

CLIMATE CHANGE IN PERSPECTIVE

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CLIMATE CHANGE IN PERSPECTIVE

- We're going to use a data-based approach to challenge some of the “accepted notions” of climate change.
 - You'll notice a common theme – advocates for climate change present only selected data to support their conclusions. We're going to look at all the data.
- We're going to examine some of the predictions that have been made by some scientists and the press about the fate of the earth and mankind if we don't address “climate change”.

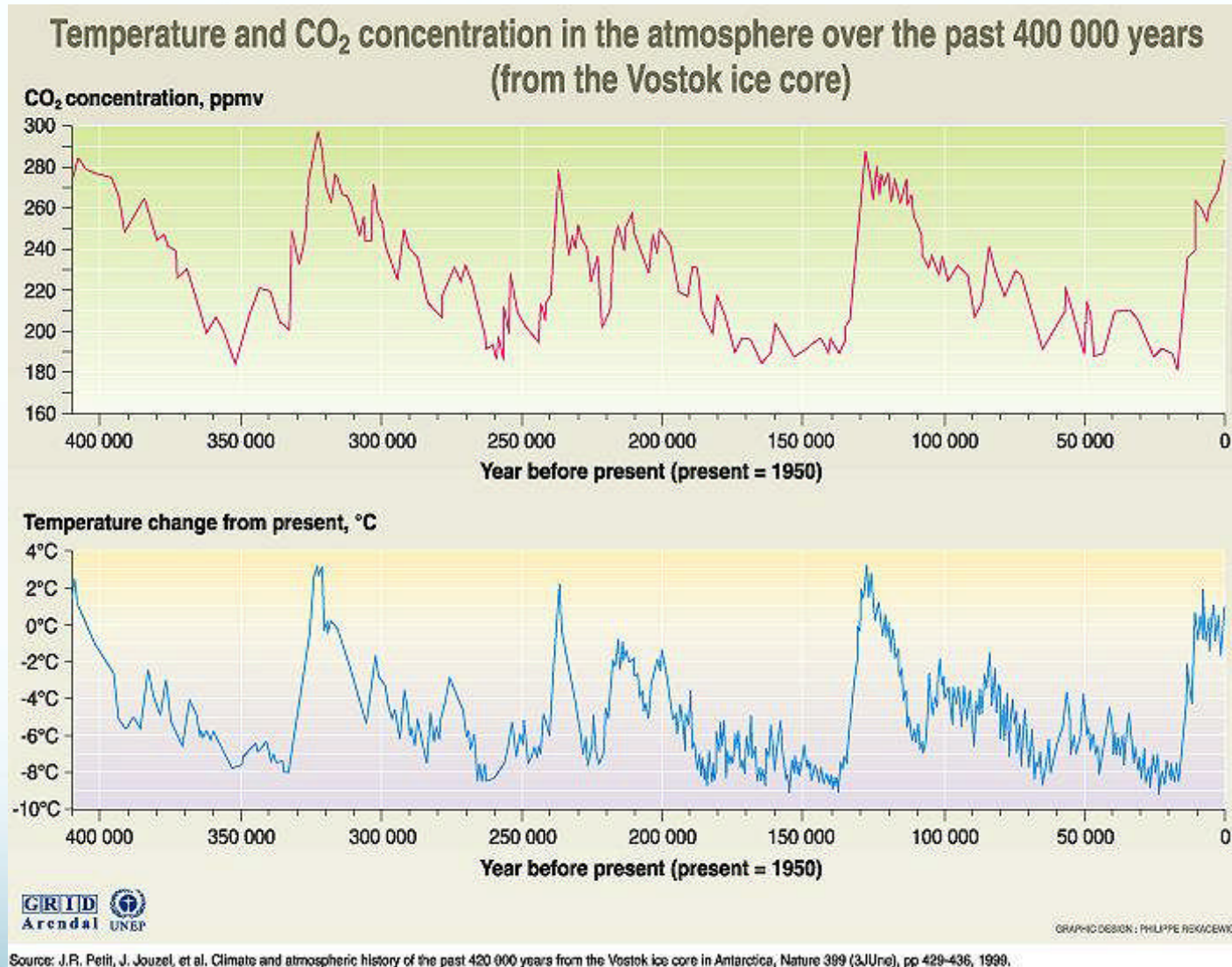
CLIMATE CHANGE IN PERSPECTIVE

Accepted notions about climate change

Modern societies dependence on fossil fuels is causing:

- More greenhouse gases (CO₂) affecting the atmosphere
- An overall warming of the earth
- An increasing number and intensity of heat waves
- ... Leading to more forest fires
- The melting of glaciers and ice caps
- ... Causing rising water levels in the oceans
- More violent storms and severe weather events

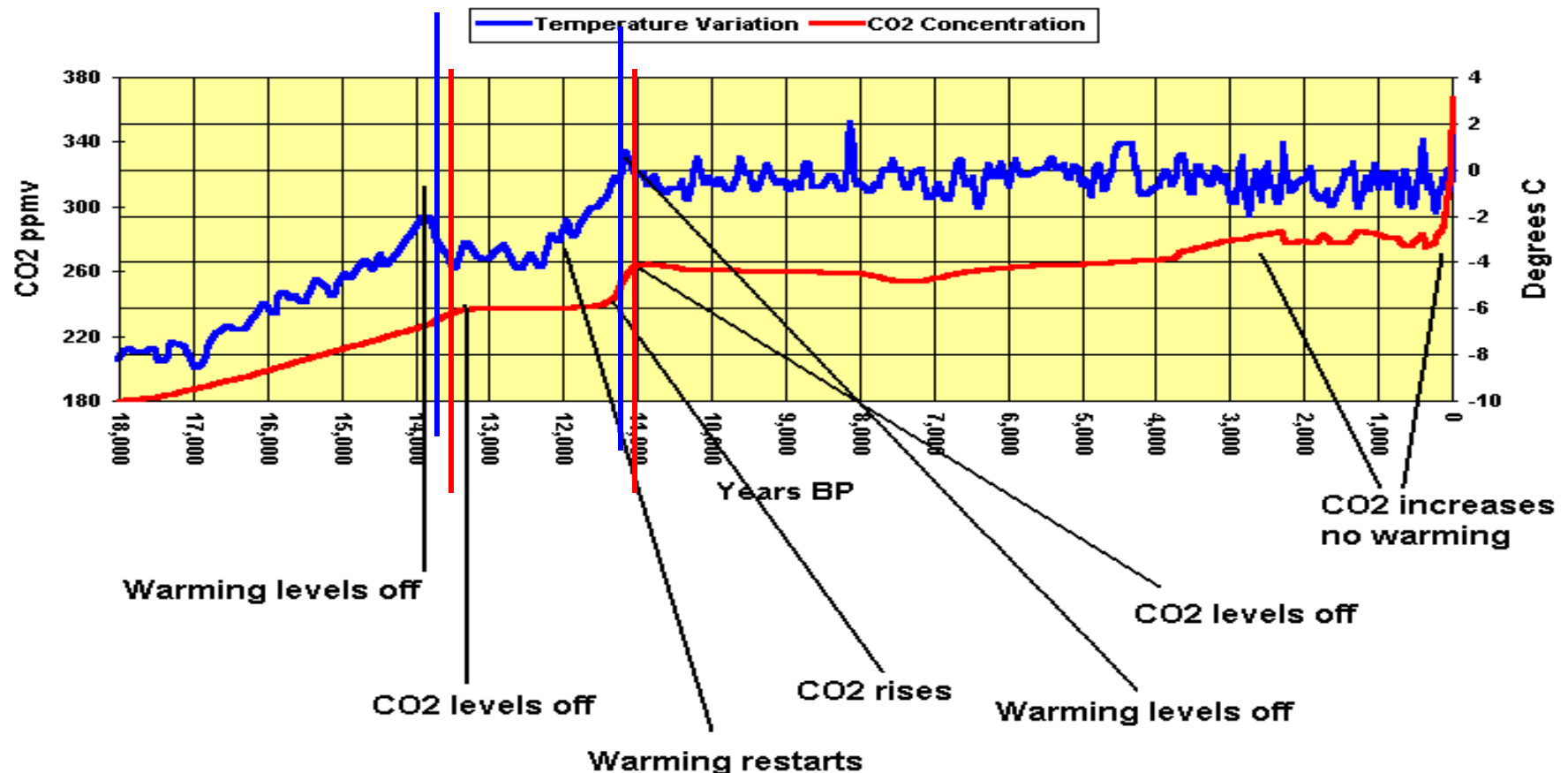
CO₂ concentration and temperature and are well correlated.



400,000 years Carbon Dioxide levels vs. Temperature

However, temperature increases come before increases in CO2 concentration.

Antarctic Ice Core Data 2



18,000 years Carbon Dioxide levels vs. temperature (my notations)

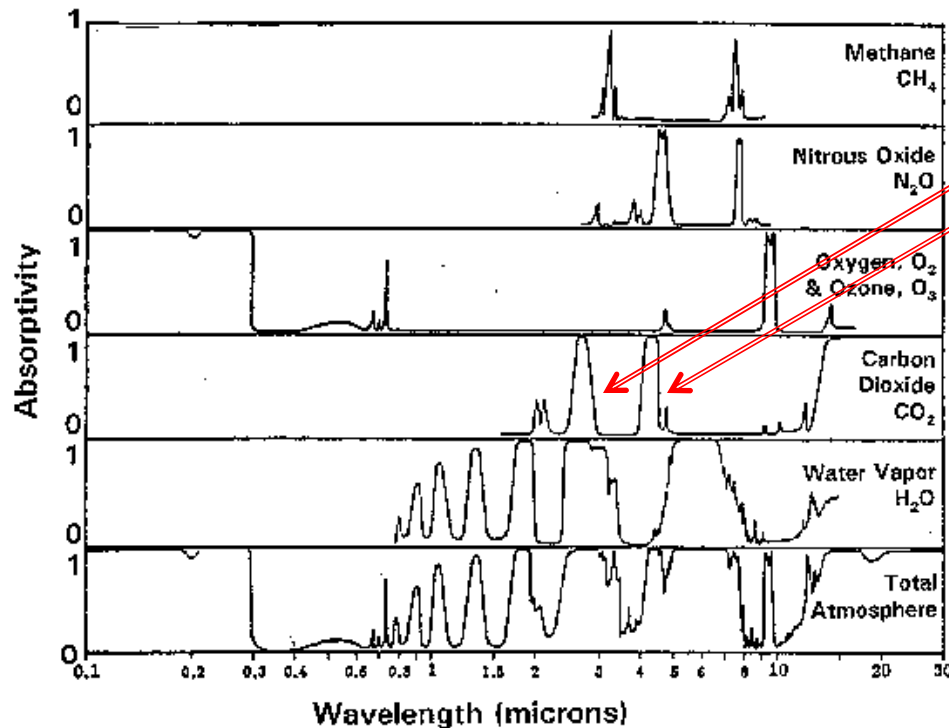
Accepted notion:

An increase in greenhouse gases (CO₂) affects the atmosphere causing an overall warming of the earth.

- The ocean has the vast majority of the CO₂ on the planet.
- When the bulk of the ocean warms, CO₂ and other dissolved gases are expelled.
- With ocean currents being roughly as they are now (the Atlantic Conveyor) it takes 800 years or more for the bulk of the ocean to warm up after the surface does.
- Therefore, the data don't support the notion that CO₂ causes an increase in temperature.
- Rather, increases in temperature cause increases in CO₂ approximately 800 years later.

Understanding the Earth's Thermostat

ABSORPTION SPECTRA FOR MAJOR NATURAL GREENHOUSE GASES IN THE EARTH'S ATMOSPHERE



[After J. N. Howard, 1959: *Proc. I.R.E.* 47, 1459; and R. M. Goody and G. D. Robinson, 1951: *Quart. J. Roy. Meteorol. Soc.* 77, 153]

There's a limit to the magnitude of the effect CO₂ concentration can have on the atmosphere.

CO₂ only absorbs infrared (heat) in two narrow wavelengths.

