

Joseph D'Aleo

- BS, MS University of Wisconsin, ABD NYU
- Fellow, CCM, Councilor of American Meteorological Society
- Formerly chaired AMS Committee on Weather Analysis and Forecasting
- College professor Lyndon State College
- Co-founder and first Director of Meteorology of The Weather Channel
- Chief Meteorologist WSI Corporation and WSI's Intellicast (Dr. Dewpoint)
- Partner, Hudson Seven LTD
- Executive Director, Icecap

Climate Change

Total Consensus
Simple Story

Climate Change Factors Anthropogenic (man-made)

Urbanization
Land Use Changes
Greenhouse gases
Aerosols

Natural

Solar
Ocean Cycles
Volcanism

Global Warming

Reconstructing the Past

Methods

Proxy
Observations
Balloon
Satellite

Environmental Impacts

Icecaps and Glaciers
Hurricanes
Snowfall
Droughts and Floods
Sea Level
Vegetation

Forecasting the Future

Climate Model Forecasts

Complexity of the problem
Assumptions/Feedbacks

Empirical Models

Solar cycles
Ocean cycles

Climate Change

**Many
Scientists
Believe
Much More
Complex**

Climate Change Factors

Anthropogenic (man-made)

Urbanization
Land Use Changes
Greenhouse gases
Aerosols

Natural

Solar Cycles
Ocean Cycles
Volcanism

Ever-Changing Climate

Reconstructing the Past

Methods

Proxy
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Environmental Impacts

Icecaps and Glaciers
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Forecasting the Future

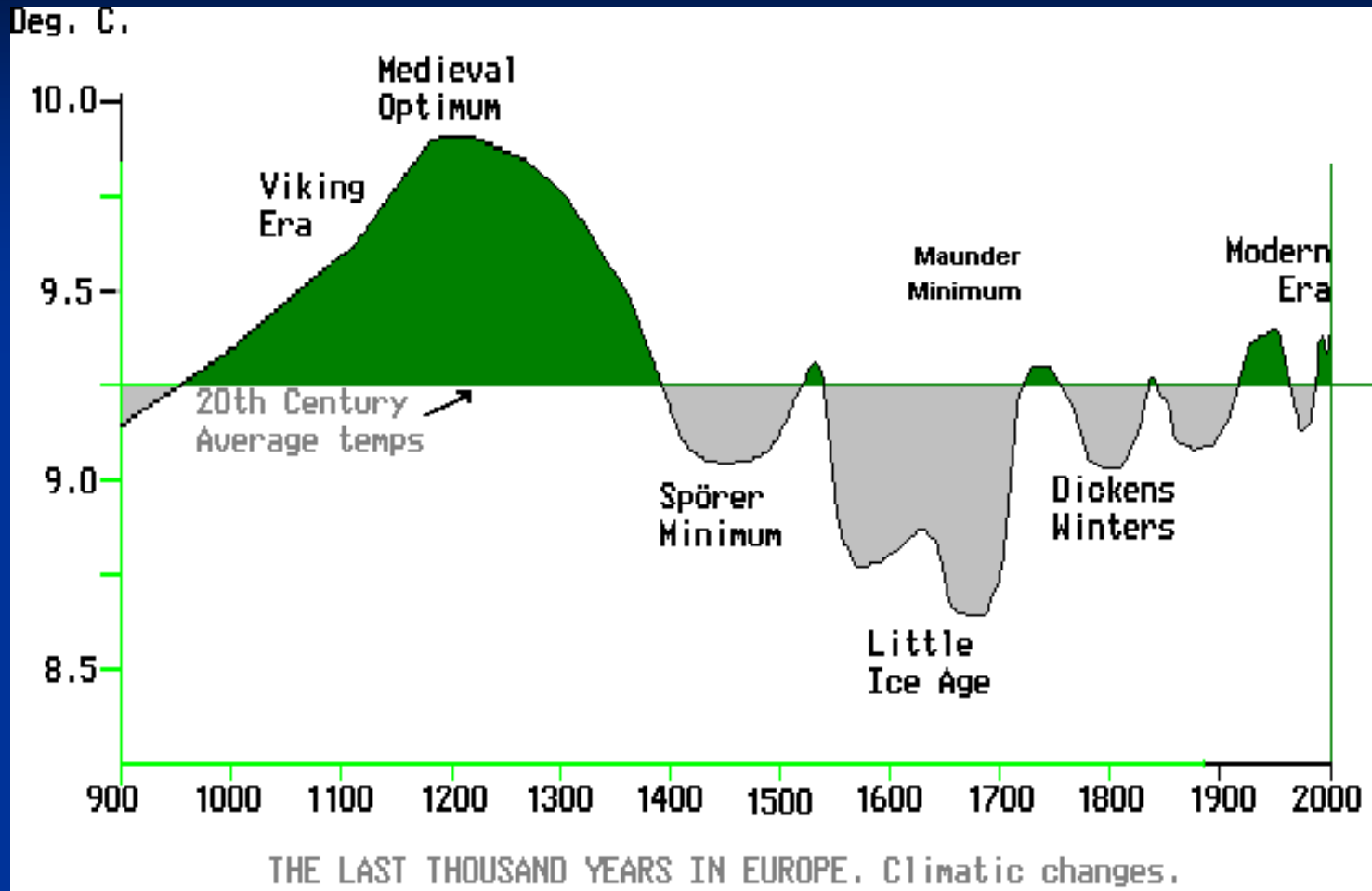
Climate Model Forecasts

Complexity of the problem
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Solar cycles
Ocean cycles

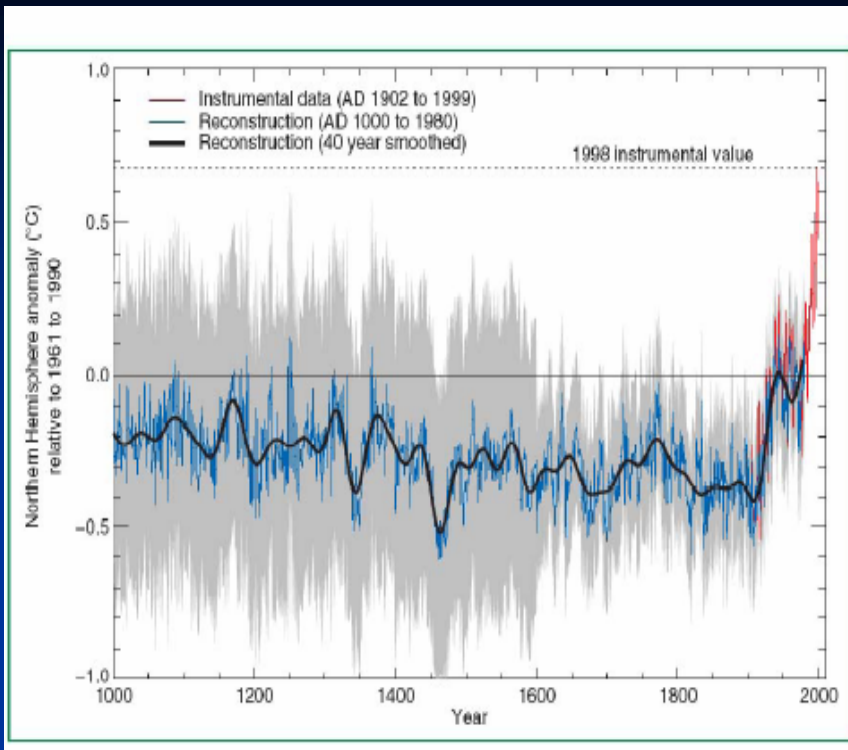
Only Constant in Nature is Change



Until 1998, the accepted historical record. Made recent warming look insignificant.

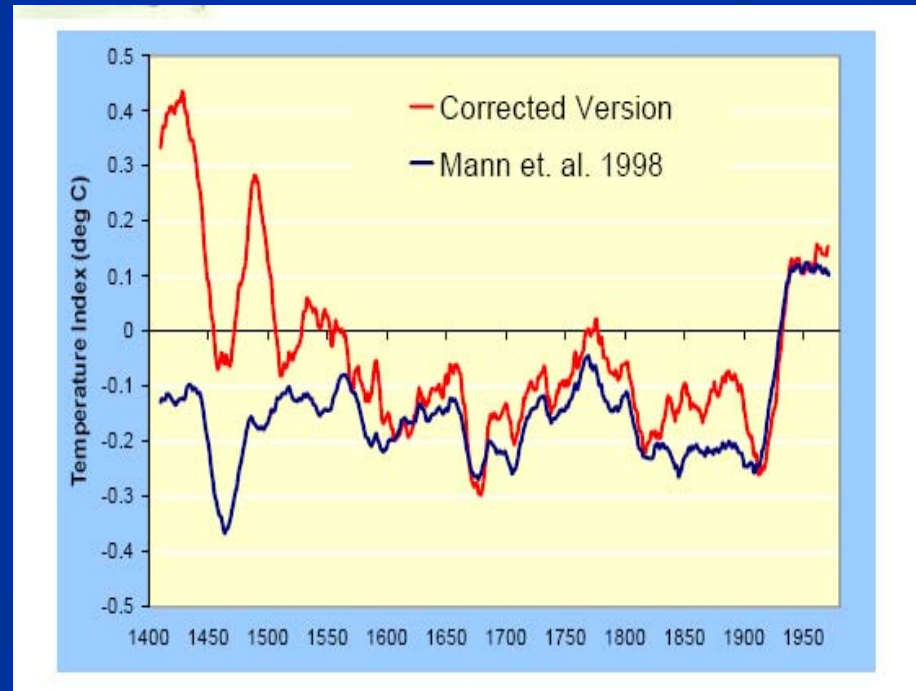
Medieval Warming Dilemma

- Dr. David Deming (University of Oklahoma)
 - “ Around 1996, I became aware of how corrupt and ideologically driven current climate research can be. A major researcher working in the area of climate change confided in me that the factual record needed to be altered so that people would become alarmed over global warming. He said, "We have to get rid of the Medieval Warm Period."

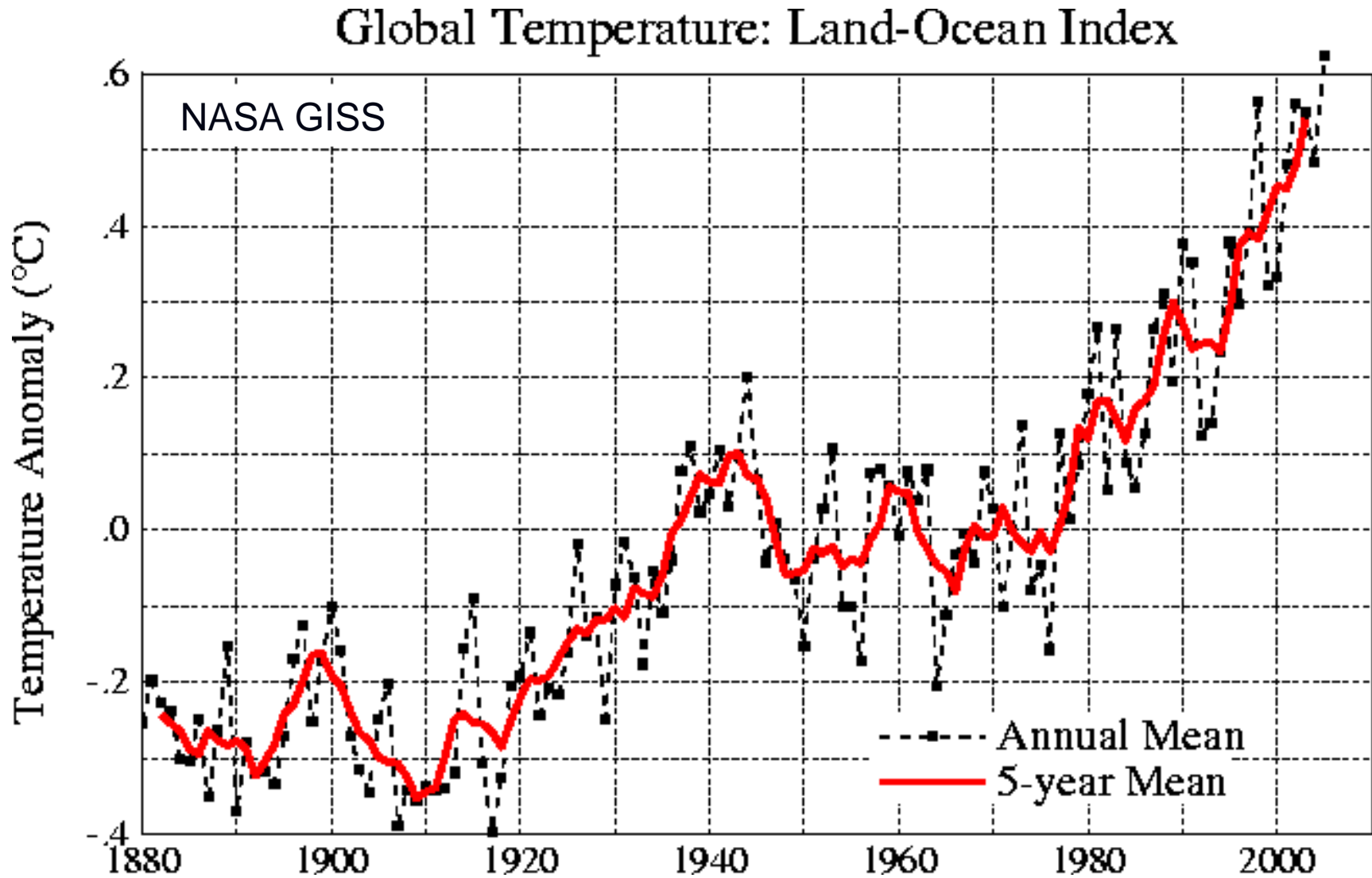


Solution: Mann et al. '98 paper did away with prior warm period.. The so-called Hockey Stick was published everywhere as proof of Global warming.

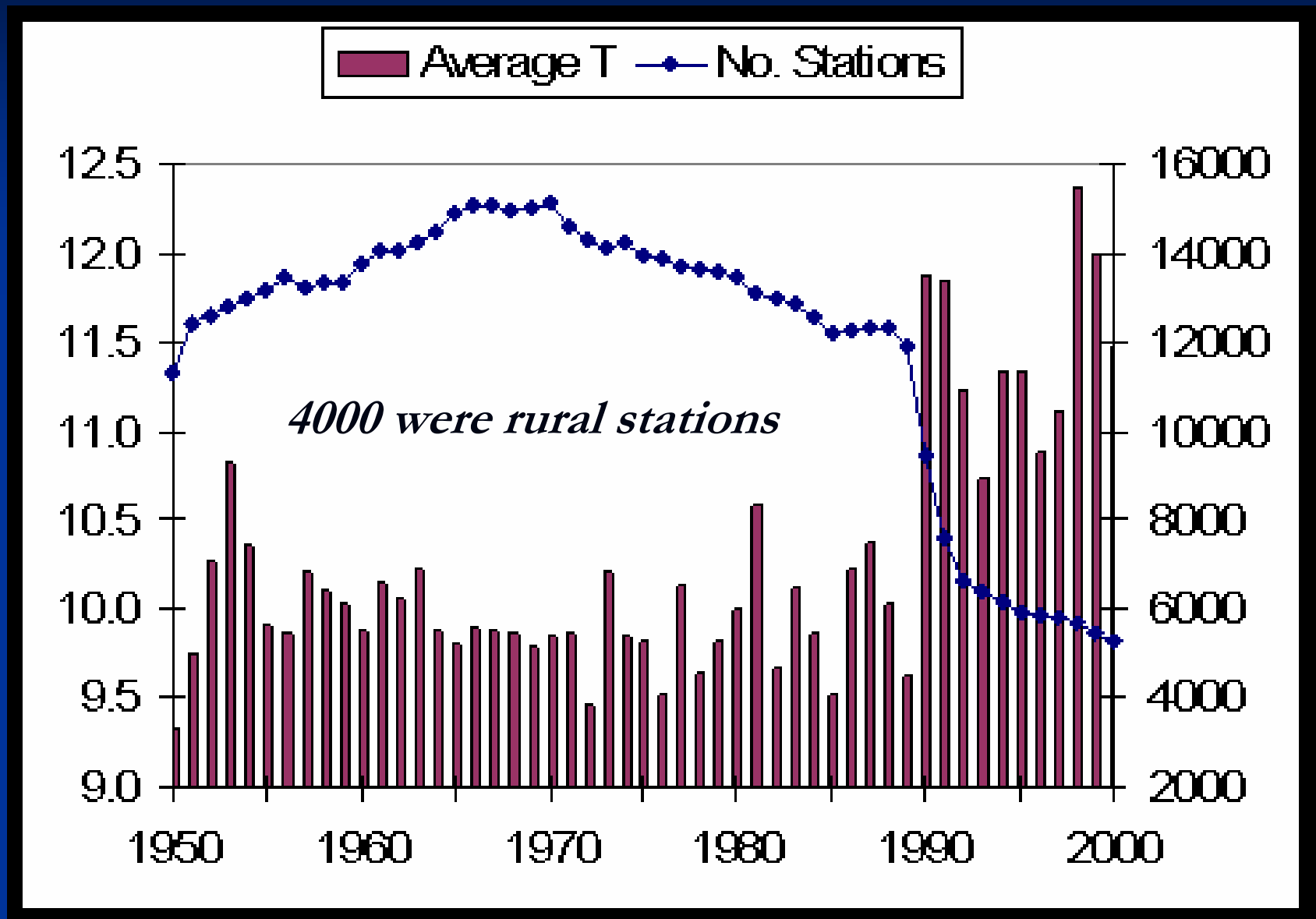
*Many flaws in the MBH work (data and algorithm) were found by McKittrick and McIntyre and then many others which corrected, restored earlier warmth
See www.climateaudit.org*



Still the government graphs are alarming...but are they right?

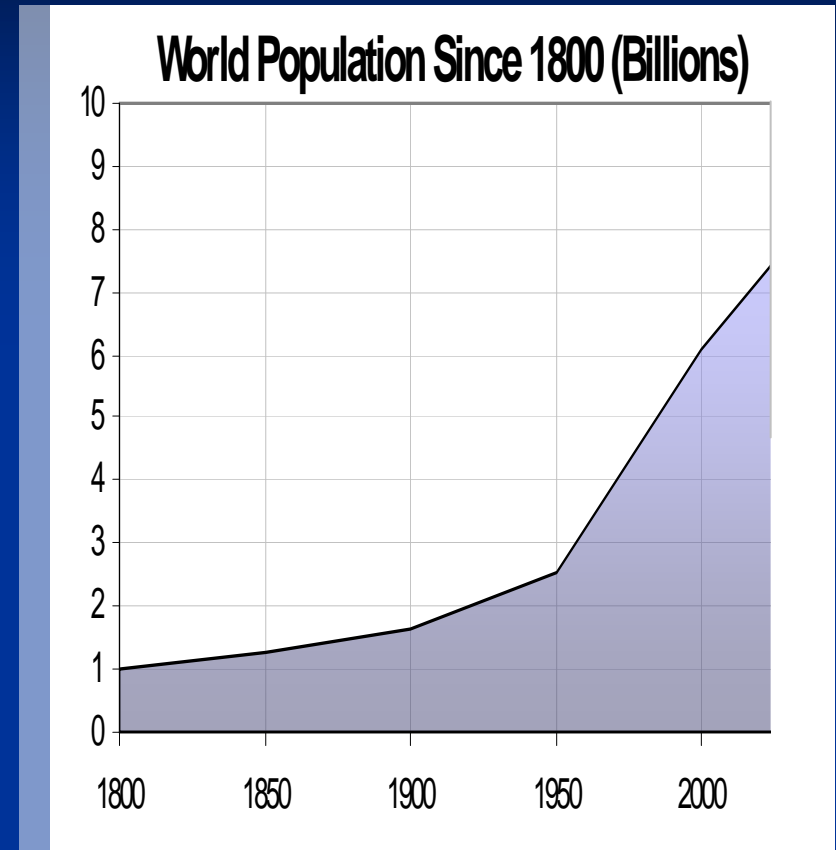


Station Dropout and Global Temps



Urban Heat Island Effect

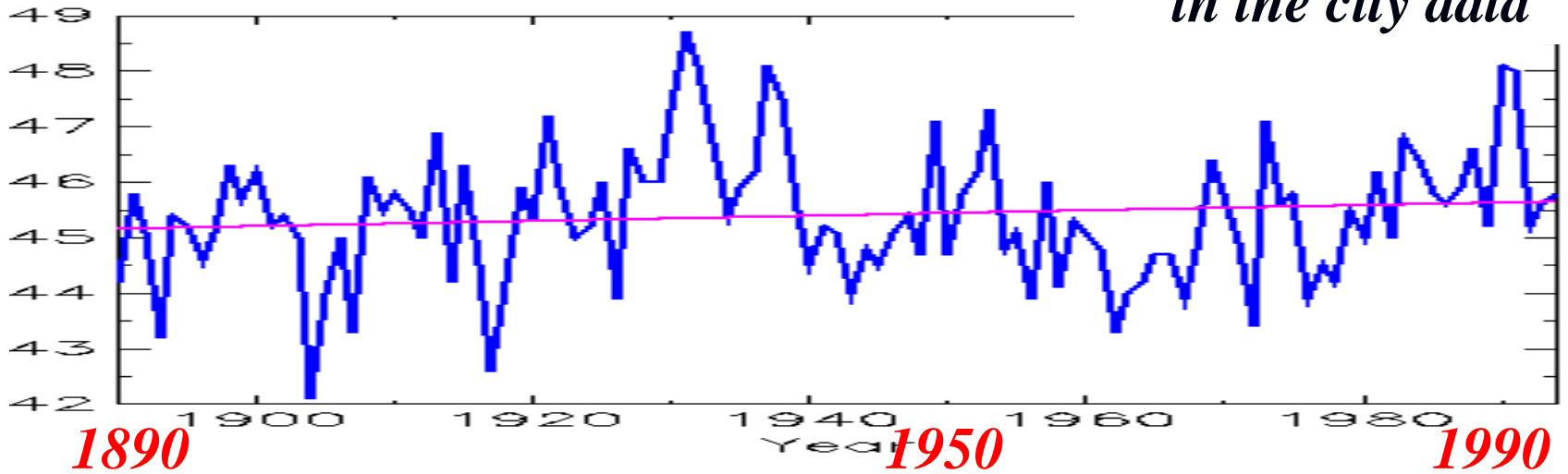
- In cities, vertical walls, steel and concrete absorb the sun's heat and are slow to cool at night
- Nights can be 10 or more degrees warmer in cities than in rural areas some nights
- More and more of the world is urbanized
- Cities grow around airports
- Some of this gets baked into global temperatures
- The combination of station dropout and urbanization can account for up to one half the warming since 1880 (Balling, Michaels and McKittrick, Kalney and Cai)



Google "What the stations say" and pick the site by John Daly, showing how rural stations across the world do not show warming

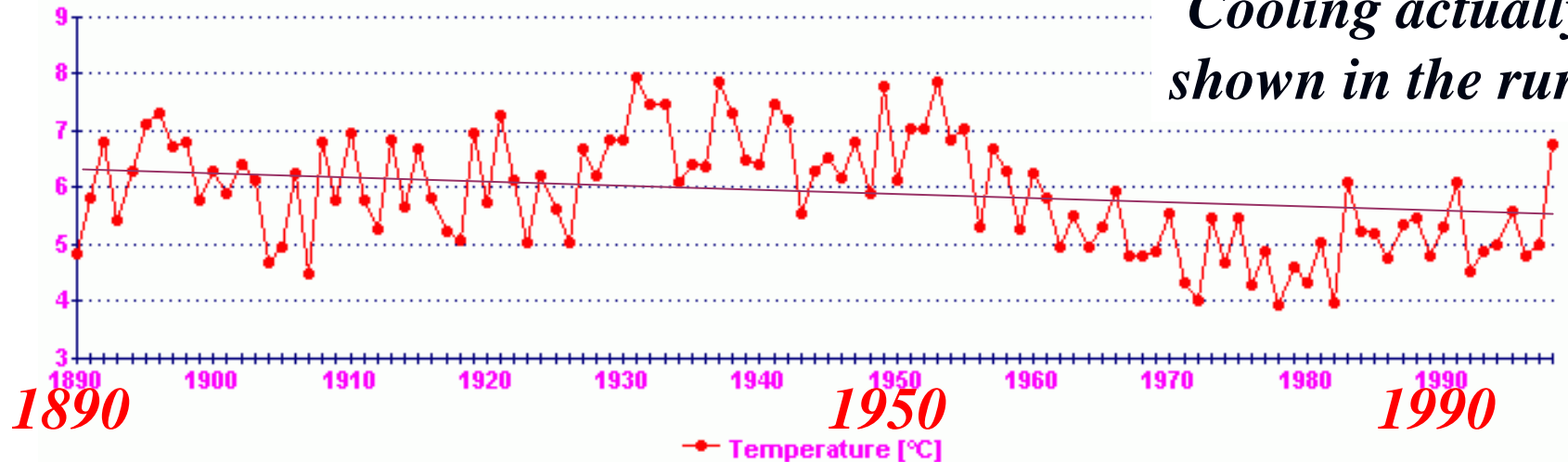
Portland, Maine, USA
Annual Mean temperature 1890-1994

