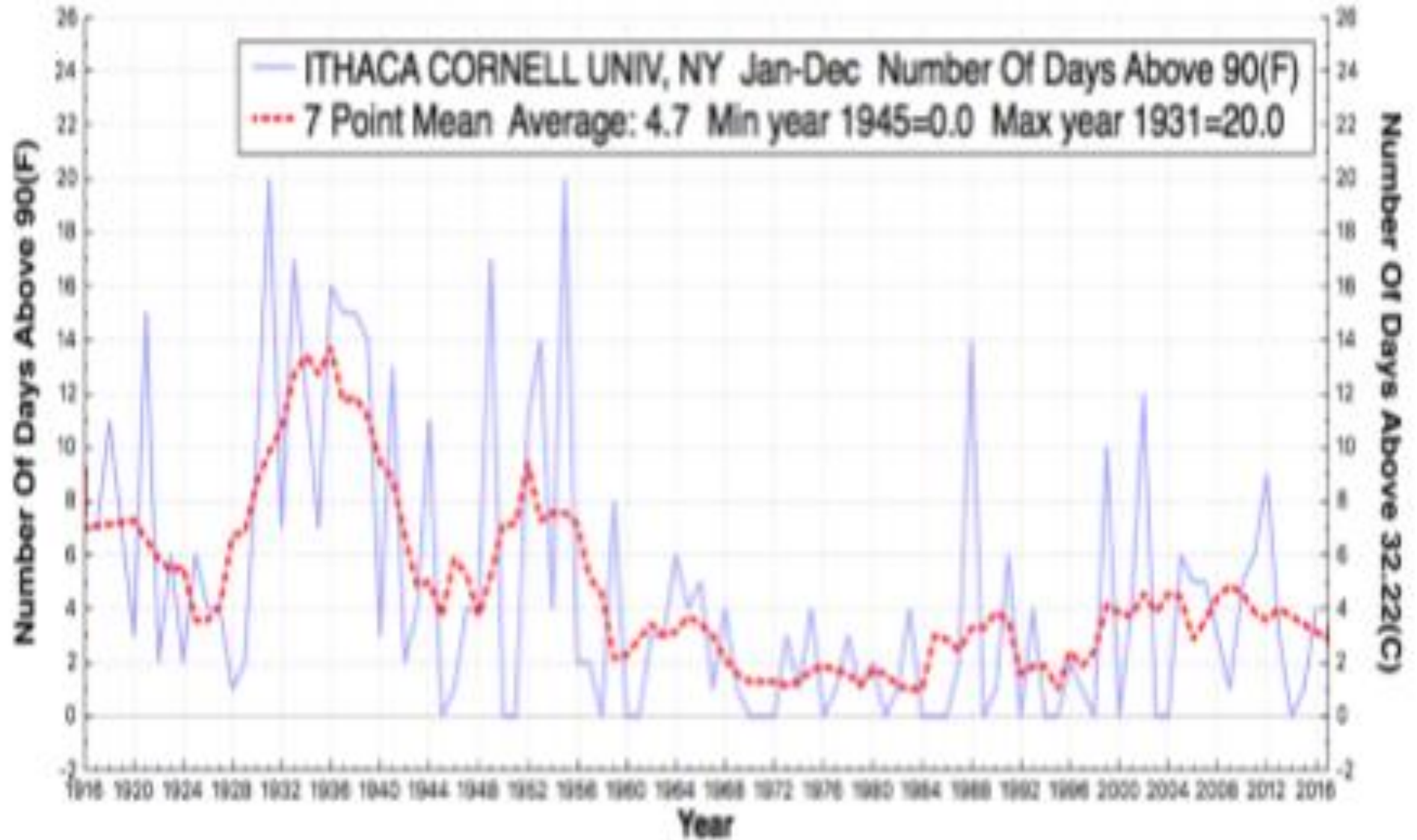
As has been clearly shown in Section IV above, the consequences of the changes made to previously reported historical versions of GAST data have been to virtually eliminate the previously existing cyclical nature of their previously reported trend cycle patterns. The notion that there was a 1930 and 40s warm period followed by a mid-1970 cool period now gets lost in the noise so to speak. In this section, particularly credible country-specific data will be used to test the validity of the now almost nonexistence of this cyclical pattern in the current versions of GAST².

Clearly, if the historical data adjustments that were made to the GAST data inappropriately removed this cyclical pattern, then all three of the current versions of GAST must be considered invalid.

Beginning with the U.S., a number of charts showing the aforementioned cyclical pattern in available U.S. city data is immediately informative. See Figures V-1 to V-4 and note the 1930s and 40s warming and 1970s cooling cyclical pattern in literally all of them.

Natural cycles at Cornell

Figures V -1



Source: NERCC

Figure V-2

Natural cycles at Chicago

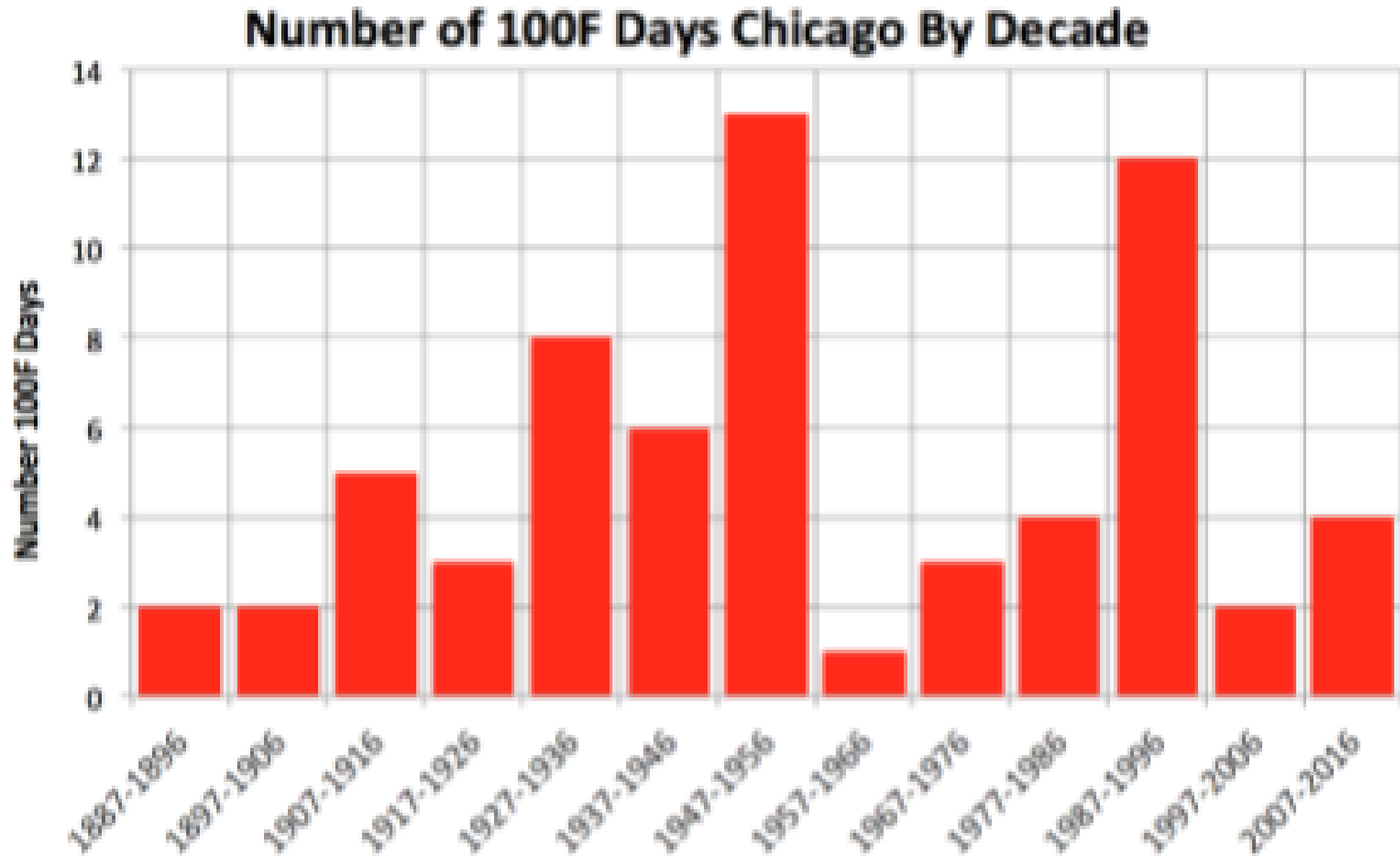
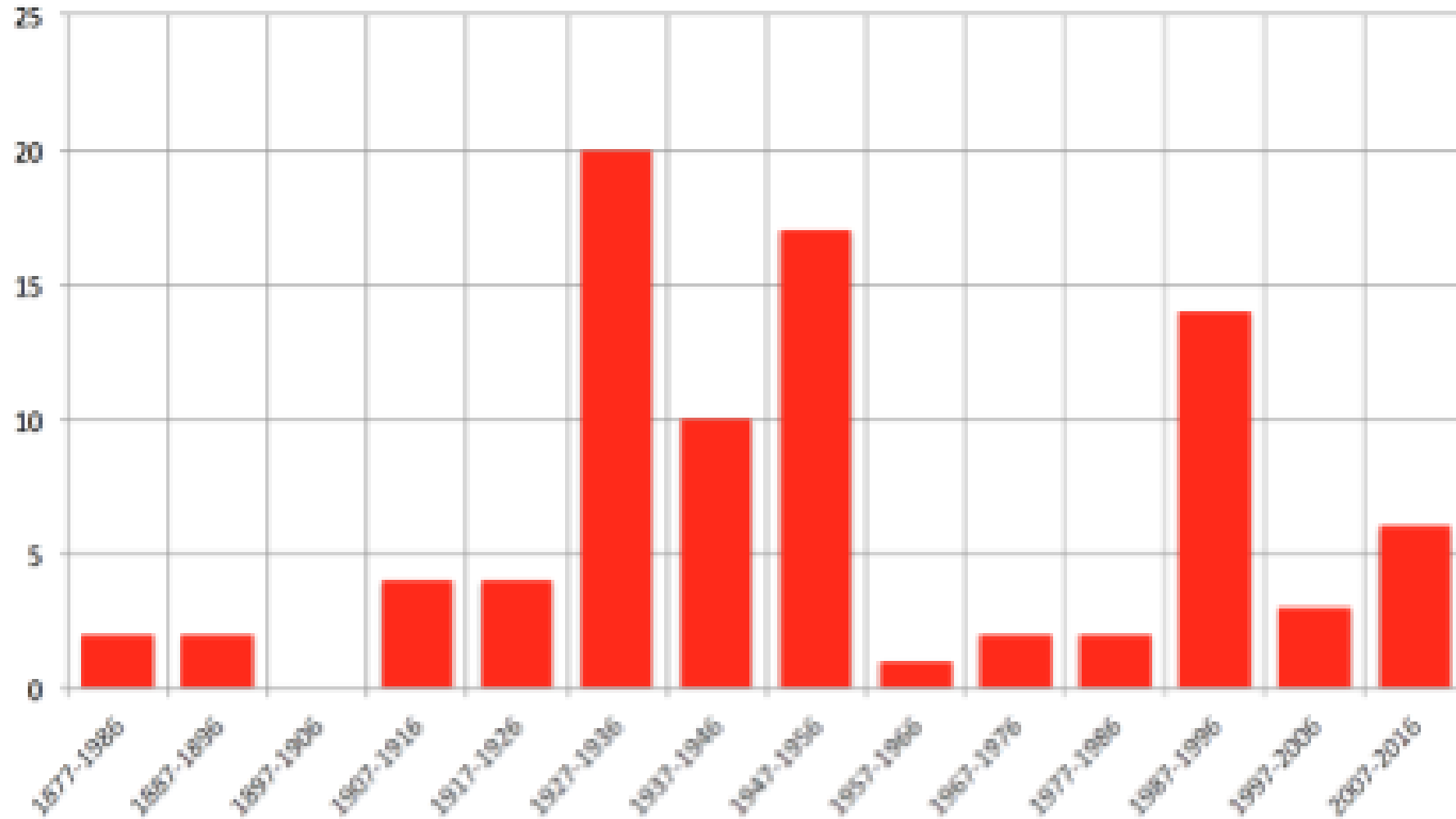