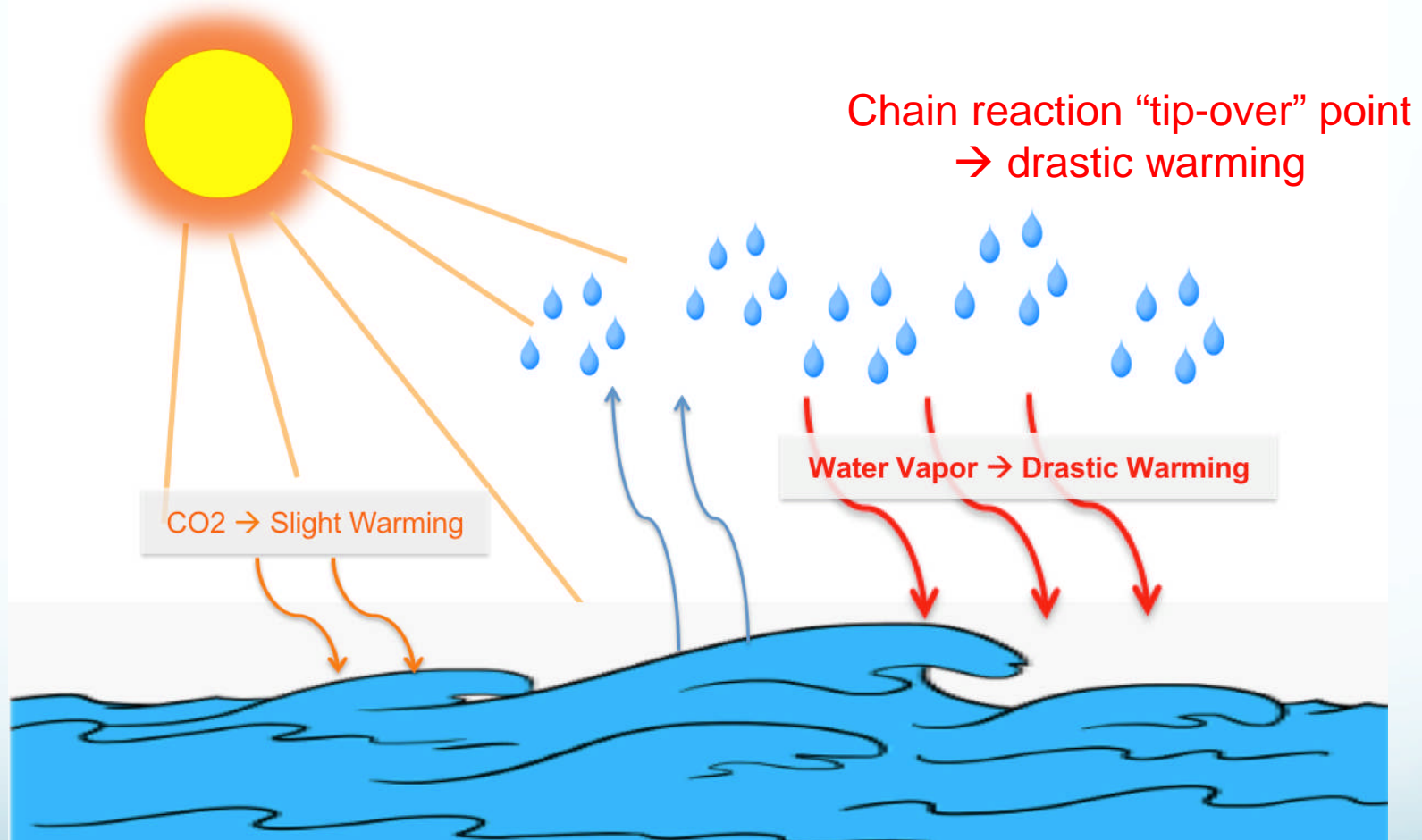
The current concentration of CO₂ already absorbs over 90% of the infrared in those wavelengths.

If you double or triple CO₂ concentrations, absorption will increase only by 10%, i.e., from 90% to 100%.

Absorption spectra of air constituents

Understanding the Earth's Thermostat

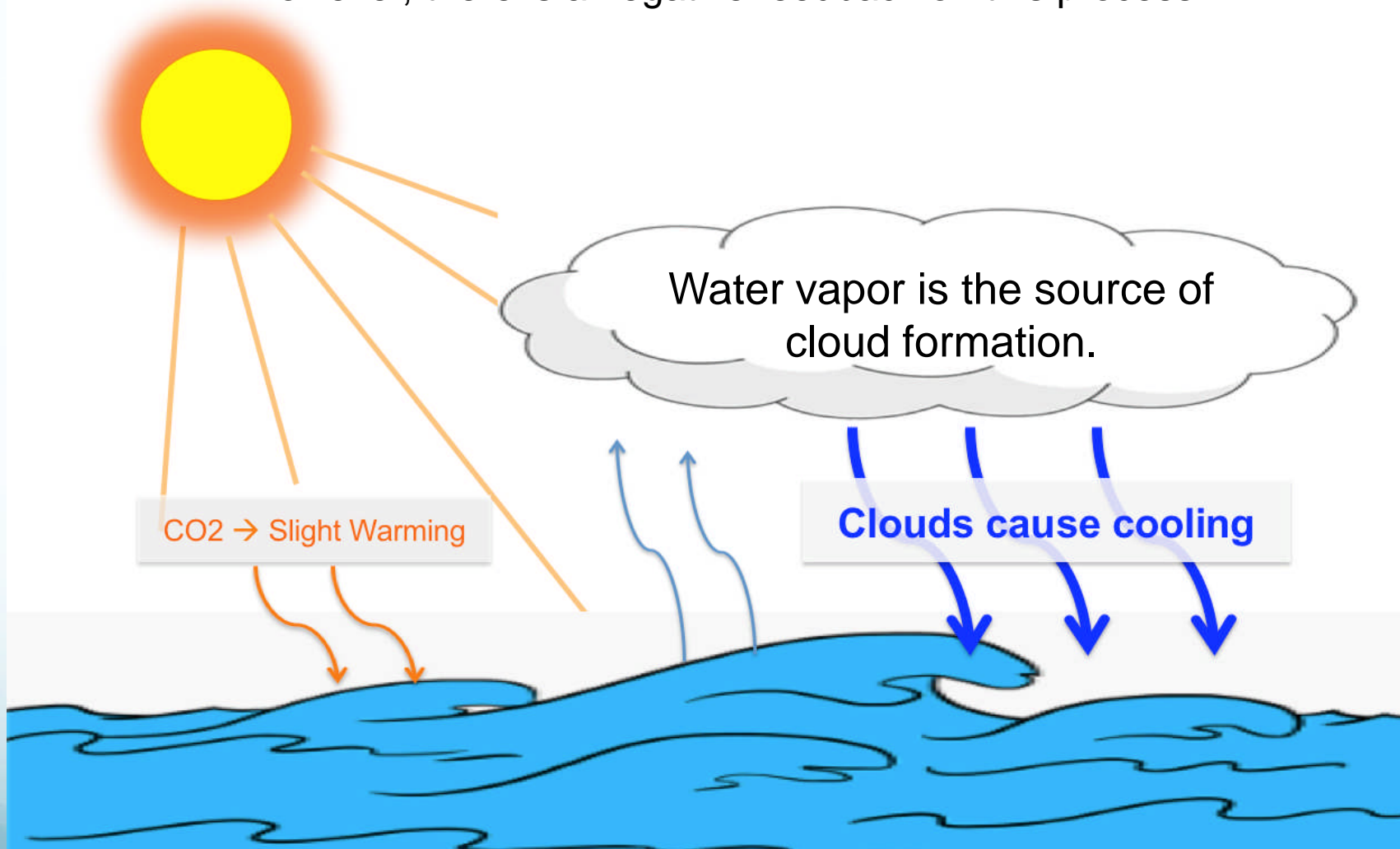
Advocates of CO₂-driven warming respond to this argument as follows:



However ...

Understanding the Earth's Thermostat

However, there is a negative feedback on this process.



Which effect wins?

Water vapor
as a greenhouse gas
→ Drastic warming

vs.

Water vapor
forming clouds
→ Cooling the atmosphere

Neither wins.

The two mechanisms are the “earth’s thermostat”

As we’ll see in the next few slides, in its history, the Earth has warmed to temperatures much higher than they are today, and has naturally recovered time and time again.

CLIMATE CHANGE IN PERSPECTIVE

Accepted notions about climate change

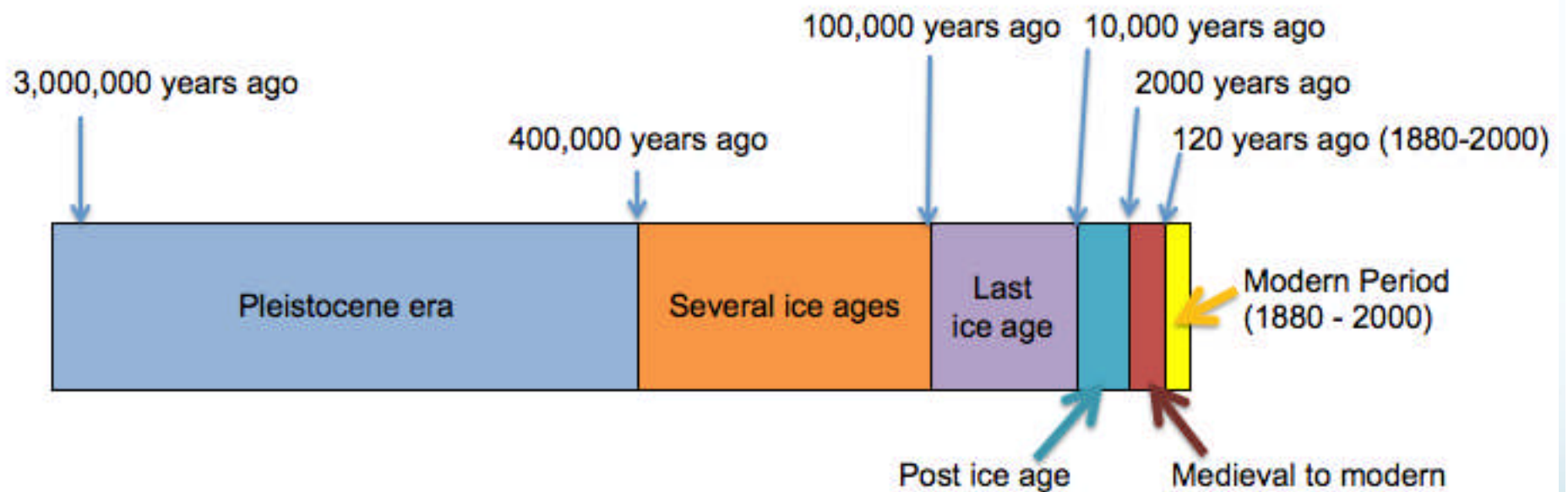
Modern societies dependence on fossil fuels is causing:

- More greenhouse gases (CO₂) affecting the atmosphere
- An overall warming of the earth

Let's look at temperature patterns in greater depth.

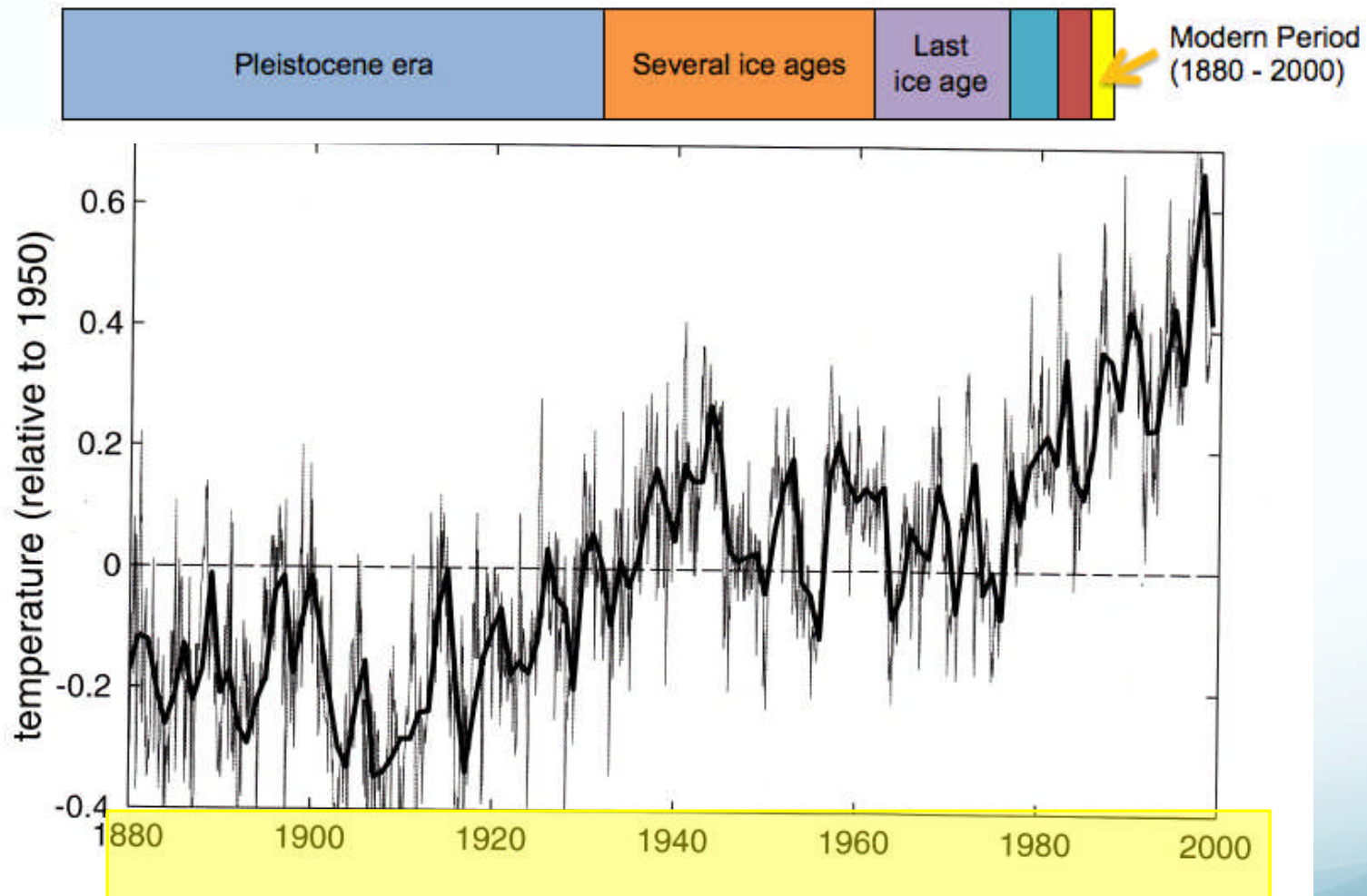
Accepted notion:
More greenhouse gases (CO₂) → Global warming

Historical temperature record starting with the modern period
and working back.