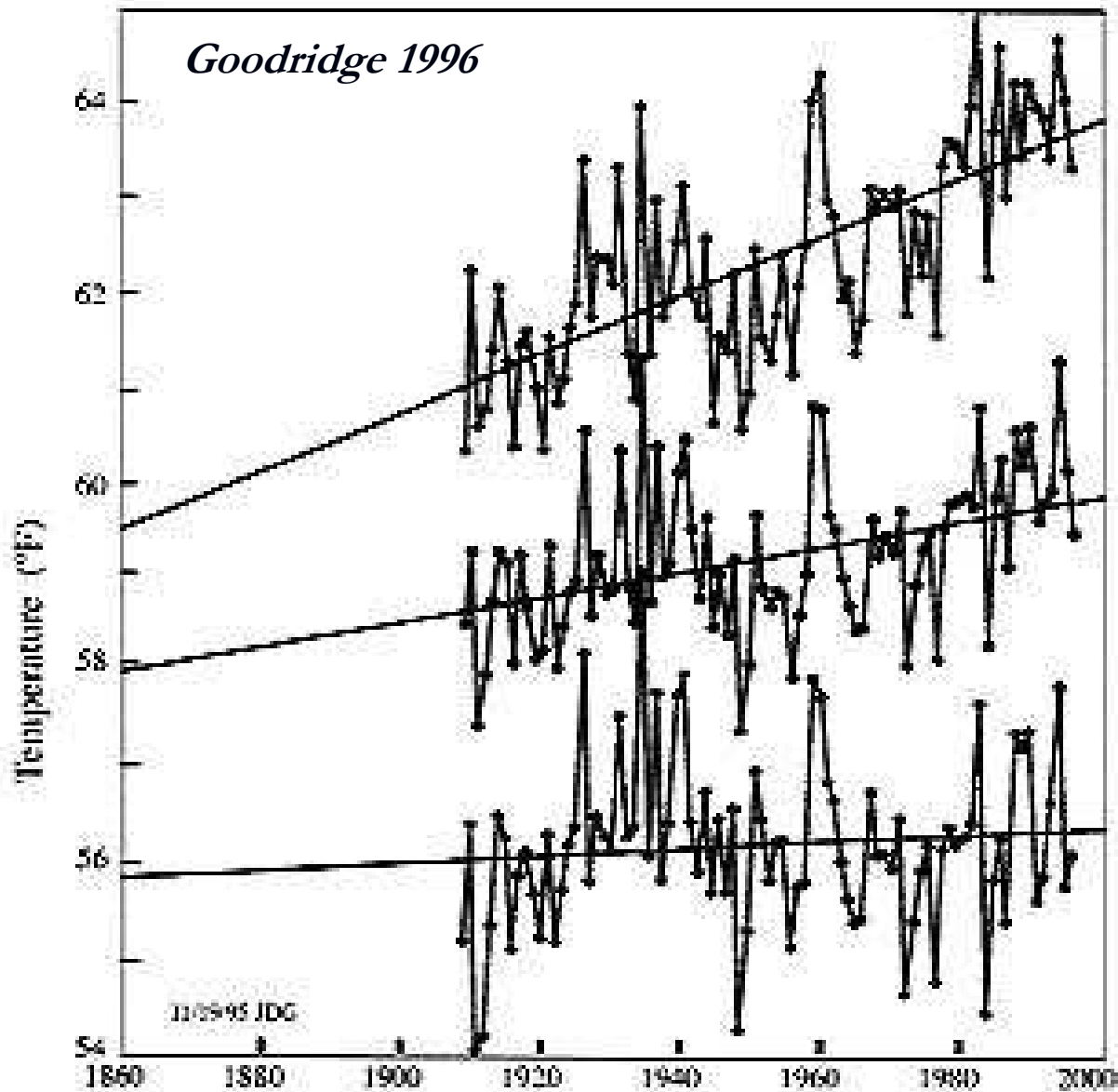
*0.5F warming shown
in the city data*



Farmington, Maine, USA
Annual Mean Temperature 1890-1998

*Cooling actually
shown in the rural*





*Counties in CA
with >1 million
Population
(+4F since 1910)*

*Counties in CA
with between
100,000 and
1 million
population
(+1F since 1910)*

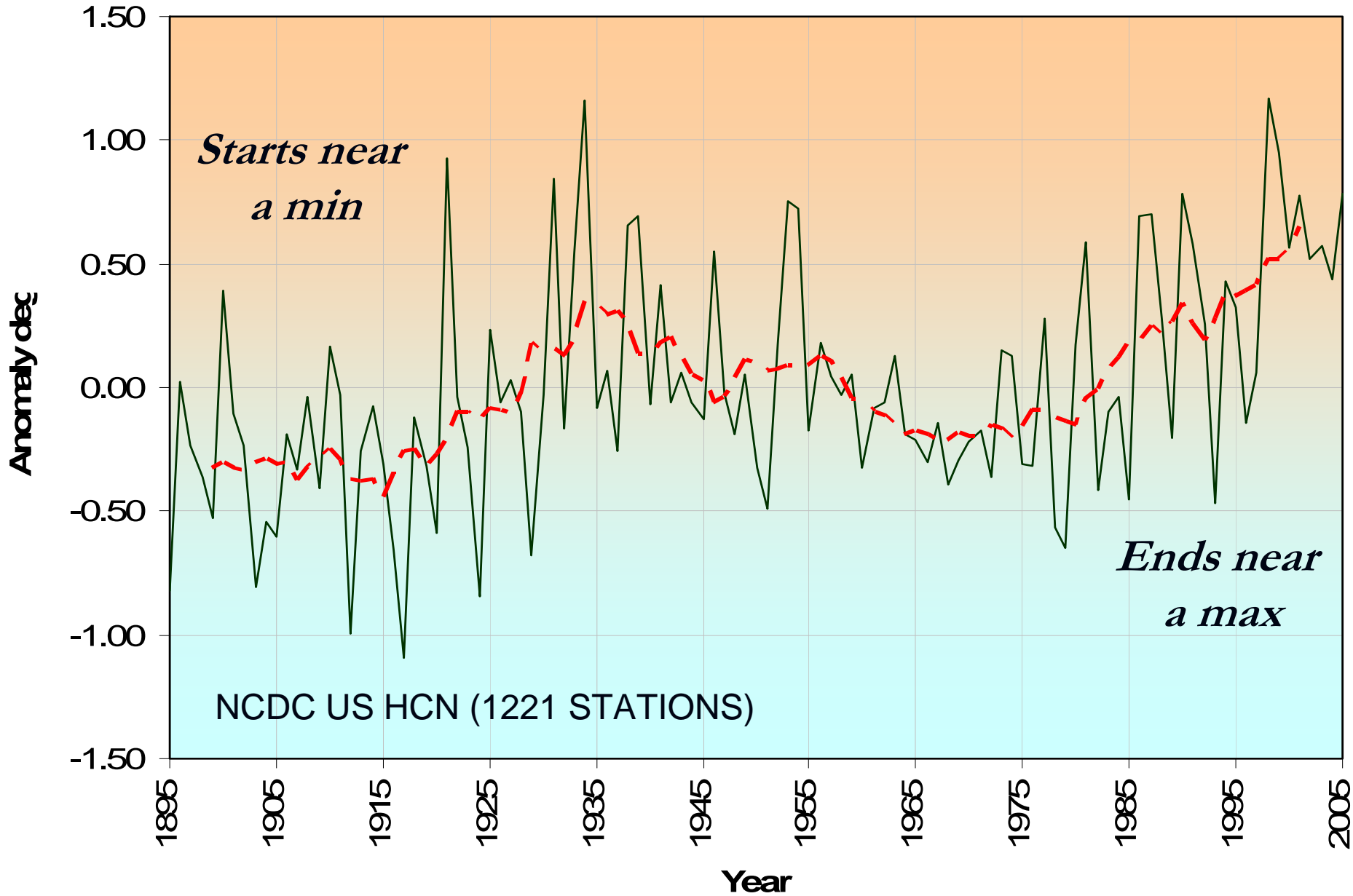
*Counties in CA
with less than
100,000
Population
(0F since 1910)*

NCDC Data Adjustment

- National Climate Data Center maintains a database of 1221 high quality stations across the contiguous 48 United States. They have made adjustments to account for changes over time in the time of observations, type of instrumentation, changes in station siting, and importantly urban warming

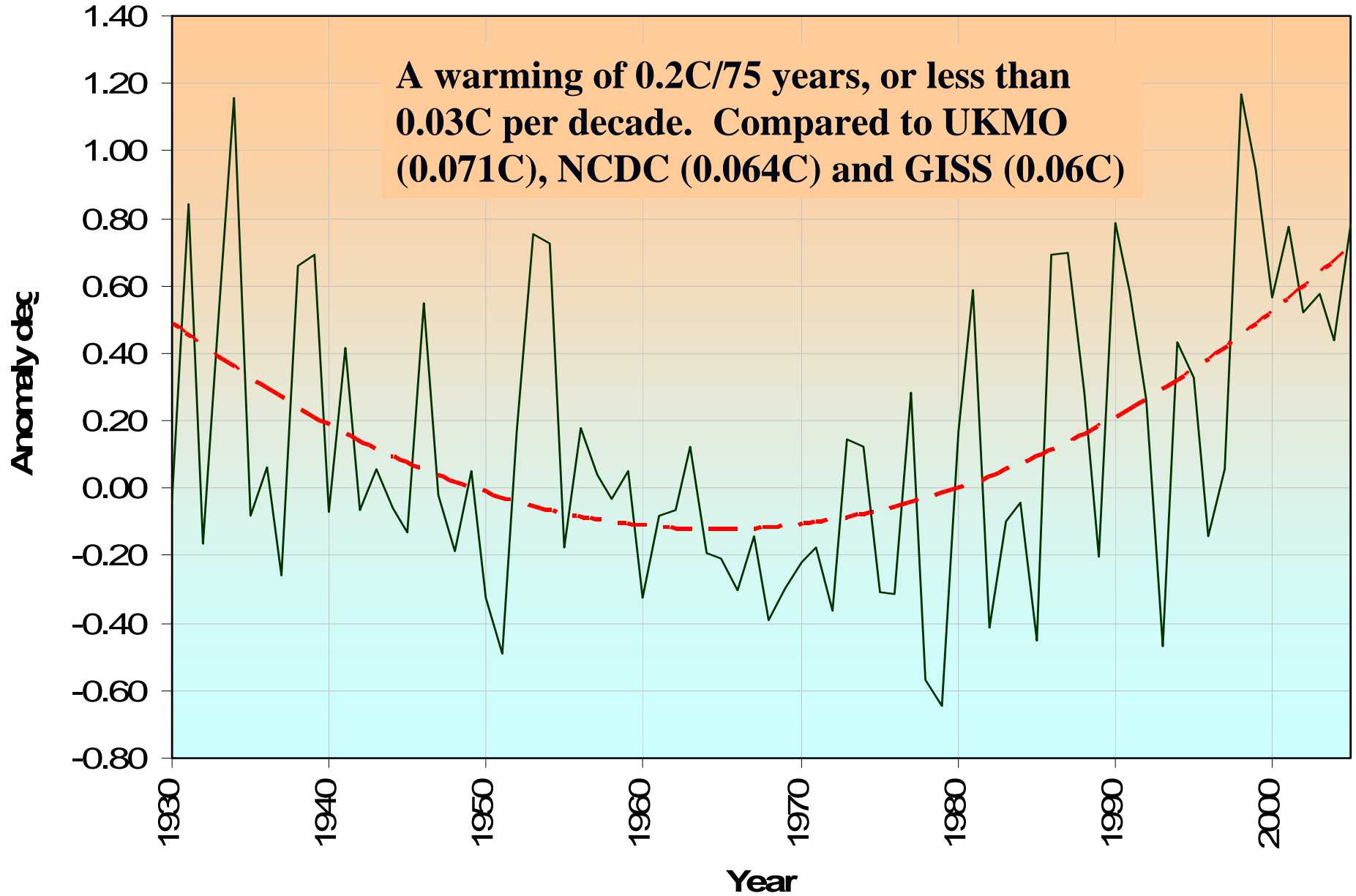
USA Annual Mean Temperatures

— USA - - 10 year Running Mean

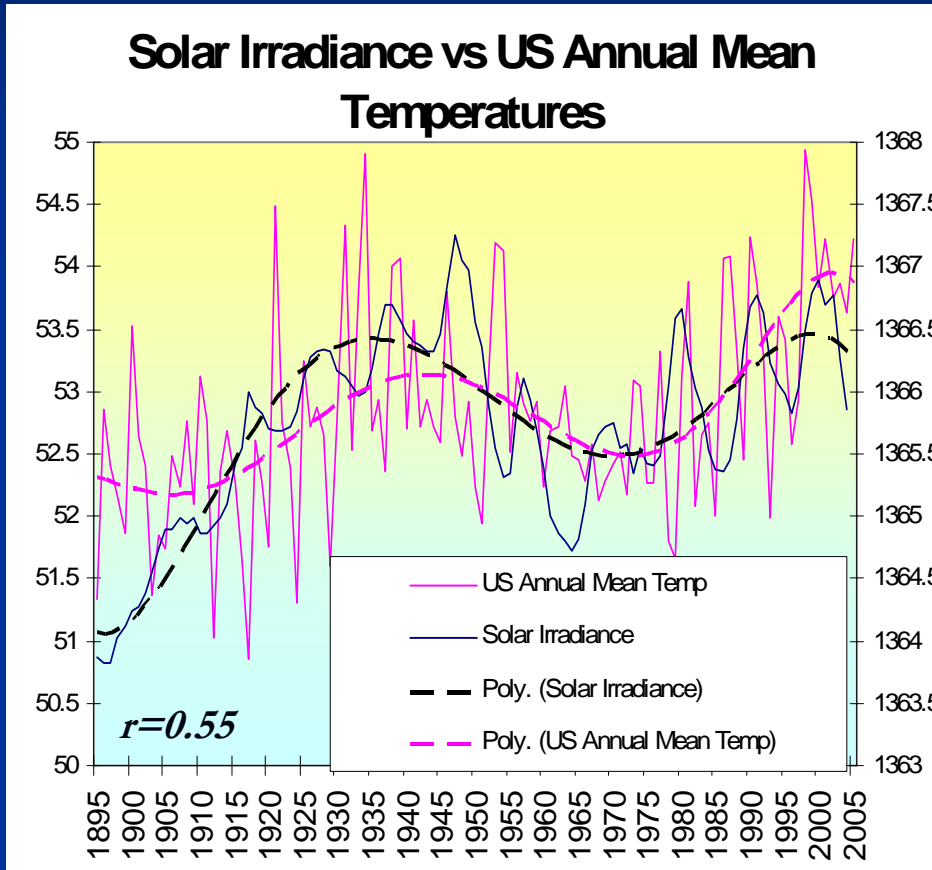


Annual Mean Temperatures

— USA — Poly. (USA)



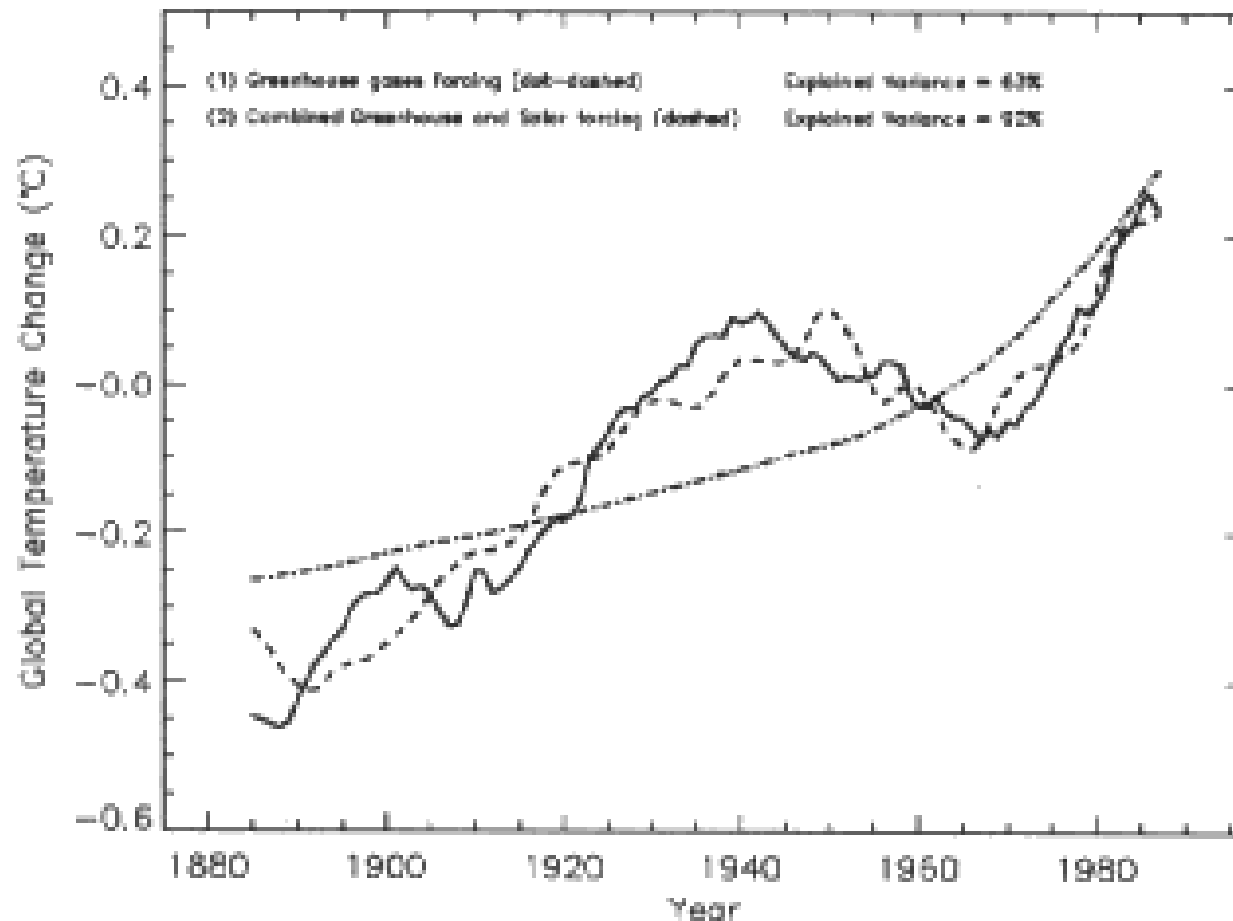
Cyclical Factors - Solar



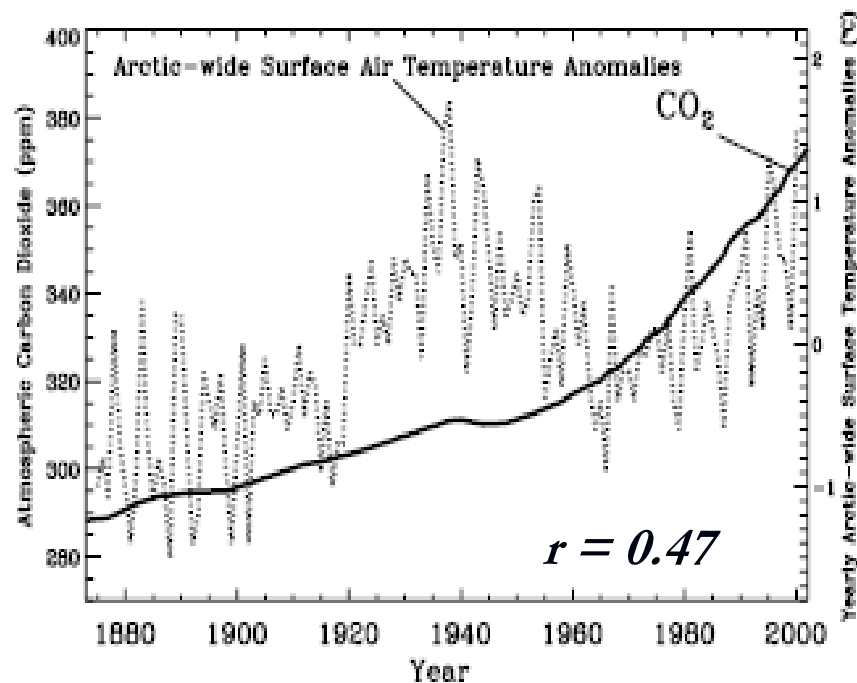
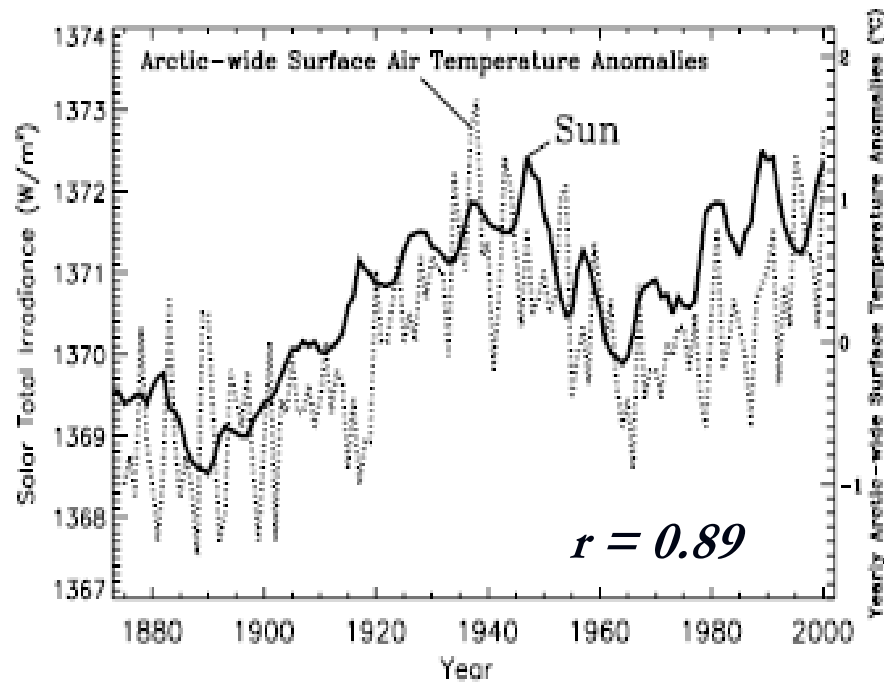
- Direct effects of changes in solar brightness or irradiance (Baliunas/Soon, Hoyt/Schatten, Wilson, Scafetta/West)
- UV warming through ozone chemistry high up in low and mid latitudes (Shindell, Labitzke)
- Geomagnetic storms that warm high latitudes (Labitzke, Pycha, Landscheidt, others)
- Active sun reduces low cloudiness (Svensmark, Bago and Butler)

Explains up to 50% of the changes !

Figure 4 Observed (solid line) and simulated (dot-dashed line, greenhouse gases alone; dashed line, solar irradiance change plus greenhouse gases) temperature anomalies. From Soon et al.1996: 891; the solar-forcing profile is from Hoyt and Schatten 1993: 18,895. The solution for solar forcing corresponds to a total solar irradiance change of at most 0.5%.