Figure V-3

Natural cycles at Detroit

Number of Summer Daily Record Highs By Decade in Detroit

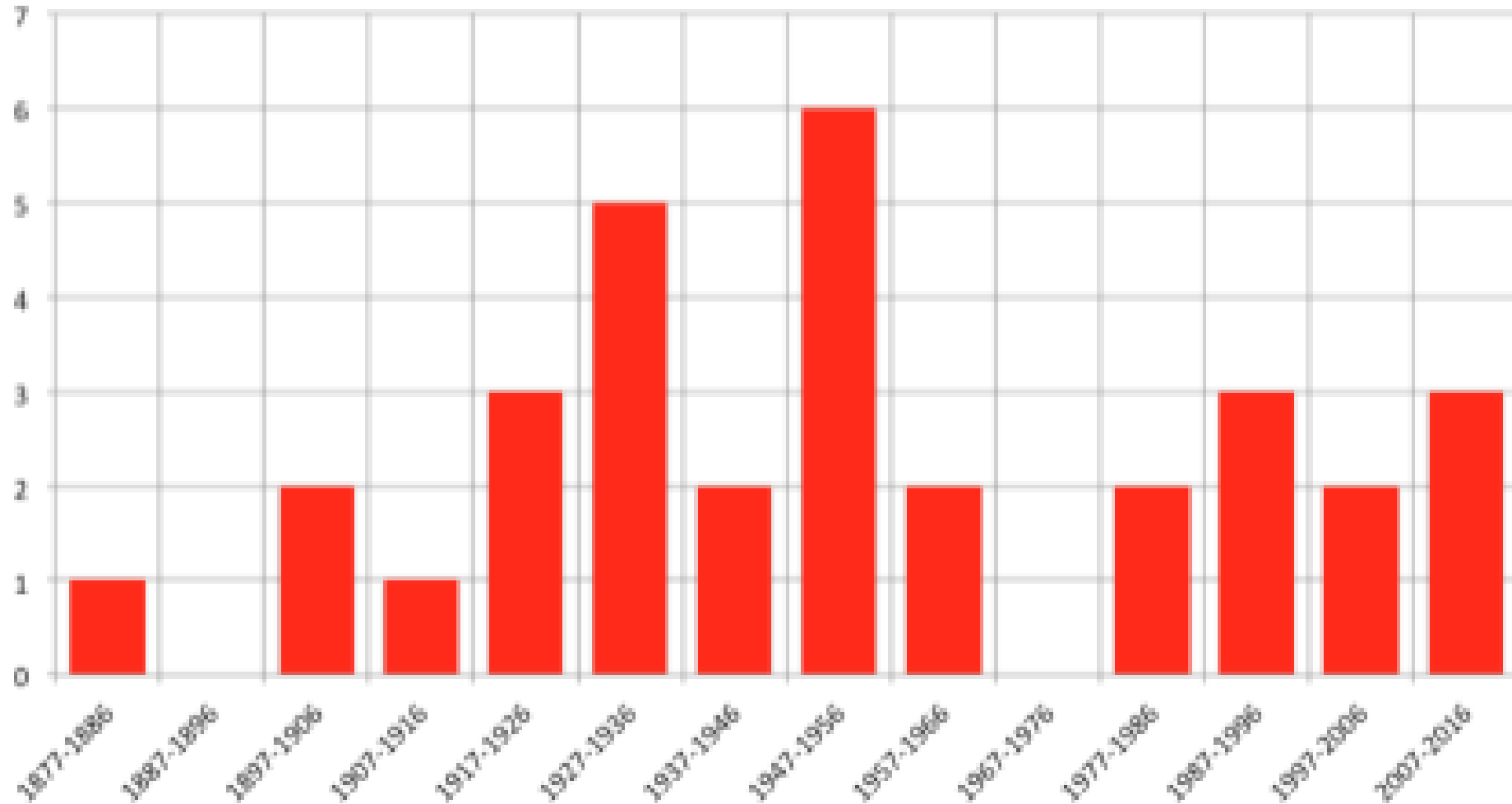


Source: NOAA NWS

Figure V-4

Natural cycles at Central Park, Manhattan, NYC

Number of 100F Days By Decade in NYC Central Park

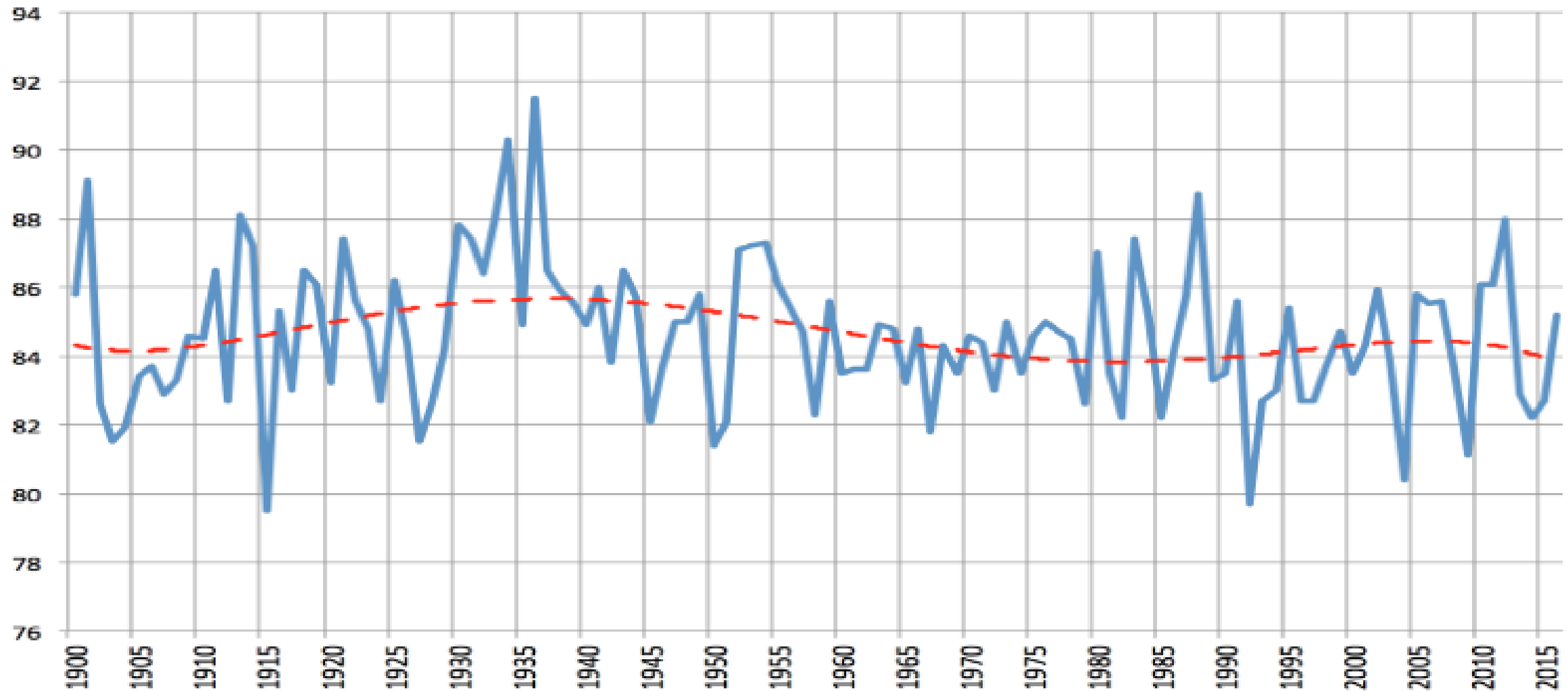


Source: NOAA NWS

Natural cycles in the USA's Corn and Bean Belt

Figure V-7

Corn and Bean Belt Average Summer Max Temperature (F)

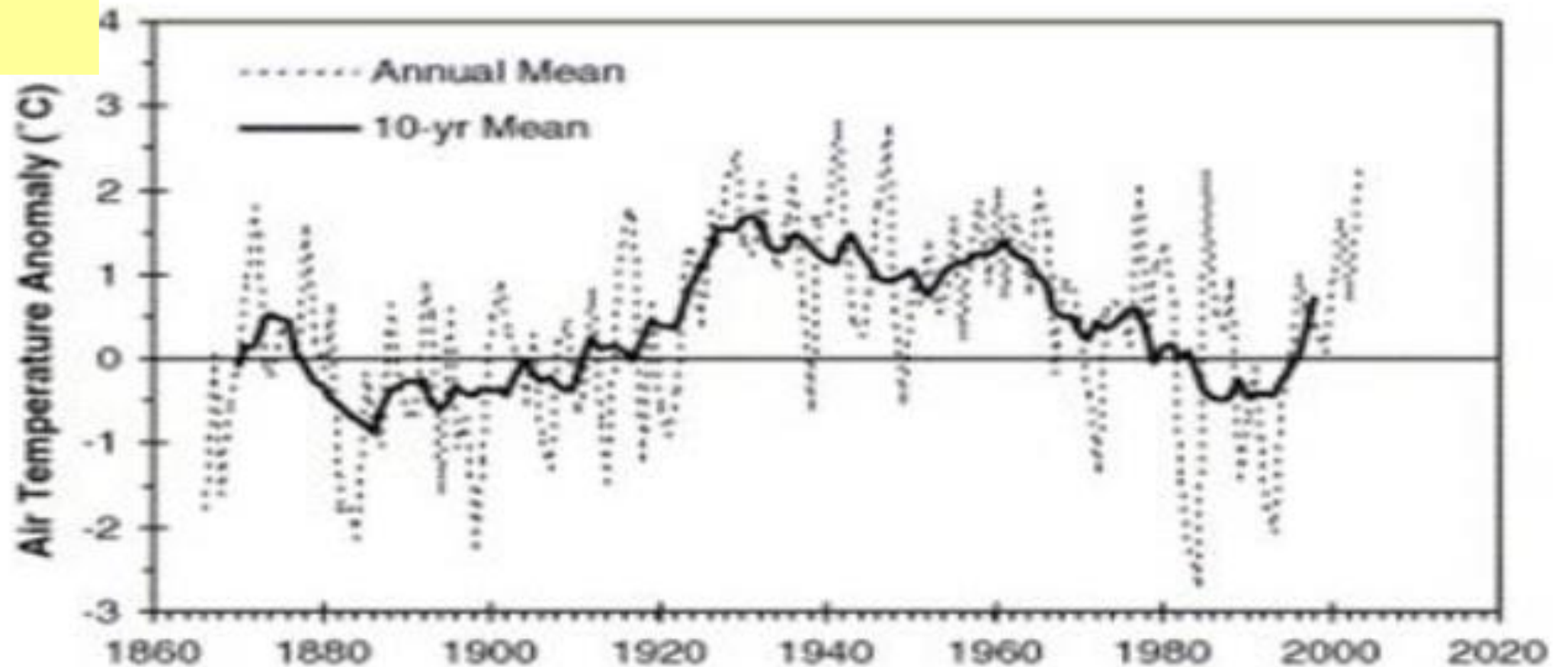


Source: NOAA Climate at a Glance

Figures V-12

Natural cycles at Nuuk, Greenland

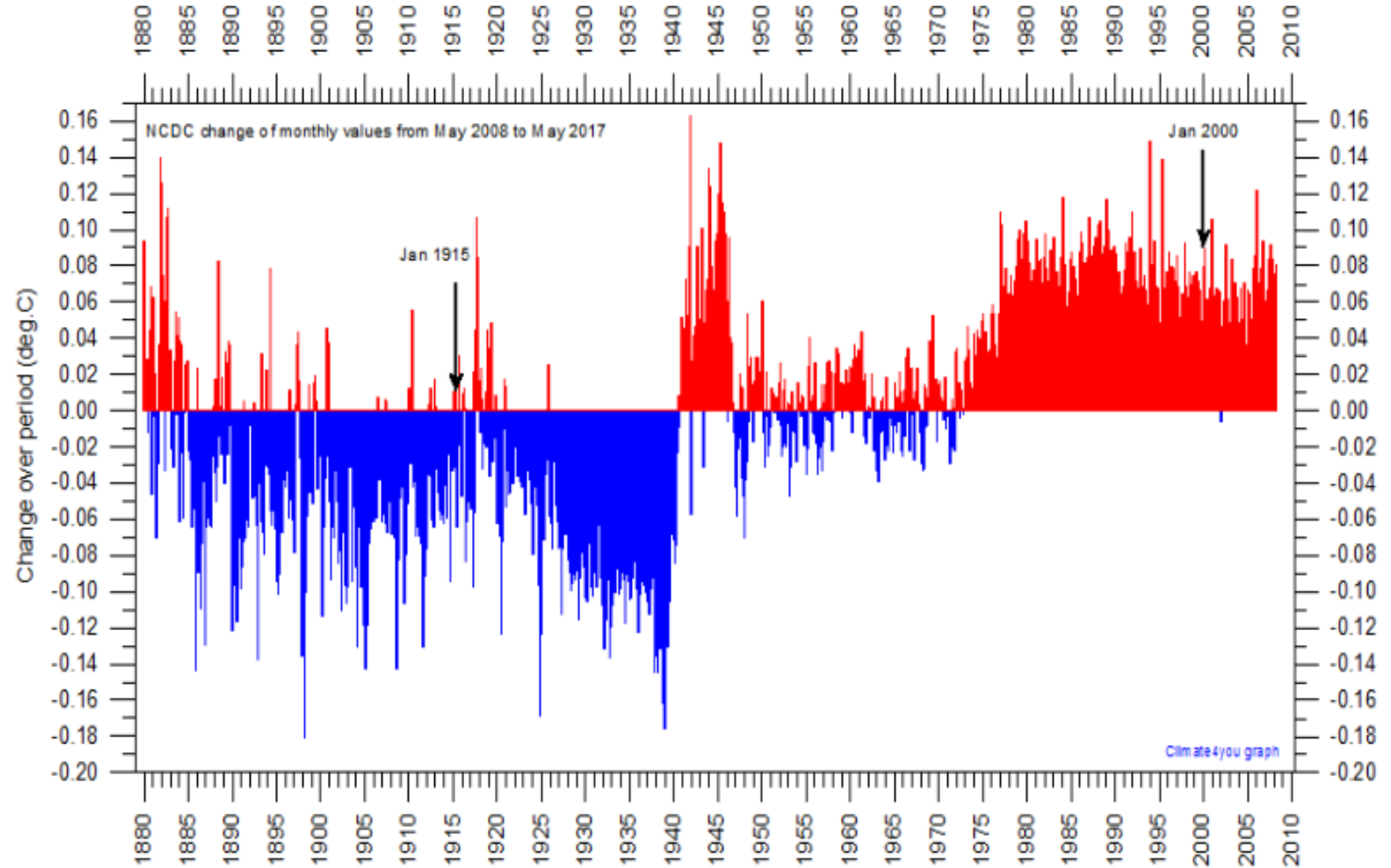
The annual and 10-year running mean of the air temperatures at Nuuk in West Greenland.



In Figure IV-6 below, it can be seen that NOAA's historical data changes made between May 17, 2008 and May 18, 2017 served to rotate the GAST trend so as to be more steeply upward sloped. In fact, to quote from the Climate4you author of the graph: ***“The net result of the adjustments made are becoming substantial, and adjustments since May 2006 occasionally exceeds 0.1°C. Before 1945 global temperatures are generally changed toward lower values, and toward higher values after 1945, resulting in a more pronounced 20th century warming (about 0.15°C) compared to the NCDC temperature record published in May 2008. Last diagram update: 18 May 2017.”***

NOAA's National
Climatic Data Center
adjustments

Figure IV-6

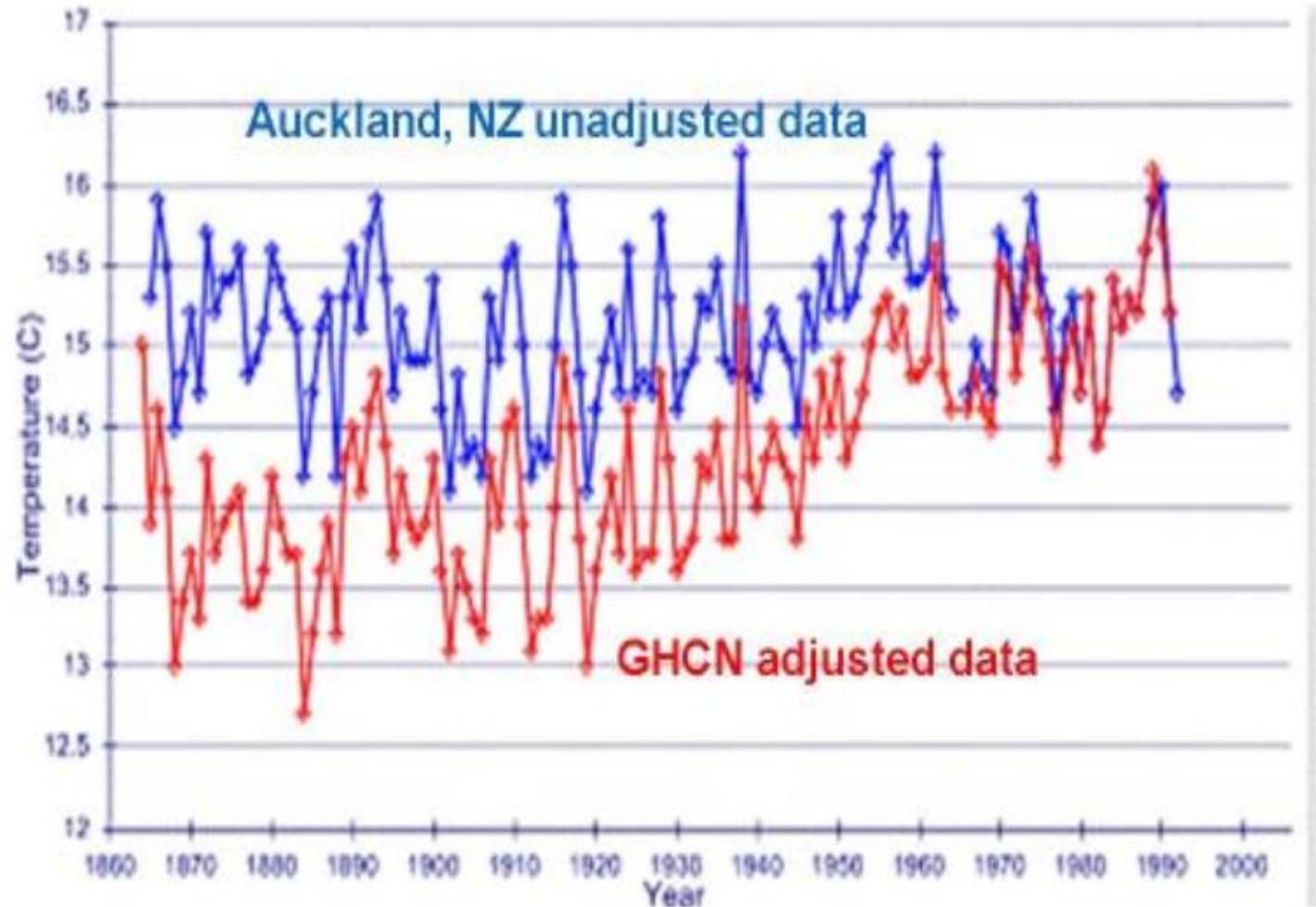


Maturity diagram showing net change since 17 May 2008 in the global monthly surface air temperature record prepared by the [National Climatic Data Center](#) (NCDC), USA.