Accepted notion:
More greenhouse gases (CO₂) → Global warming

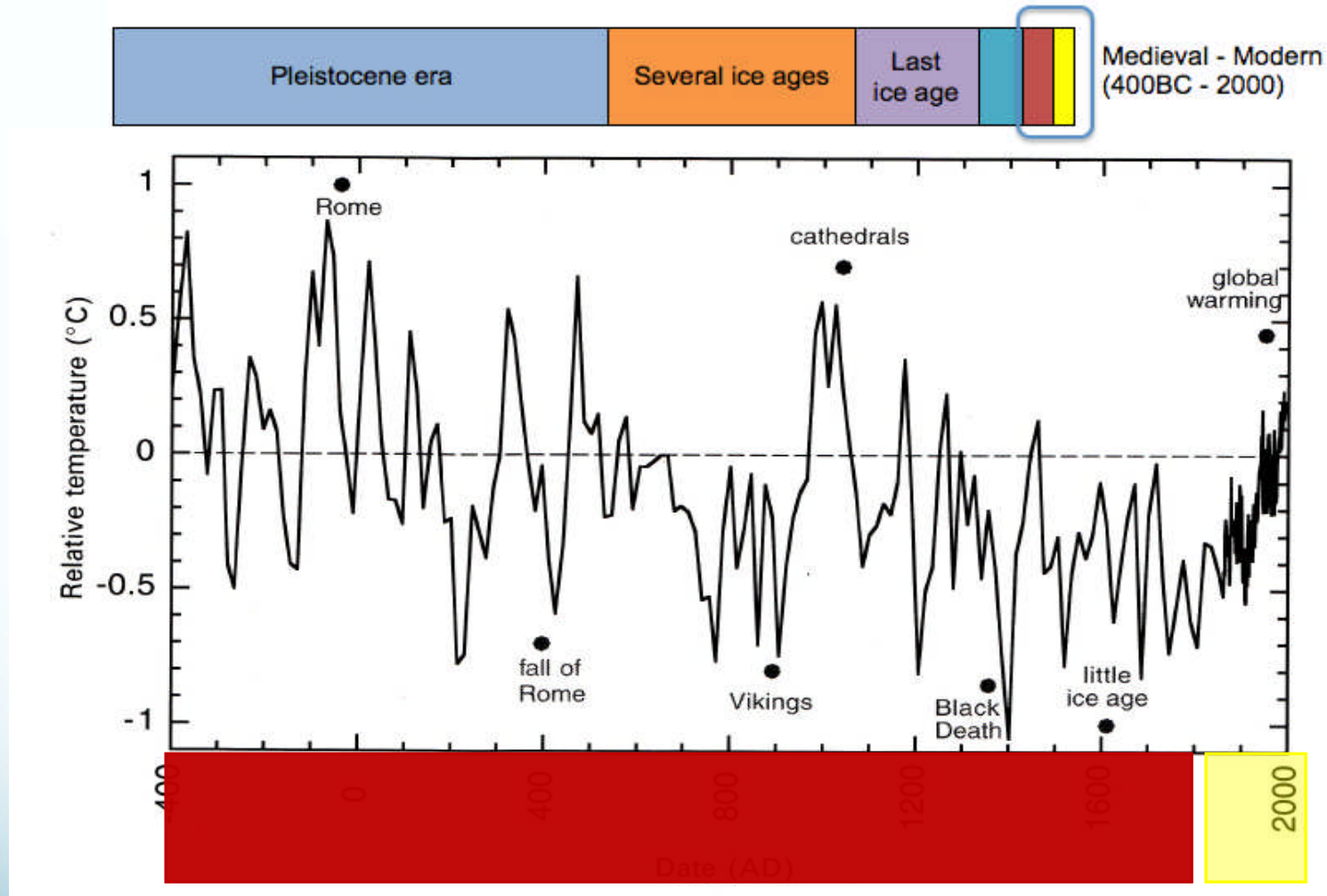
Climate change advocates show changes in the modern period (1880 to 2000)
in support of global warming.



Ice Ages and Astronomical Causes, Muller & MacDonald (Springer-Praxis, 2000)

Accepted notion:
More greenhouse gases (CO₂) → Global warming

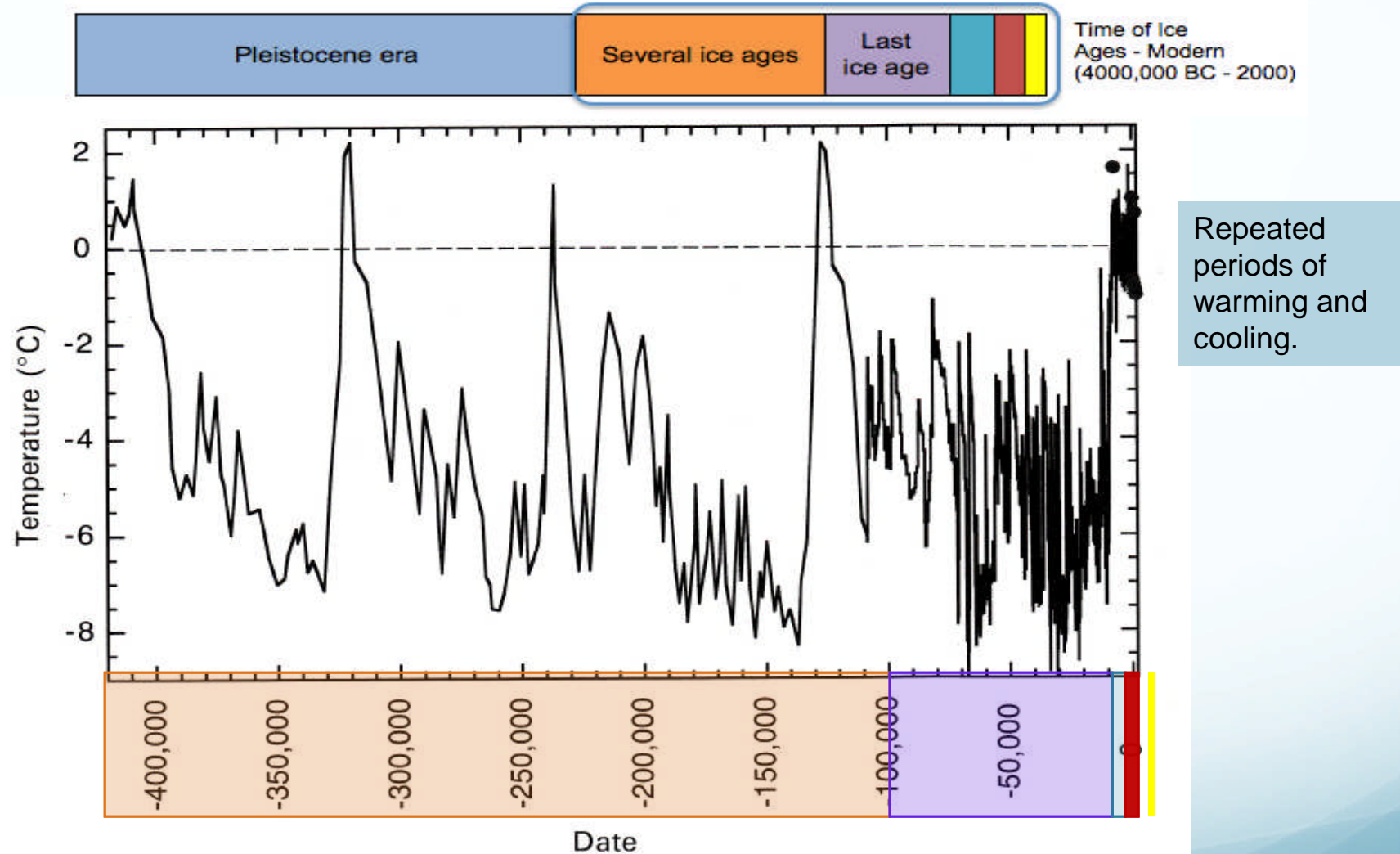
Data you don't usually see: Medieval to Modern (400 BC to 2000)



Ice Ages and Astronomical Causes, Muller & MacDonald (Springer-Praxis, 2000)

Accepted notion:
More greenhouse gases (CO₂) → Global warming

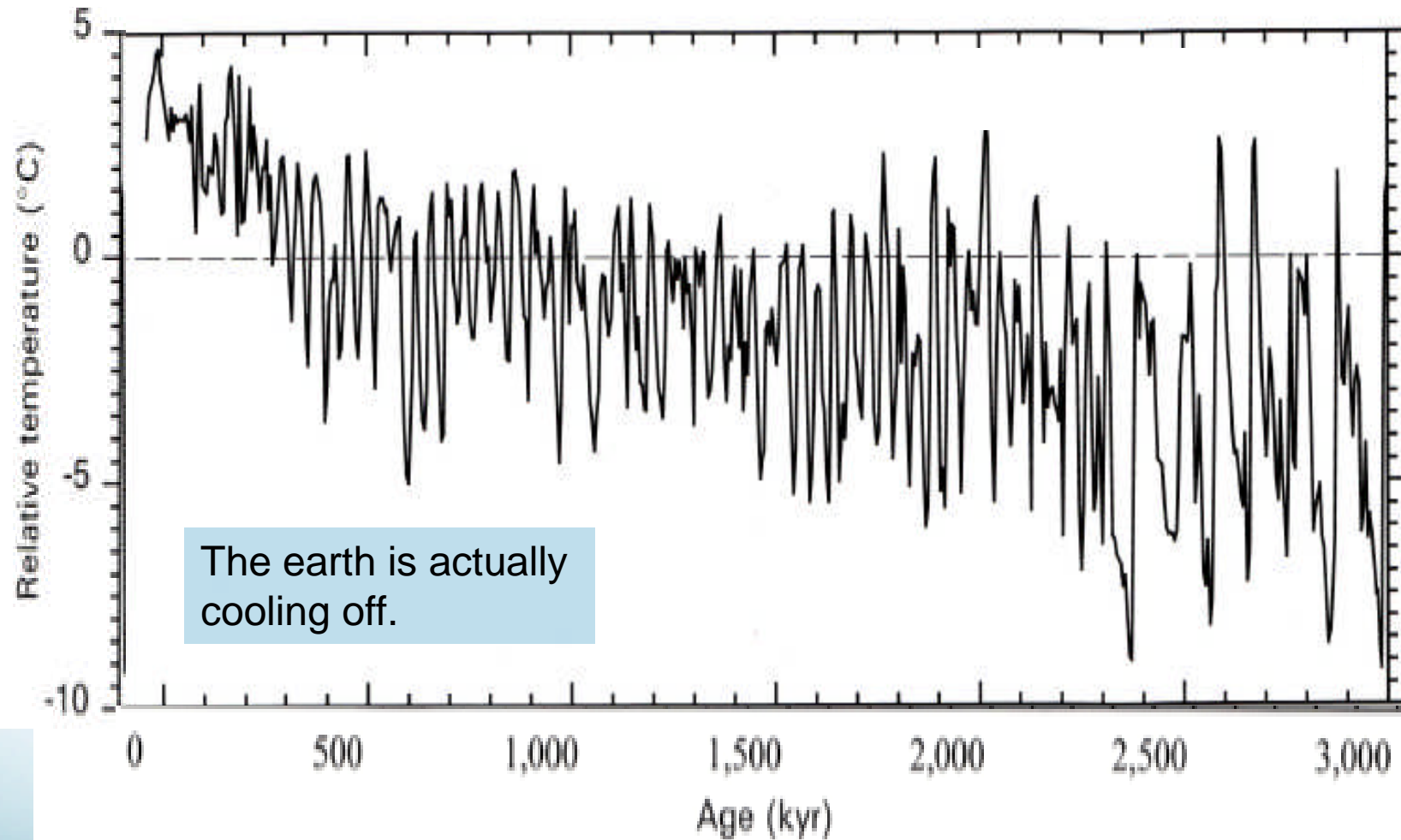
Data you don't usually see: Time of Ice Ages to Modern (400,000 BC to 2000)