Fit is much better of solar with global temperatures than with greenhouse gases

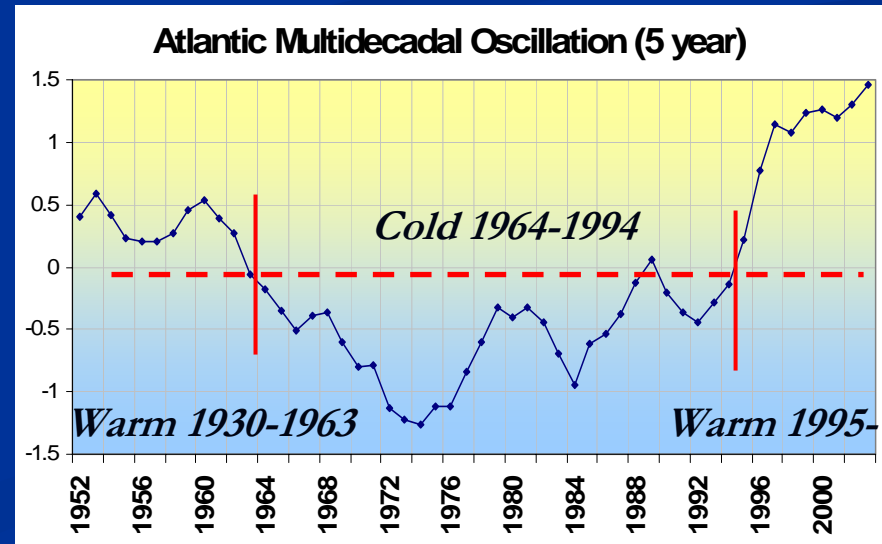
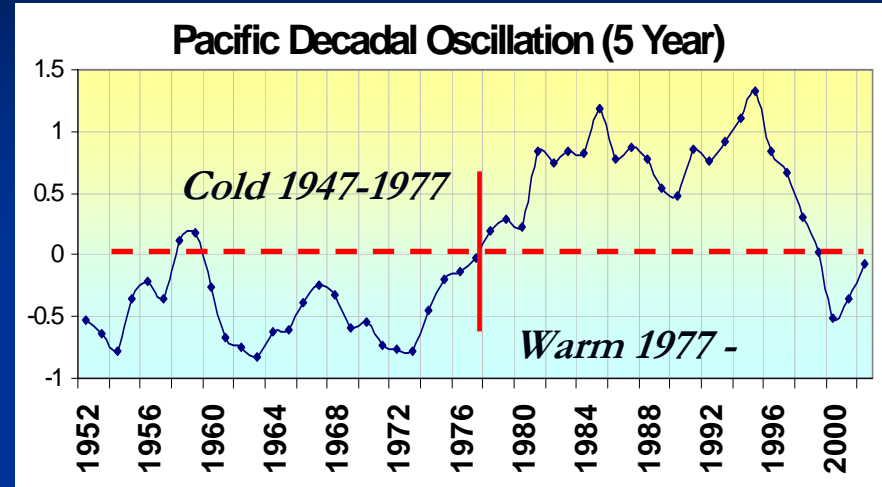


Fit is much better of solar with arctic temperatures (Polyokov) than with greenhouse gases

(Soon GRL 2005)

Cyclical Factors - Oceans

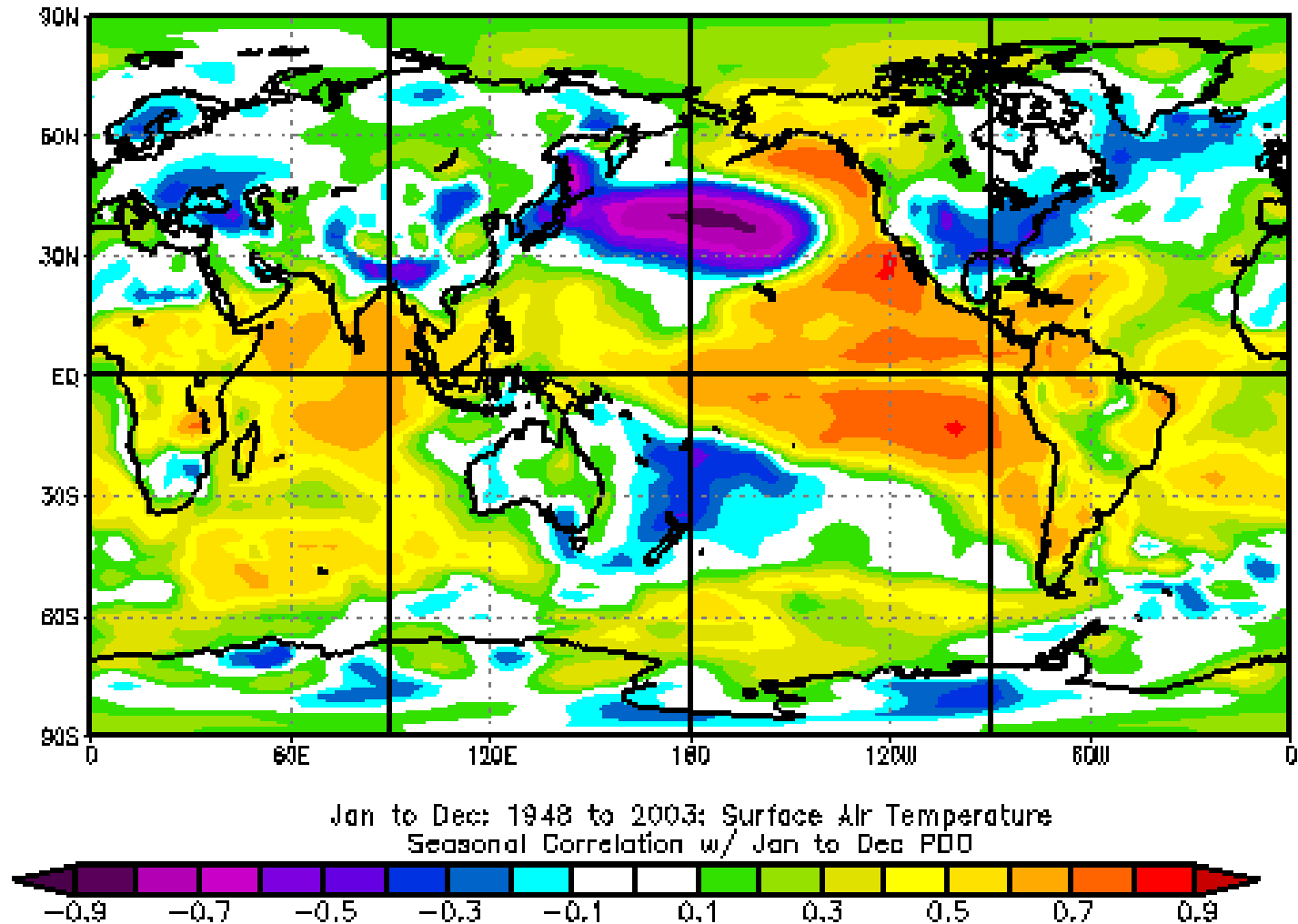
- Multi-decadal cycles in the ocean temperature patterns in both Pacific and Atlantic
 - Pacific Decadal Oscillation
 - Atlantic Multidecadal Oscillation
- They have a major influence on temperatures over adjacent land areas and the frequency and strength of storms



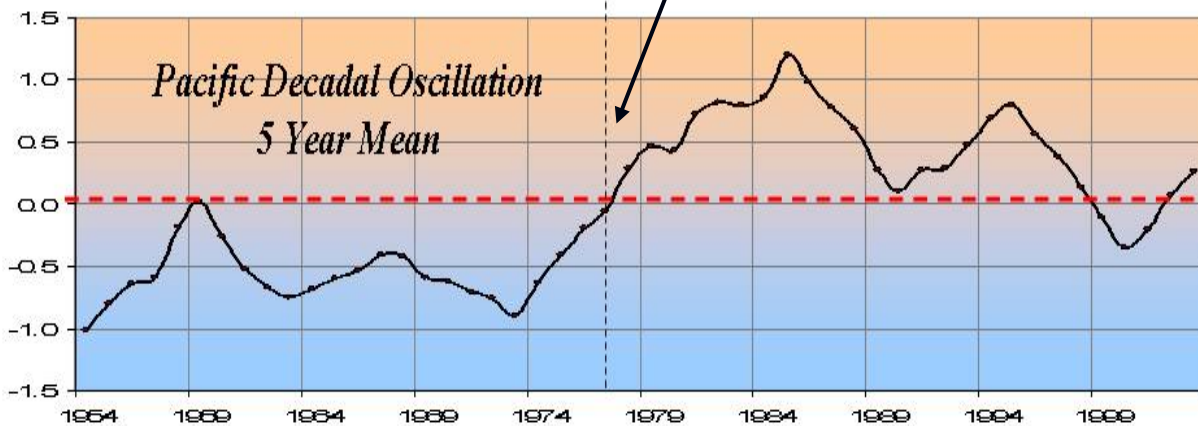
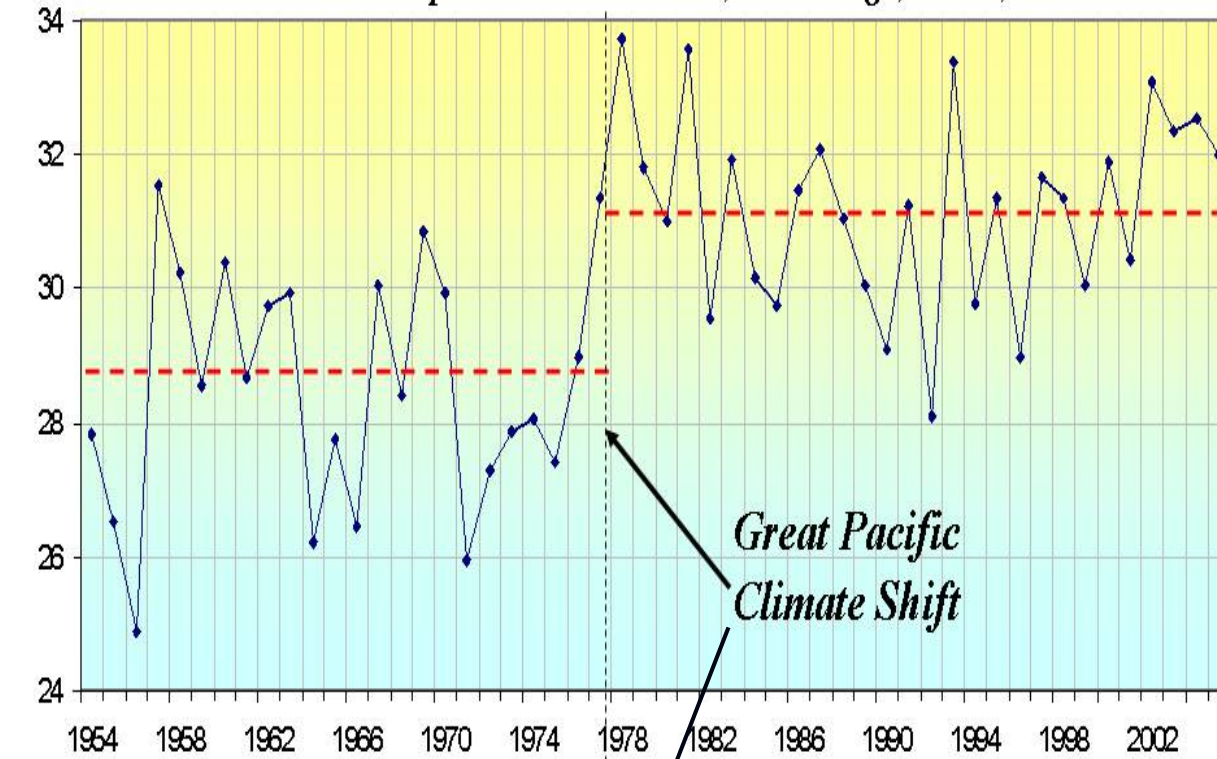
Pacific Decadal Oscillation

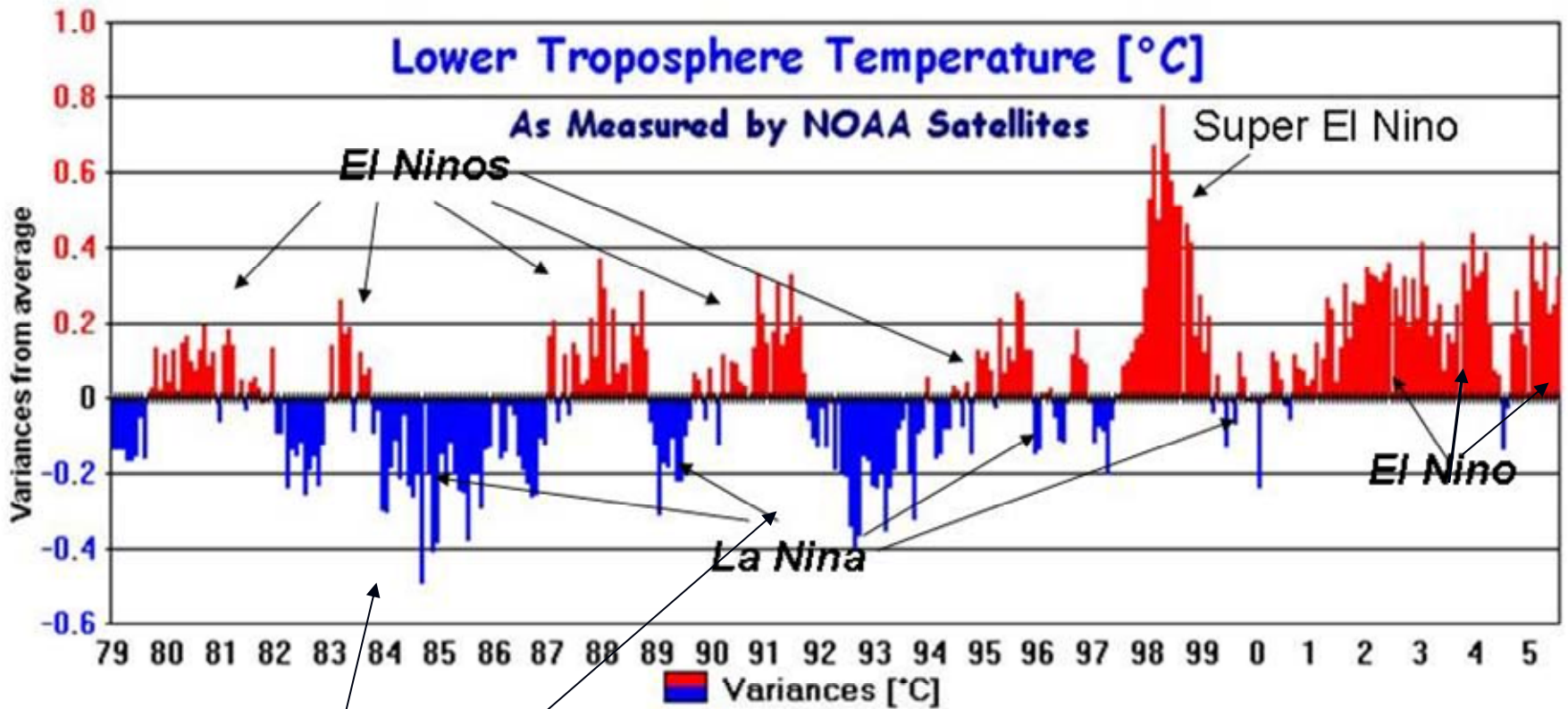
Positive PDO (since 1977) favors warm Alaska and more El Ninos

NCEP/NCAR Reanalyses

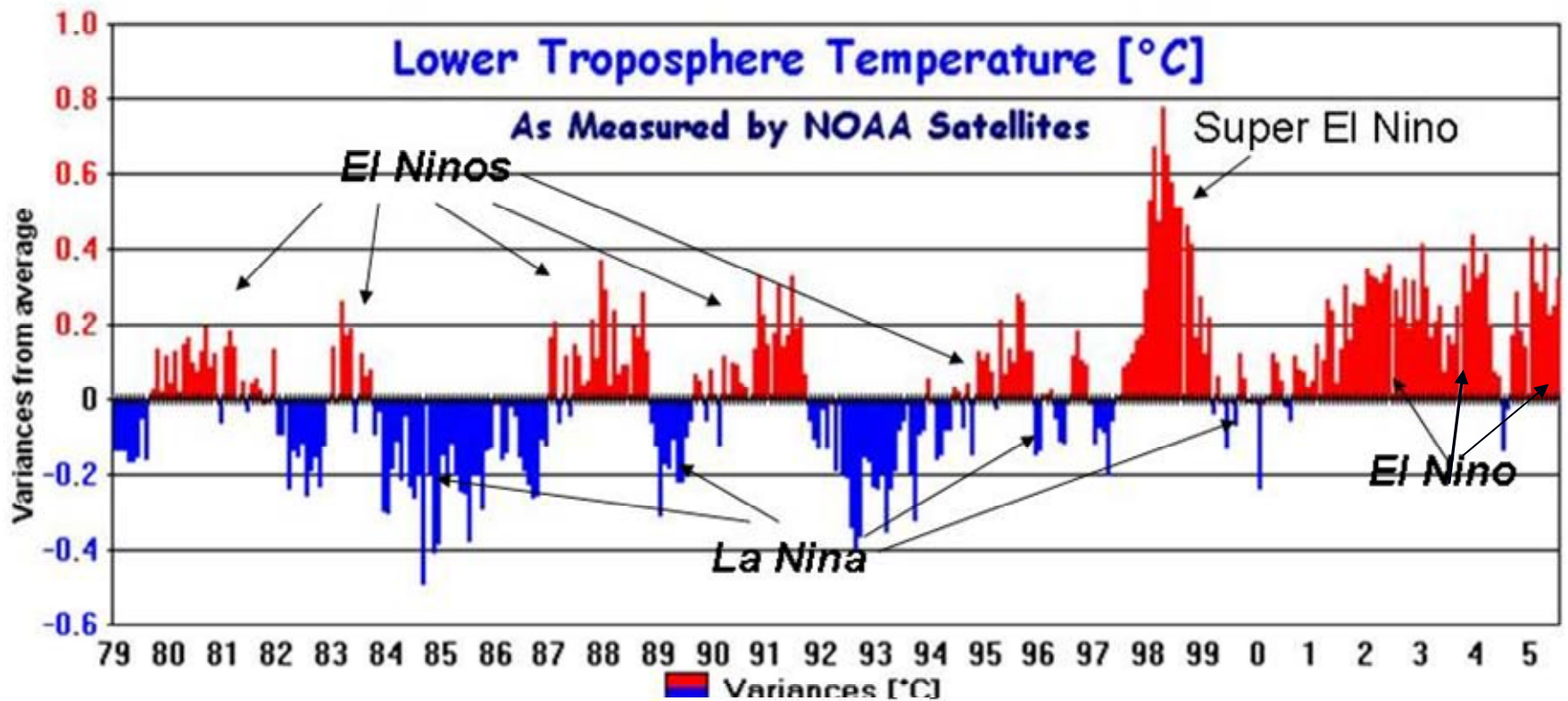


Mean Annual Temperatures Fairbanks, Anchorage, Nome, Alaska

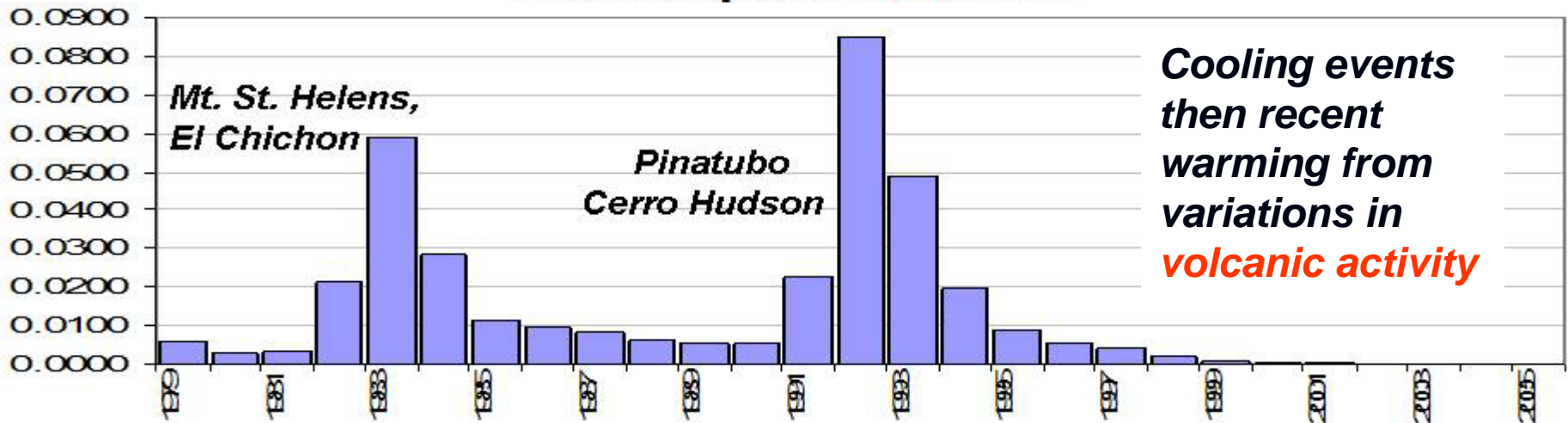




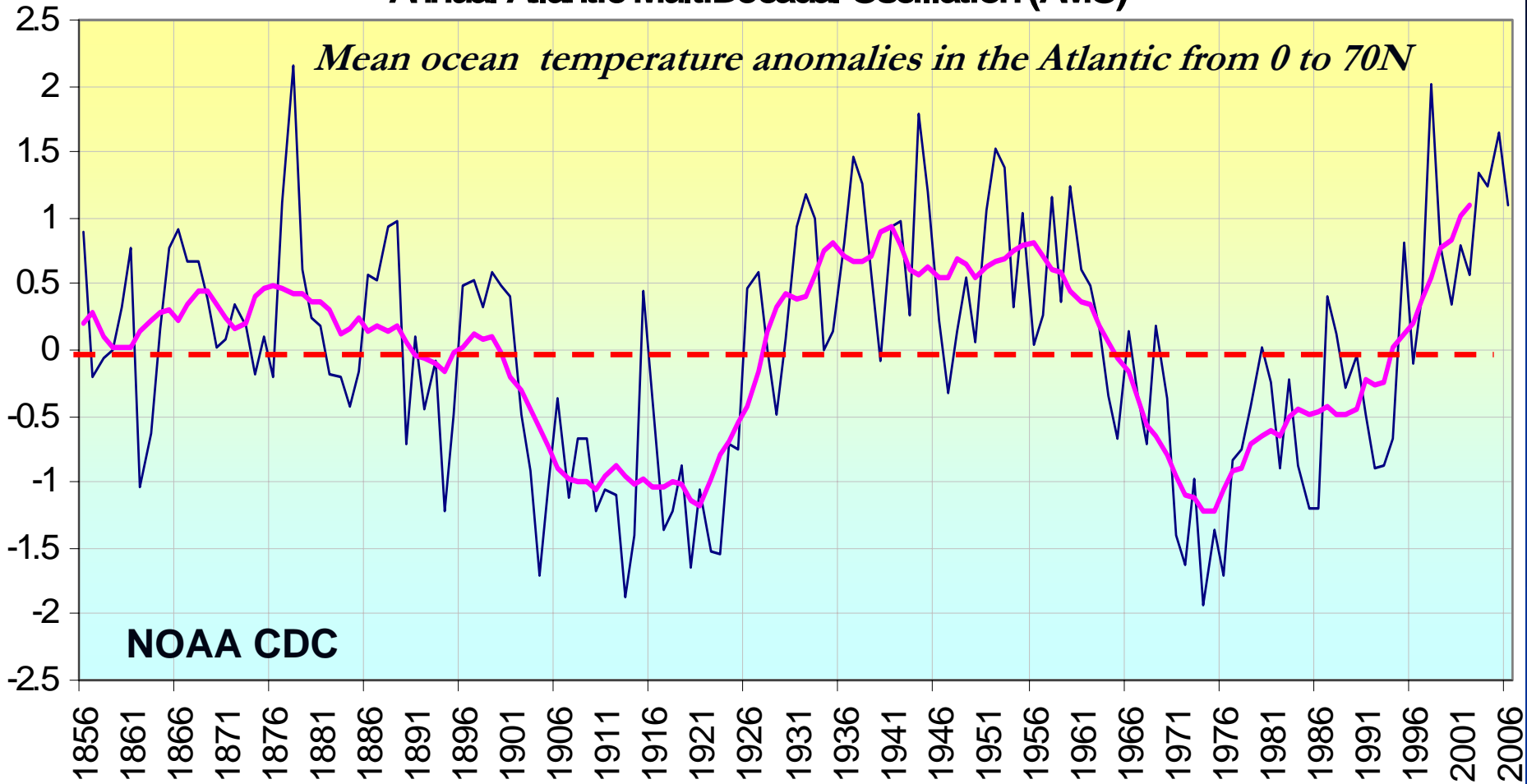
Twice as Many El Ninos as La Ninas in warm PDO mode



Aerosol Optical Thickness



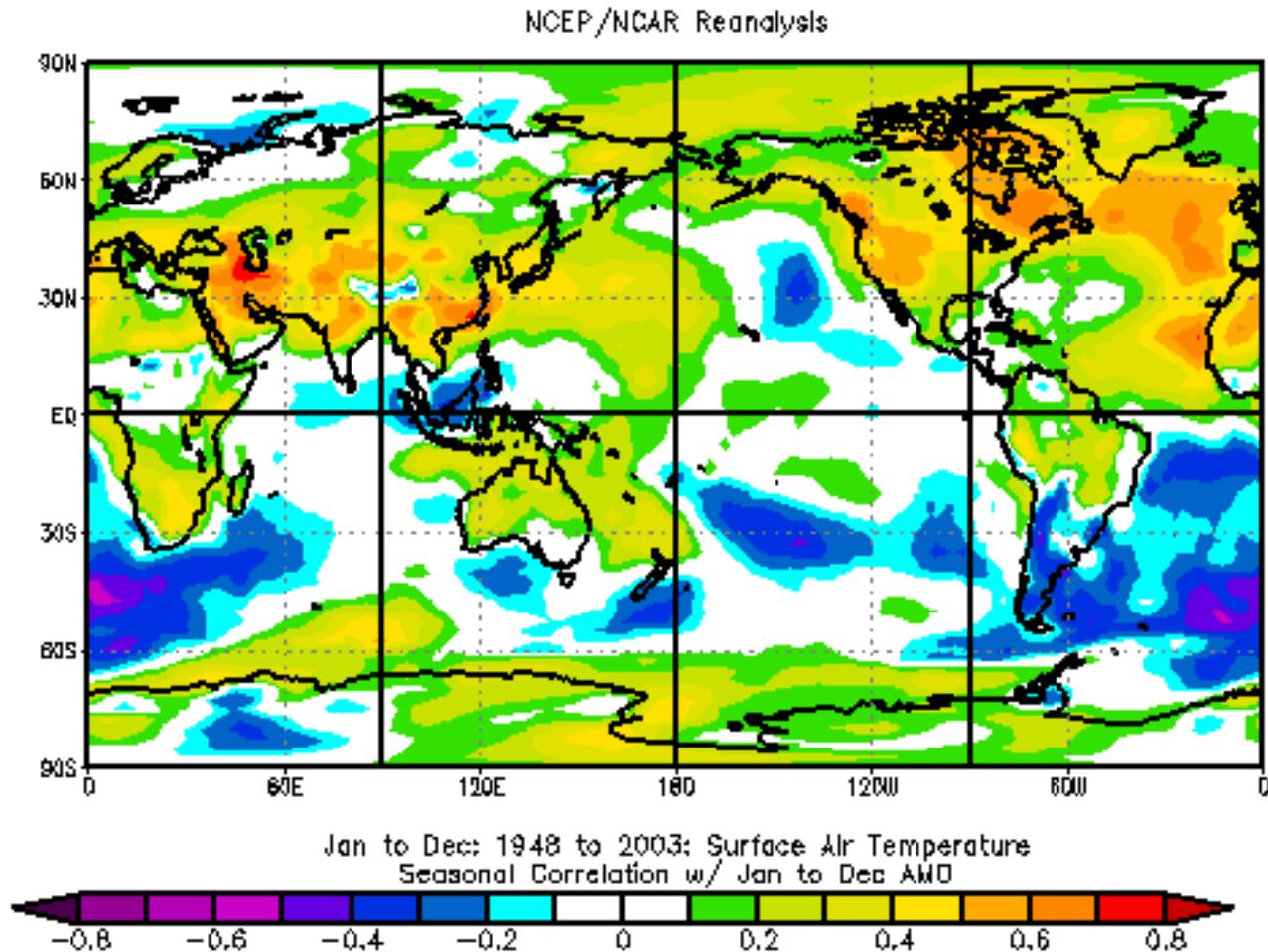
Annual Atlantic MultiDecadal Oscillation (AMO)