Adjustments done at the
Global Historical Climatic
Network, GHCN

Figure V-19

Auckland, New Zealand



<http://www.climate4you.com/>

Climate4you

Home

Air Temperatures

Global Temperature

Oceans

Polar Temperature

Polar Precipitation

Air Pressure

Greenhouse Gasses

Climate in Europe

Climate + Clouds

Climate + Volcanoes

Climate + Landscape

Climate + History

Urban Heat Island

Sea Ice

Snow Cover

Permafrost

Sun

Data smoothing

Key updates:

Temp UAH MSU

Temp RSS MSU

Temp HadCRUT

Temp NCDC

Temp GISS

ALLinONE

Equator Temperature

Arctic Temperature

Antarctic Temperature

Oceanic heat content

CO₂ and Temperature

Temperature and CO₂

[Cyclic temperature variation](#)

[Monthly new sletters](#)

[The BIG picture](#)

Getting things into perspective: [The BIG picture](#)

Surface temperatures ([GISS](#)) for the YEAR 2017 compared to last 10 years: [72N-60S](#) [Arctic](#) [Antarctic](#)

Surface temperatures ([GISS](#)) for FEBRUARY 2018 compared to last 10 years: [72N-60S](#) [Arctic](#) [Antarctic](#)

Latest global monthly temperature estimate: [UAH](#) [RSS](#) [HadCRUT](#) [NCDC](#) [GISS](#)

Change over time of global monthly temperature estimates: [UAH](#) [RSS](#) [HadCRUT](#) [NCDC](#) [GISS](#)

<http://www.climate4you.com/>

Climate reflections

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- [20080306: Reflections on the significance of recent global surface air temperature changes](#)
- [20080715: Handling the present period without global warming by Grouphink](#)
- [20080911: Is the global temperature increase 1981-2005 unique compared to the general temperature rise since the end of the Little Ice Age ?](#)
- [20080927: Reflections on the correlation between global temperature and atmospheric CO₂](#)
- [20120128: Reflections on effects of the NCDC and GISS transition to GHCN version 3](#)
- [20120201: GISS corrections of the Nuuk Greenland surface air temperature record](#)

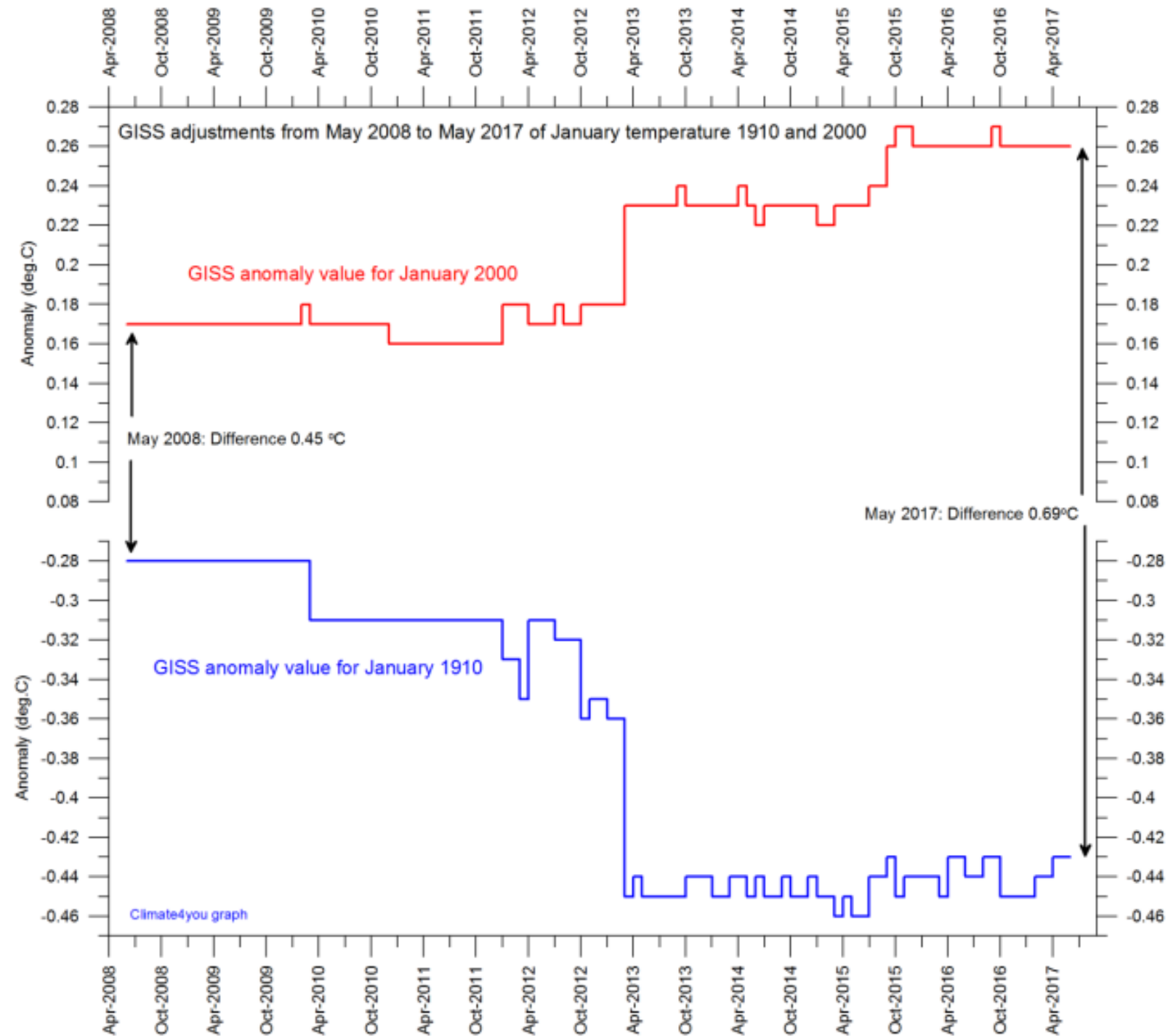
Climate4you update April 2017



Contents:

- Page 2: April 2017 global surface air temperature overview
- Page 3: Comments to the April 2017 global surface air temperature overview
- Page 4: Temperature quality class 1: Lower troposphere temperature from satellites
- Page 5: Temperature quality class 2: HadCRUT global surface air temperature
- Page 6: Temperature quality class 3: GISS and NCDC global surface air temperature
- Page 9: Comparing global surface air temperature and satellite-based temperatures
- Page 10: Global air temperature linear trends
- Page 11: Global temperatures: All in one, Quality Class 1, 2 and 3

Adjustments made
over time by
NASA GISS



Adjustments made over time by NASA GISS

8

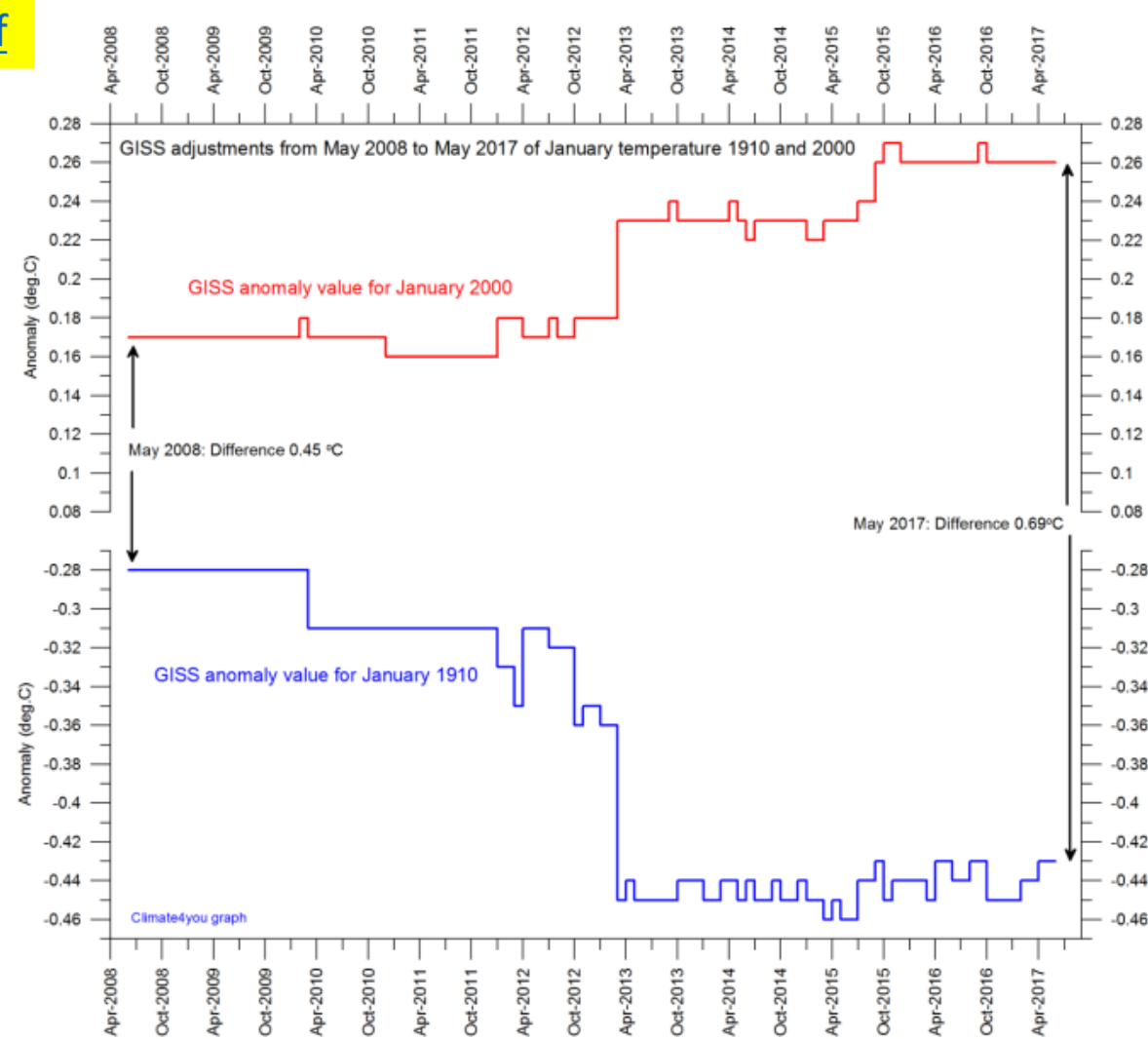


Diagram showing the adjustment made since May 2008 by the [Goddard Institute for Space Studies](#) (GISS), USA, in anomaly values for the months January 1910 and January 2000.

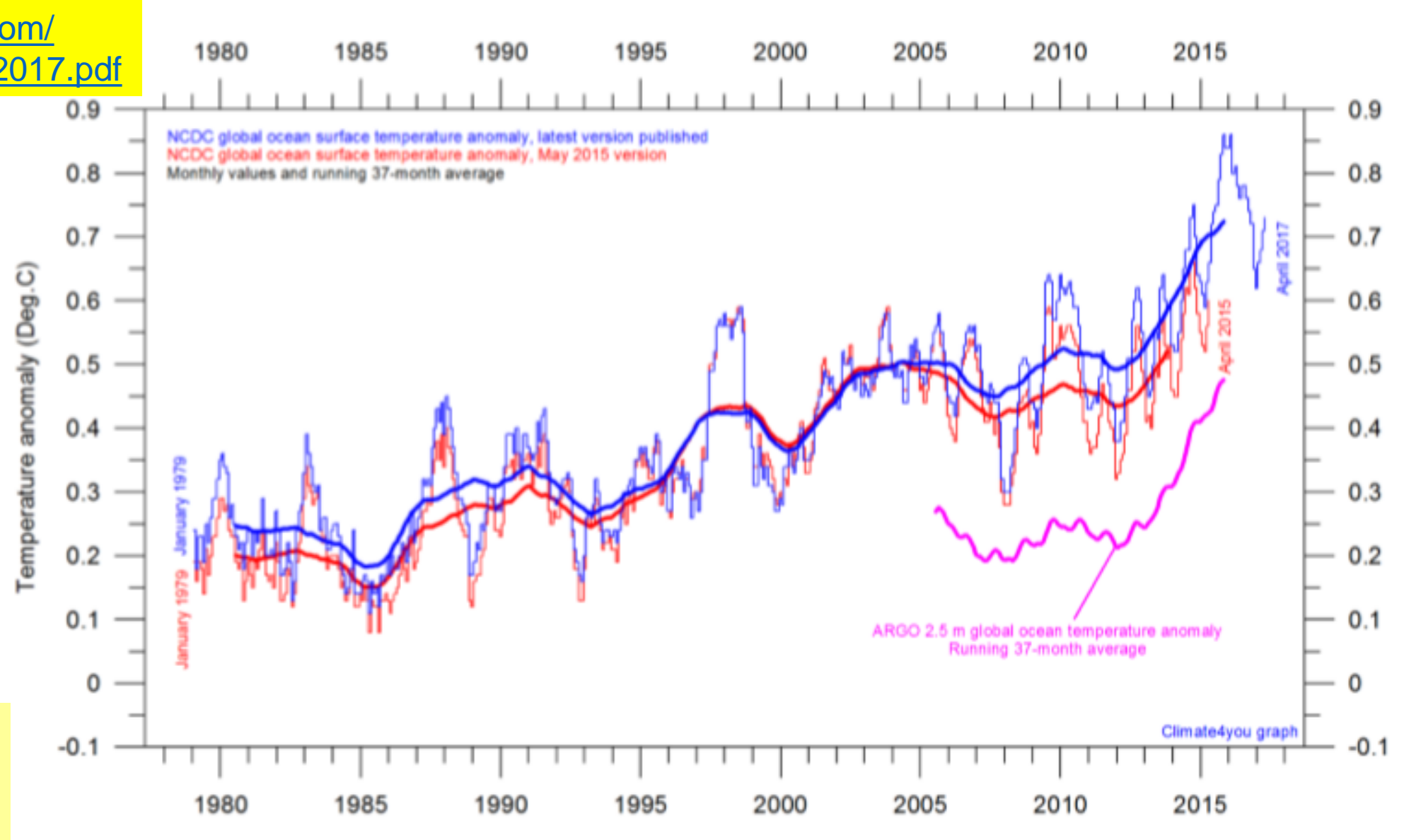
Note: The administrative upsurge of the temperature increase from January 1915 to January 2000 has grown from 0.45 (reported May 2008) to 0.69C (reported May 2017). This represents an about 53% administrative temperature increase over this period, meaning that more than half of the reported (by GISS) global temperature increase from January 1910 to January 2000 is due to administrative changes of the original data since May 2008.

NOAA's National Climatic Data Center Adjustments.

NCDC SSTs were adjusted to ignore buoys and floats and use data from ships contaminated by engine heat.

Tom Karl's data can never be replicated.

Computer died and the software was not "RCS-compliant."



June 18, 2015: NCDC has introduced a number of rather large administrative changes to their sea surface temperature record. The overall result is to produce a record giving the impression of a continuous temperature increase, also in the 21st century. As the oceans cover about 71% of the entire surface of planet Earth, the effect of this administrative change is clearly seen in the NCDC record for global surface air temperature.