Ice Ages and Astronomical Causes, Muller & MacDonald (Springer-Praxis, 2000)

Accepted notion:
More greenhouse gases (CO₂) → Global warming

Data you don't usually see: Back to the Pleistocene Era (3,000,000 years)



Ice Ages and Astronomical Causes,
Muller & MacDonald (Springer-Praxis, 2000)
mirror image of original

CLIMATE CHANGE IN PERSPECTIVE

Accepted notion:

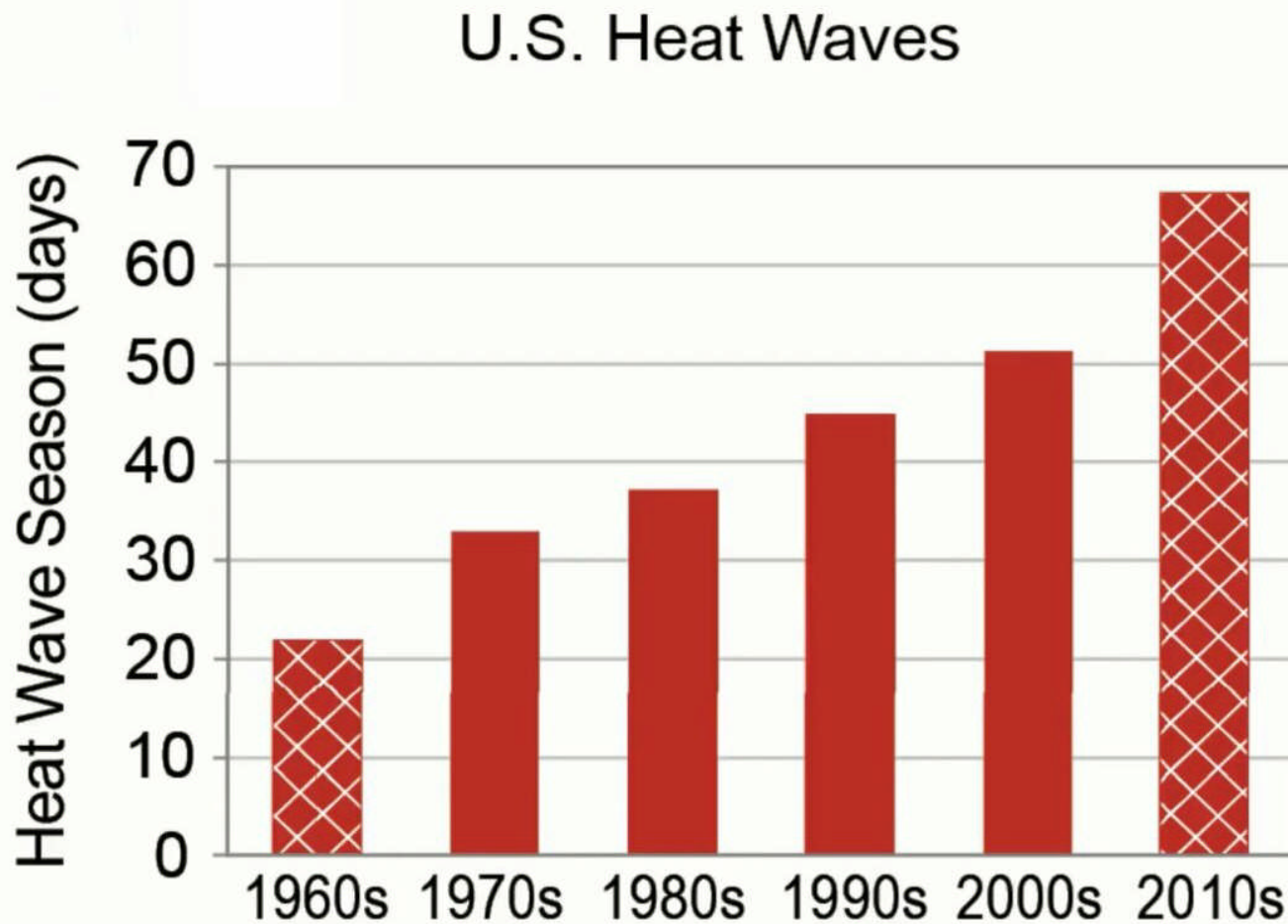
Dependence on fossil fuels is causing more greenhouse gases (CO₂) affecting the atmosphere and leading to global warming.

The complete data shows:

Throughout history, the earth has warmed and cooled periodically.

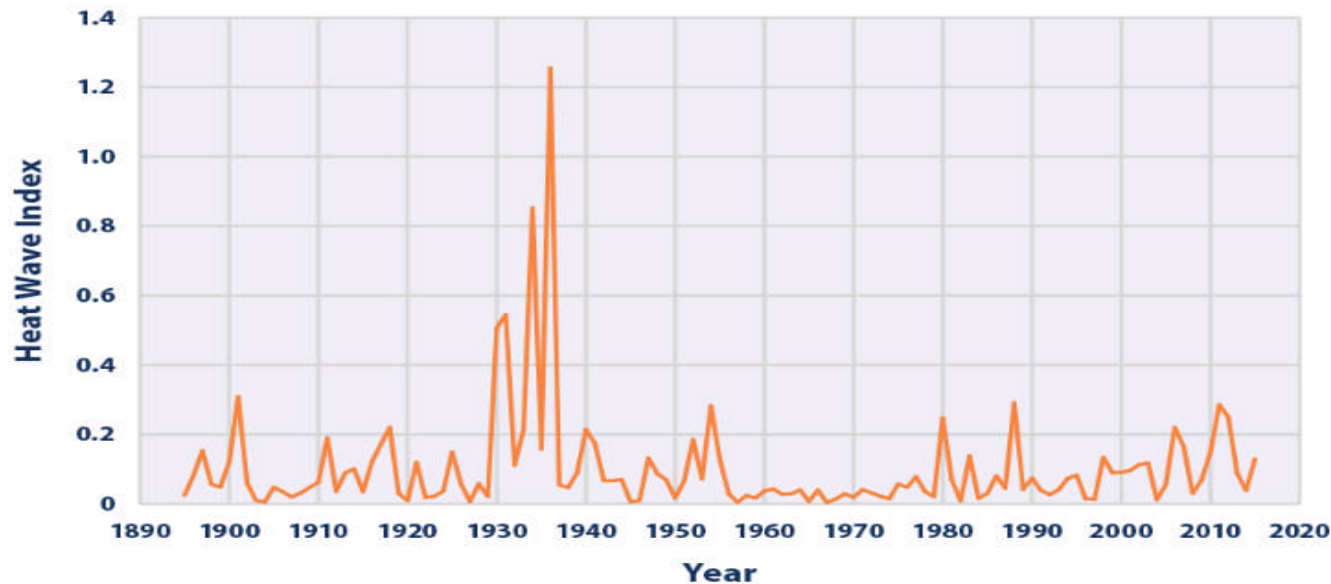
Increases in temperature come before increases in CO₂ concentration.

Accepted notion:
There is an increasing number of heat waves.



If you go back further in time, there are fewer heat waves now than in the 1930s.

Figure 1. U.S. Annual Heat Wave Index, 1895–2015



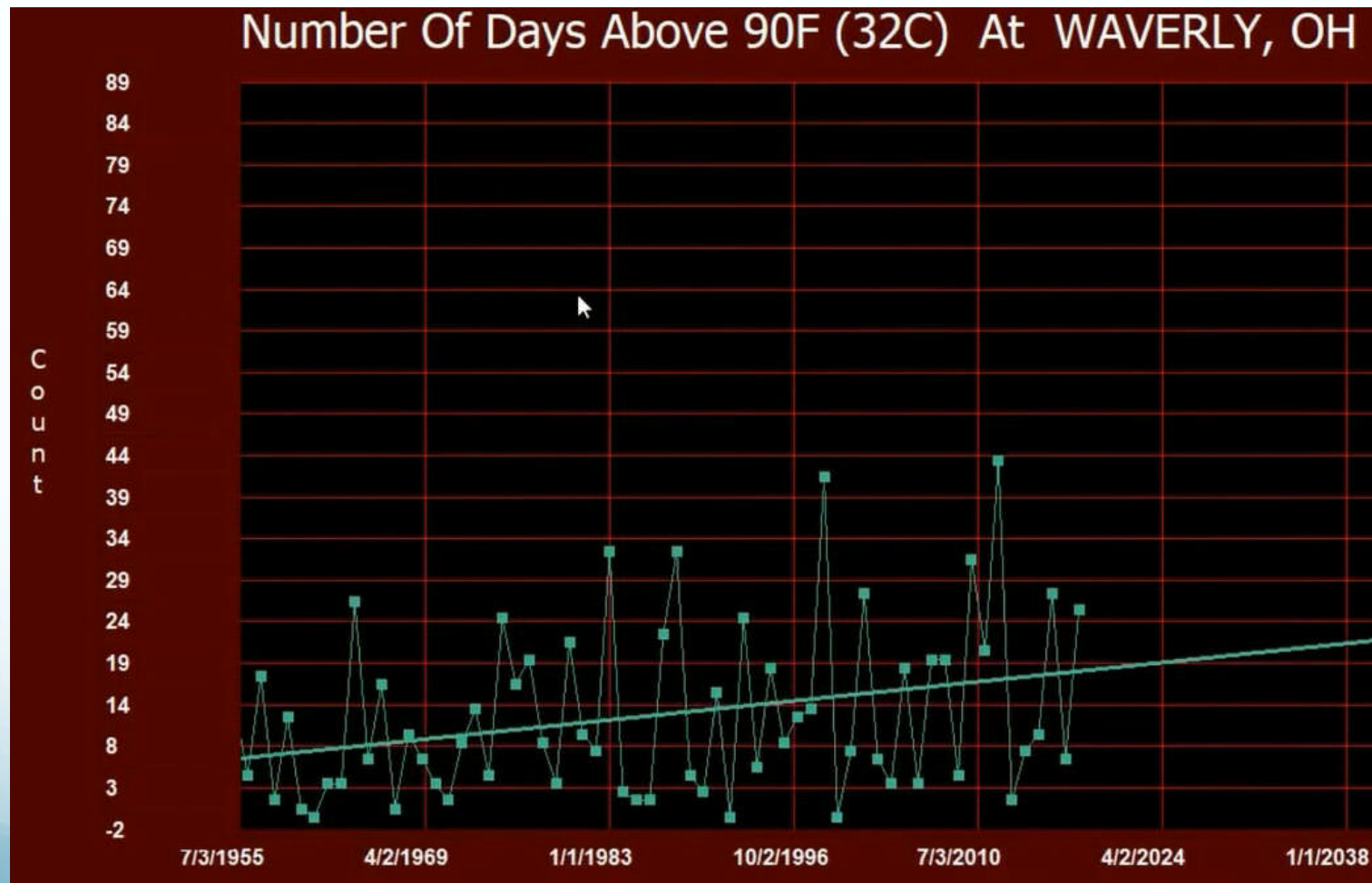
This figure shows the annual values of the U.S. Heat Wave Index from 1895 to 2015. These data cover the contiguous 48 states. Interpretation: An index value of 0.2 (for example) could mean that 20 percent of the country experienced one heat wave, 10 percent of the country experienced two heat waves, or some other combination of frequency and area resulted in this value.