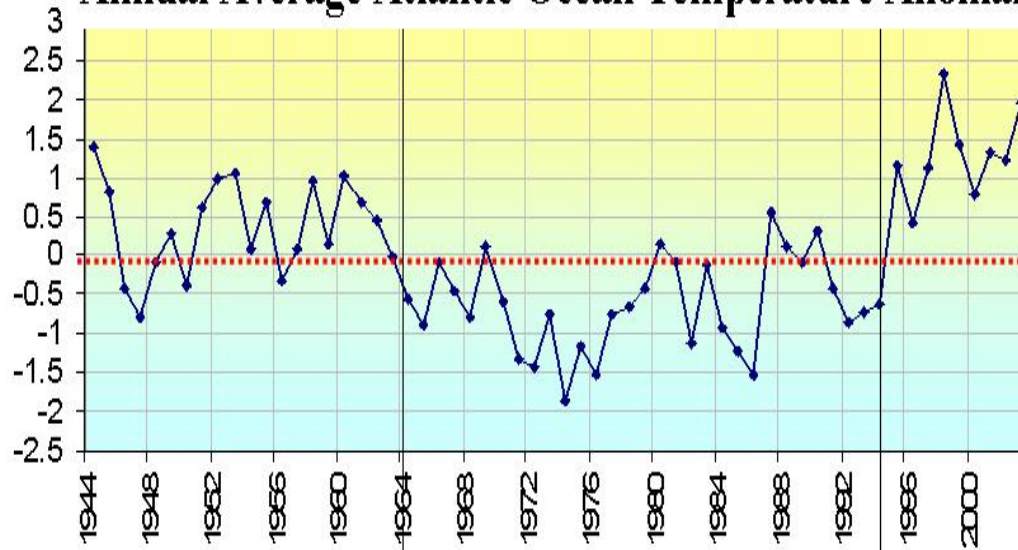
AMO is real as confirmed in the data and paper by Knight et al., 2006, despite attempts by Mann and Emmanuel in Eos 2006 to prove it a statistical artifact

Atlantic Multidecadal Oscillation

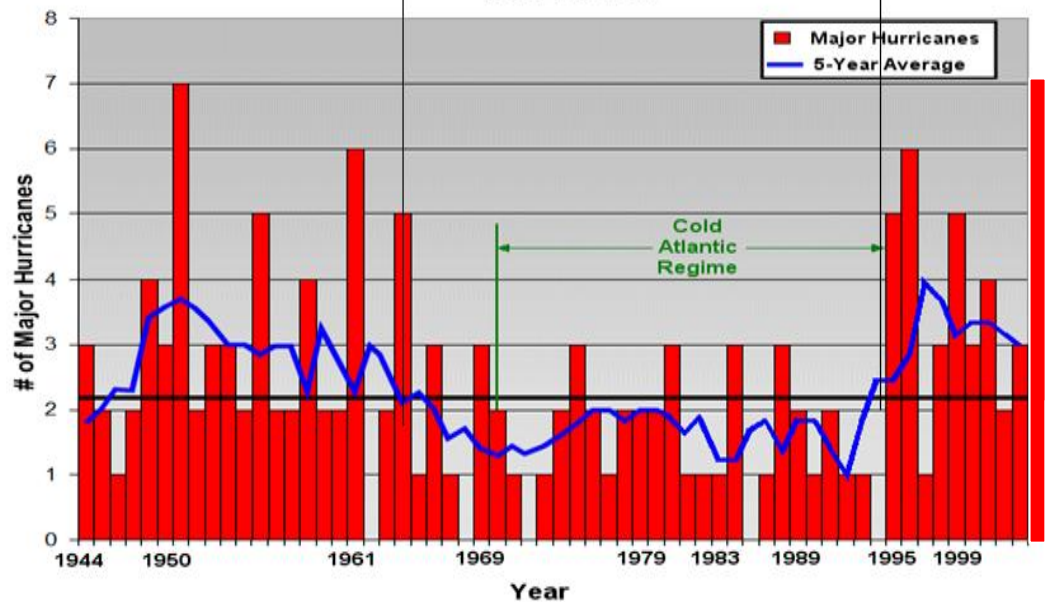
Correlates with general warmth, statistically significant in places



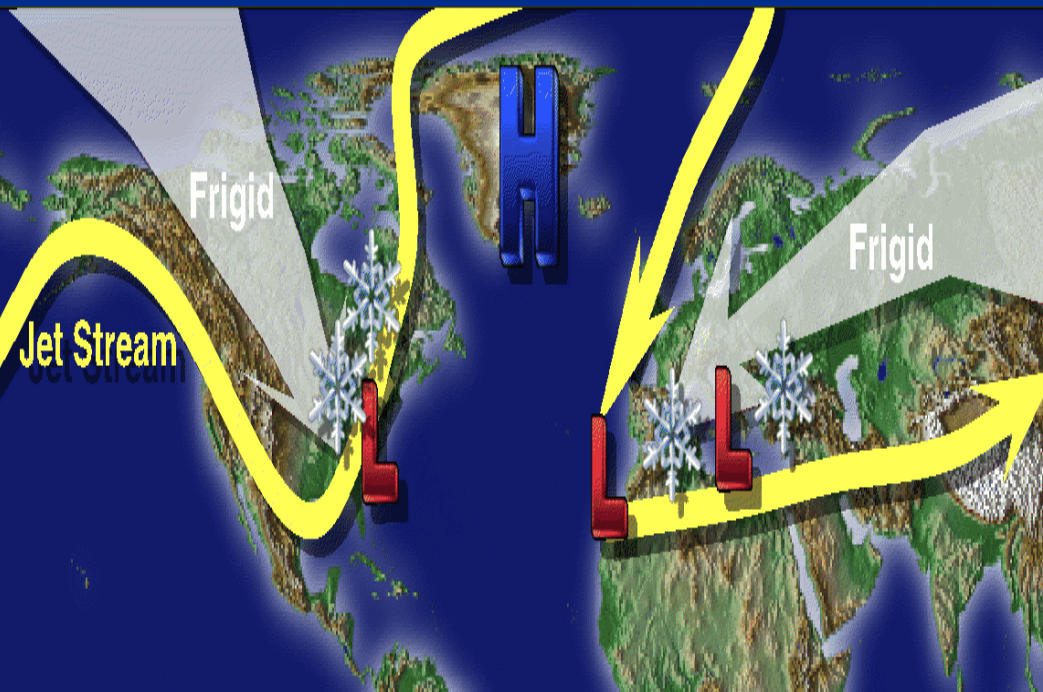
Annual Average Atlantic Ocean Temperature Anomaly



Major Atlantic Hurricanes 1944 to 2003



Atlantic Multidecadal Oscillation



- Warm mode in Atlantic favors more amplified winter patterns and often more snow in eastern US and Eurasia (negative mode of the so-called North Atlantic Oscillation or NAO)

Atlantic Multidecadal Oscillation

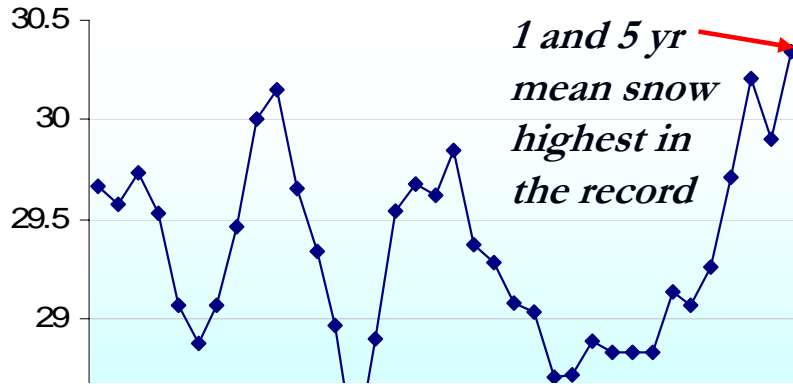
Since 1995, new single storm, season and multi-season records set in the eastern US and Eurasia

Boston 12 year running mean highest on record (Extending back to 1880s)



Lowest in the entire record 1979/80-1990/91 – 32.2"

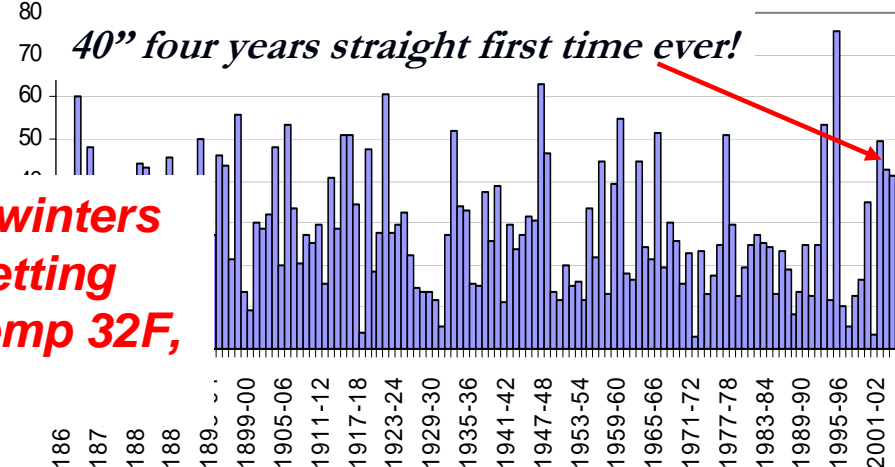
5 Year Average January Snowcover Eurasia



1 and 5 yr mean snow highest in the record

Seasonal Snowfall Central Park 1869-2006

40" four years straight first time ever!

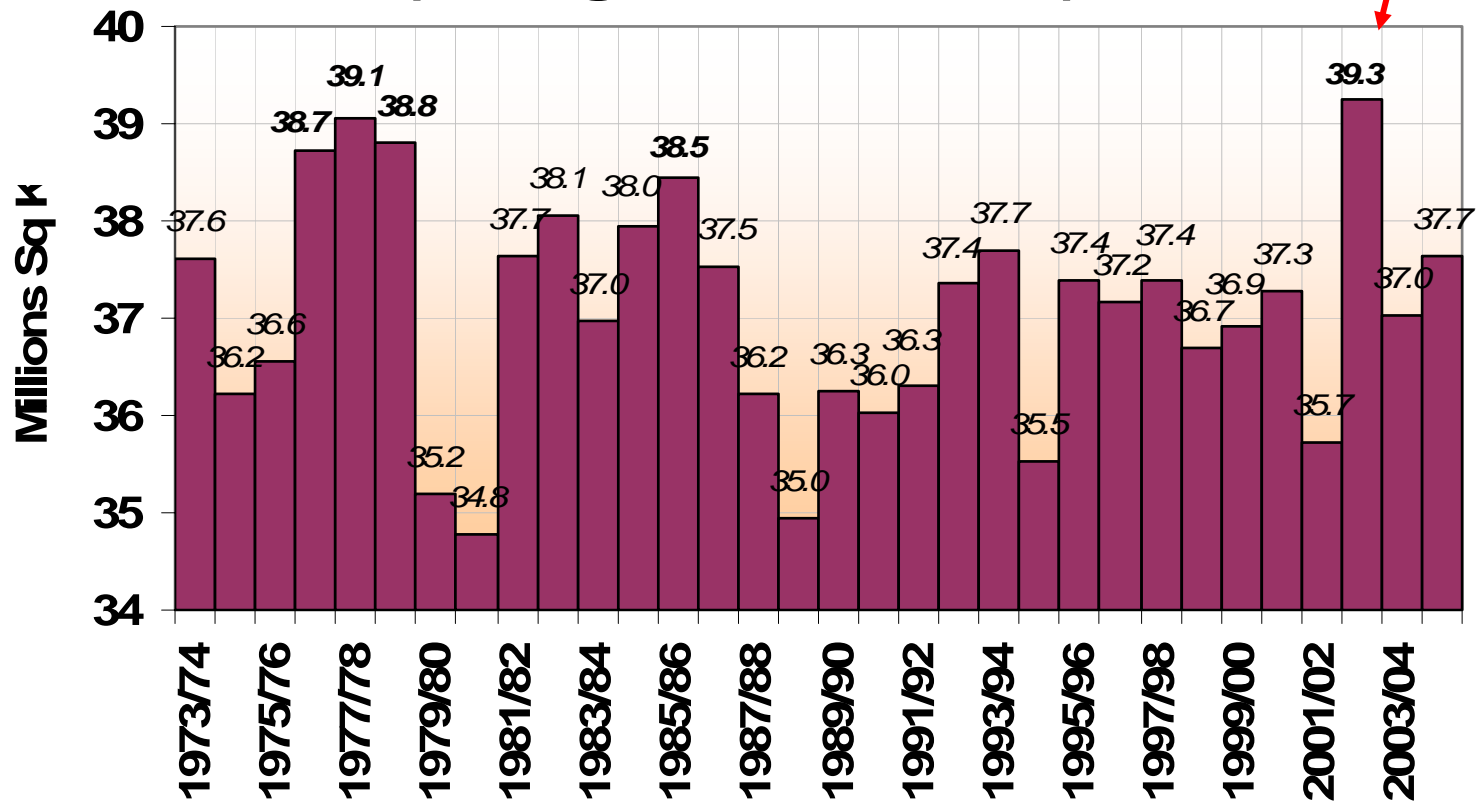


2 IPCC Fourth Assessment says that in winters cities that average near freezing are getting less snowfall. NYC average January temp 32F, BOS average winter temp 32F

Winter Ice/Snow Extent Increasing

Northern Hemisphere Snowcover (Average October-March)

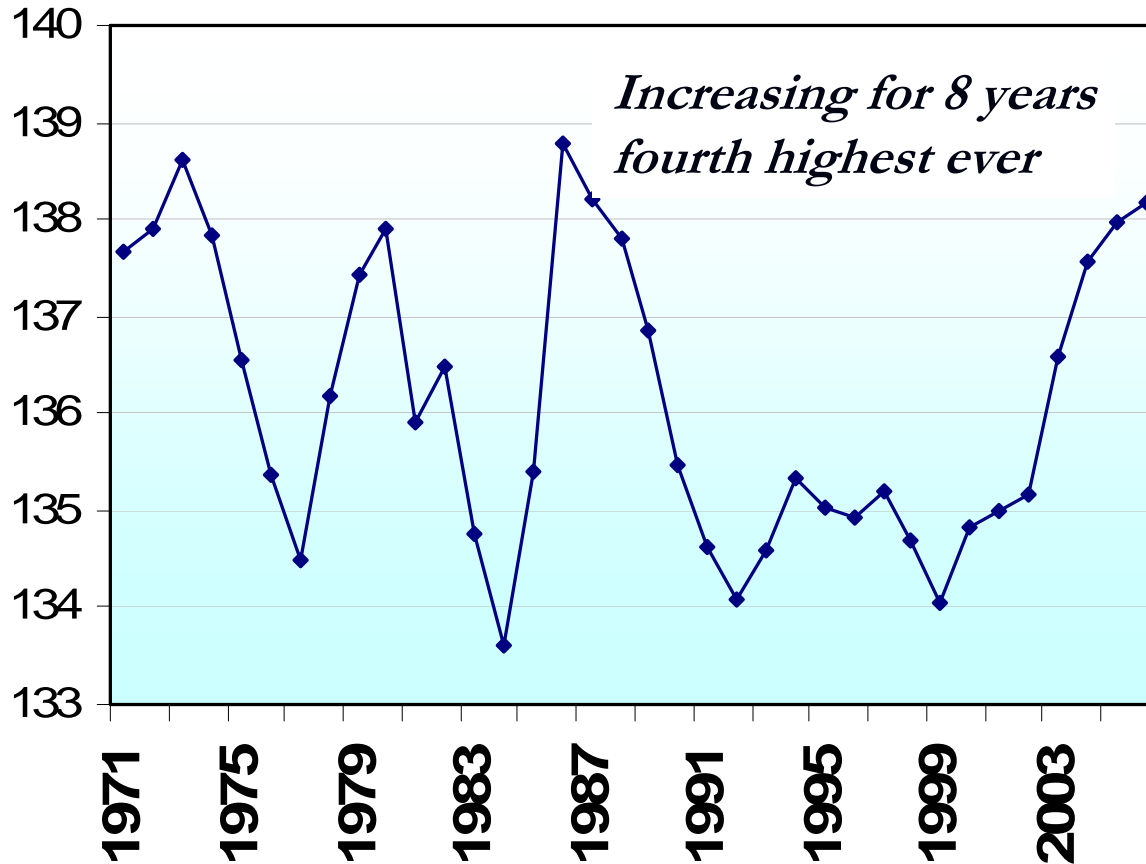
New Record



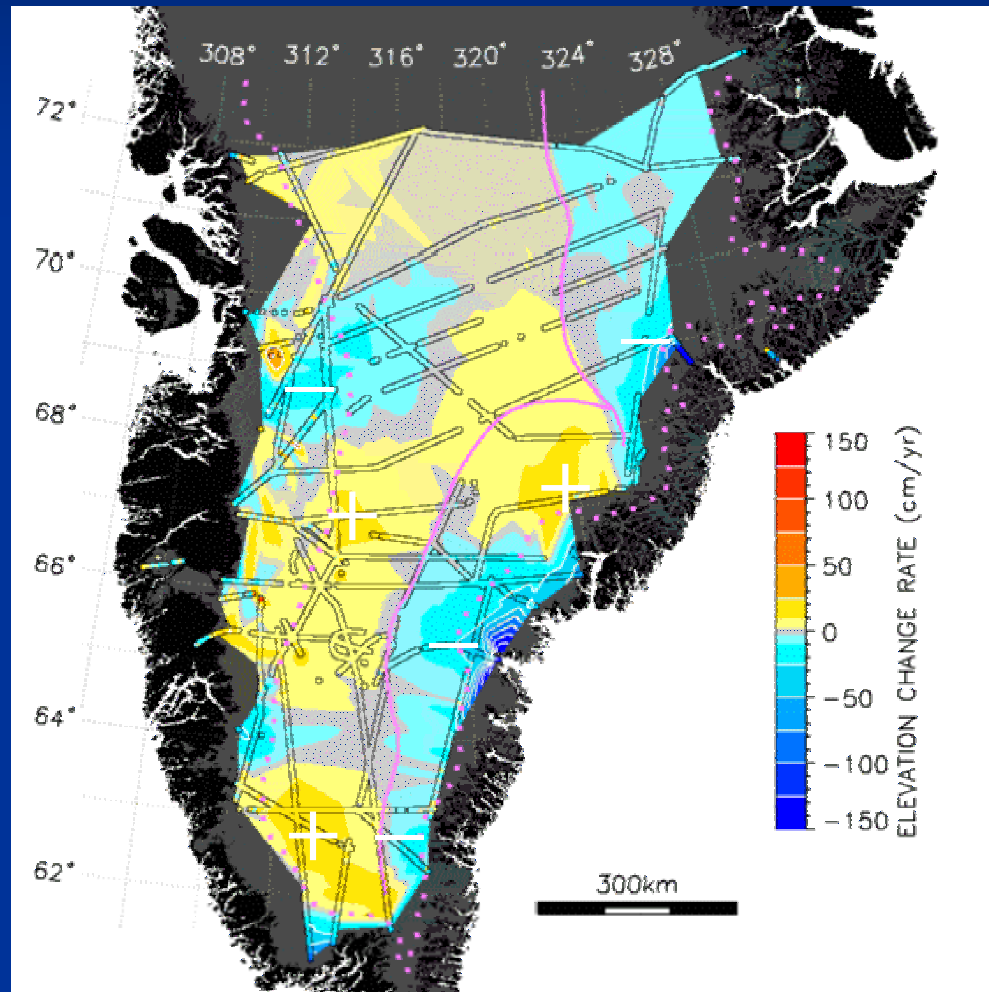
Ranking: #1 2002/03, #2 1977/78, #3 1978/79, #4 1976/77, #5 1985/86

Winter Ice/Snow Extent Increasing

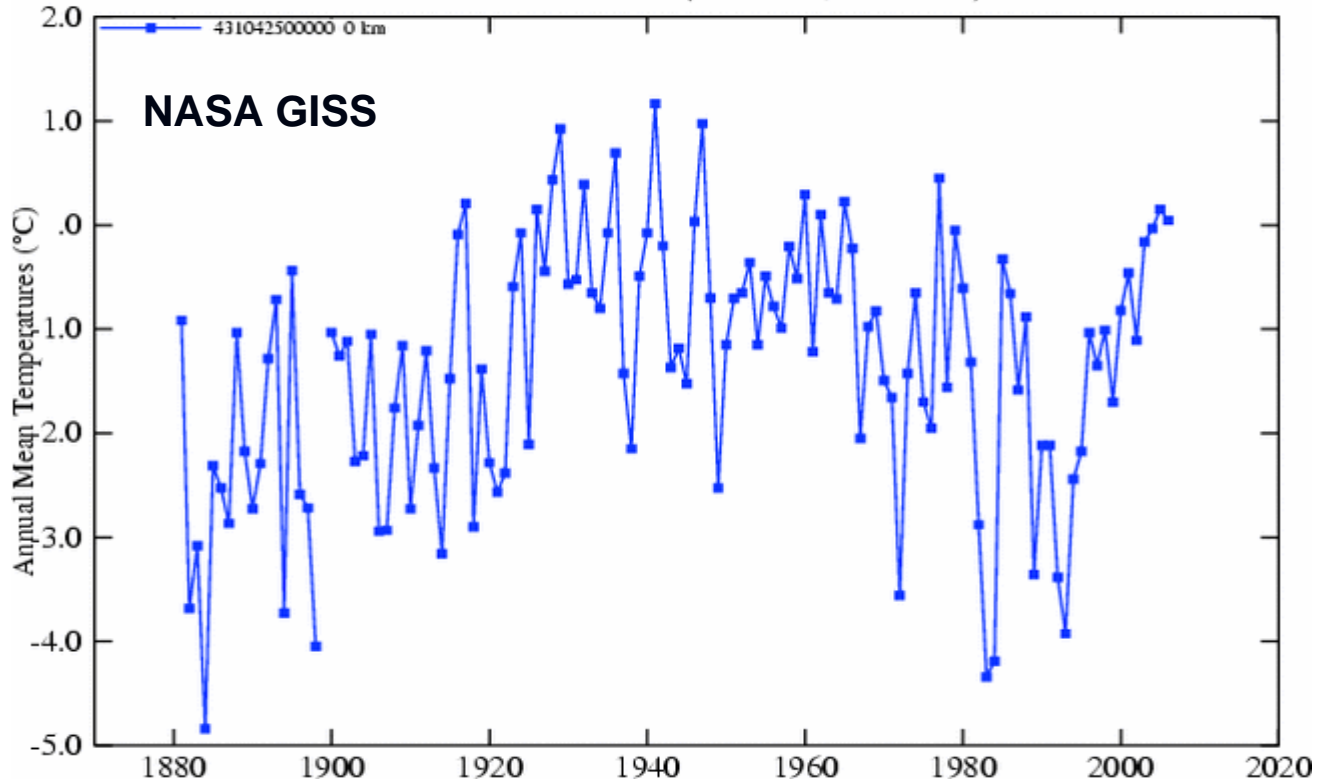
**5 Year Average Winter Snowcover
Northern Hemisphere
(Year Ending)**