The next section contains elements from two reports

“A Critical Look at Surface Temperature Records,” by Joe D’Aleo

<https://thsresearch.files.wordpress.com/2017/05/chap3-published-in-elsevier.pdf>

and

“Surface Temperature Records: Policy-Driven Deception,” by Joe D’Aleo and Anthony Watts

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

Chapter 3

A Critical Look at Surface Temperature Records

Joseph D'Aleo

CCM, AMS Fellow, 18 Glen Drive, Hudson, NH 03051, USA

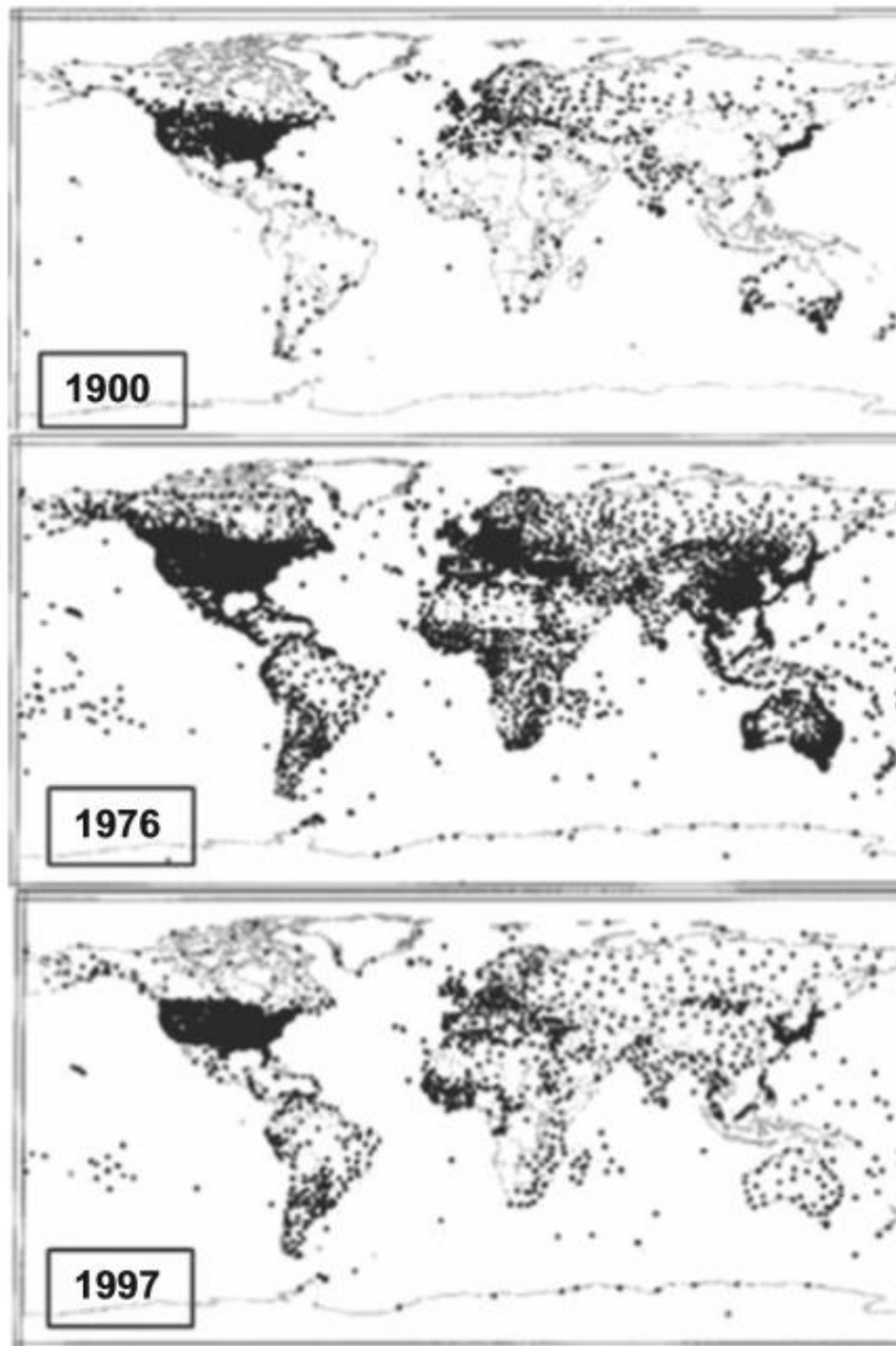
SURFACE TEMPERATURE RECORDS: POLICY-DRIVEN DECEPTION?

by Joseph D'Aleo and Anthony Watts



<https://thsresearch.files.wordpress.com/2017/05/chap3-published-in-elsevier.pdf>

FIGURE 4 Stations in 1900, 1976, and 1997 used in the global GHCN database (sources: Peterson and Vose NCDC, 1997).



Global Climate
Stations GHCN

*(Peterson and
Vose, NCDC)*

<https://thsresearch.files.wordpress.com/2017/05/chap3-published-in-elsevier.pdf>

What happens to Global surface temperature when the Soviet Union collapses and closes hundreds of research Stations in Siberia?

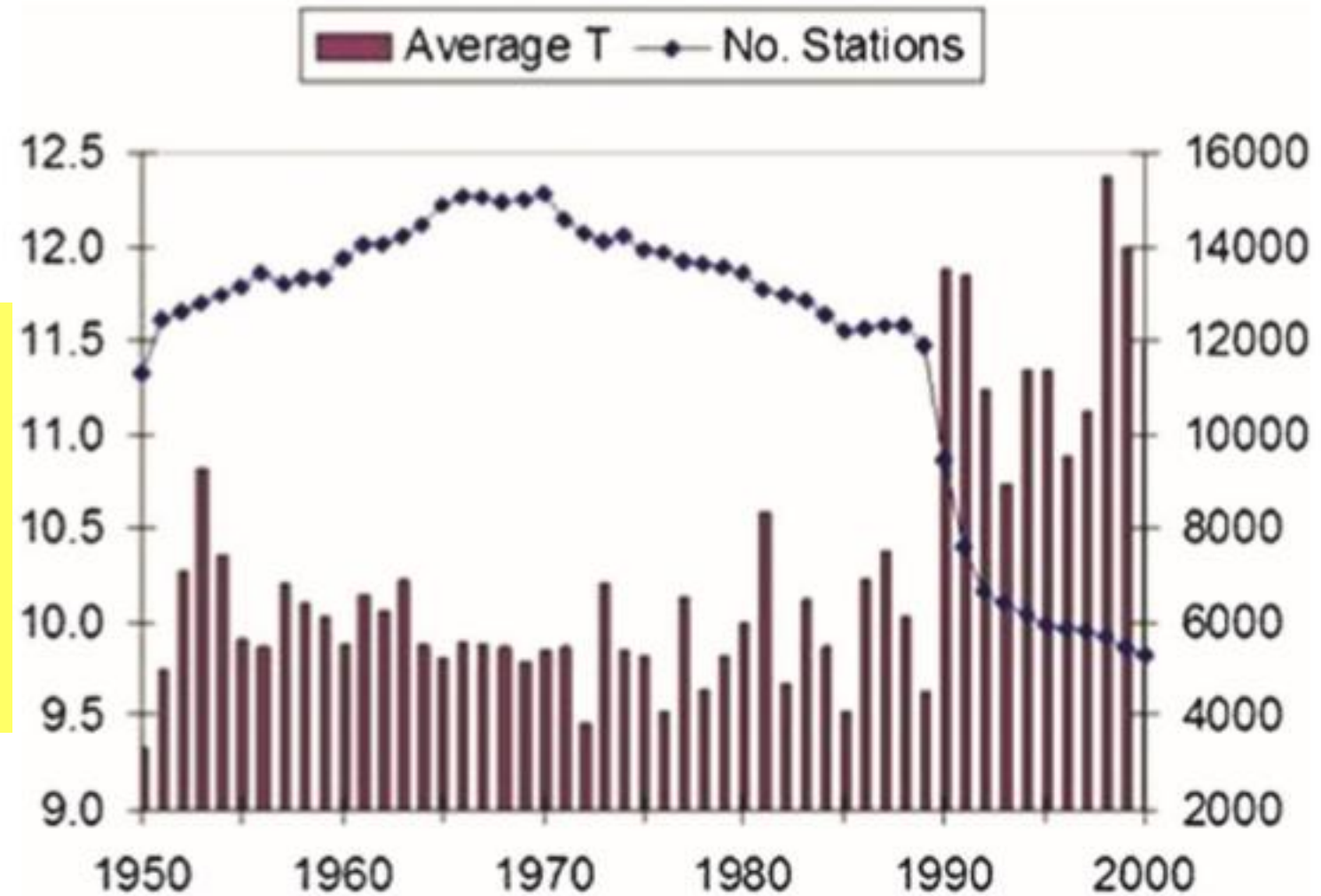
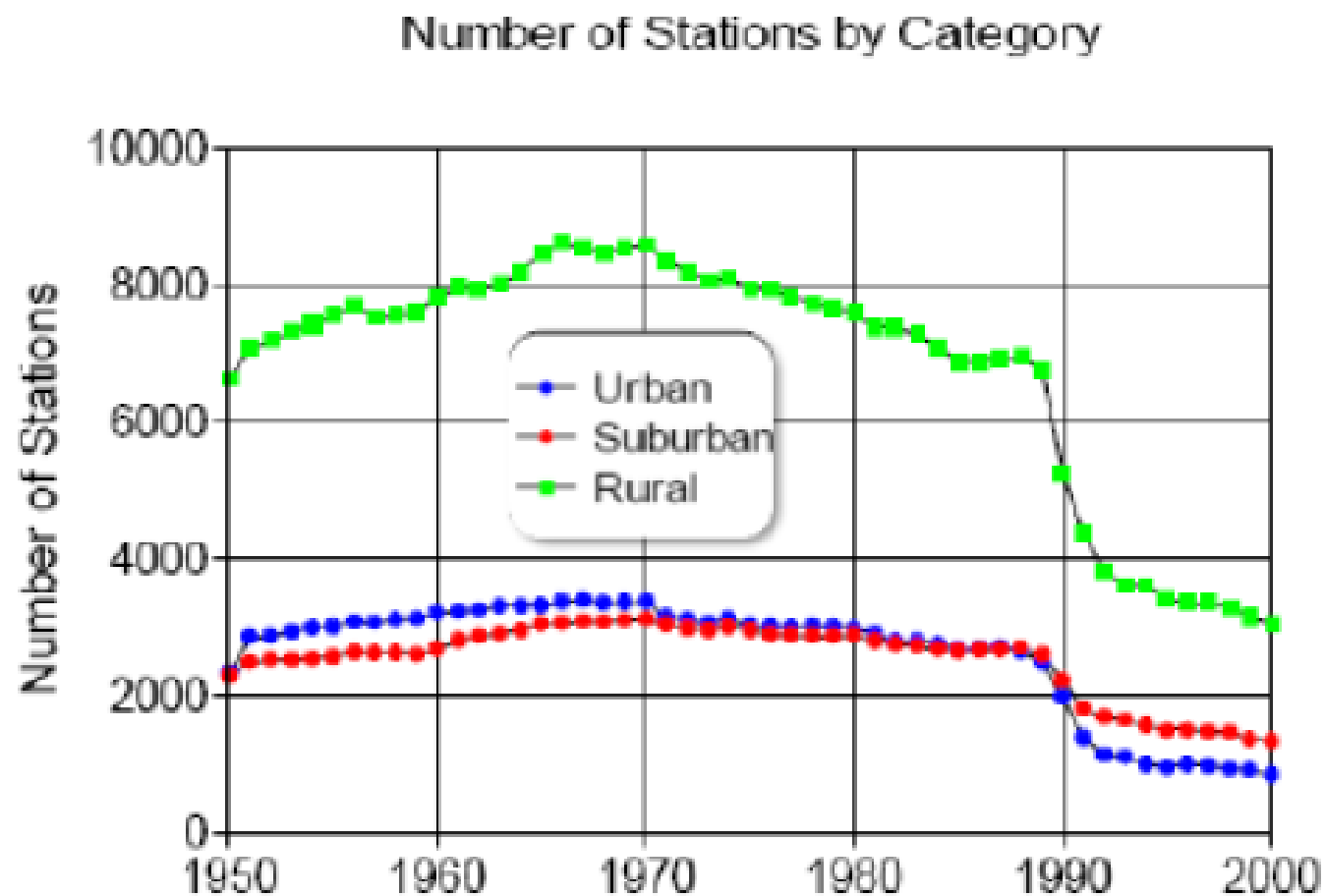


FIGURE 5 Plot of the number of total station ID's in each year since 1950 and the average temperatures of the stations in the given year.

The number of stations that dropped out tended to be disproportionately rural –



(Station count represent every station reported by GHCN - analyses above from Jonathan Drake.)

In Canada, the highlighted stations <Black outlines> were used in the temperature analysis.

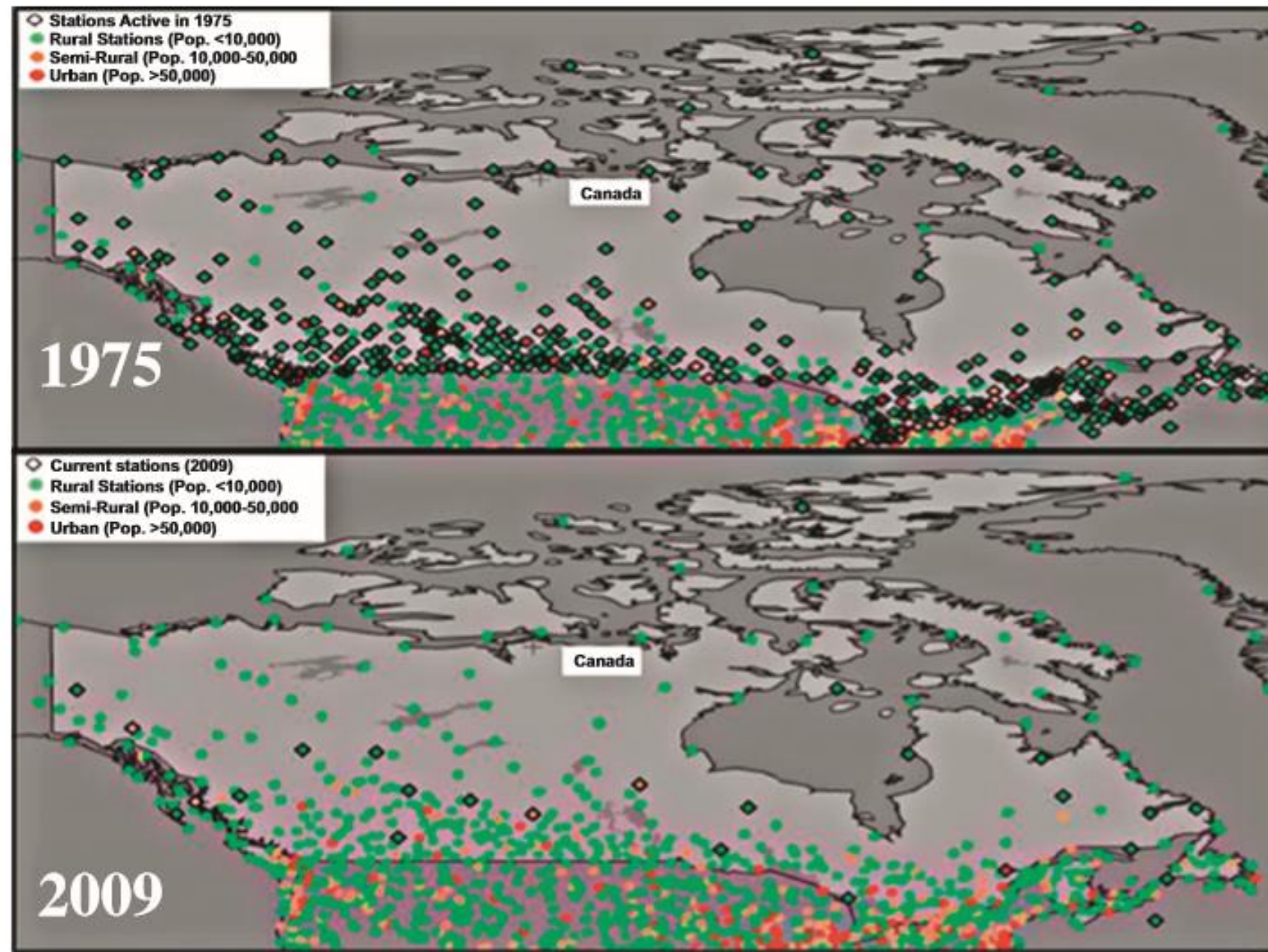


FIGURE 9 Canadian stations used in annual analyses in 1975 and 2009 (*source: Verity Jones from GHCN*).