Data source: Kunkel, 2016⁶

Web update: August 2016

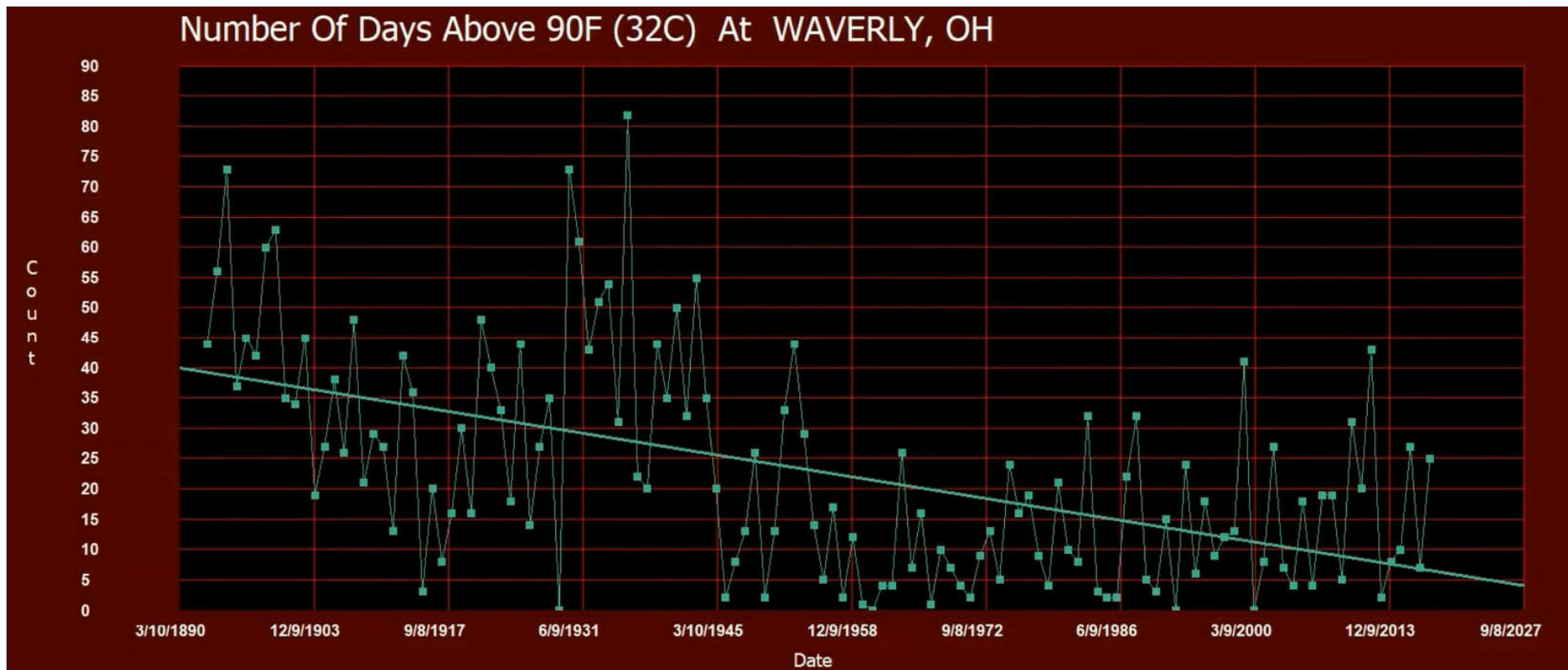
One example of selecting a small slice of data that supports your narrative.

The number of days above 90F since 1955
Best fit straight line \rightarrow the slope shows an increase



If we look at all the data ...

The number of days above 90F since 1890
Best fit straight line → the slope shows a decrease



CLIMATE CHANGE IN PERSPECTIVE

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Dependence on fossil fuels is causing more greenhouse gases (CO₂) affecting the atmosphere and leading to global warming.

There is an increasing number of heat waves.

The complete data shows:

Throughout history, the earth has warmed and cooled periodically.

Increases in temperature come before increases in CO₂ concentration.

We're experiencing fewer heat waves now than in the 1930s.

CLIMATE CHANGE IN PERSPECTIVE

Accepted notions:

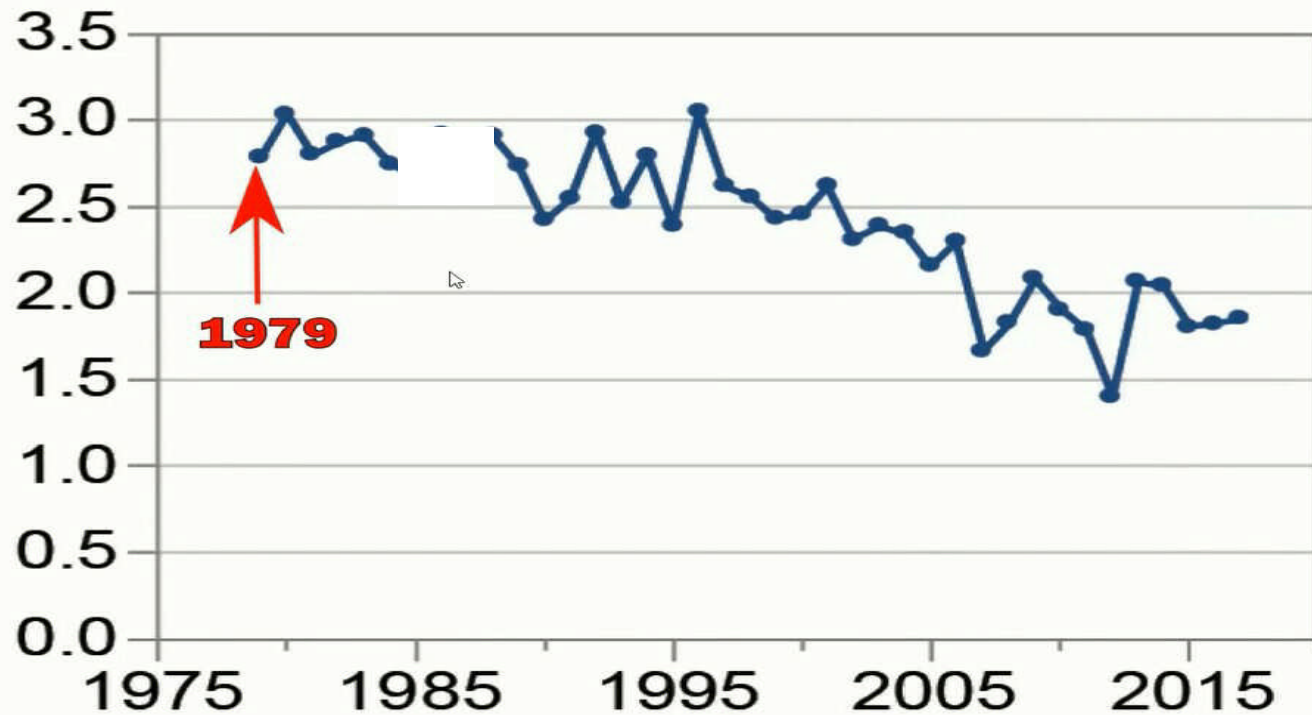
Glaciers and Icecaps are melting

... Causing the ocean levels to rise

Are glaciers melting?

Slice of satellite data from 1979.
Seems to indicate glaciers are melting.

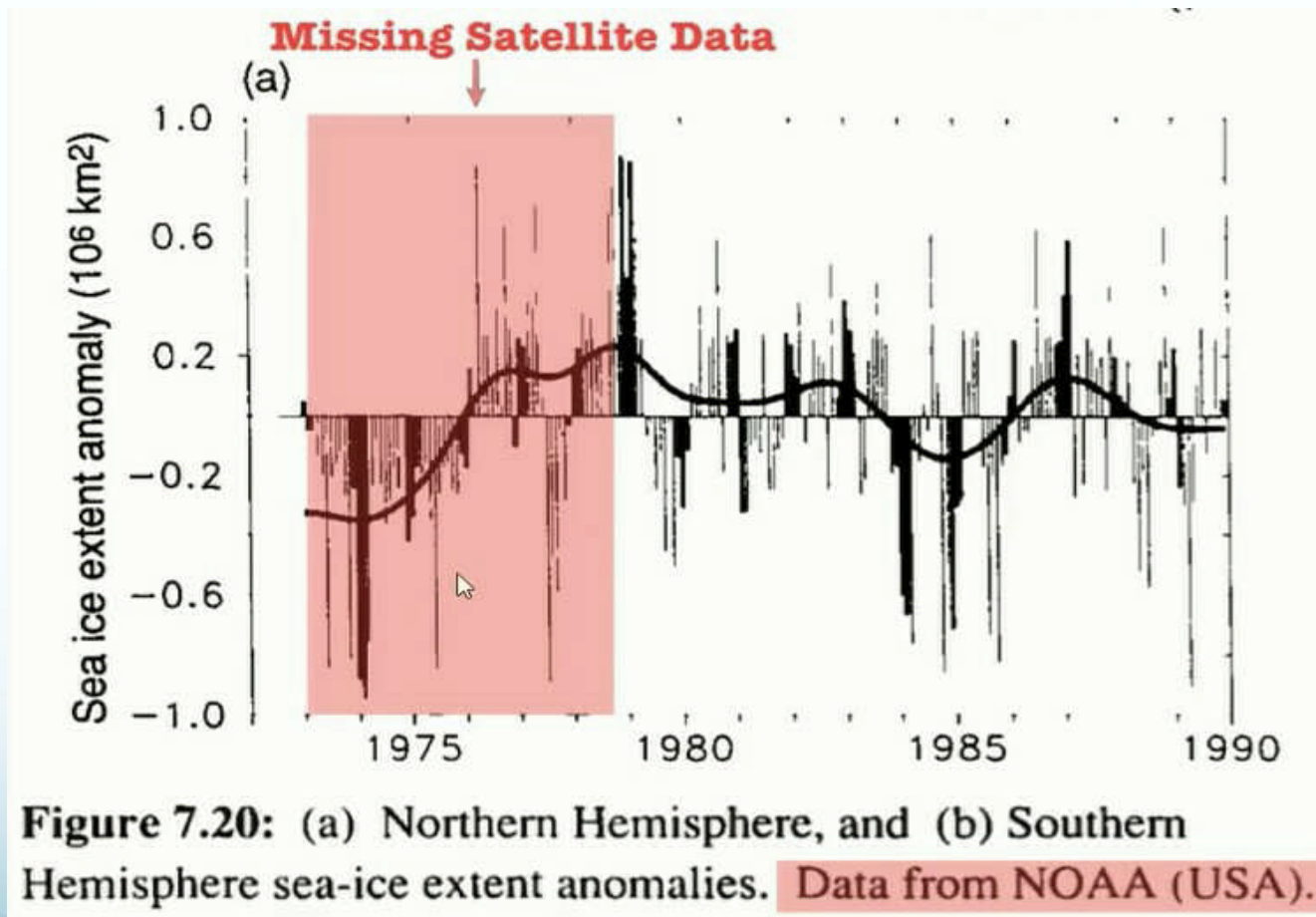
Arctic Sea Ice Extent



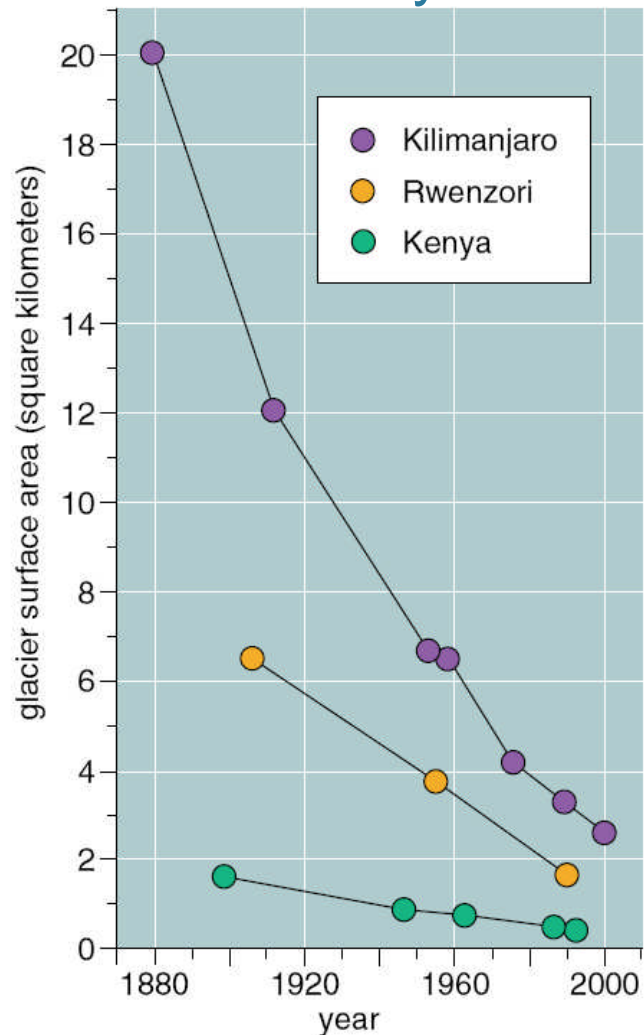
Are glaciers melting? – Not if you look further back

Satellite data from 1973.

Amount of sea ice modulates. In fact it's a bit greater now.



Are icecaps are melting? Not if you look at all the circumstances.