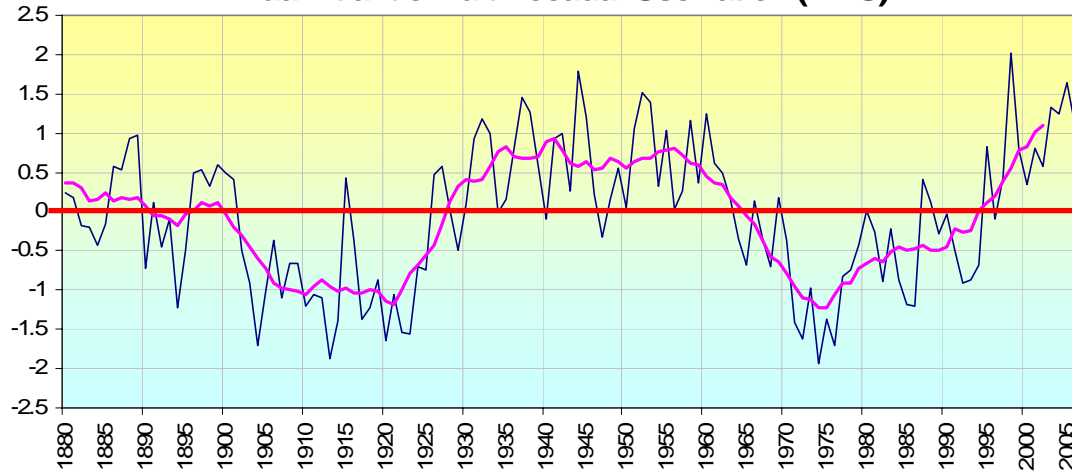
NASA found Greenland ice thinner along some of the edges



Godthab Nuuk (64.2 N,51.8 W)

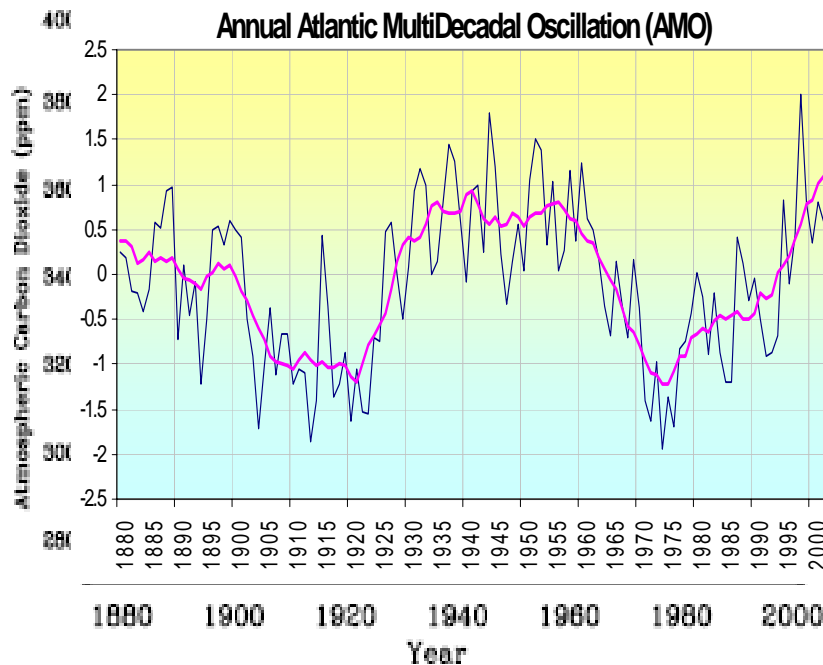
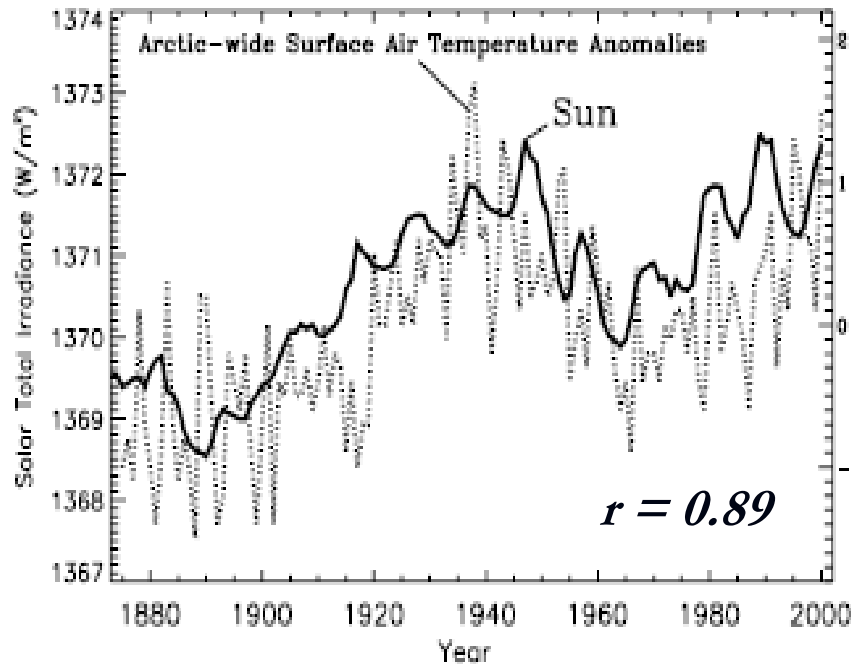


Annual Atlantic MultiDecadal Oscillation (AMO)



$r = 0.50$ AMO

$r = 0.91$ NAO



Arctic Annual Mean Temperatures vs Solar Irradiance (Soon)

Correlates well with the AMO!!!

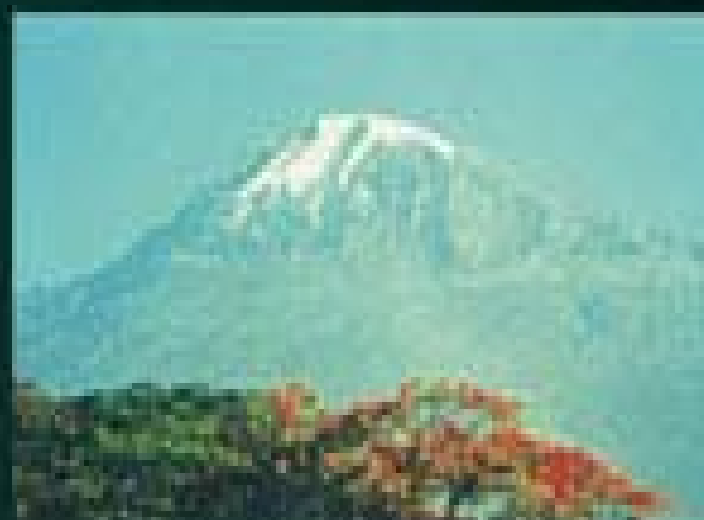
Dmitrenko and Polyokov found warm Atlantic water flows under arctic ice and is playing a role in ice thinning as it did in 1930s (when thickness decreased by 30% from 1890)

Kilimanjaro

Africa



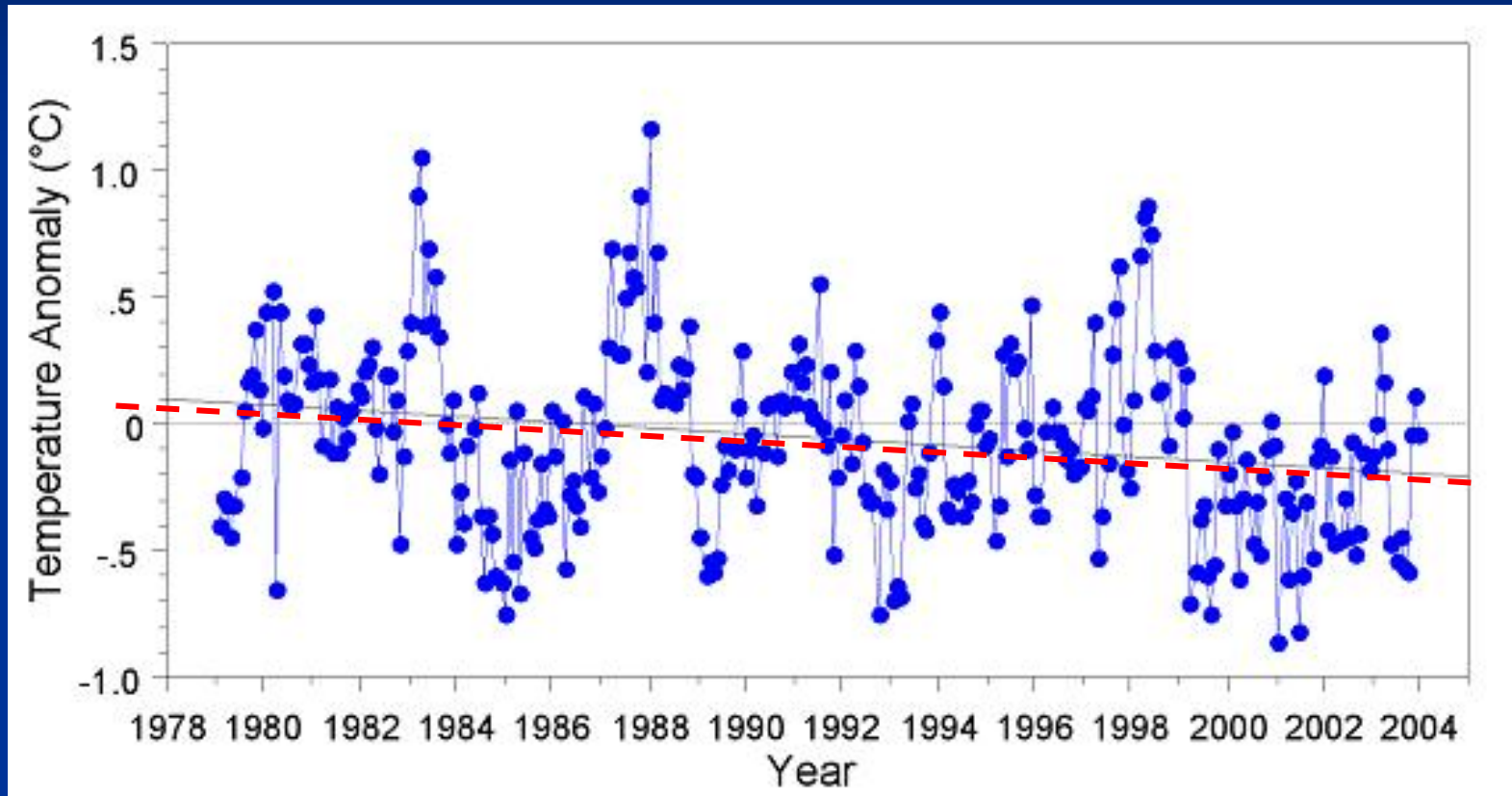
1970



2000

Kilimanjaro Snowfield

- Certainly not due to global warming – temperatures have been cooling last 25 years



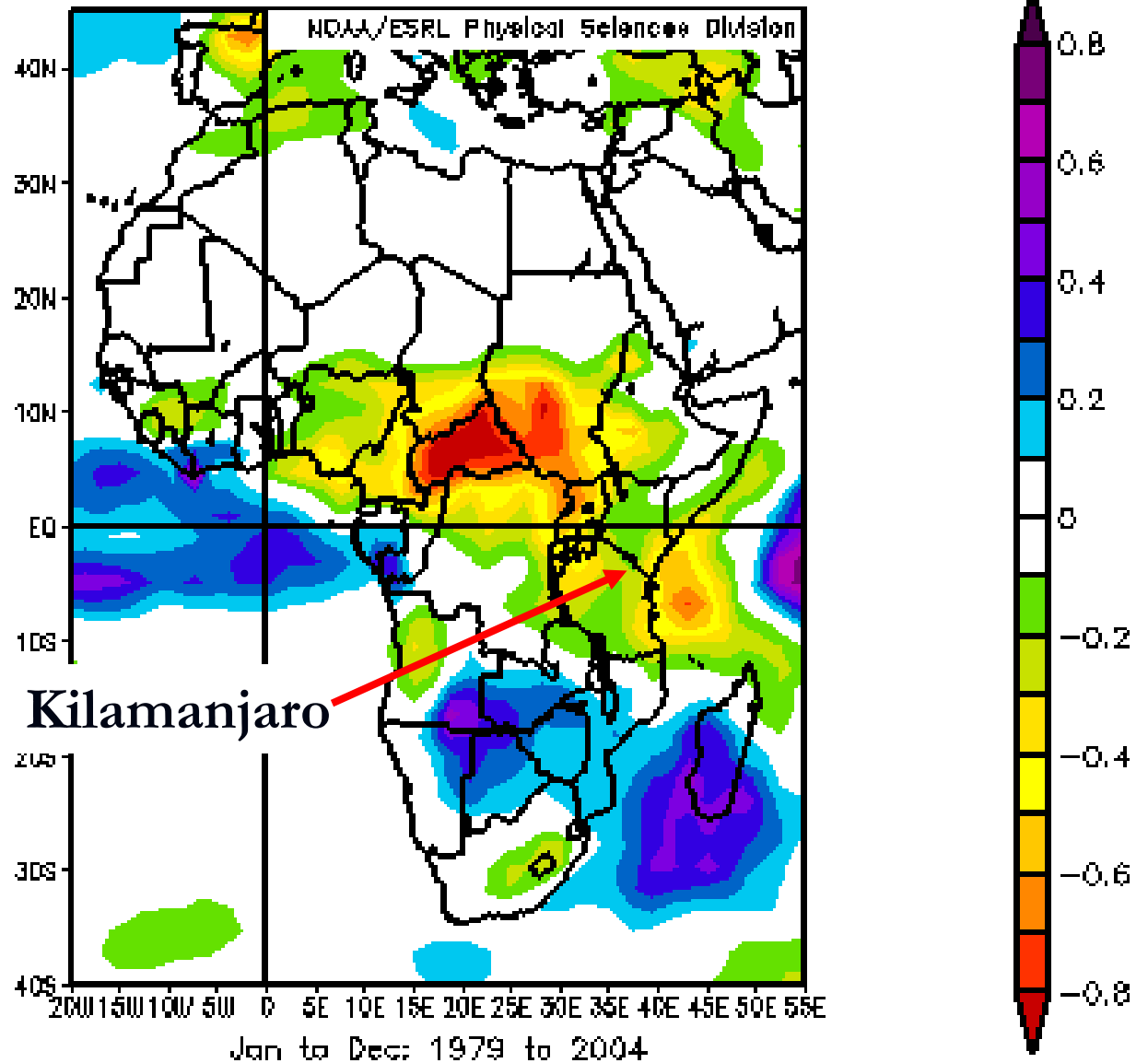
- Ice retreat has been due to less precipitation, explained by the Atlantic and local land use changes

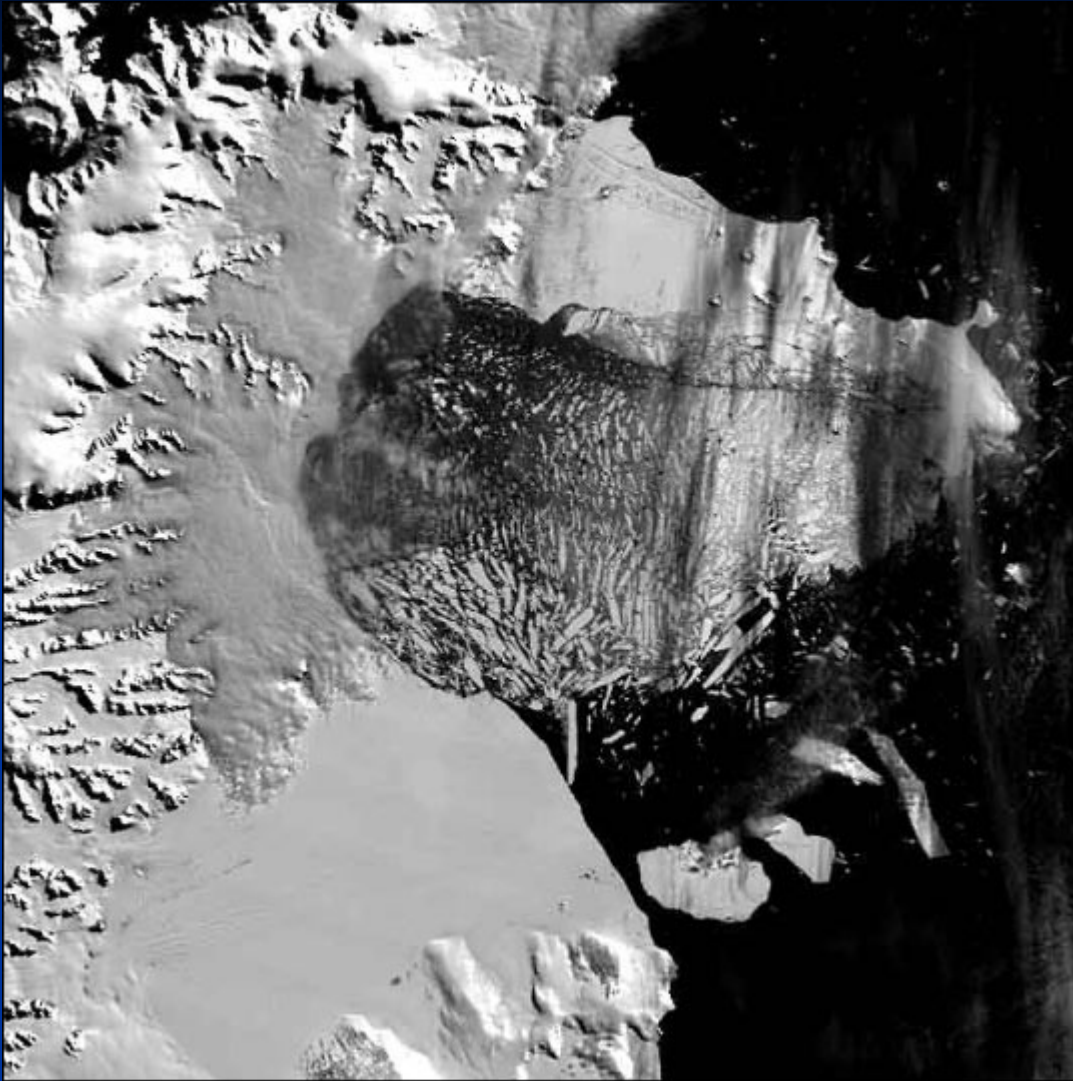
NCEP/NCAR Reanalysis

Surface Precipitation Rate (mm/day) Composite Anomaly 1968-1996 clima

Precipitation anomalies same 25 years

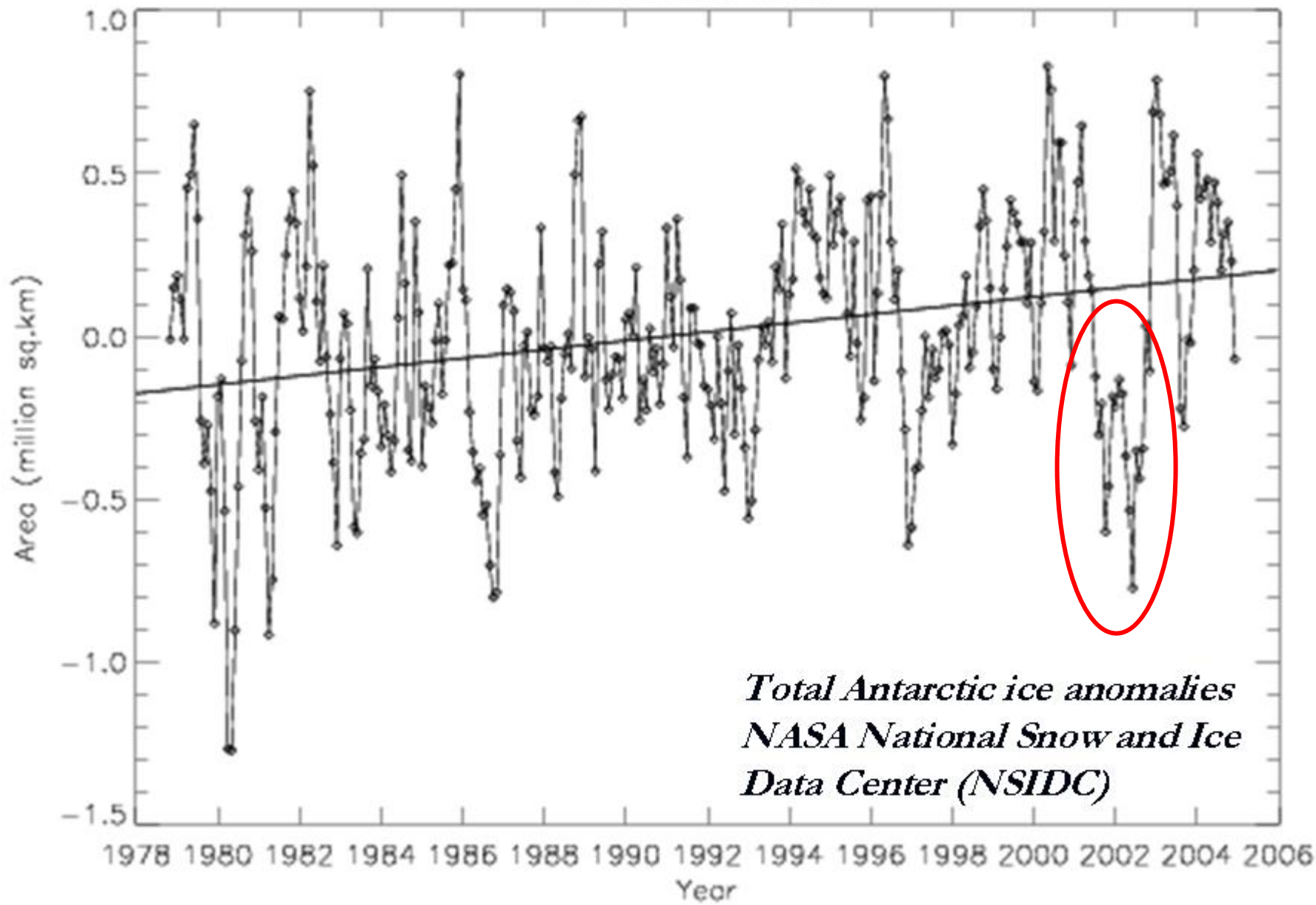
Relates to Atlantic Multidecadal Oscillation





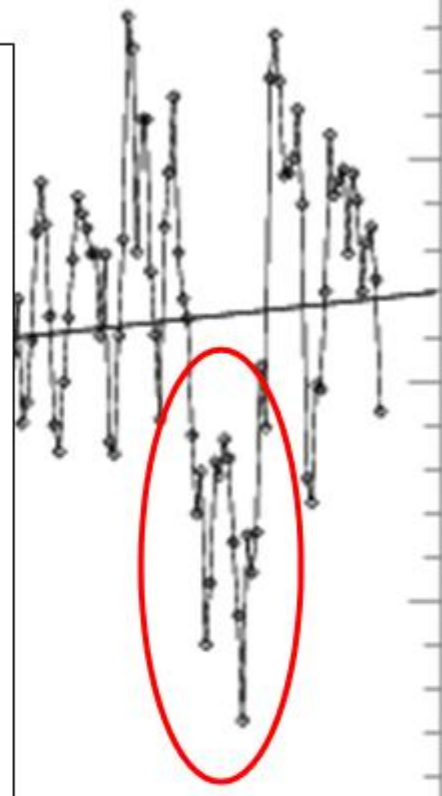
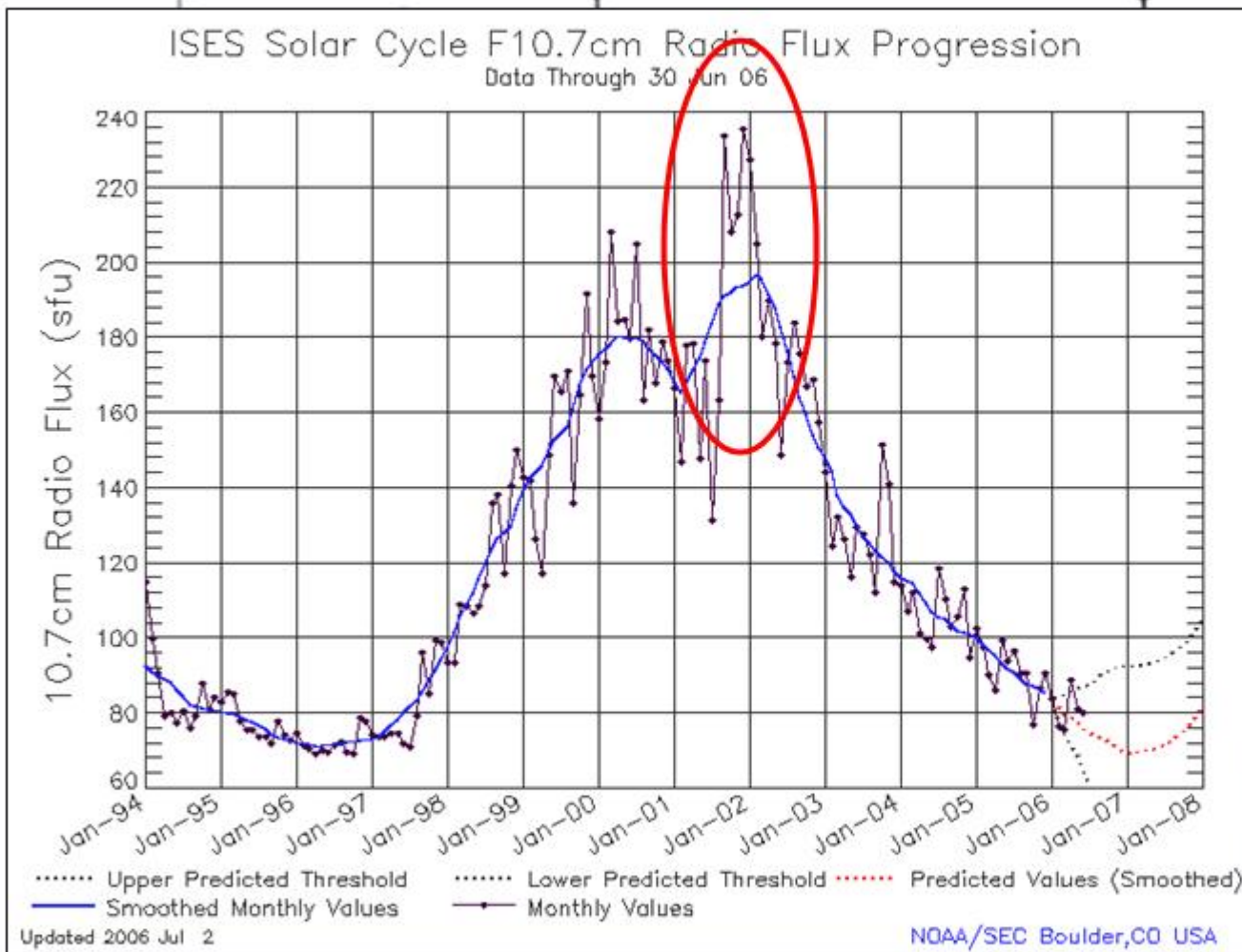
Antarctica
Summer 2002
Larsen Ice Sheet
Break-up