CANADA

In Canada, number of stations dropped from 600 to fewer than 50.

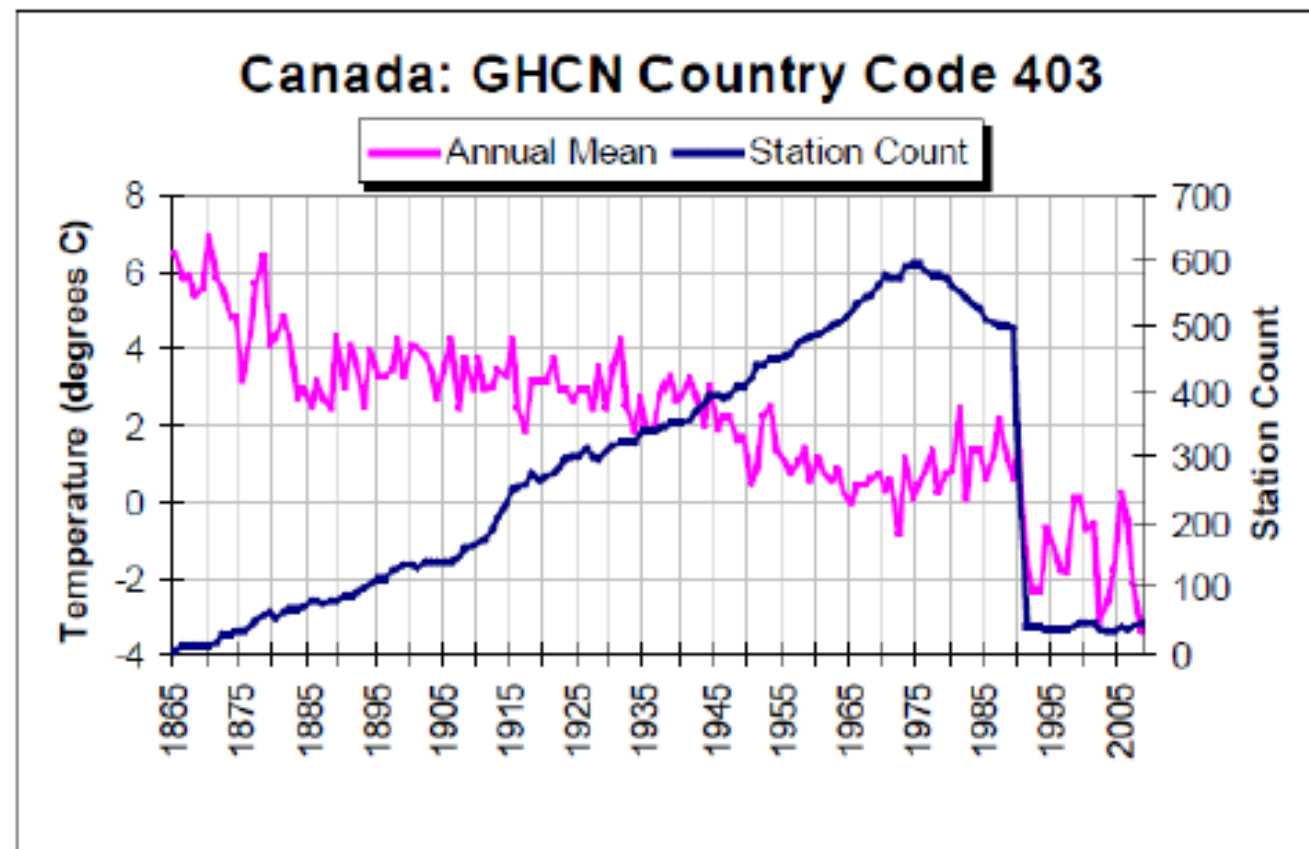
Percentage of stations below 300 feet tripled.

Percentage of Stations above 3000 feet reduced by half.

Canada's depicted warmth, from interpolating from more southerly locations to fill northerly vacant grid boxes.

Simple average of available stations shows cooling.

Just one thermometer remains for everything north of the 65th parallel.



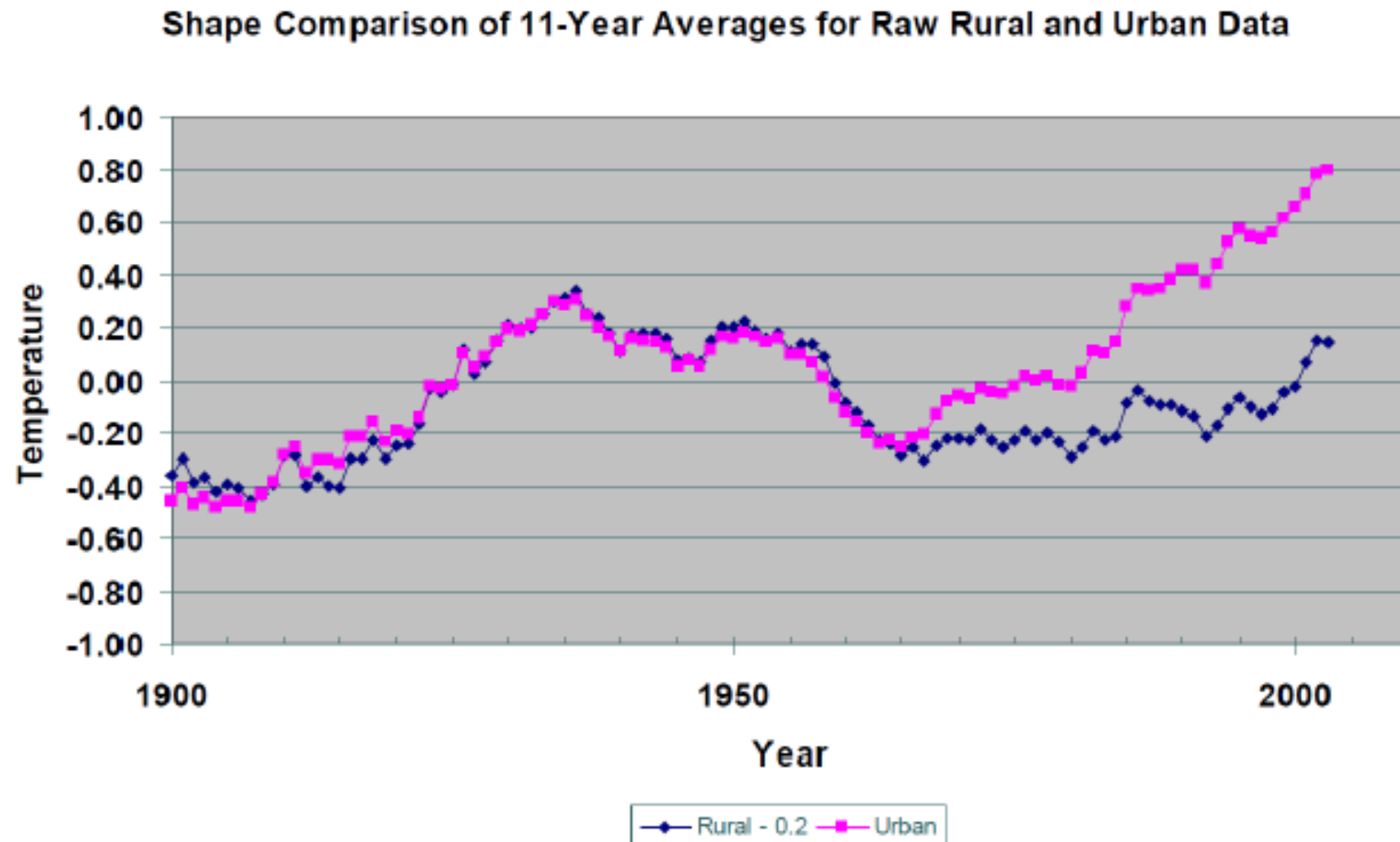


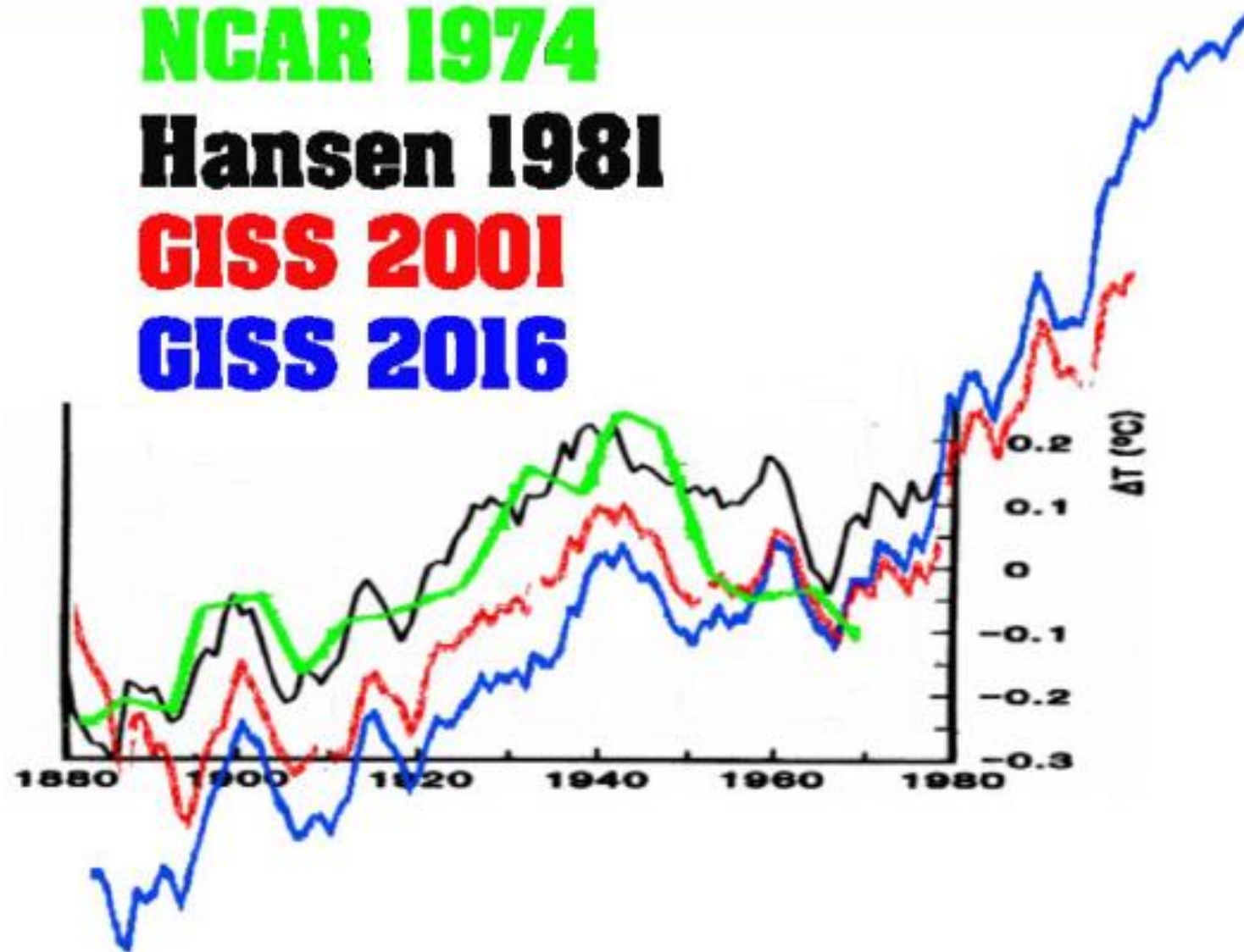
Figure 6 – Comparison of 11- yr averages of raw rural and urban temperatures. Rural data are offset by a factor of '-0.2', due to the smaller value of the average, compared to the urban, for the 1961-1990 period.

NCAR 1974

Hansen 1981

GISS 2001

GISS 2016

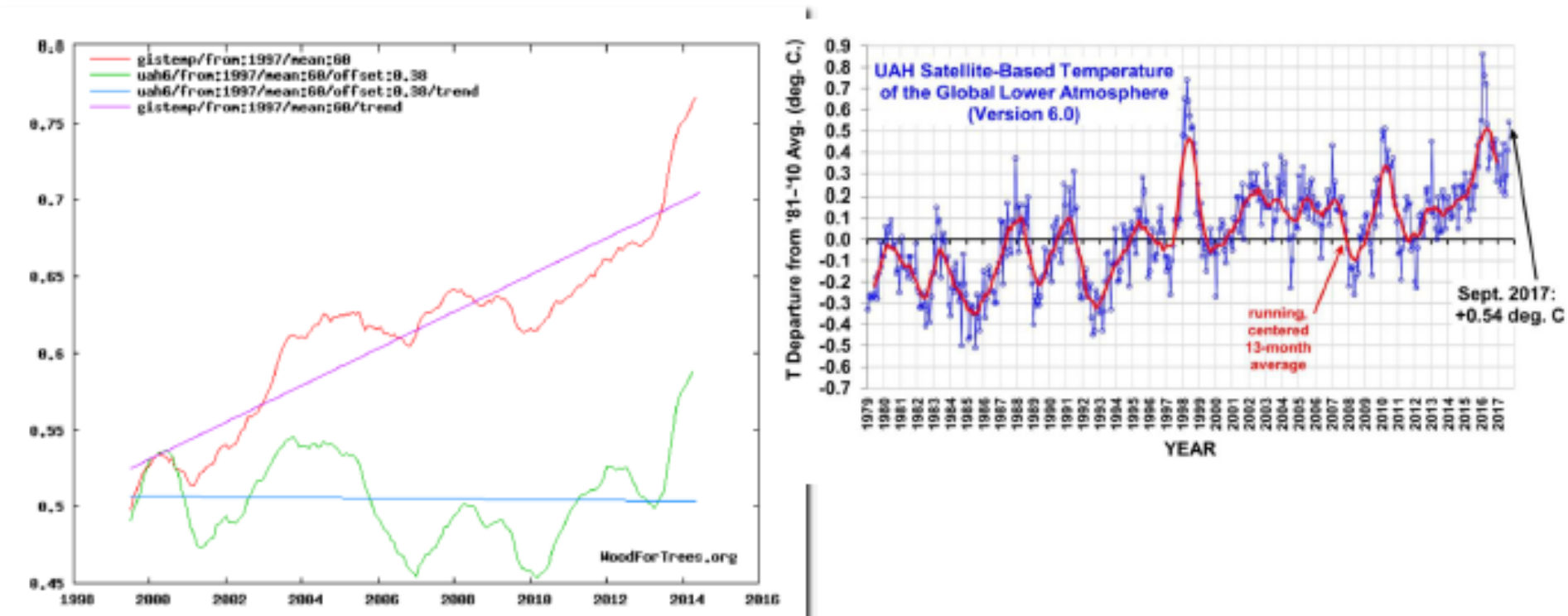


A real issue results from comparing Surface Temperatures with Satellite-based Temperatures

Surface temperatures are sensed with Liquid-in-glass thermometers in Stephenson Screens.
(Red line, below.)

Satellite –sensed temperatures come from Microwave Sensing Units, MSUs, measuring emission of O₂ in the microwave spectrum, in the Lower Troposphere, the atmosphere's greenhouse (Green line, below)

The issue is, the Surface Warming is responding to a phenomenon different from the greenhouse gases in the greenhouse, the Lower Troposphere.