As an example:

- Kilimanjaro: the maximum temperature on the mountain ever recorded is -2.4°C . Ice doesn't melt at -2.4°C .
- Deforestation of the surrounding terrain started 150 years ago under British rule and continues today under local government. As a result, the air is much drier.
- Dry air flows over the glaciers and turns the ice directly to vapor.
- In other words sublimation.

Glacier surface area on major mountain ranges in East Africa (Mote & Kaser)

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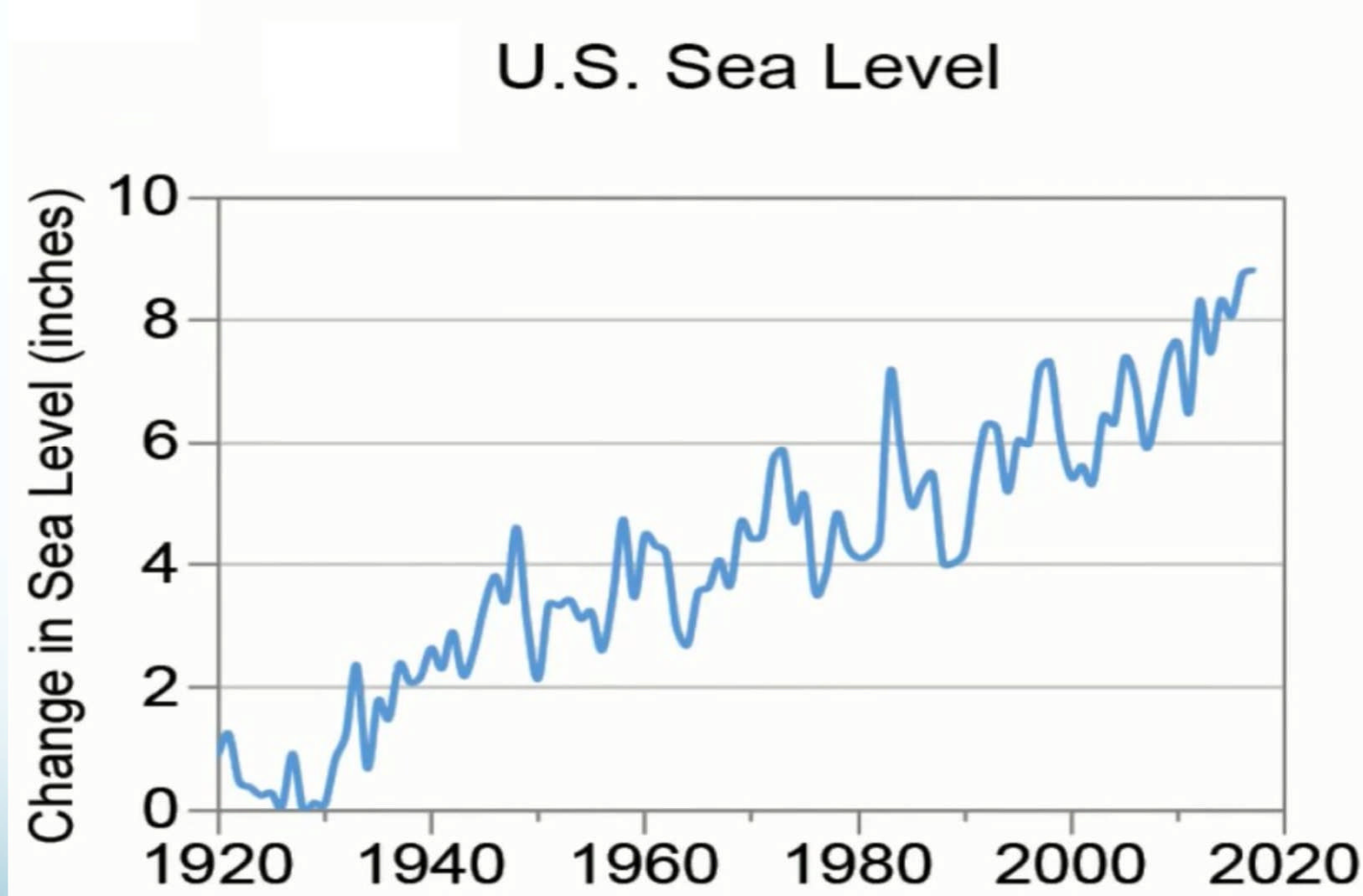
We're experiencing fewer heat waves now than in the 1930s.

Satellite data indicate sea ice levels are actually higher than in about 1970.

Temperatures remain below freezing. Deforestation and resulting dry air is causing ice caps to sublime.

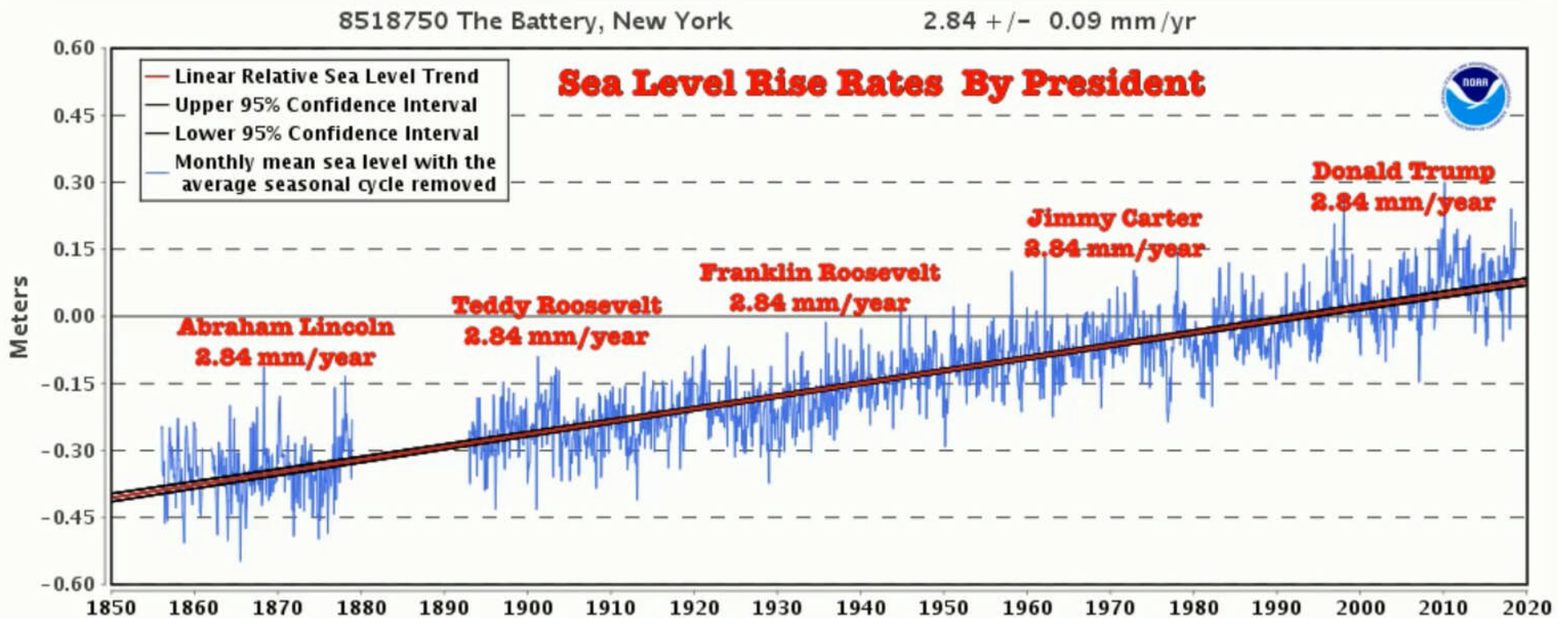
Accepted notion: Sea levels are rising more rapidly due to increased use of fossil fuels in recent years

Typically, you see data from about 1920 that supports this point of view.



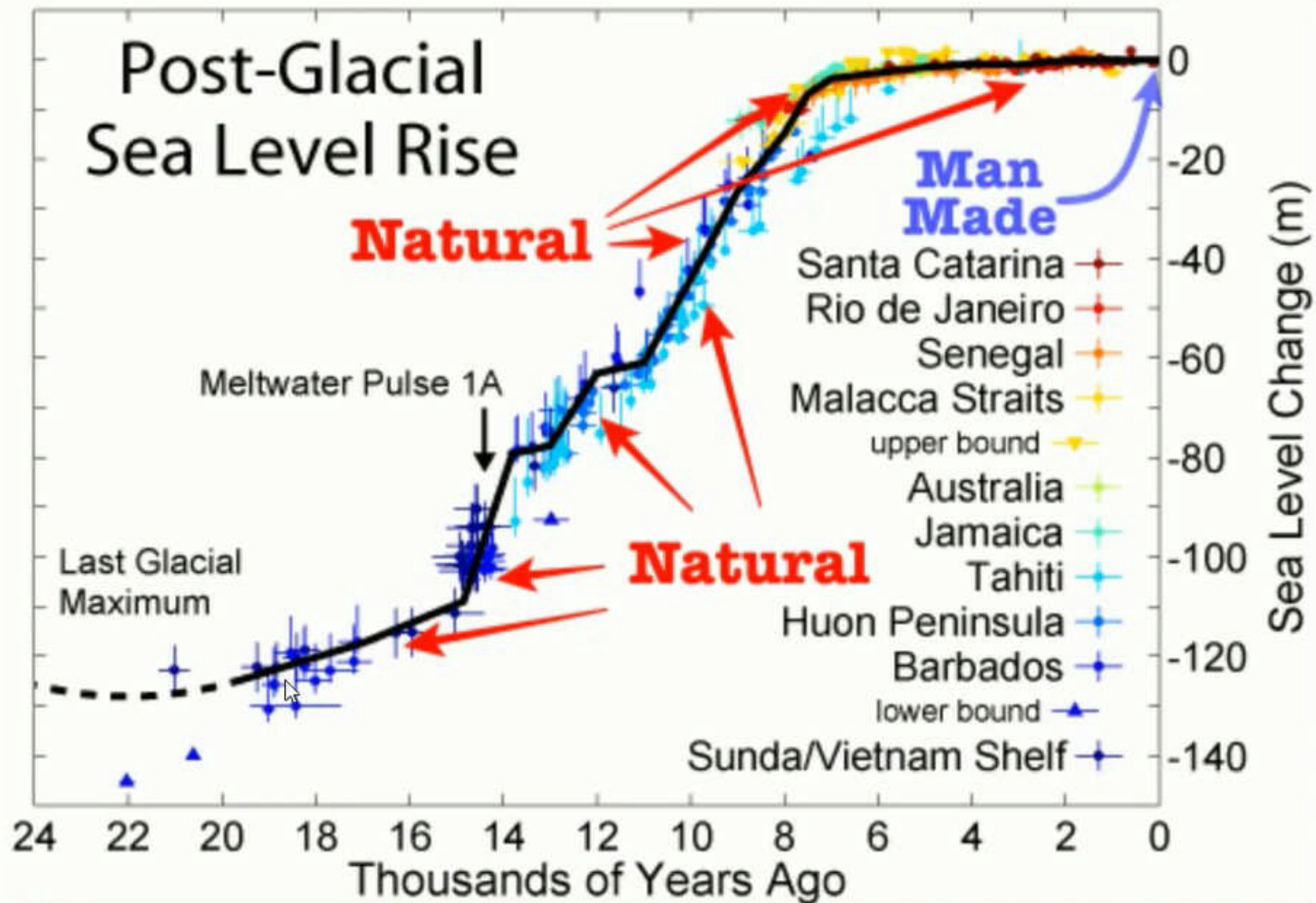
In fact, sea levels have been increasing pretty steadily at a rate of 2.84 mm/year for the last couple of hundred years.

Were there more fossil fuels burned in Abraham Lincoln's time than there are today?



Going back further we see that sea levels began increasing after the last glacial maximum about 16-18 thousand years ago.

The increase has slowed considerably in the last several thousand years.



CLIMATE CHANGE IN PERSPECTIVE

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Melting glaciers and ice caps are causing ocean levels to rise.