Antarctic Total



*Total Antarctic ice anomalies
NASA National Snow and Ice
Data Center (NSIDC)*

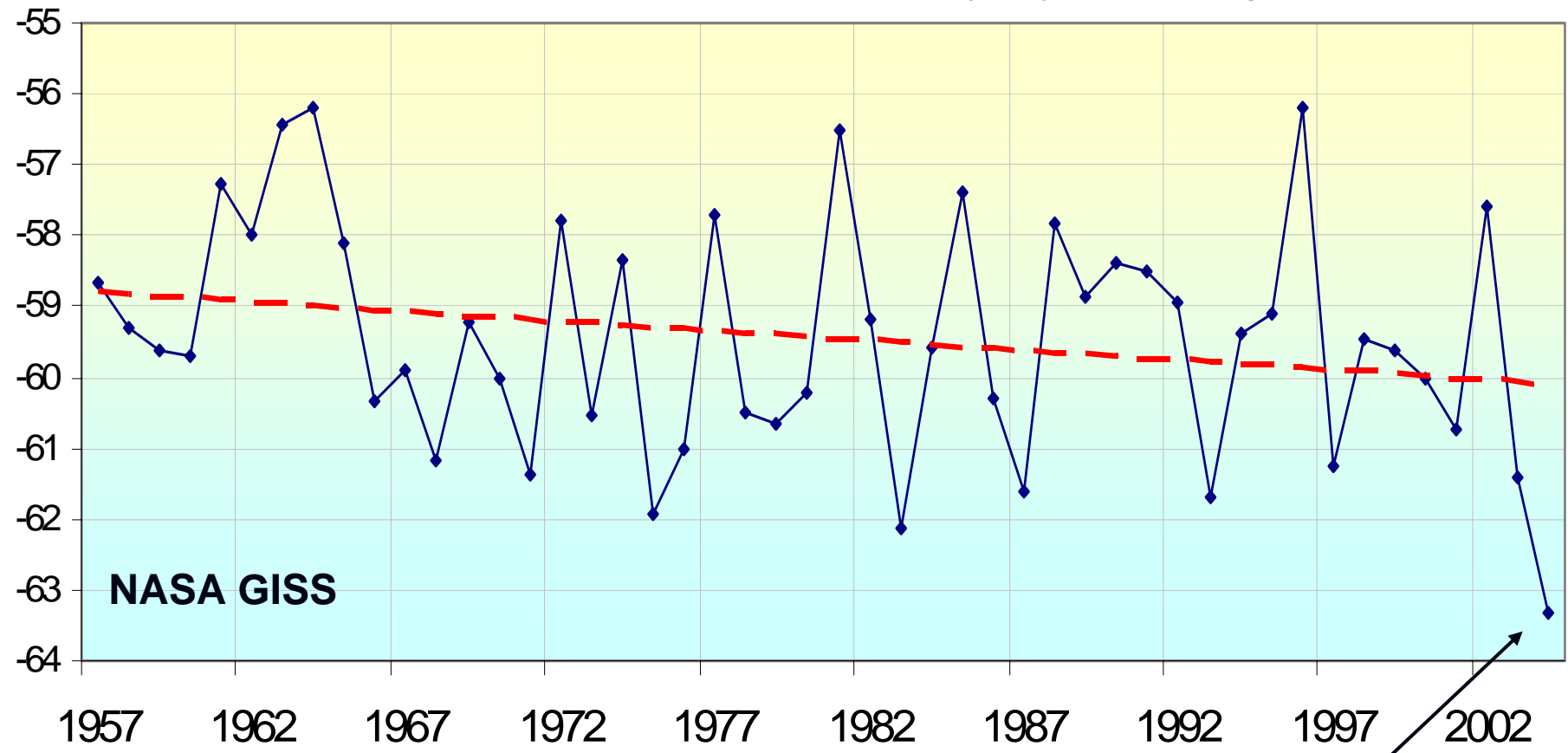
Antarctic Total



Antarctic Ice
Snow and Ice
(NSIDC)

1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006
Year

Amundsen-Scot, South Pole Winter (JJA) Mean Temp



NASA GISS

Note 2004 winter was the coldest of the entire record

The real "Canary in the Coal Mine"

Is There a Total Consensus ?

- Most scientists are not climatologists. Most work in other fields and may be observing first-hand the effects of climate change natural and man-made and many believe global warming is real (though 17,200 of them signed petition urging US not to sign Kyoto)
- Modelers at major centers (NCAR, NASA) and big universities that receive major global warming grants profess their believe in greenhouse warming as do all environmental groups
- Many other climatologists/meteorologists not tied to the money flow that work closely with the data see the importance of local factors such as urbanization and see changes that are cyclical and natural
 - Survey of American Association of State Climatologists in 1997 showed 73% felt natural cycles were largely behind climate changes
 - Accuweather did an informal survey of TV and forecast meteorologists and 75% believed in natural cycles

Summary

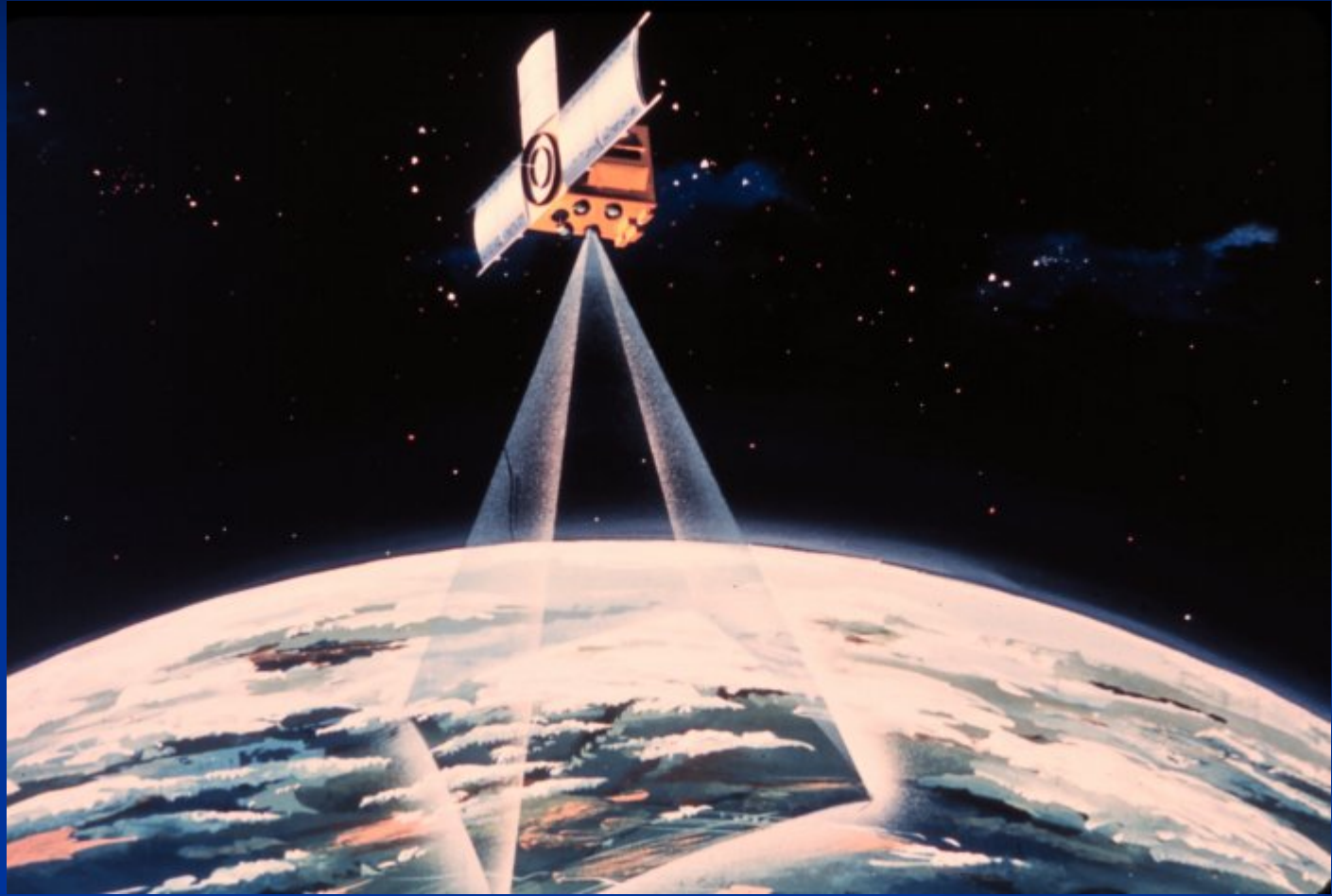
- Man plays some role in the world's climate through greenhouse gases and especially urbanization
- Lack of warming in rural areas suggest the greenhouse component is likely small and overall estimates overdone
- Background temperatures and storminess are cyclical in nature and correlate far better with natural cycles in the sun and oceans than with greenhouse gases
- The world's ice and snow situation is not exactly as has been portrayed but where changes are occurring, they too can be mostly explained by these same cycles
- Though it may be true that a majority of world's scientists believe in global warming, a great many climate scientists who work with the actual data see natural cycles at work

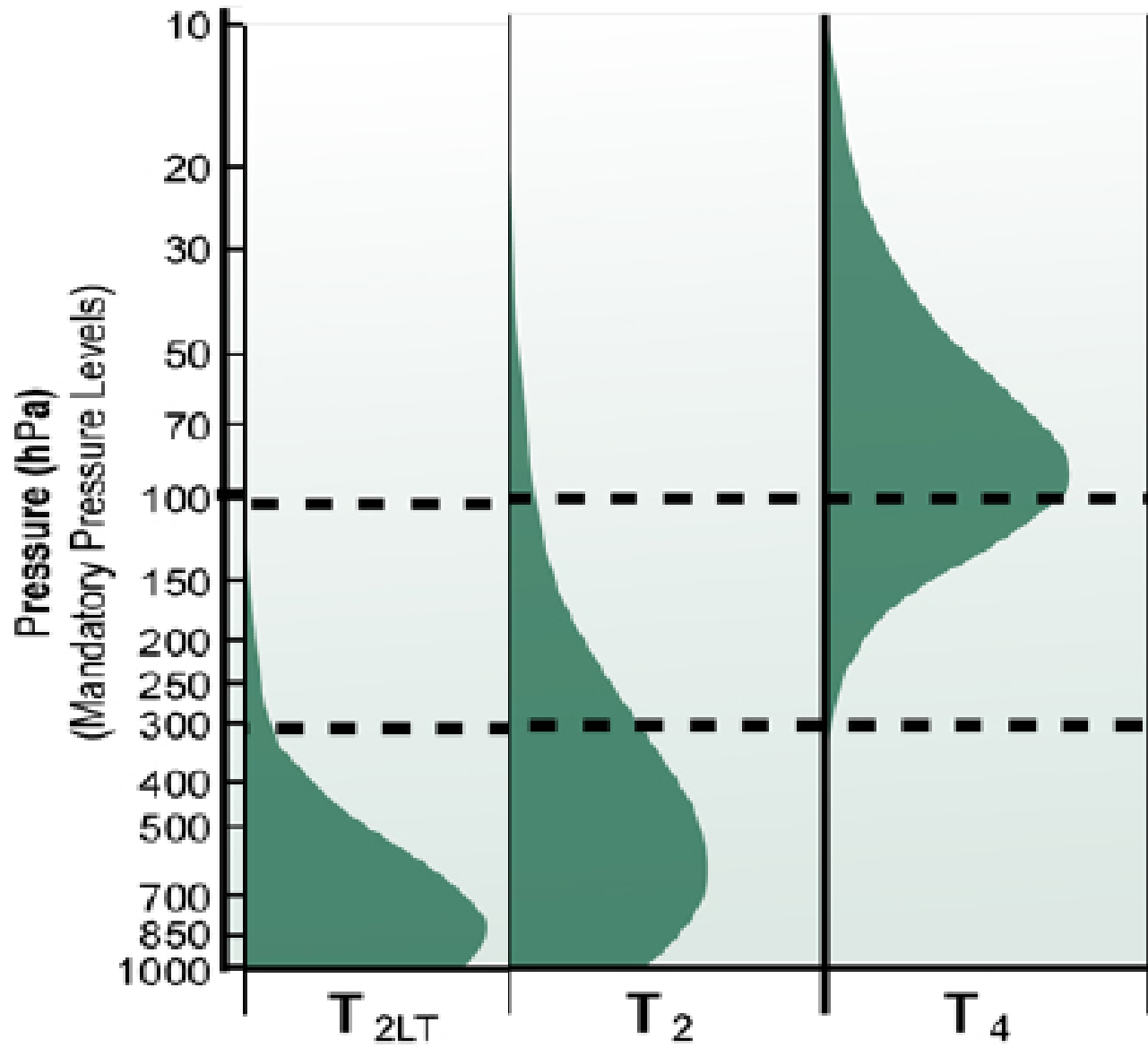
Dr. Ben Herman

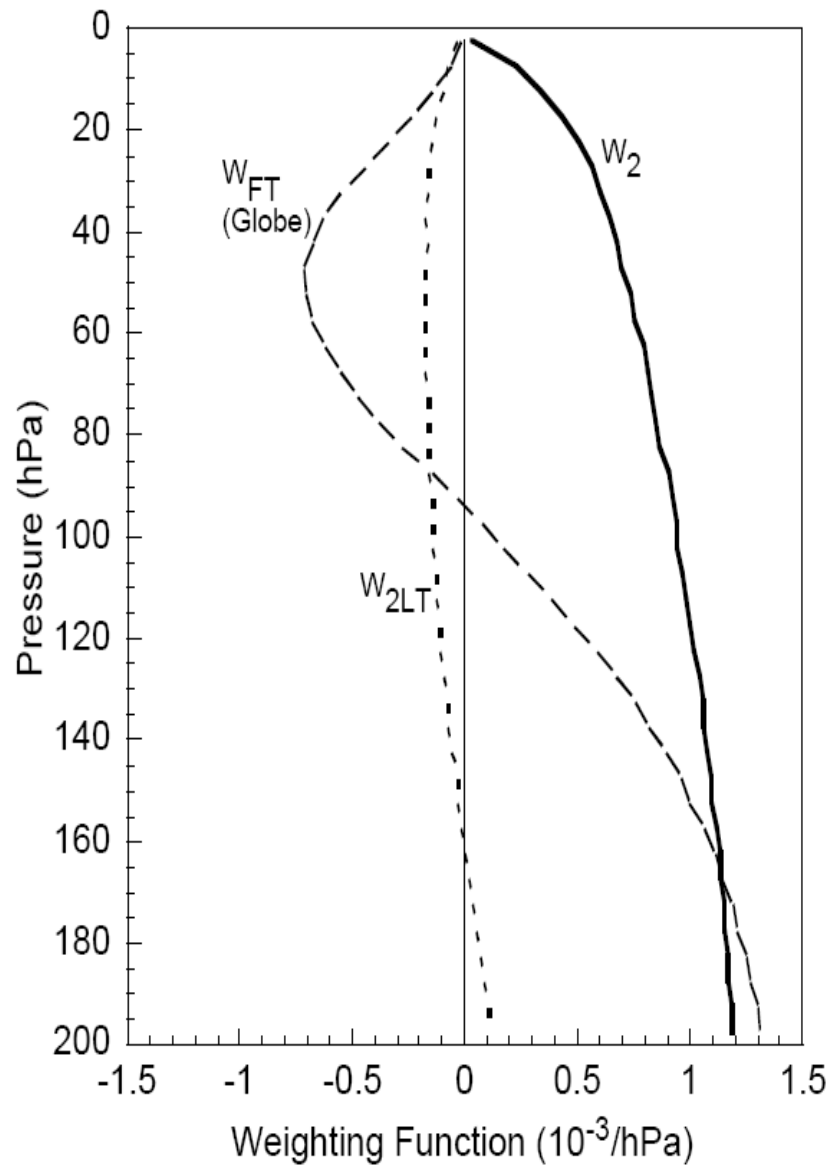
- Professor University of Arizona Department of Atmospheric Sciences, Institute of Atmospheric Physics
- Research Interests: Radiative transfer and remote sensing
- Dr. Herman is primarily concerned with the optics of atmospheric aerosols, polarization and scattering, and the analysis of remote sensing data obtained from aircraft and satellites.
- Currently, he is working on several satellite based remote sensing projects to monitor ozone, temperature, water vapor and aerosols from space.
- Widely published in journals on these topics

Tropospheric Temperature Trends as Measured by Satellite

Dr. Ben Herman



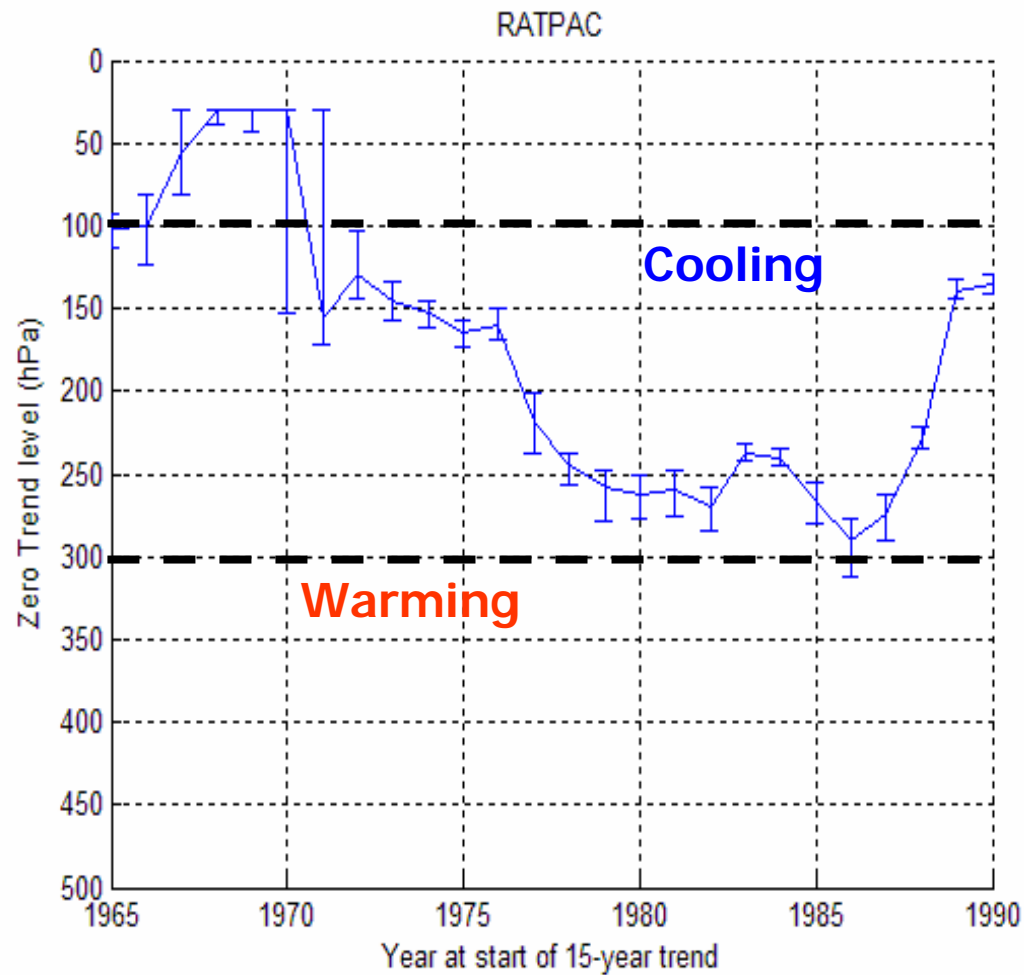


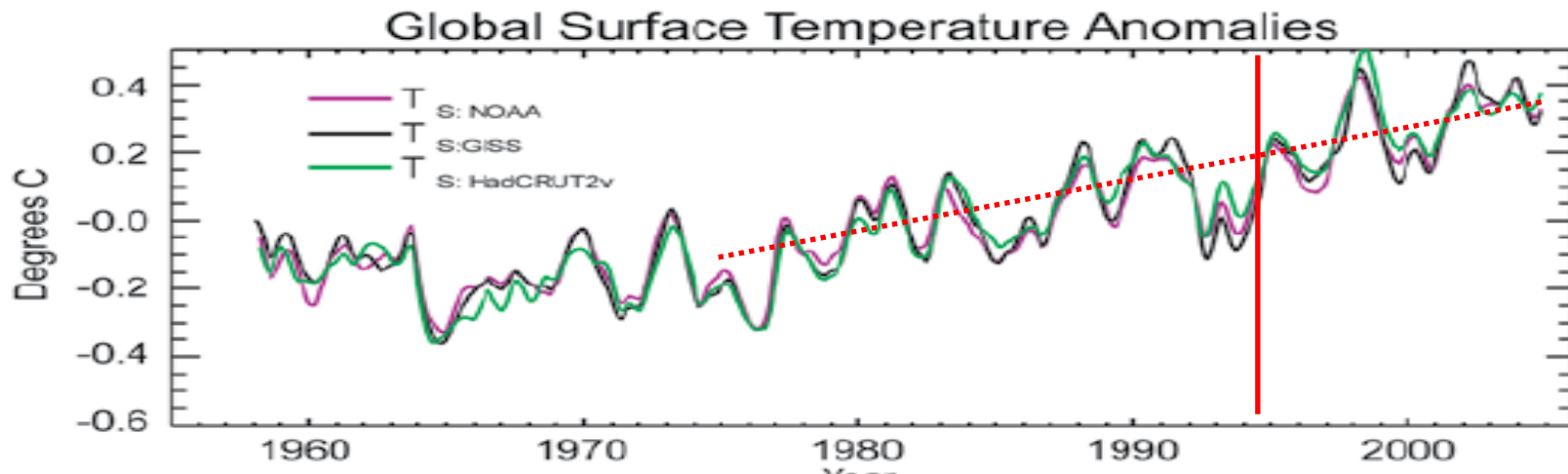
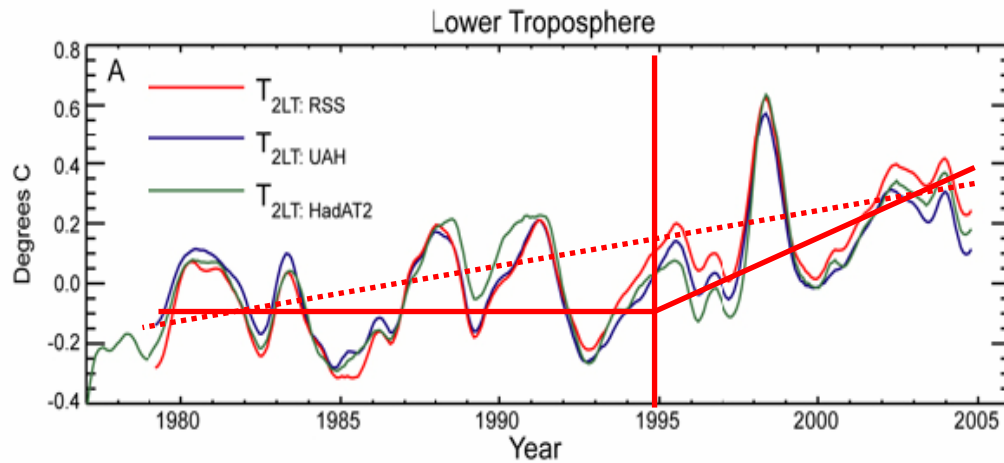
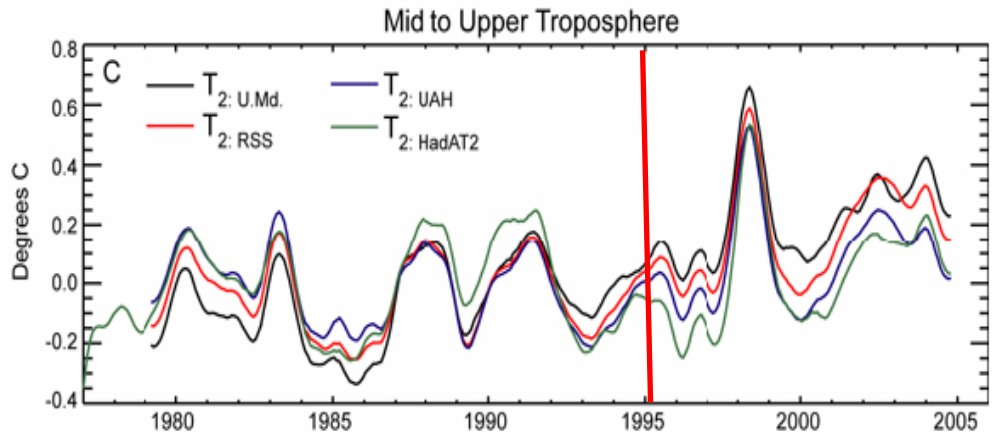