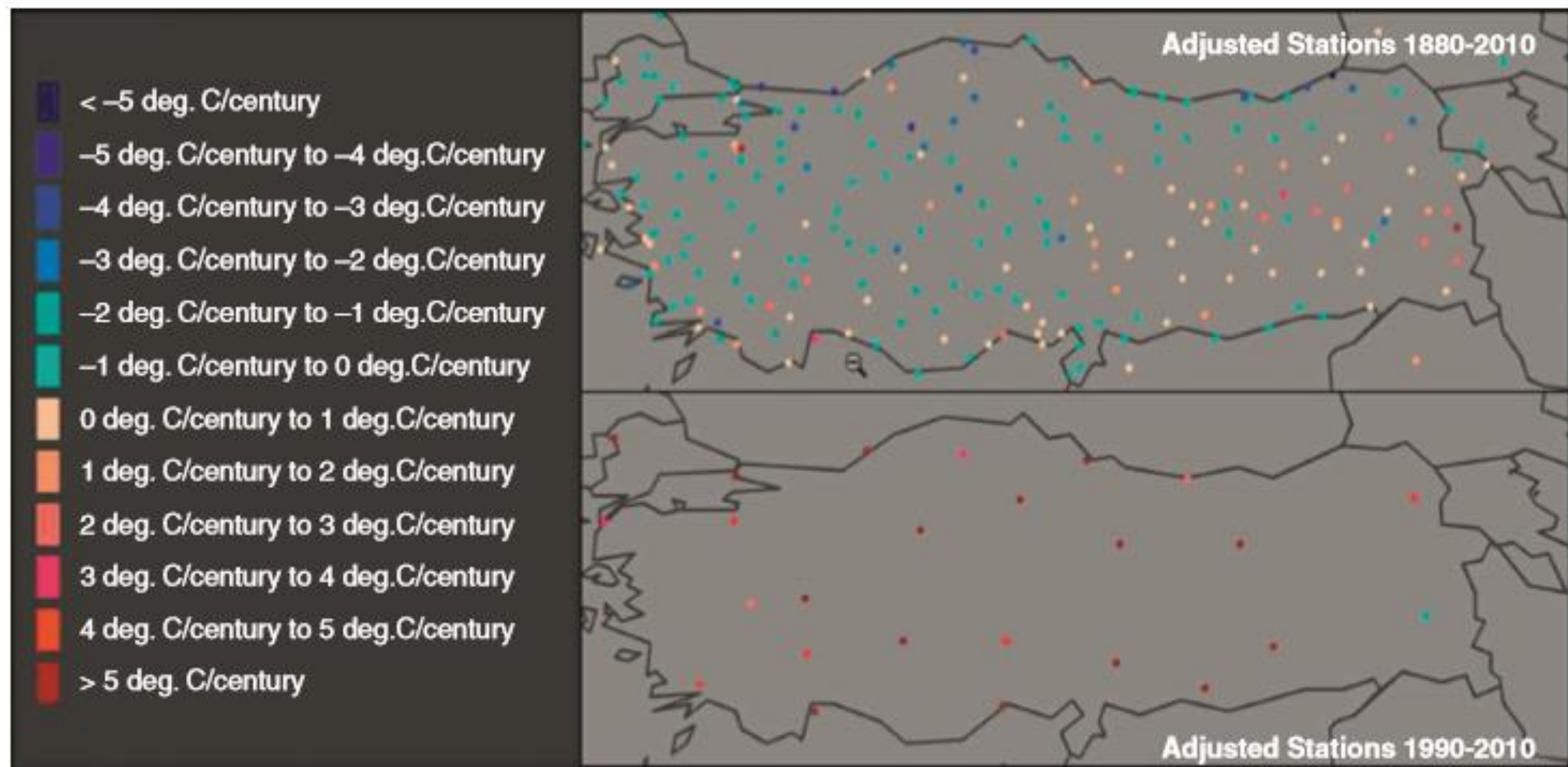


FIGURE 11 Verity Jones maps showing station temperature trends for (top) all stations active during 1880–2010 and (bottom) for stations active after 1990. The result is that Turkey is shown to be warming when the data shows cooling.

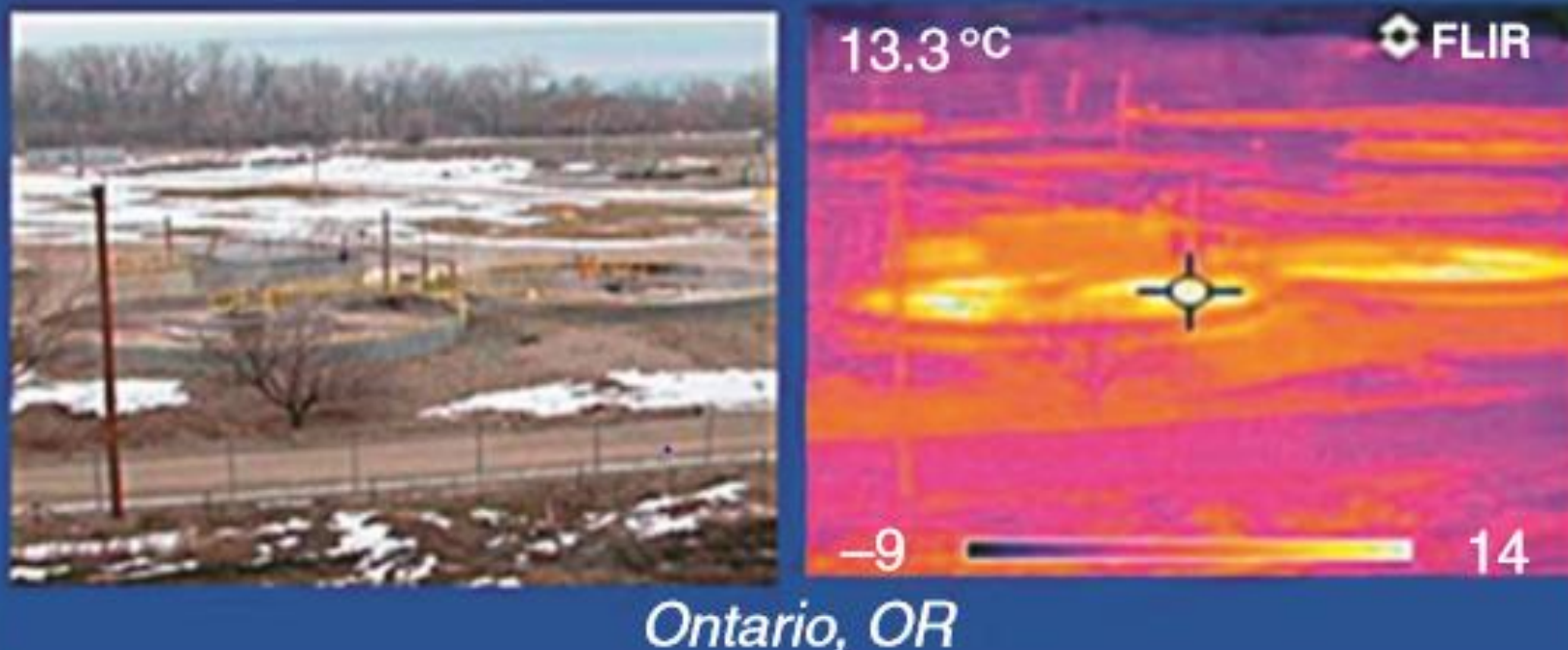


USHCN weather station at Hopkinsville, KY (Pielke et al., 2006). The station is sited too close to a building, too close to a large area of tarmac, and directly above a barbecue.



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

Waste Treatment Plants



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.)

FIGURE 14 One of many waste treatment plants serving as stations in USHCN.

USHCN - Station Site Quality by Rating

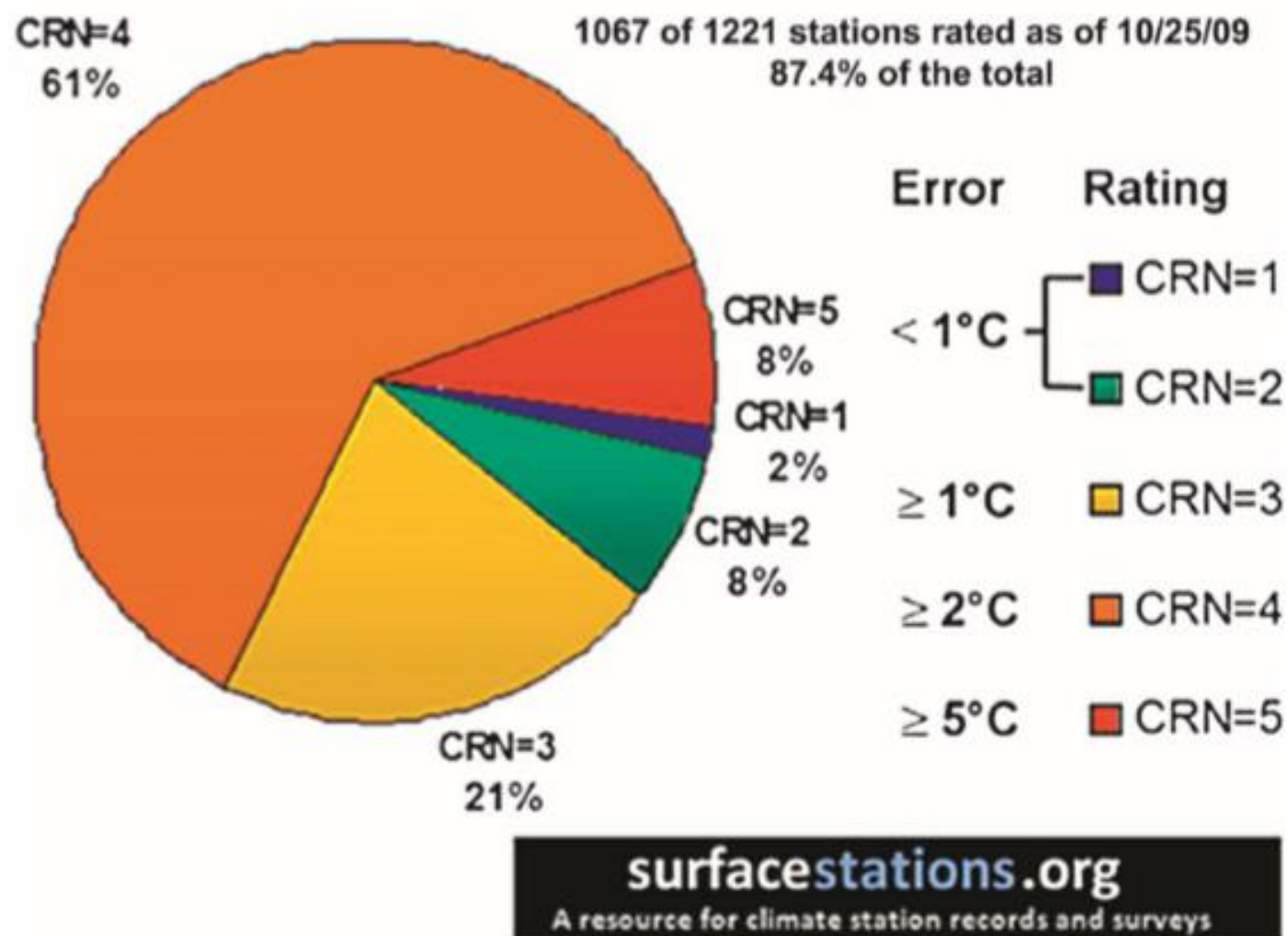
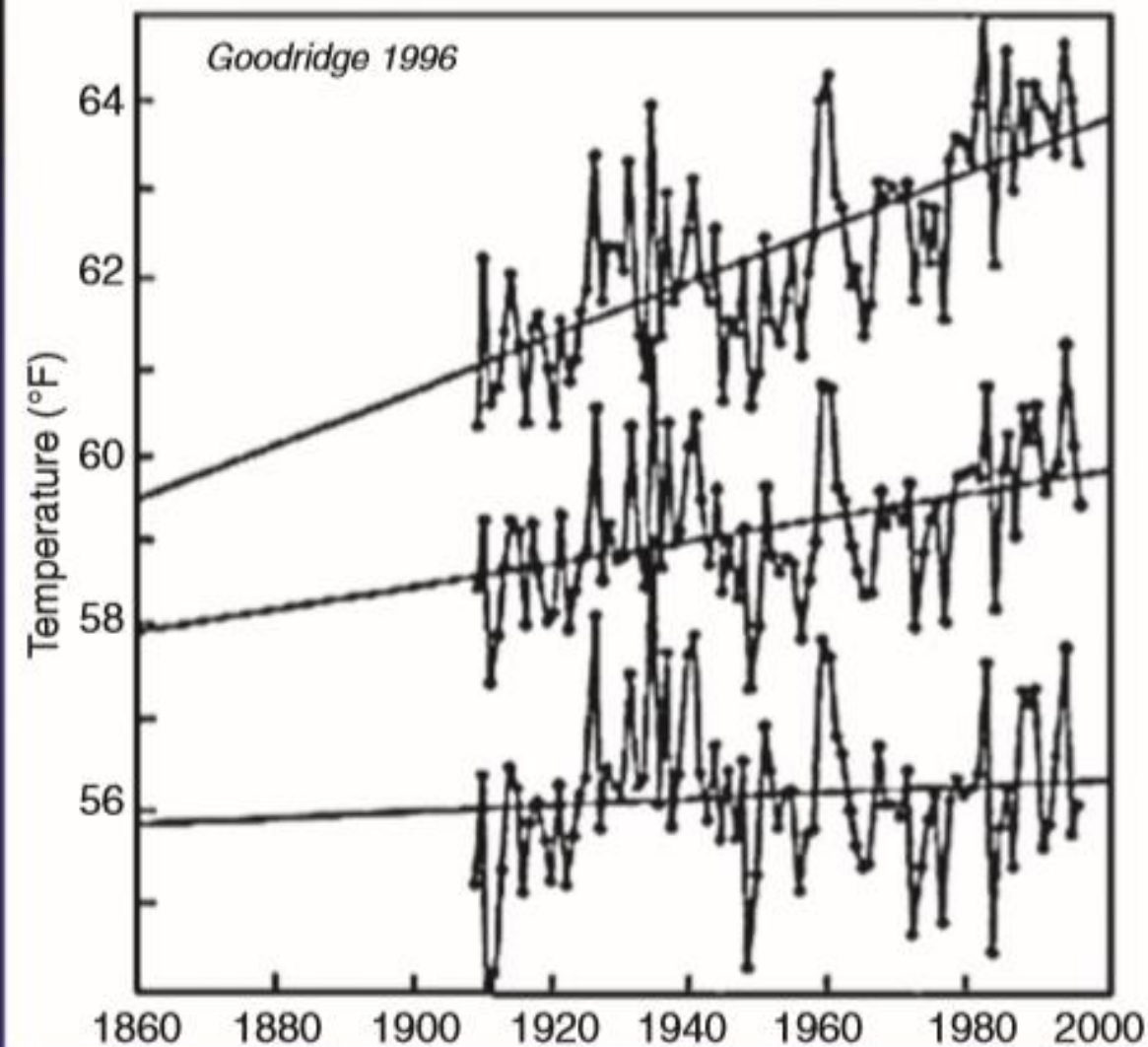


FIGURE 15 Surfacestations.org quality rating by stations for 1,067 U.S. climate stations as of 10/25/2009. Only 10% meet minimal CRN ranking (CRN 1 or 2).



**Counties in CA
with >1 million
Population
+4F**

**Counties in CA
with between
100,000 and
1 million
Population
+1F**

**Counties in CA
with less than
100,000
Population
0F**

FIGURE 16 Jim Goodrich analysis of warming in California counties by population 1910–1995.