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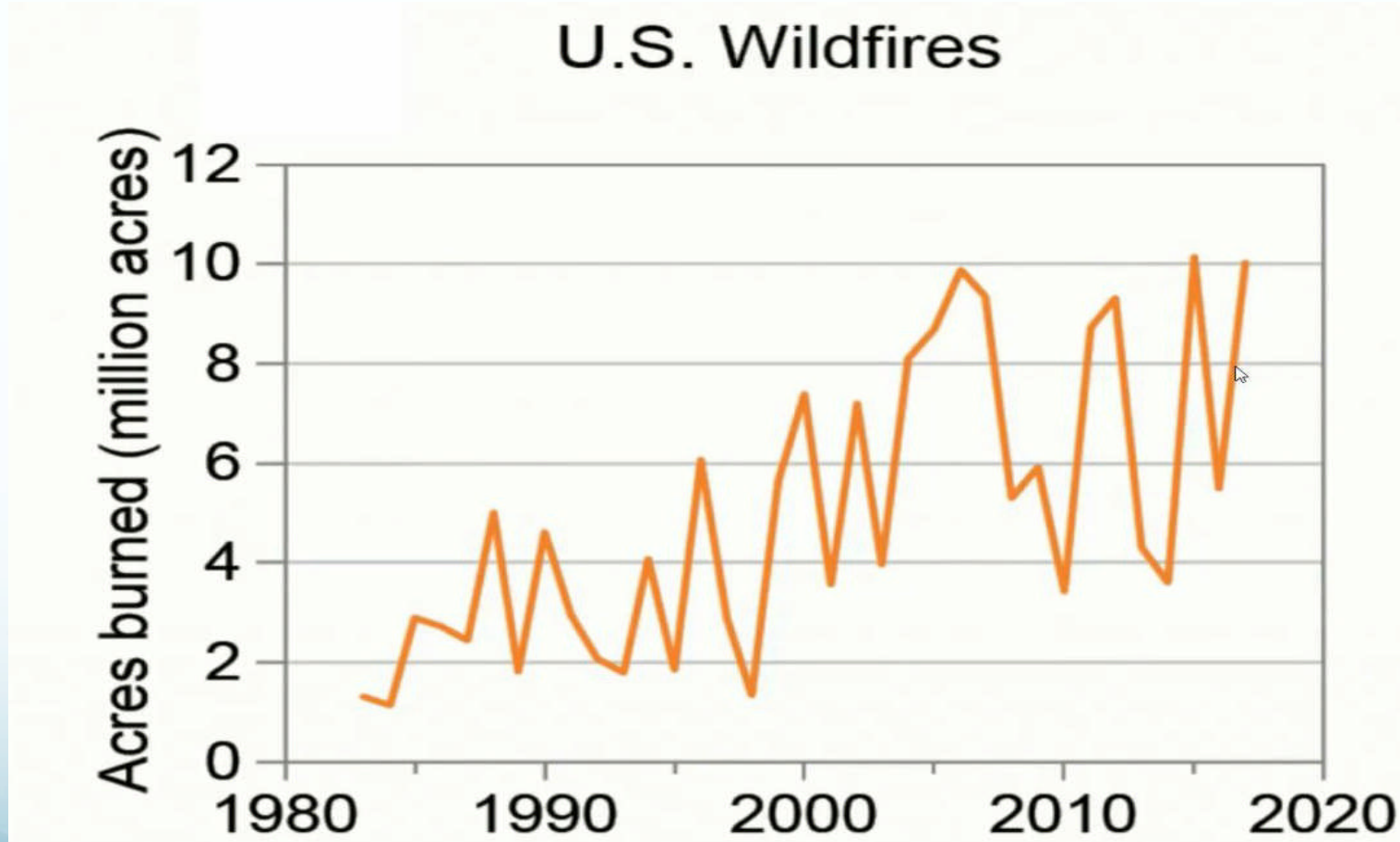
We're experiencing fewer heat waves now than in the 1930s.

Sea ice levels are actually higher than in about 1970. Deforestation and resulting dry air is causing ice caps to sublime.

There is no evidence that the steady rise in sea levels is related to human activity. The rise pre-dates the industrial revolution and the dramatic increase in world-wide population with the increased use of fossil fuels.

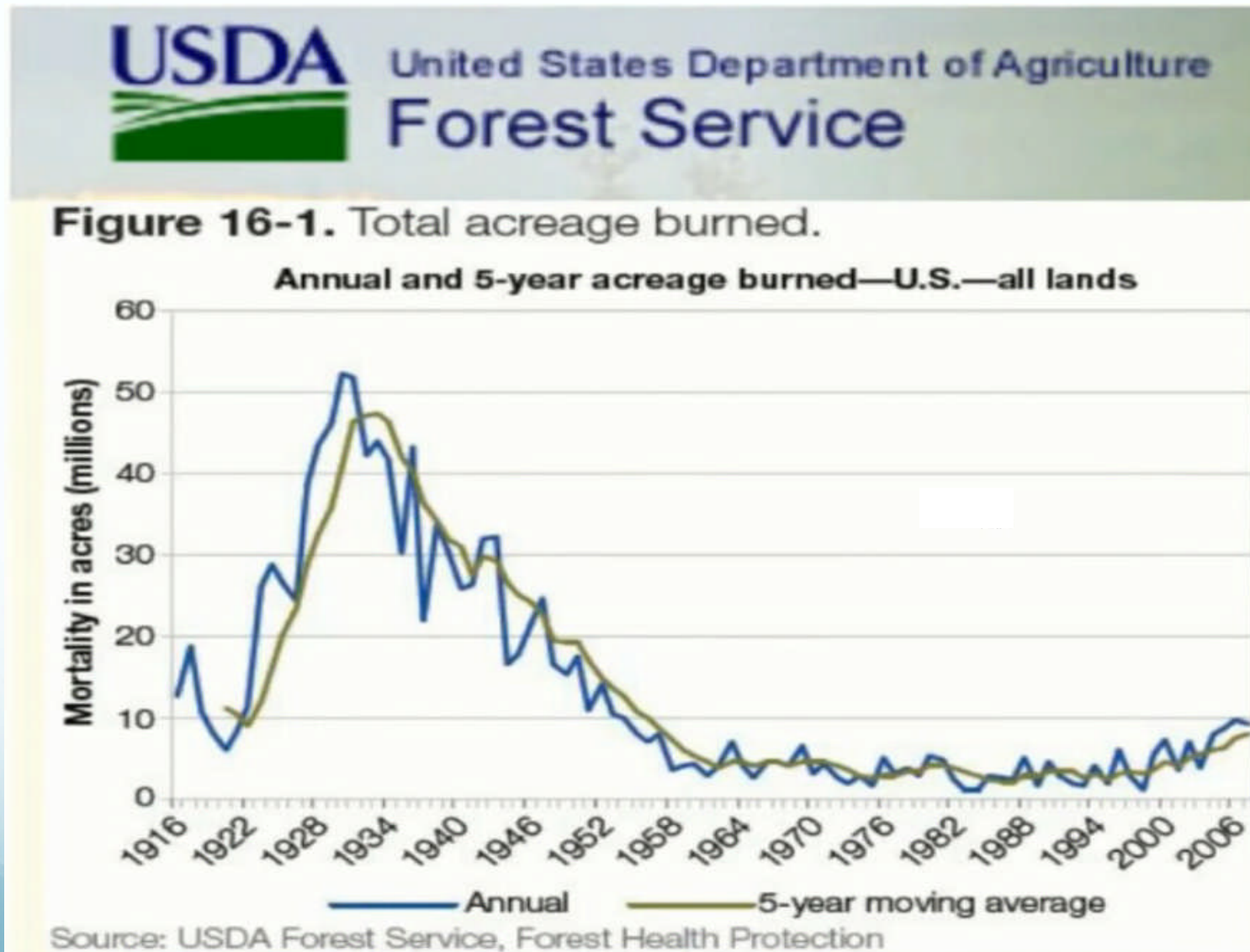
Accepted notion:
In recent years we're experiencing a lot more wild fires!

Slice of data from about 1980 seems to indicate this is true.



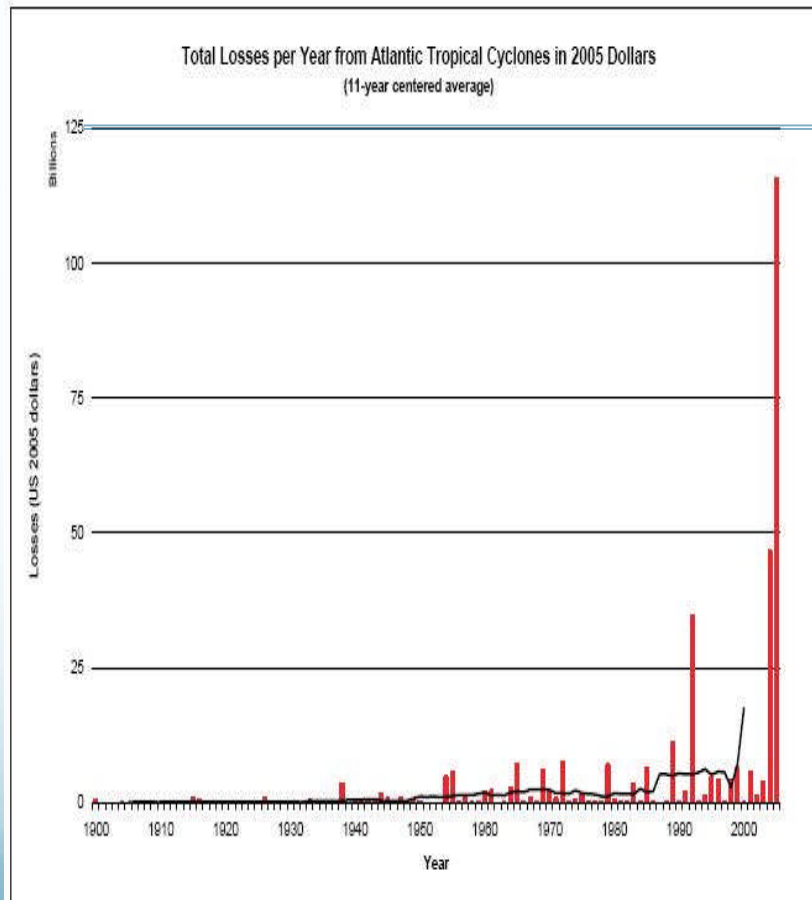
If we go further back to about 1920 ...

There are fewer wild fires now than in the first half of the century!

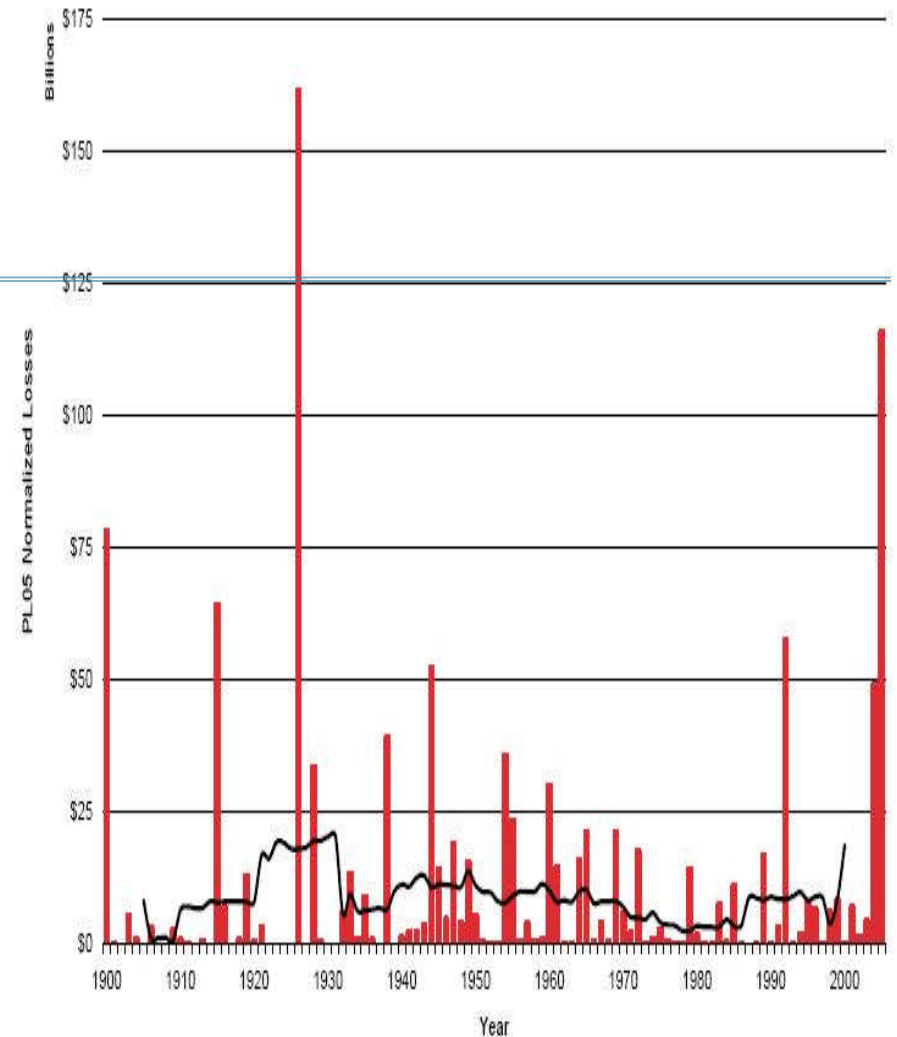


Accepted notion:
Storms have become more destructive as the Earth warms.