From Fu and Johanson(2004), Submitted

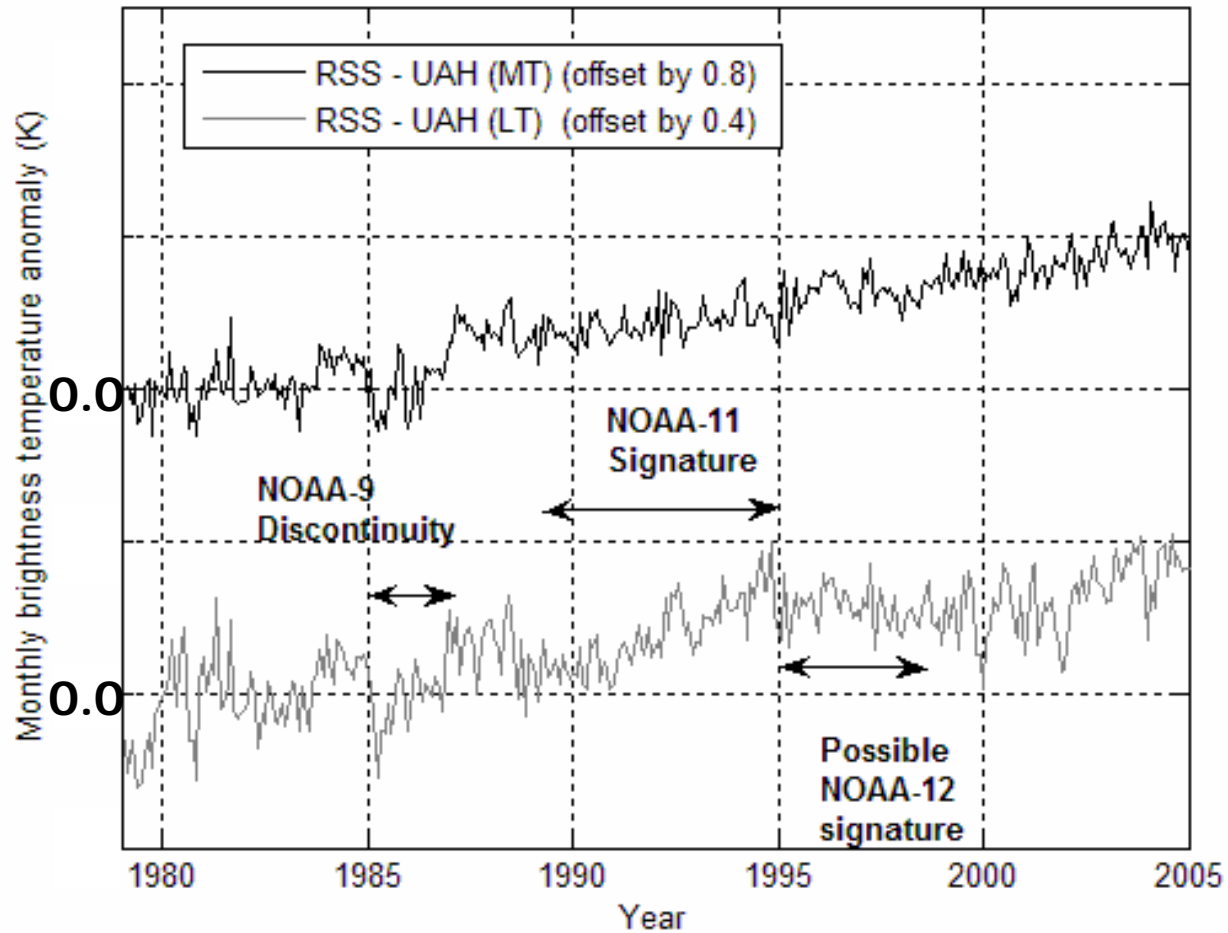
ZTL Method

❖ Note tendency of ZTL





From CCSP 2006



From Randall and Herman (2007), Submitted

References

- *Temperature Trends in the Lower Atmosphere: Steps for Understanding and Reconciling Differences*. Thomas R. Karl, Susan J. Hassol, Christopher D. Miller, and William L. Murray, editors, 2006. A Report by the Climate Change Science Program and the Subcommittee on Global Change Research, Washington, DC.
- Fu, Q., and C. M. Johanson (2004), Stratospheric influences on MSU-derived tropospheric temperature trends: A direct error analysis, *Journal of Climate*, 17, 4636-4640.

Dr William Gray

- Dr Gray received his Ph.D. from the University of Chicago, Dept. of Geophysical Sciences in 1964.
- He has been with Colorado State University's Dept. of Atmospheric Science since 1961, and has been a professor since 1974.
- Focus on global observational and theoretical aspects of tropical meteorological research for more than 40 years. Most of this effort has gone to the investigation of meso-scale tropical weather phenomena.
- Has provides skillful public hurricane forecasts since 1984
- Won the Neil Frank award in 1995 for his pioneer and exemplary work in seasonal hurricane forecasting

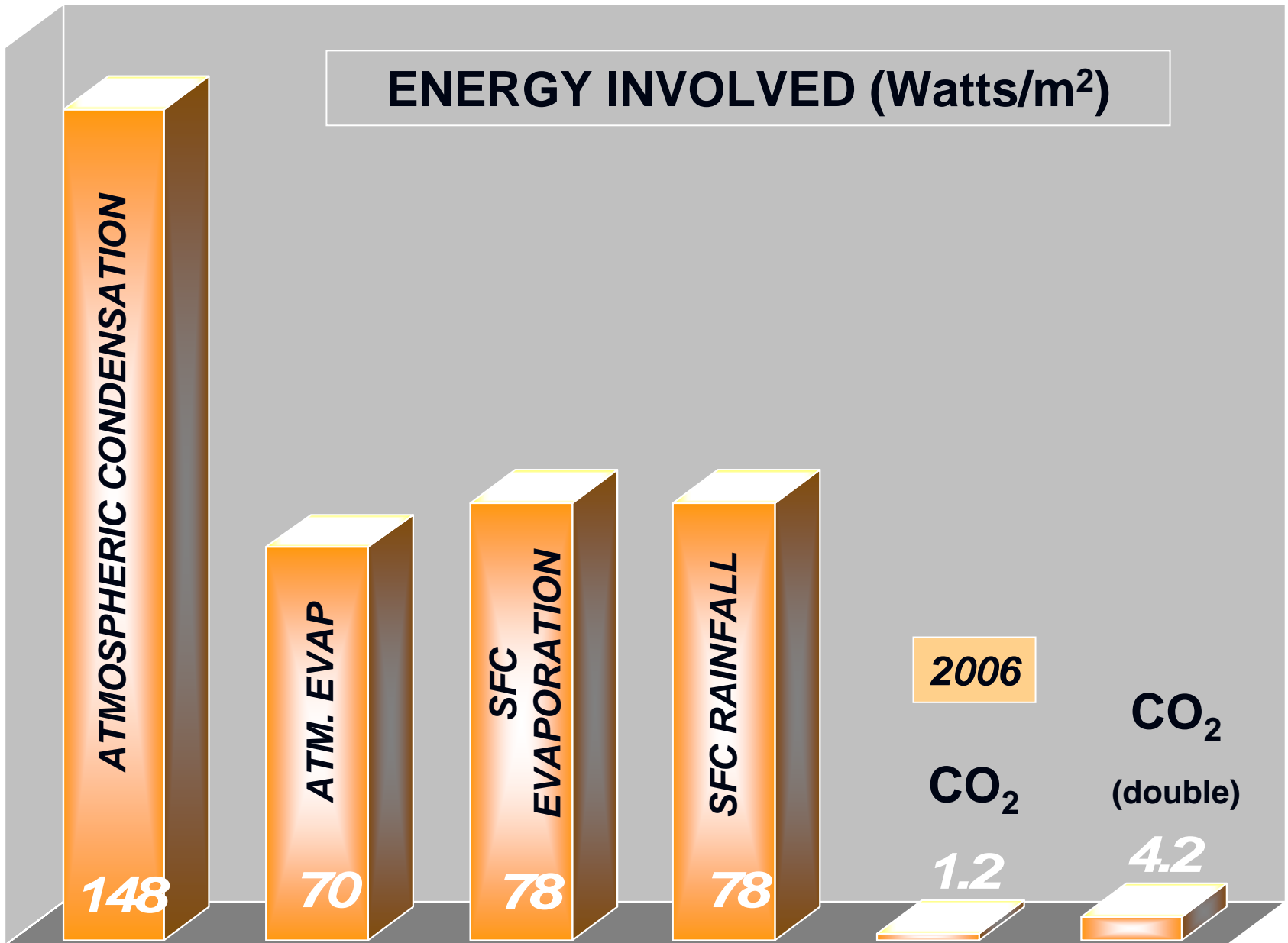
BACKGROUND

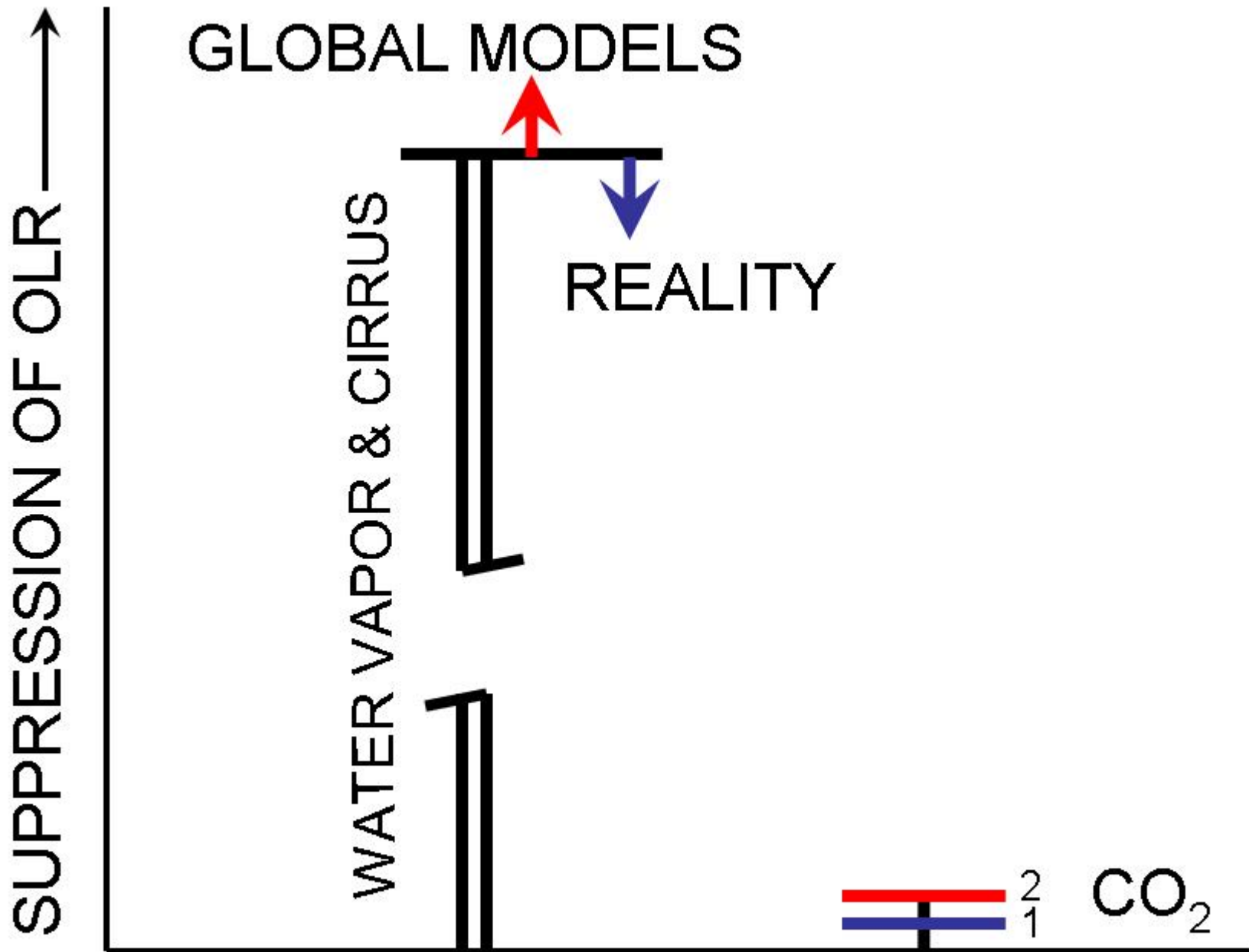
- TROPICAL METEOROLOGY
 - FIELD EXPERIENCED
 - TROPICAL CYCLONES
 - SEASONAL FORECASTS

PROBLEMS

- HYDROLOGIC
CYCLE
- DEEP OCEAN
CURRENTS

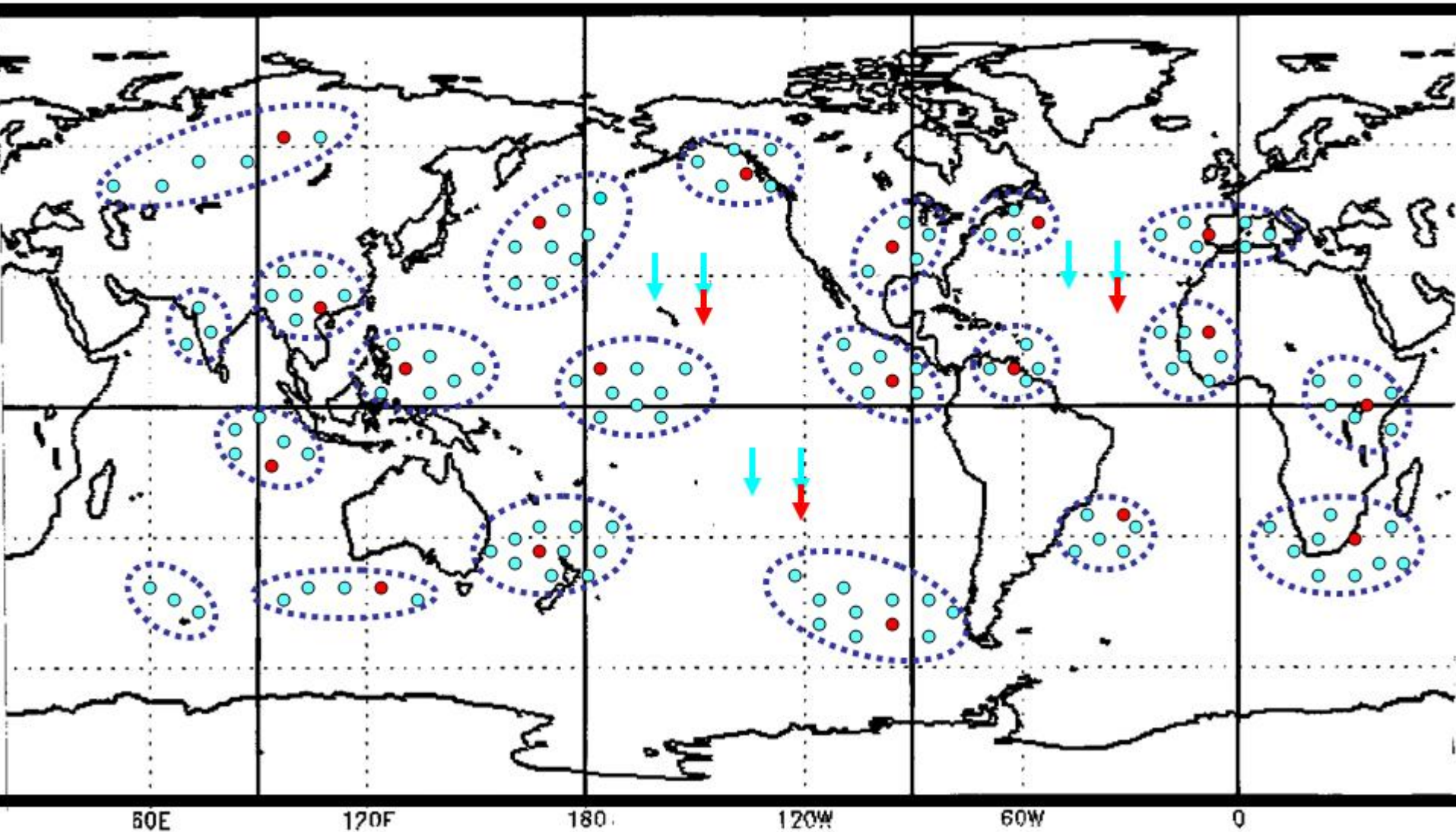
ENERGY INVOLVED (Watts/m²)