U.S. State Maximum and Minimum Monthly Records by Decade

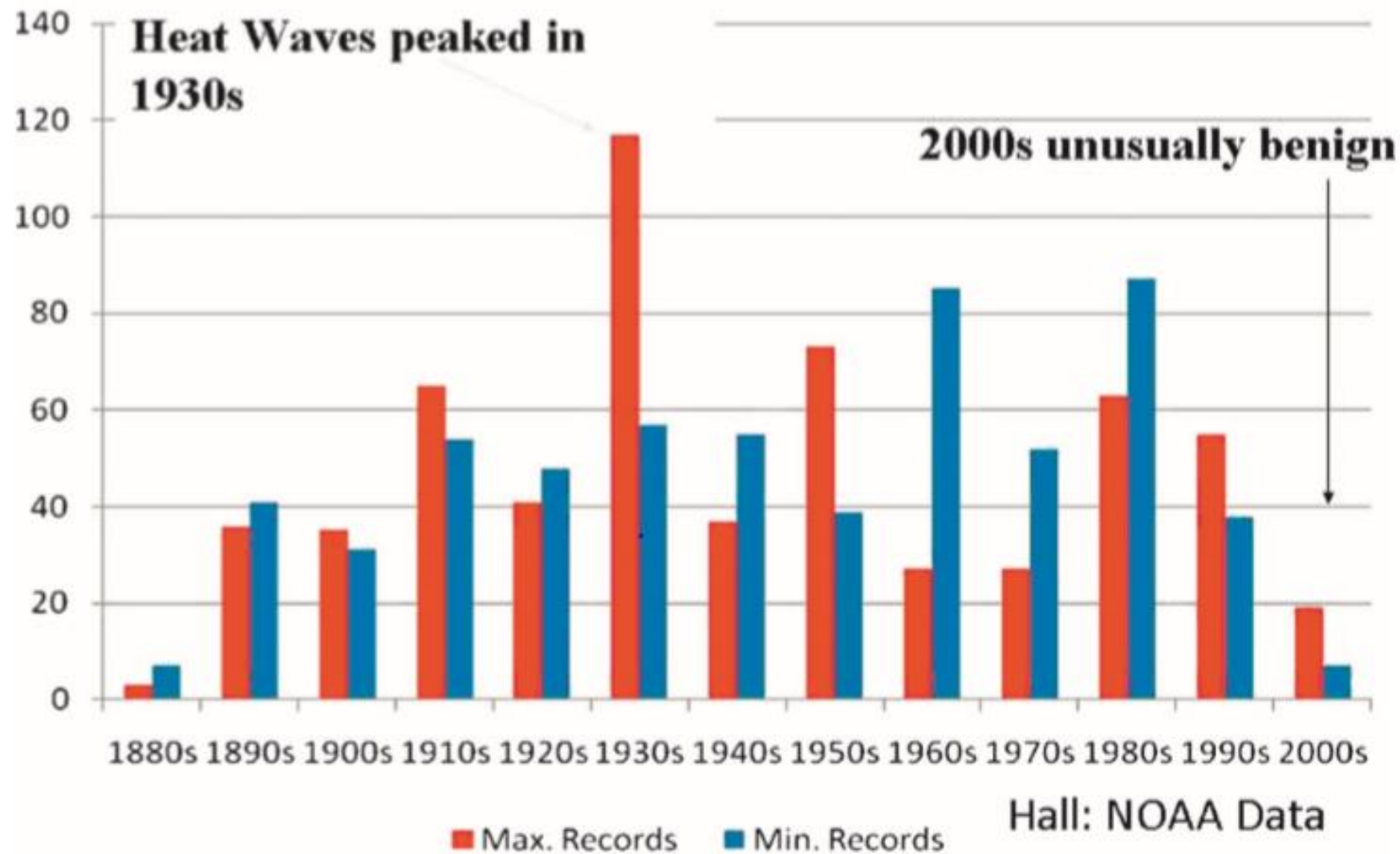


FIGURE 19 United States all-time monthly record lows and highs by decade. Compiled by Hall from NOAA NCDC data.

USHCN v1 Versus v2

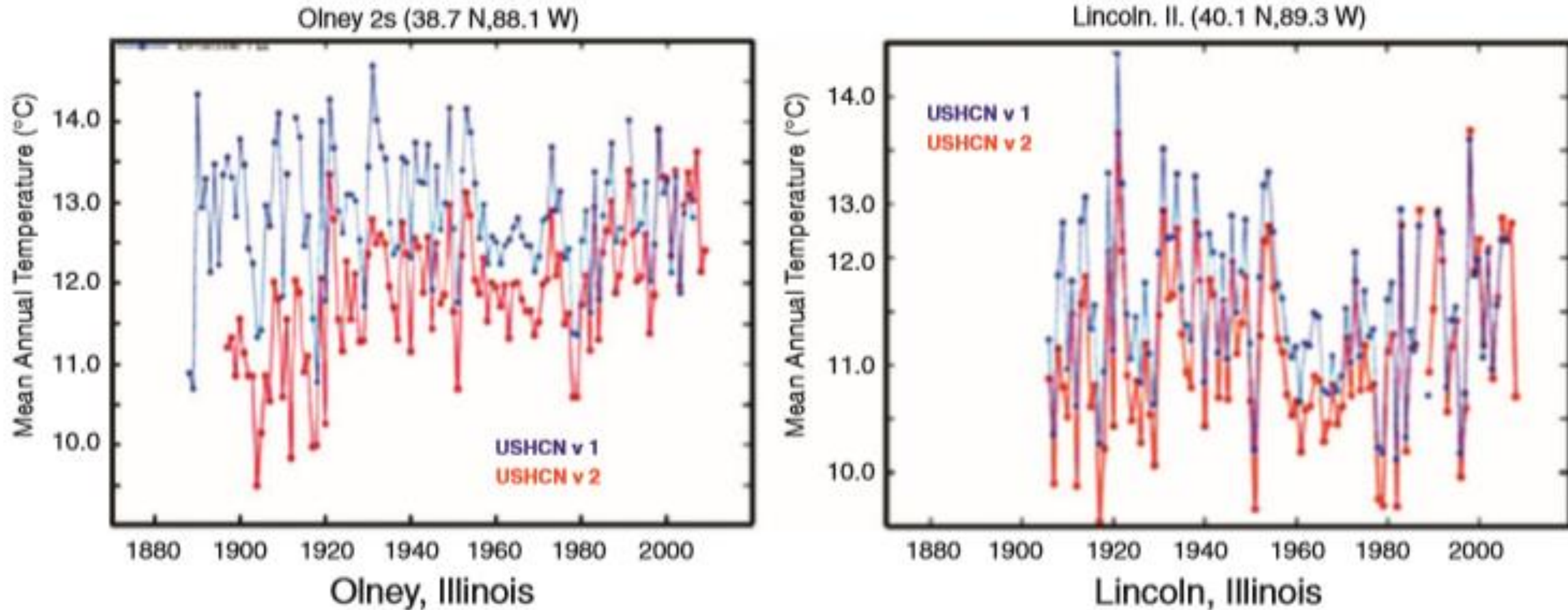
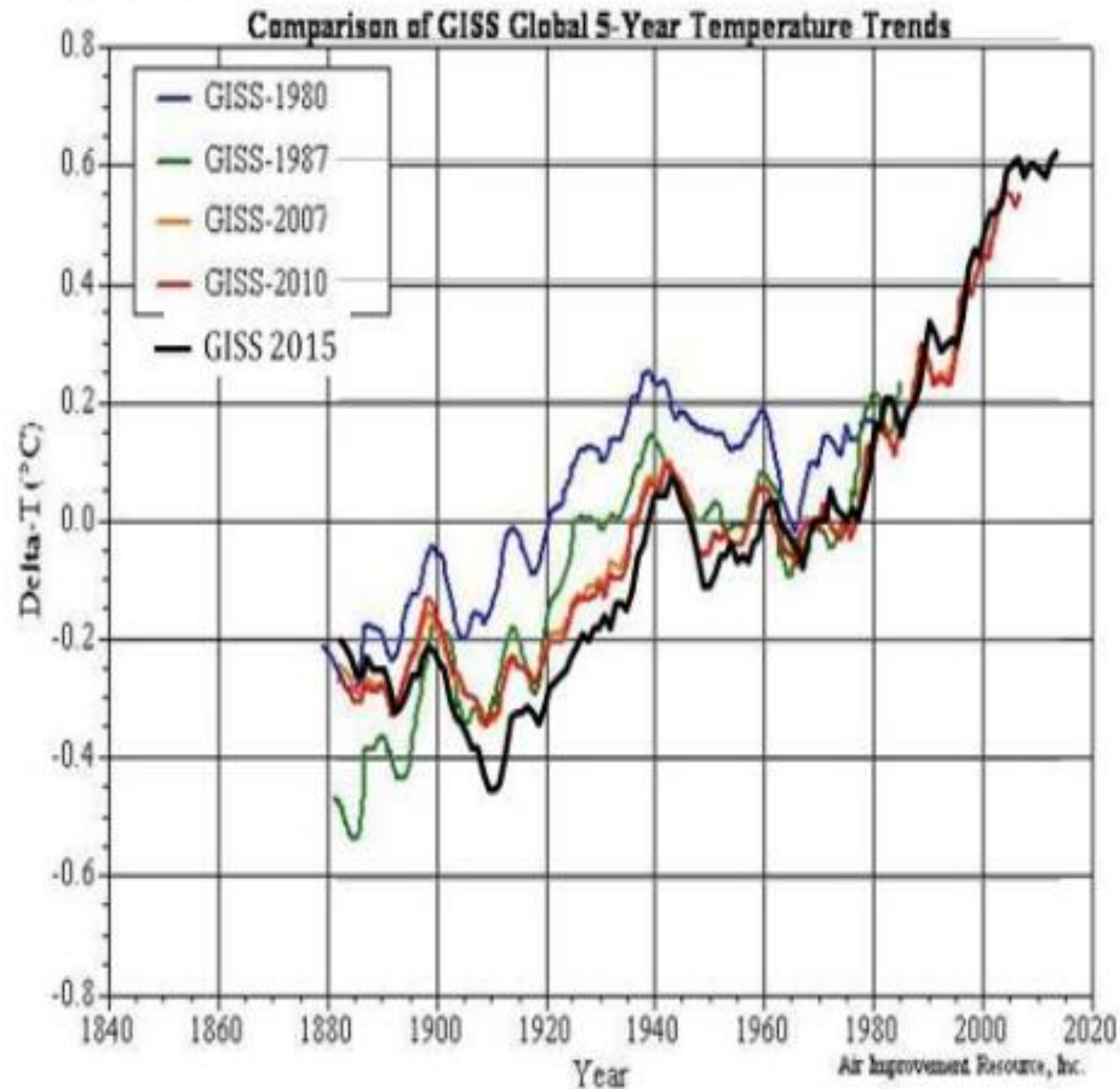


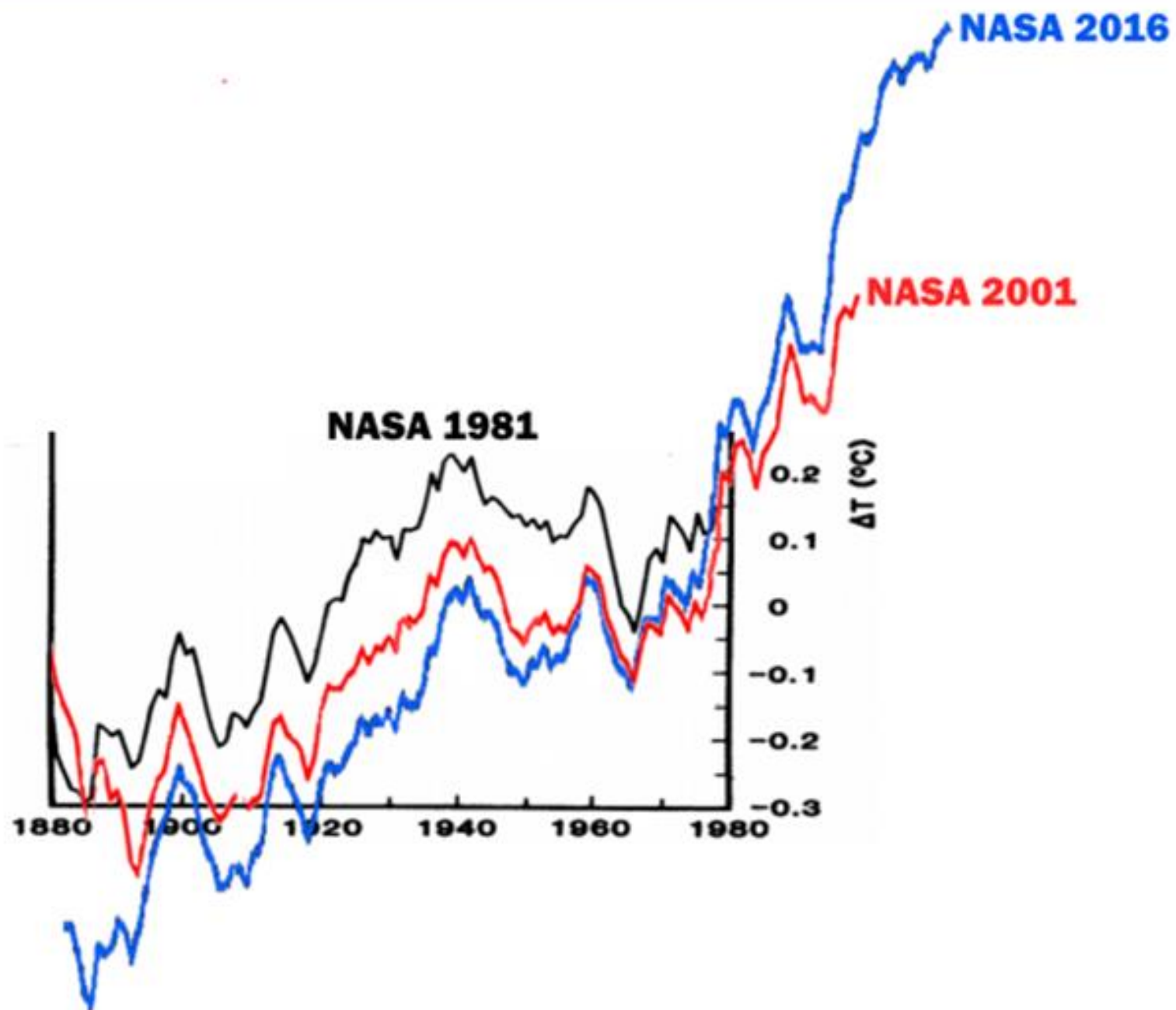
FIGURE 22 NOAA USJCN version 1 vs. version 2 for Olney and Lincoln Illinois.

1 and version 2 superimposed (thanks to Mike McMillan). Notice the clear tendency to cool off the early record and leave the current levels near recently reported levels or increase them. The net result is either reduced cooling or enhanced warming not found in the raw data (Fig. 22).