Total losses in 2005 US dollars



Total normalized losses in US dollars



Hurricane damage 1900 - 2000 (Pielke, Natural Hazards Review, 2008, v.6, p.13)

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Normalized in US dollars, the extent of storm damage has not increased.

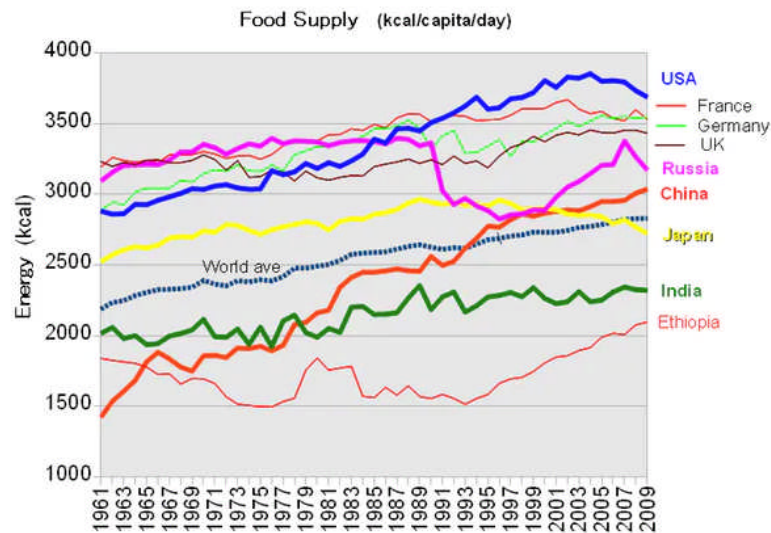
Predictions:

Massive flooding, apocalyptic crop failures due to global warming are right around the corner.

1. **San Jose Mercury News (CA)** - June 30, 1989 - 3F
General News

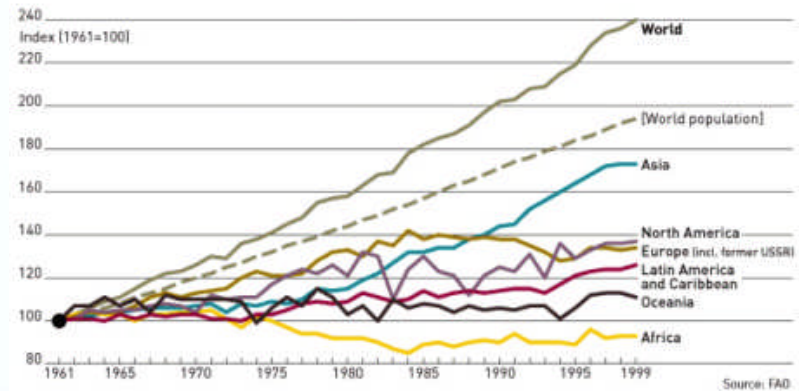
GRIM FORECAST

A senior environmental official at the United Nations, Noel Brown, says entire nations could be wiped off the face of the earth by rising sea levels if global warming is not reversed by the year 2000. Coastal flooding and crop failures would create an exodus of "eco-refugees," threatening political chaos, said Brown, director of the New York office of the U.N. Environment Program. He said governments have a 10-year window of opportunity to solve the greenhouse effect before it goes beyond human...



Food availability is higher in wealthy countries than in developing nations. The U.N. Food and Agricultural Organization considers 2700 kcal/capita/day a satisfactory level of food supply. Masaqui/Wikipedia, CC BY-SA

WORLD AGRICULTURAL PRODUCTION

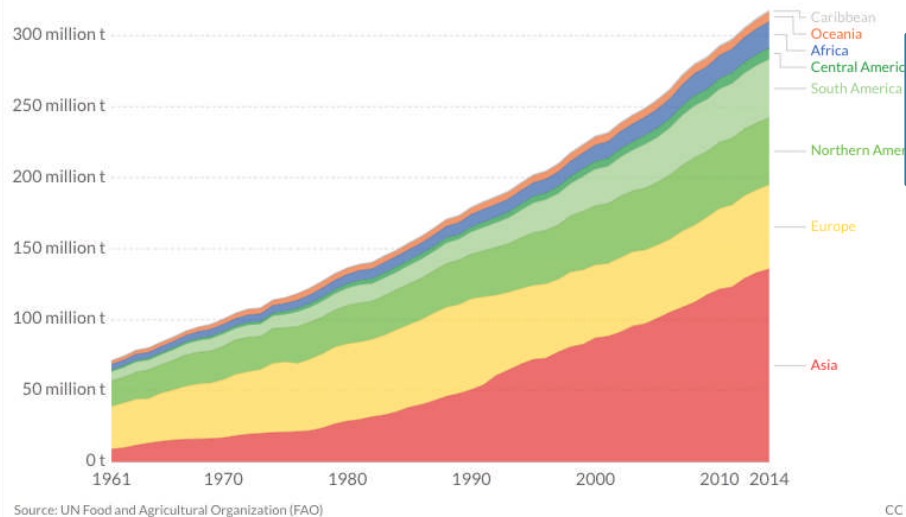


Food Production by Region. Source: Waugh

Our World in Data

Meat production

Meat includes cattle, poultry, sheep/mutton, goat, pigmeat, and wild game. Figures are given in terms of dressed carcass weight, excluding offal and slaughter fats.



Not a lot of evidence that we're running out of food!

The real reason for pushing the climate change narrative.



“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]

Opinion of Matin Durrani,
managing editor of Physics World magazine

“I’m not sure for how long my own optimism will last, and for sure there will be plenty of downs as well as ups over the next 10 years. But as cognitive psychologist Stephen Pinker argued in his 2018 book *Enlightenment Now*, the world is, overall, improving. Whether measured in terms of health, literacy, safety or prosperity, things are only getting better – and those advances are due, in no small part, to science.”

Climate change in the press

Newsweek, April 28, 1975

The Cooling World
“The Coming Ice Age” was predicted.

SCIENCE

The Cooling World

There are ominous signs that the earth's weather patterns have begun to change dramatically and that these changes may portend a drastic decline in food production—with serious political implications for just about every nation on earth. The drop in food output could begin quite soon, perhaps only ten years from now. The regions destined to feel its impact are the great wheat-producing lands of Canada and the U.S.S.R. in the north, along with a number of marginally self-sufficient tropical areas—parts of India, Pakistan, Bangladesh, Indochina and Indonesia—where the growing season is dependent upon the rains brought by the monsoon.

The evidence in support of these predictions has now begun to accumulate so massively that meteorologists are hard-

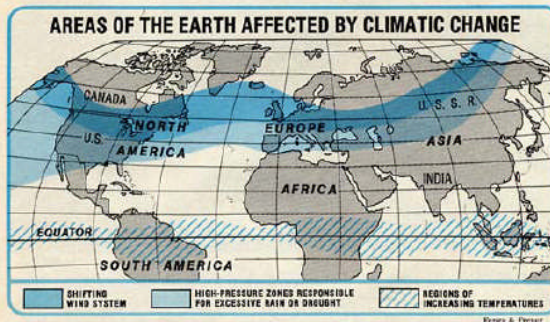
reduce agricultural productivity for the rest of the century. If the climatic change is as profound as some of the pessimists fear, the resulting famines could be catastrophic. “A major climatic change would force economic and social adjustments on a worldwide scale,” warns a recent report by the National Academy of Sciences, “because the global patterns of food production and population that have evolved are implicitly dependent on the climate of the present century.”

A survey completed last year by Dr. Murray Mitchell of the National Oceanic and Atmospheric Administration reveals a drop of half a degree in average ground temperatures in the Northern Hemisphere between 1945 and 1968. According to George Kukla of Columbia University, satellite photos indicated a sudden, large increase in Northern Hemisphere snow cover in the winter of 1971-72. And

ic change is at least as fragmentary as our data,” concedes the National Academy of Sciences report. “Not only are the basic scientific questions largely unanswered, but in many cases we do not yet know enough to pose the key questions.”

Extremes: Meteorologists think that they can forecast the short-term results of the return to the norm of the last century. They begin by noting the slight drop in over-all temperature that produces large numbers of pressure centers in the upper atmosphere. These break up the smooth flow of westerly winds over temperate areas. The stagnant air produced in this way causes an increase in extremes of local weather such as droughts, floods, extended dry spells, long freezes, delayed monsoons and even local temperature increases—all of which have a direct impact on food supplies.

“The world's food-producing system,” warns Dr. James D. McQuigg of NOAA's Center for Climatic and Environmental Assessment, “is much more sensitive to



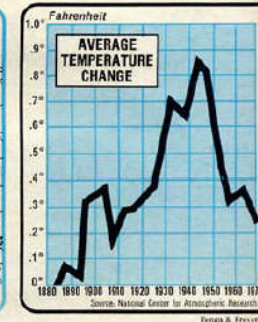
pressed to keep up with it. In England, farmers have seen their growing season decline by about two weeks since 1950, with a resultant over-all loss in grain production estimated at up to 100,000 tons annually. During the same time, the average temperature around the equator has risen by a fraction of a degree—a fraction that in some areas can mean drought and desolation. Last April, in the most devastating outbreak of tornadoes ever recorded, 148 twisters killed more than 300 people and caused half a billion dollars' worth of damage in thirteen U.S. states.

Trend: To scientists, these seemingly disparate incidents represent the advance signs of fundamental changes in the world's weather. The central fact is that after three quarters of a century of extraordinarily mild conditions, the earth's climate seems to be cooling down. Meteorologists disagree about the cause and extent of the cooling trend, as well as over its specific impact on local weather conditions. But they are almost unanimous in the view that the trend will

a study released last month by two NOAA scientists notes that the amount of sunshine reaching the ground in the continental U.S. diminished by 1.3 per cent between 1964 and 1972.

To the layman, the relatively small changes in temperature and sunshine can be highly misleading. Reid Bryson of the University of Wisconsin points out that the earth's average temperature during the great ice ages was only about 7 degrees lower than during its warmest eras—and that the present decline has taken the planet about a sixth of the way toward the ice age average. Others regard the cooling as a reversion to the “little ice age” conditions that brought bitter winters to much of Europe and northern America between 1800 and 1900—years when the Thames used to freeze so solidly that Londoners roasted ovens on the ice and when iceboats sailed the Hudson River almost as far south as New York City.

Just what causes the onset of major and minor ice ages remains a mystery. “Our knowledge of the mechanisms of climat-



the weather variable than it was even five years ago.” Furthermore, the growth of world population and creation of new national boundaries make it impossible for starving peoples to migrate from their devastated fields, as they did during past famines.

Climatologists are pessimistic that political leaders will take any positive action to compensate for the climatic change, or even to allay its effects. They concede that some of the more spectacular solutions proposed, such as melting the arctic ice cap by covering it with black soot or diverting arctic rivers, might create problems far greater than those they solve. But the scientists see few signs that government leaders anywhere are even prepared to take the simple measures of stockpiling food or of introducing the variables of climatic uncertainty into economic projections of future food supplies. The longer the planners delay, the more difficult will they find it to cope with climatic change once the results become grim reality.

—PETER GWYNNE with bureau reports

Newsweek, April 28, 1975



Time Magazine

1977

“How to survive the coming ice age”

2006

Special report on Global Warming
“Be worried. Be very worried.”



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The number of heat waves is increasing.

Glaciers and ice caps are melting.

Melting glaciers and ice caps are causing ocean levels to rise.

In recent years we're experiencing a lot more wild fires!

Storms have become more destructive as the Earth warms.

The complete data contradicts!

Throughout history, the earth has warmed and cooled periodically. Increases in temperature come before increases in CO₂ concentration.

Fewer heat waves now than in the 1930s.

Sea ice levels are actually higher than in about 1970. Deforestation and resulting dry air is causing ice caps to sublime.

The rise in sea levels pre-dates the industrial revolution.

There are fewer wild fires now than in the first half of the century!

Normalized in US dollars, the extent of storm damage has not increased.

CLIMATE CHANGE IN PERSPECTIVE

We've discussed many of the accepted notions of "climate change", and have found serious flaws in the theory that globe warming exists, and that it's caused by human activity.

My opinion is that this theory is, at best, misguided. At worst, it's a scam.

Over 30,000 scientists, including 7000 PhDs, have signed a petition declaring their skepticism.

In spite of the evidence to the contrary, what if it's true?

We have a choice:

Prohibit the use of fossil fuels as a means to prevent climate change.

The costs?

- Trillions of dollars.
- Condemning billions of people to poverty, especially those in underdeveloped and developing countries.
- We would push ourselves back to 1910 living conditions
- If we're lucky, we might reduce the projected temperature increase of a fraction of a degree.

-- or --

Look for realistic mitigating solutions, rather than prevention.