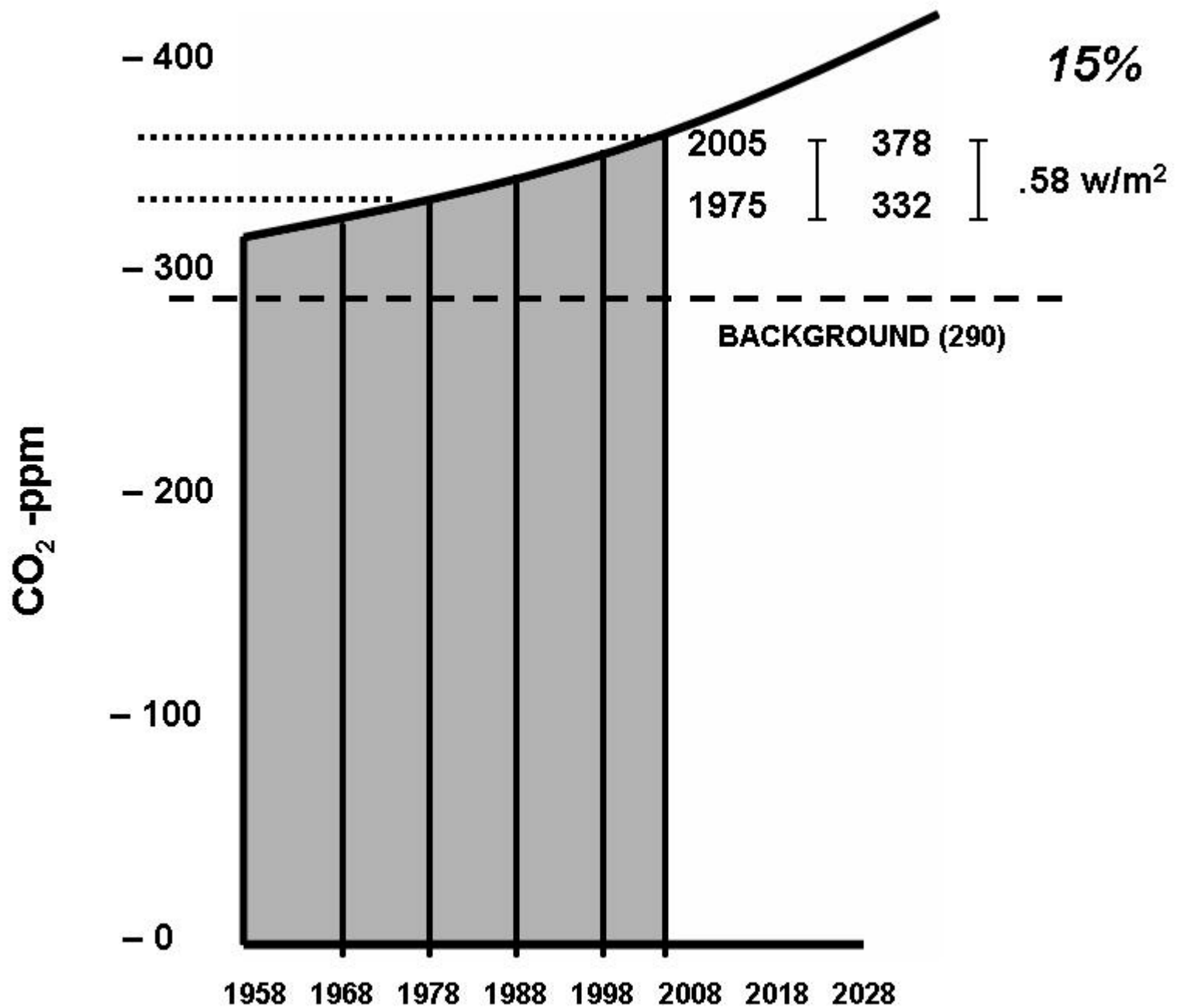


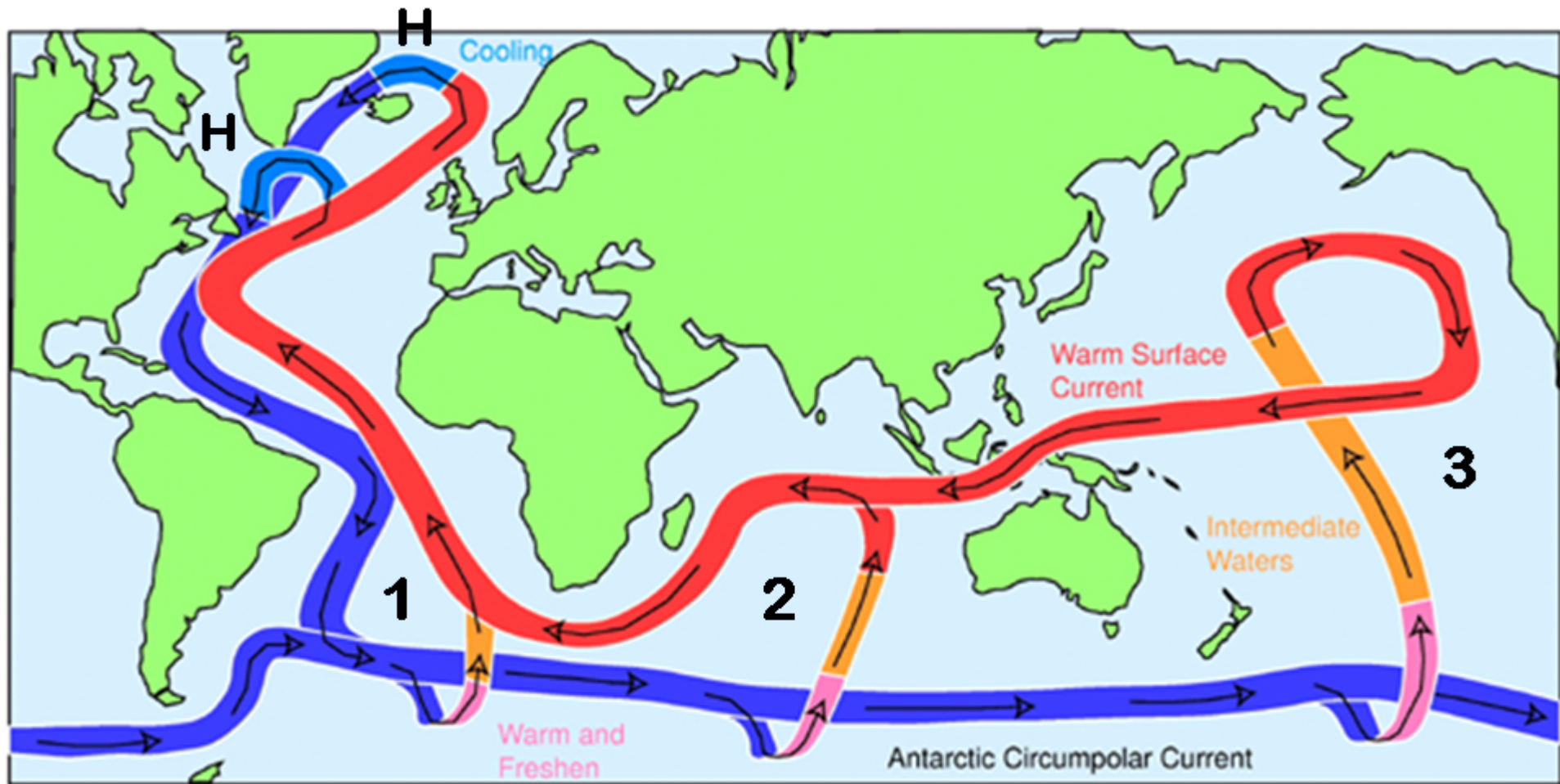


Northern Hemisphere SUMMER

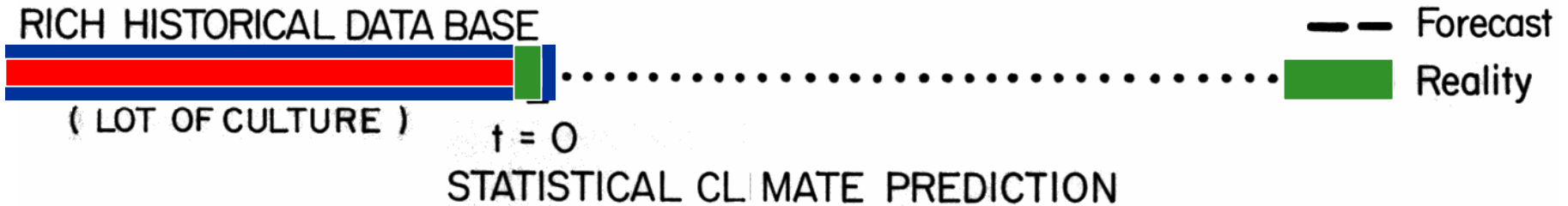
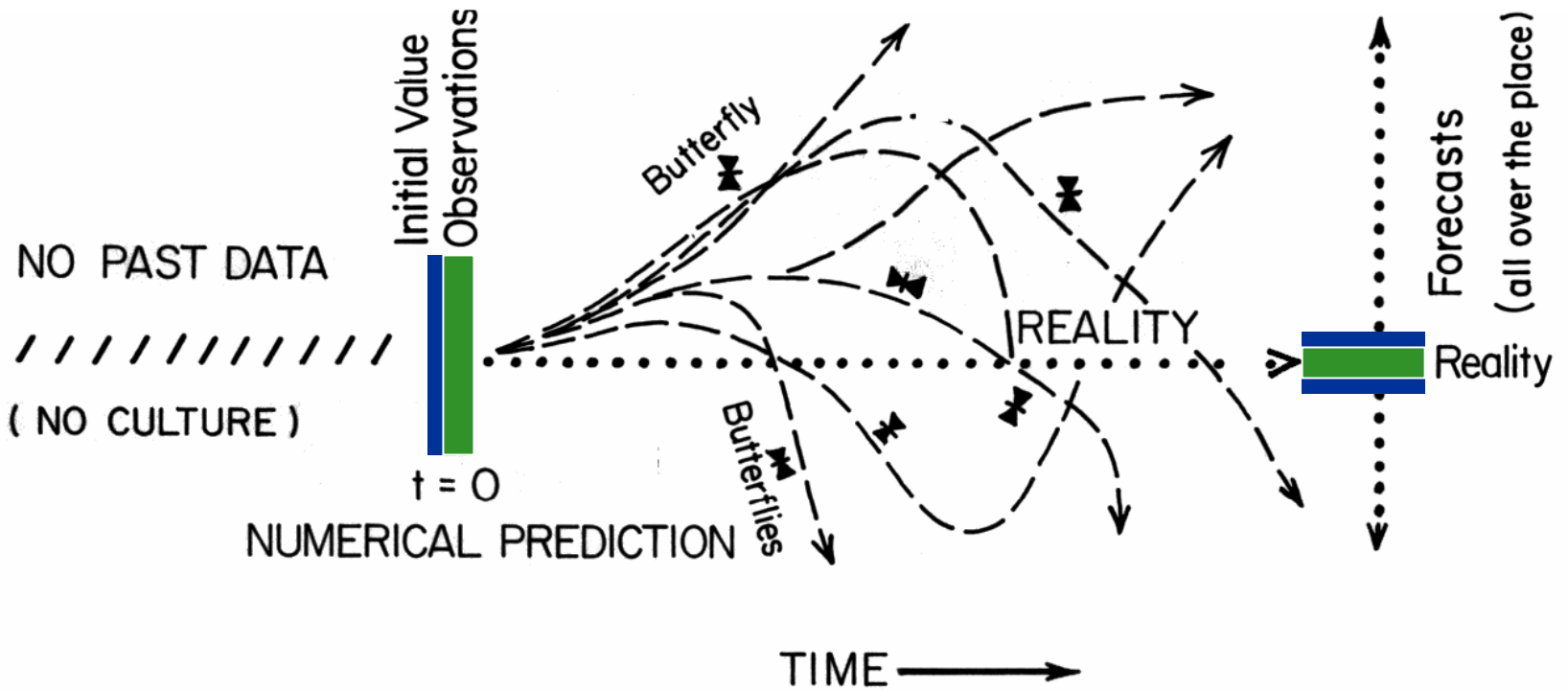
- Areas of Rain
- Extra Areas of Rain

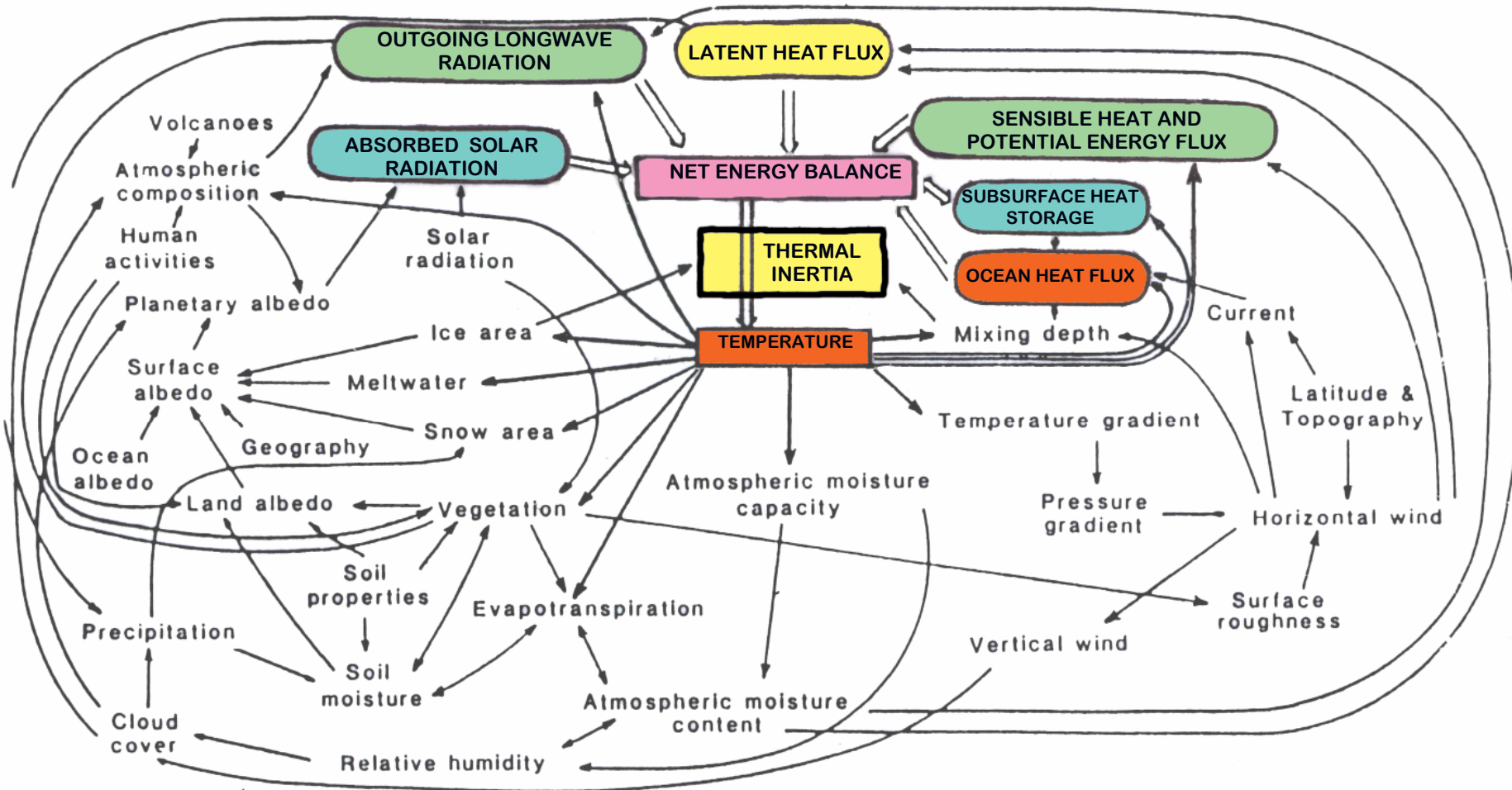




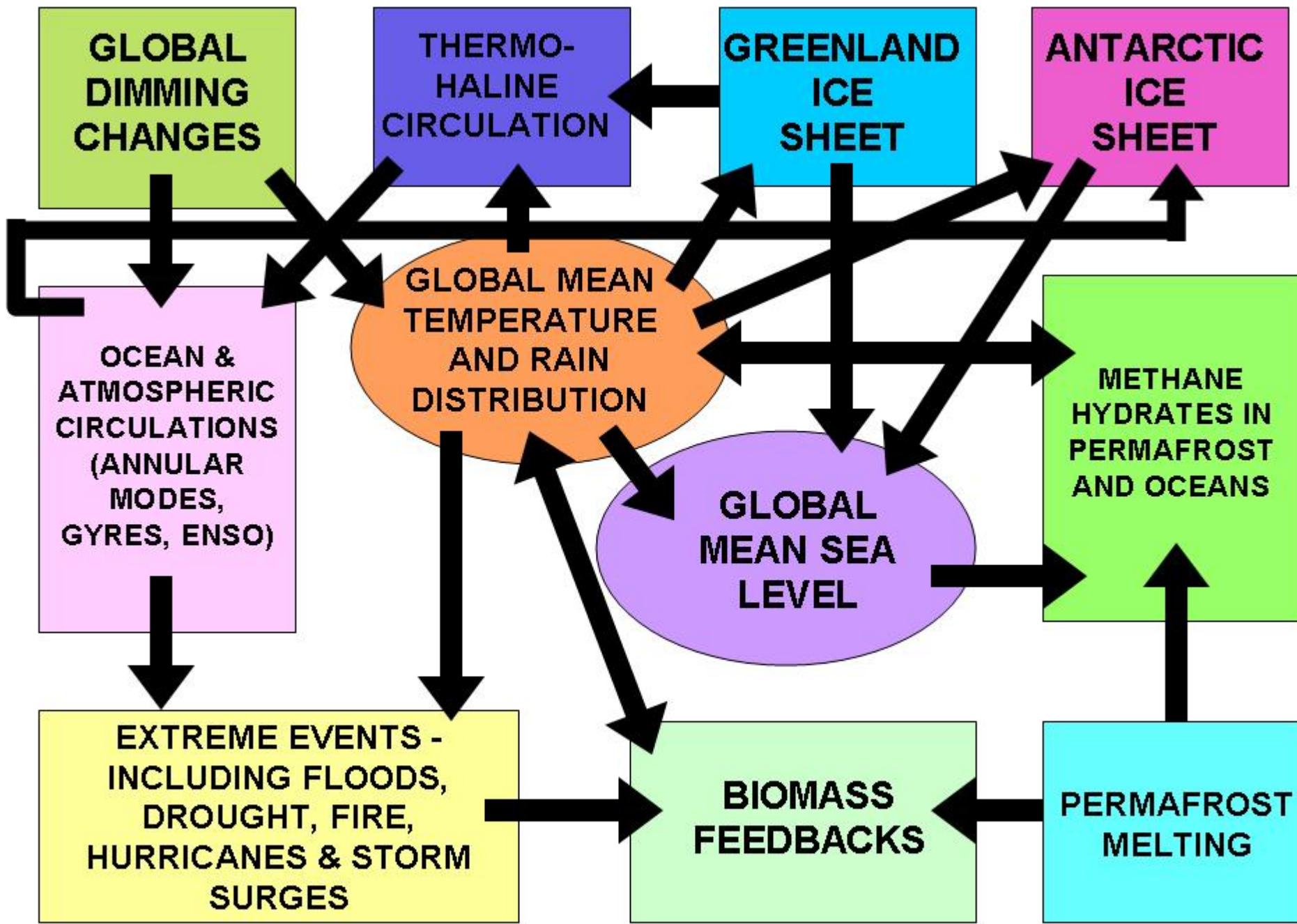


FROM JOHN MARSHALL (MIT)





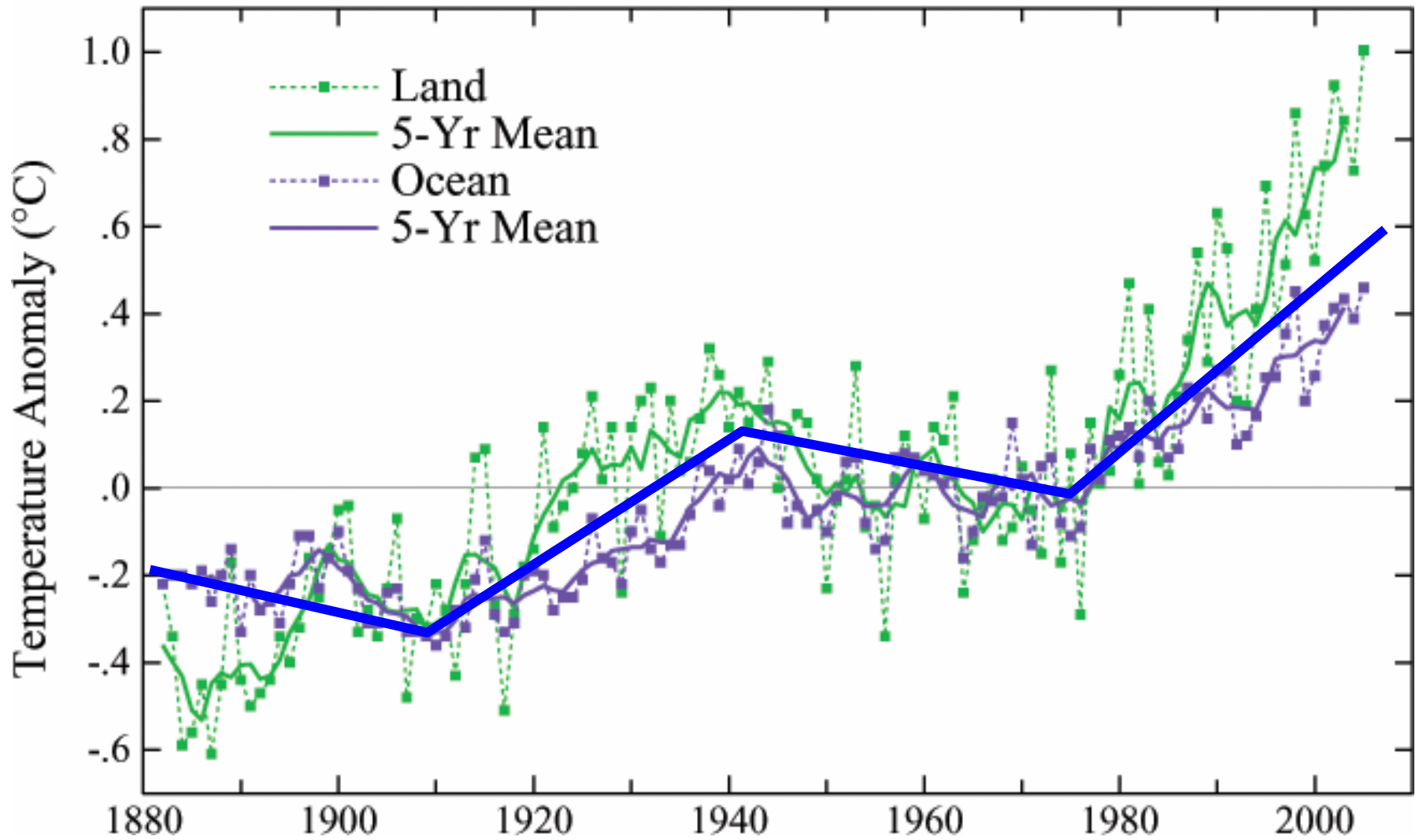
**Flow diagram for climate modeling, showing feedback loops.
From Robock (1985).**



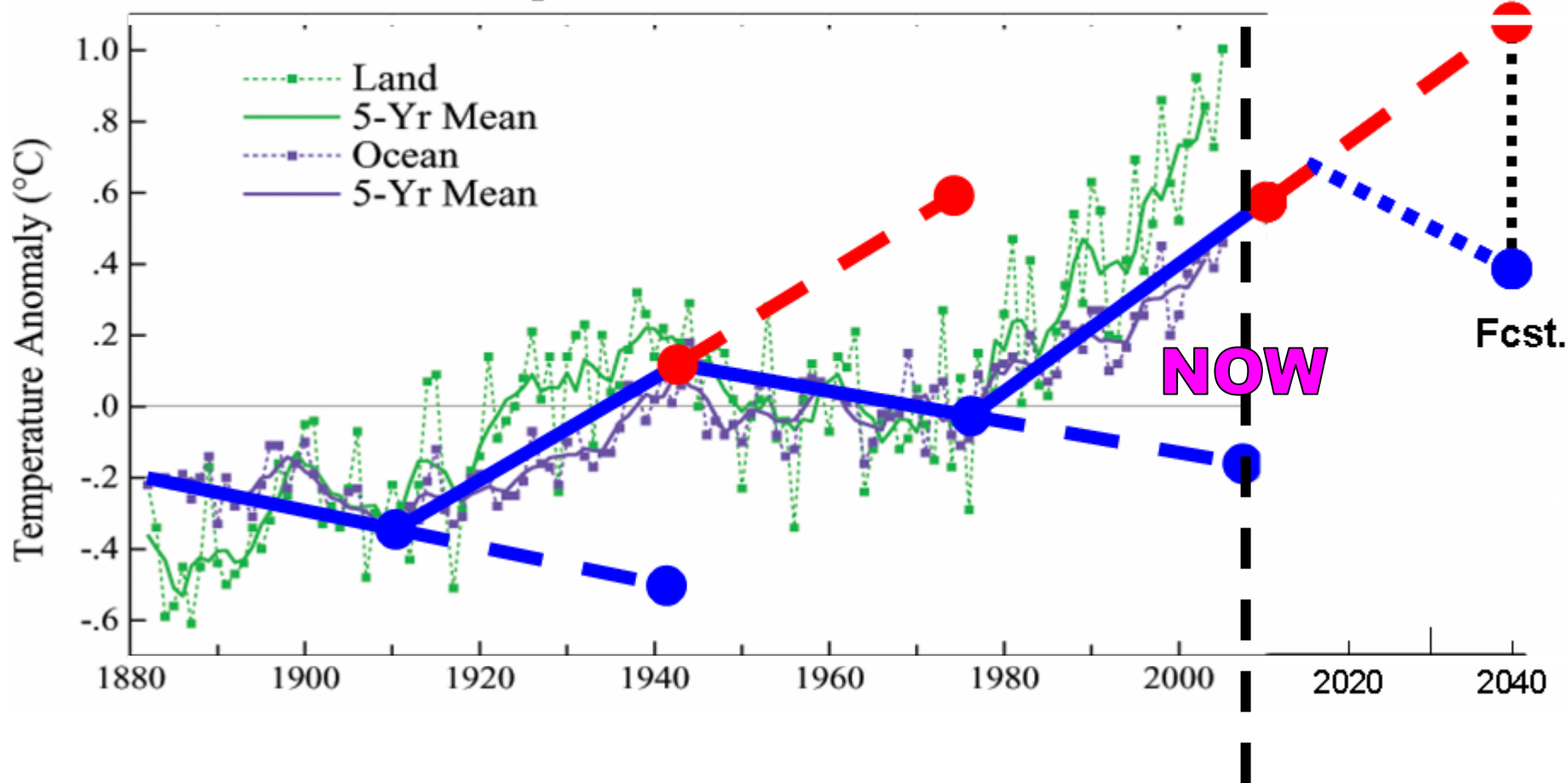
From – A. Berrie Pittock (22 August 2006, EOS Article) “Are Scientists Understanding Climate Change?”

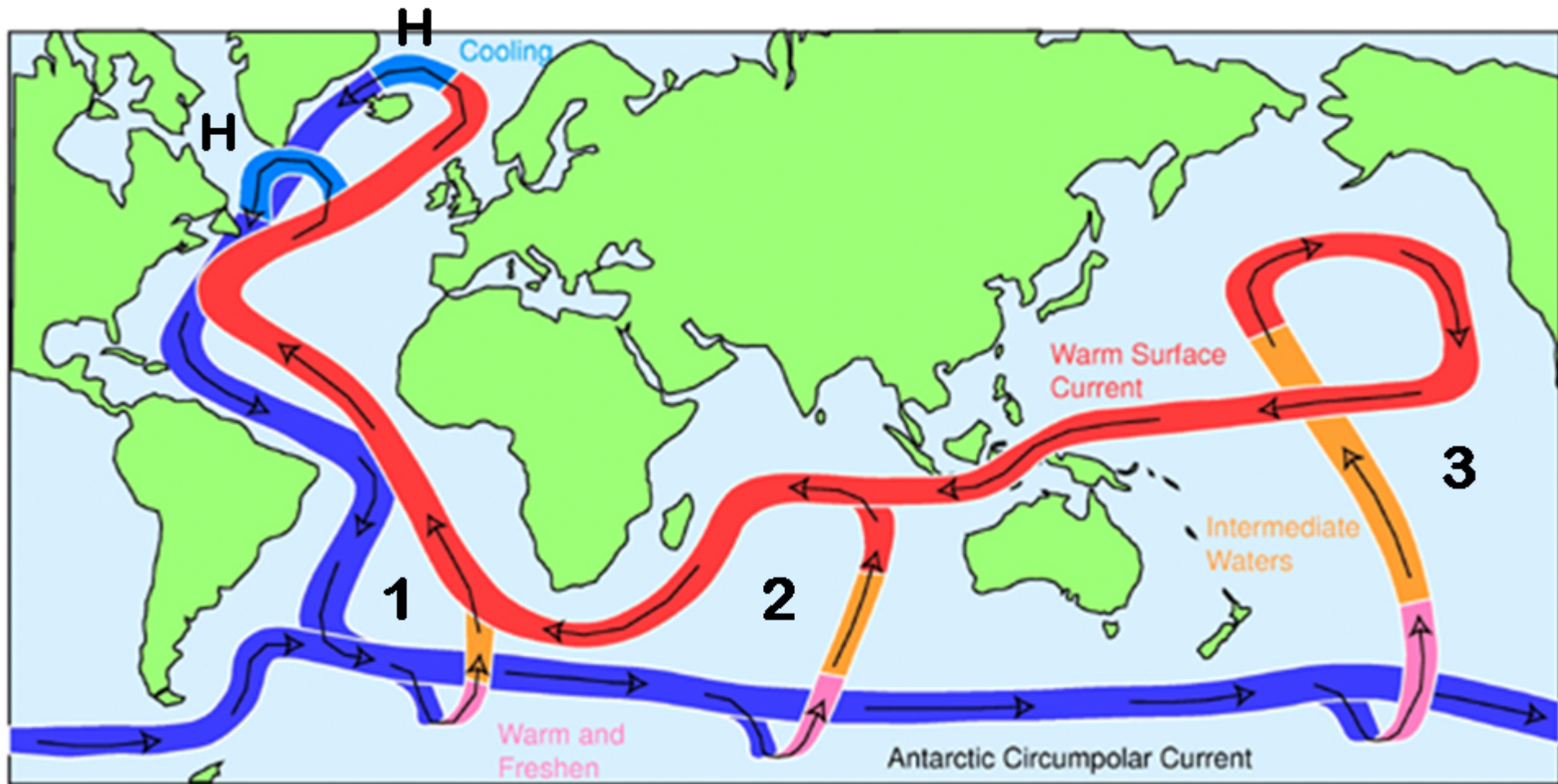
**Global models
do not issue
seasonal, yearly,
or decadal forecasts -
why? They don't
have any skill**

Mean Temperature over Land & Ocean



Mean Temperature over Land & Ocean





FROM JOHN MARSHALL (MIT)

RECOMMENDATION

IT IS UNWISE TO FORCE A
REDUCTION IN GLOBAL
FOSSIL-FUEL PRODUCTION
AND A WEAKENING OF
GLOBAL ECONOMIC
DEVELOPMENT AT THIS TIME
BASED ON WHAT WE KNOW
NOW.

Climate Change

**Many
Scientists
Believe
Much More
Complex**

Climate Change Factors Anthropogenic (man-made)

Urbanization
Land Use Changes
Greenhouse gases
Aerosols

Natural

Solar Cycles
Ocean Cycles
Volcanism

Ever-Changing Climate

Reconstructing the Past Methods

Proxy
Observations
Balloon
Satellite

Environmental Impacts

Icecaps and Glaciers
Hurricanes
Snowfall
Droughts and Floods
Sea Level
Vegetation

Forecasting the Future Climate Model Forecasts

Complexity of the problem
Assumptions/Feedbacks

Empirical Models

Solar cycles
Ocean cycles

Cooling May Have Already Begun

- NOAA research (Lyman et al) has shown the global oceans have shown rapid cooling from 2003 and 2005, giving back 20% of the entire heat content gained since 1957
- If history repeats, Pacific will go to cool mode first (soon) and Atlantic follow in a decade or so
- NCDC and CRU data shows temperatures trend is down from peak in 1998

Solar Cycle Changes

- Last cycle max was 25% weaker than prior two cycles.
- 9 of 12 solar cycle predicting models suggest upcoming 11-year solar cycle(s) could be much weaker (see Lund cycle 24)
- Hathaway (NASA) says “*Solar Cycle 25, which peaks in the year 2022, should be one of the weakest ever observed*”
- Very weak solar cycles have been historically associated with cold periods, **even mini-ice-ages**

The Russians Agree

- Russian Academy of Science has **warned of an imminent recurrence of a minor Ice Age**, similar to the one in the 17th century, when temperatures dropped in Europe, North America and Greenland, the Thames and Dutch canals froze in winter, and people fled from Greenland because of unbearable cold.
- The scientists made the conclusion on the basis of a big decline in solar activity expected the next 50 years or so