Figure IV-1

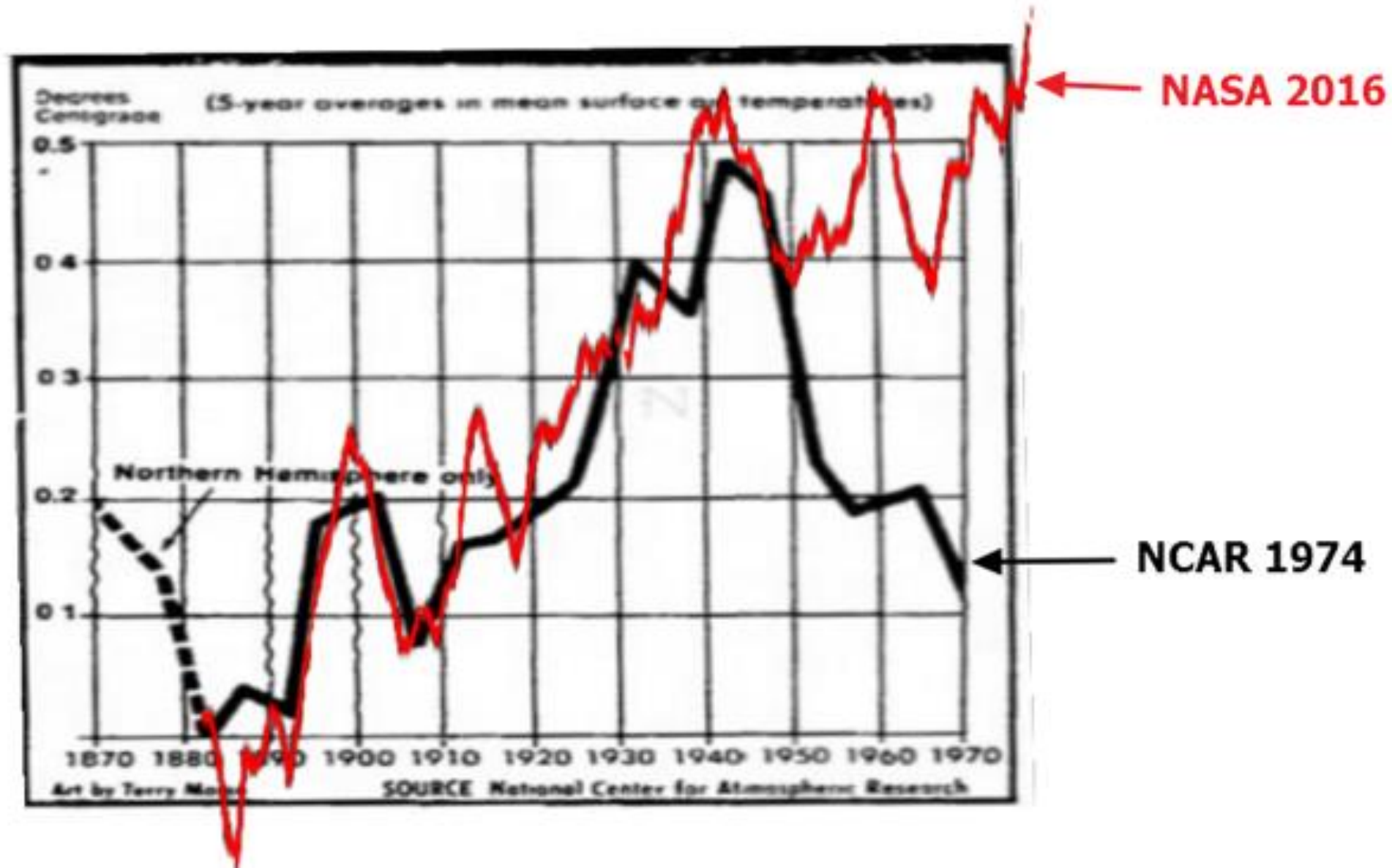


Source: GISS, and Air Improvement Resource, Inc.



BLACK trace shows the “tooth-shaped” temperatures published by NCAR in 1974, during the “Global Cooling” scare of the 1970s

RED trace shows a recent NASA GISS temperature History.



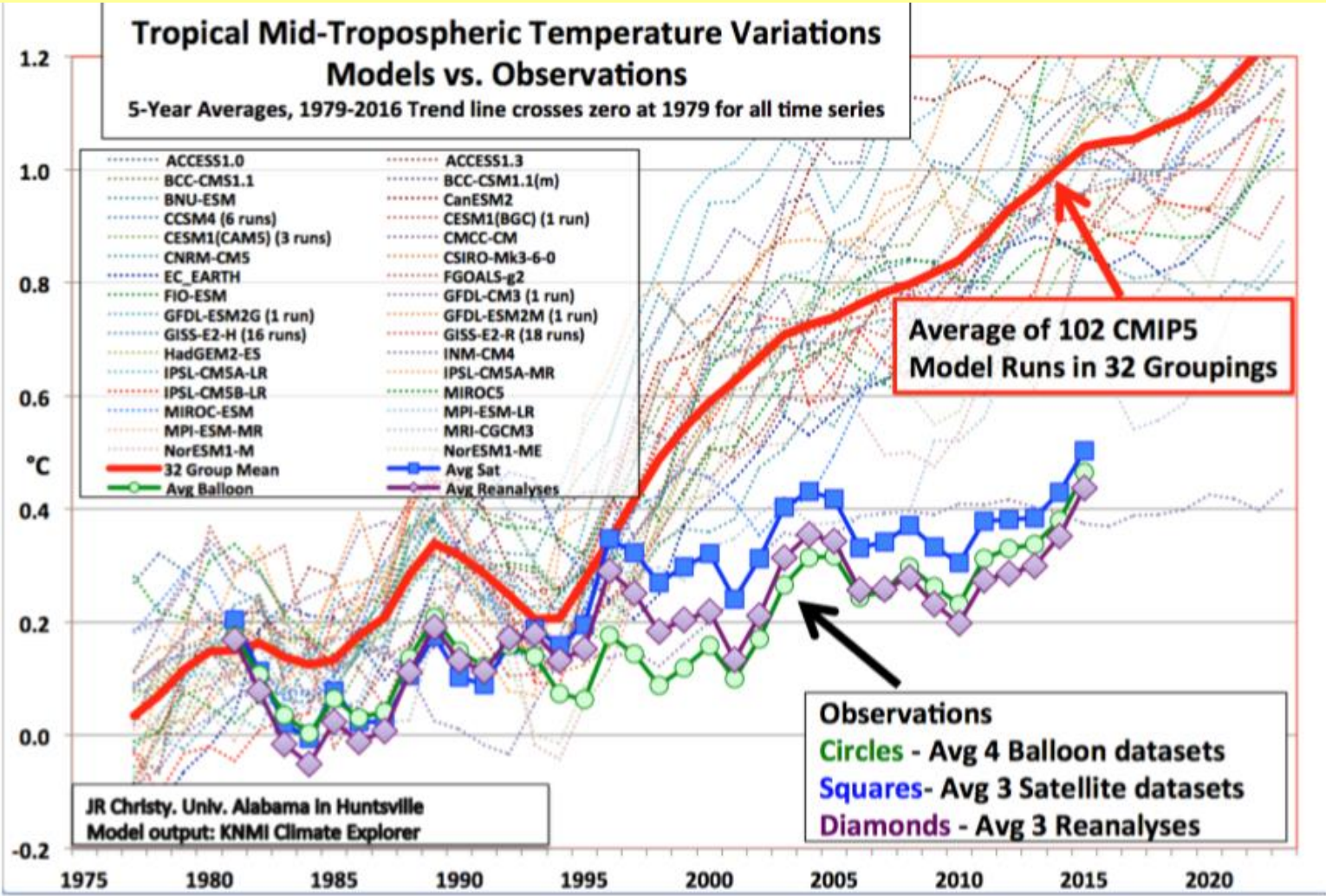
3. Computer Models

3. Computer Models

All Models show the Hot Spot, which does not exist in nature.

Models fail the explicit criteria for their use in detection & attribution. Not fit for making \$\$ Trillion policy decisions.

Could not satisfy HISA Requirements



Five-year averaged values of annual mean (1979-2016) tropical bulk TMT as depicted by the average of 102 IPCC CMIP5 climate models (red) in 32 institutional groups (dotted lines). The 1979-2016 linear trend of all time series intersects at zero in 1979. Observations are displayed with symbols: Green circles - average of 4 balloon datasets, blue squares - 3 satellite datasets and purple diamonds - 3 reanalyses. The last observational point at 2015 is the average of 2013-2016 only, while all other points are centered, 5-year averages.

As an IPCC Reviewer, John Christy of UAH suggested that this diagram be simplified.

These Reviewer Comments were ignored.

Next graphic shows why IPCC did not want Christy's changes posted to the report.

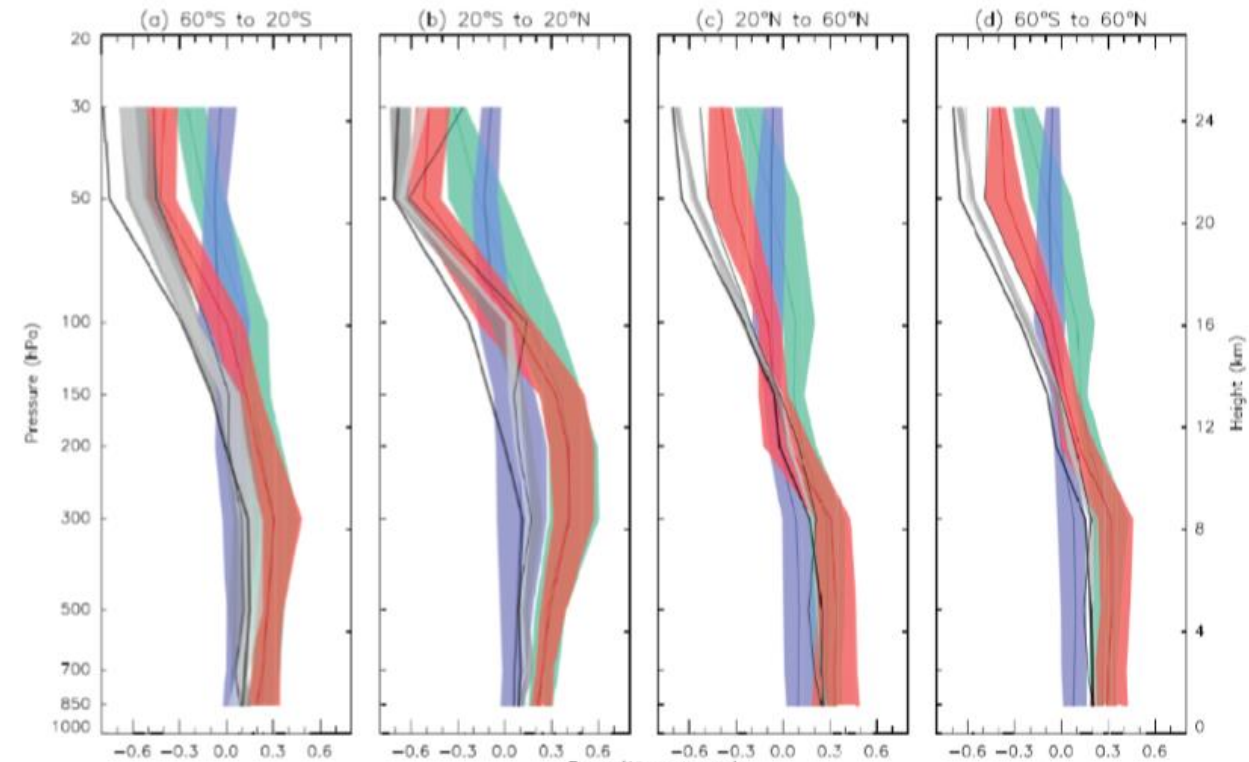


Figure 10.SM.1 | Observed and simulated zonal mean temperatures trends from 1979 to 2010 for CMIP5 simulations containing both anthropogenic and natural forcings (red), natural forcings only (blue) and greenhouse gas forcing only (green) where the 5th to 95th percentile ranges of the ensembles are shown. Three radiosonde observations are shown (thick black line: Hadley Centre Atmospheric Temperature data set 2 (HadAT2), thin black line: Radiosonde Observation Correction using REanalyses (RAOBCORE) 1.5, dark grey band: Radiosonde Innovation Composite Homogenization (RICH)-obs 1.5 ensemble and light grey: RICH- τ 1.5 ensemble. (Adapted from Lott et al. (2013) but for the more recent period from 1979 to 2010.)

Figure 4. This is Fig. 10.SM.1 of the IPCC AR5 Supplementary Material for Chapter 10. These are trends (1979-2010) for various vertical levels of the atmosphere from (a) observations (gray band – difficult to see), from (b) models without extra GHGs (blue band) and (c) models with extra GHGs and other forcings (red band). The lower portion of the tropical chart (second panel from left) is simplified in Fig. 5 and used for the following discussion

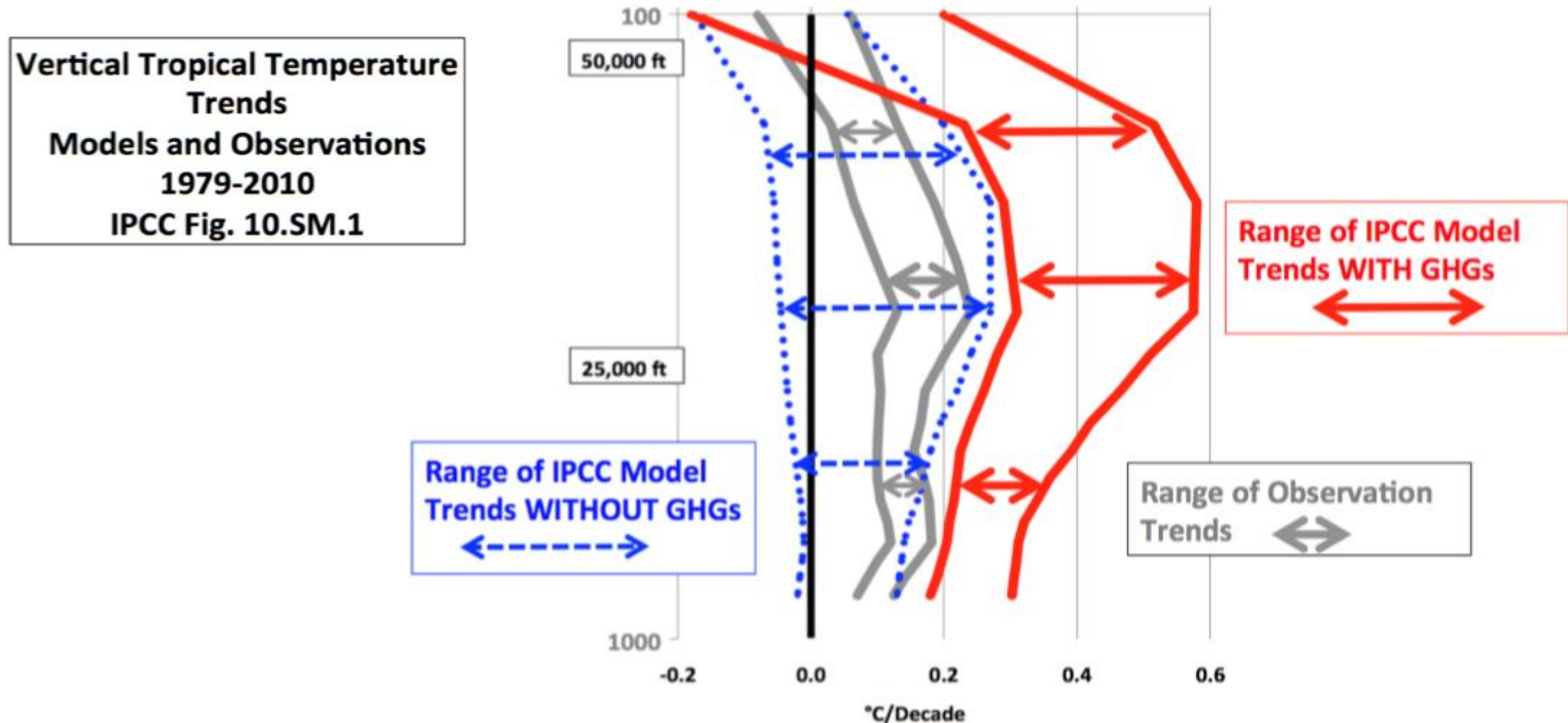


Figure 5. Simplification of IPCC AR5 shown above in Fig. 4. The colored lines represent the range of results for the models and observations. The key point displayed is the lack of overlap between the GHG model results (red) and the observations (gray). The non-GHG model runs (blue) overlap the observations almost completely.

<http://www.cfact.org/2016/01/26/measuring-global-temperatures-satellites-or-thermometers/>

How Much Warming?

Since 1979, it is generally accepted that the satellites and radiosondes measure 50% less of a warming trend than the surface thermometer data do, rather than 30-50% greater warming trend that theory predicts for warming aloft versus at the surface.

“NASA Trend” shows
“adjusted” Surface
thermometer data in red from
NASA GISS.

“Satellite Trends” show
RSS satellite-derived
temperatures in green, UAH
satellite-derived Temperatures
in aqua.

Why are surface and satellite
Temperatures showing fundamentally
Different rates of temperature change?

Why does NASA GISS analyze
Surface
Thermometers, leaving RSS and UAH
to analyze data from NASA's own
Satellites?

Alarmists say that greenhouse gases
Cause warming, why don't the
Satellite Temperatures of the
Greenhouse itself show this warming?

<https://realclimatescience.com/2018/01/my-climate-forecast-from-three-years-ago/>

