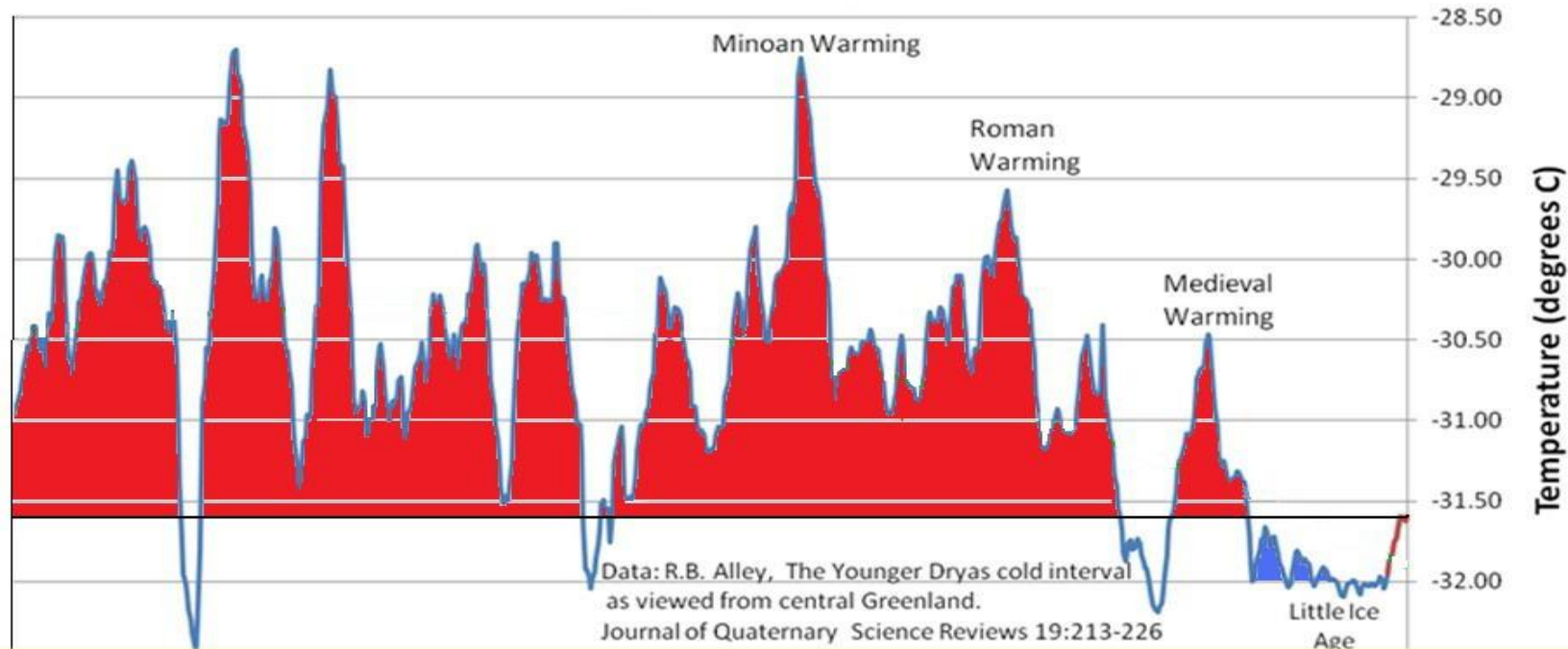


Doubting Catastrophic Anthropogenic Climate Change

“Studying Proxy Data”



Bob Endlich

bendlich@msn.com

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Cruces Atmospheric Sciences Forum

Studying Proxy Data

Background:

Al Gore mentioned data from the Vostok Ice Cores as his “proof” that increasing atmospheric <CO₂> caused global warming. This piqued my curiosity, since such data were unavailable to me as a Geology Major 25 years previous. I looked up the plots, studied the data, and found many interesting elements:

To introduce this subject a bit more...

Definitions of sorts: “proxies, temperature proxies, and temperature proxy data”

Note on ice cores as temperature proxies

Note on the differences and similarities between Antarctica and Arctic temperature proxy data sets

Examples of the Vostok and EPICA DOME C Ice Core temperature data plots from Antarctica

Examples of the GISP2 Ice Core temperature data plots from Greenland

Proxies, Temperature proxies and Temperature proxy data, informal descriptions

Liquid-in-glass thermometers, and deployment of them in screens, such as the Stephenson Screen are recent inventions, so we have only about 150 years for most long records.

When scientists note a phenomenon in nature which is dependent, for example, on temperature, and that process is quantified, a long “time series” of the results of that phenomenon is made available for study, and a “proxy” time series is developed.

In cold regions, snow which accumulates to depth, and compresses into ice has developed over thousands, even tens, or hundreds of thousands, of years. Work on this has yielded ice core temperature records from ice cores drilled into ice at great depth. Similar proxies exist for trees, and fossils in mud beds of oceans.

Water consists of H₂O; Oxygen exists in two common forms, O-16 and O-18, isotopes of Oxygen

The ratio of O16/O18 varies in the Gulf Stream and other water bodies that evaporate water into the air and which subsequently falls as snow. The O16/O18 ratio from that snow turned to ice yields a temperature time history.

This is explained in <https://casf.me/book-review-john-kehers-inconvenient-skeptic/> and the accompanying presentation graphics under <https://casf.me/casf-monthly-meeting-presentations>, the end graphics.

Note on ice cores as temperature proxies

Literature Source:

Petit, J.R. et al: 1999. *Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica*. Nature 399: 429-436. (paywalled)

Summary: <http://www.co2science.org/articles/V2/N12/C1.php>

“The authors, partners in a long-term collaboration among Russia, the United States and France, retrieved the deepest ice core ever recovered - reaching a depth of 3,623 meters - from the Russian Vostok station in East Antarctica. By careful analysis of this historic ice core, they reconstructed trends of many climatic and environmental parameters, including temperature and CO2 concentration, over a period of 420,000 years.”

What was learned:

“Over four glacial-interglacial cycles, the succession of changes through each cycle of glacial growth and termination was similar, with atmospheric and climatic properties oscillating between fairly stable lower and upper bounds. Surface temperature, for example, varied over a range of approximately 12°C, while atmospheric CO2 concentration ranged from a low of 180 ppm to a high of 290 ppm.” <Underlining Added>

For reference, the present <CO2> is about 412 PPM, it was 300 PPM in 1919, as published by Oak Ridge National Laboratory: <http://cdiac.ornl.gov/ftp/trends/co2/siple2.013>
more info at <https://casf.me/climate-shorts/> “Examining the Hypothesis of CO2 vs High Temperatures...”

Note on similarities and differences between Antarctica and Arctic temperature proxy data sets.

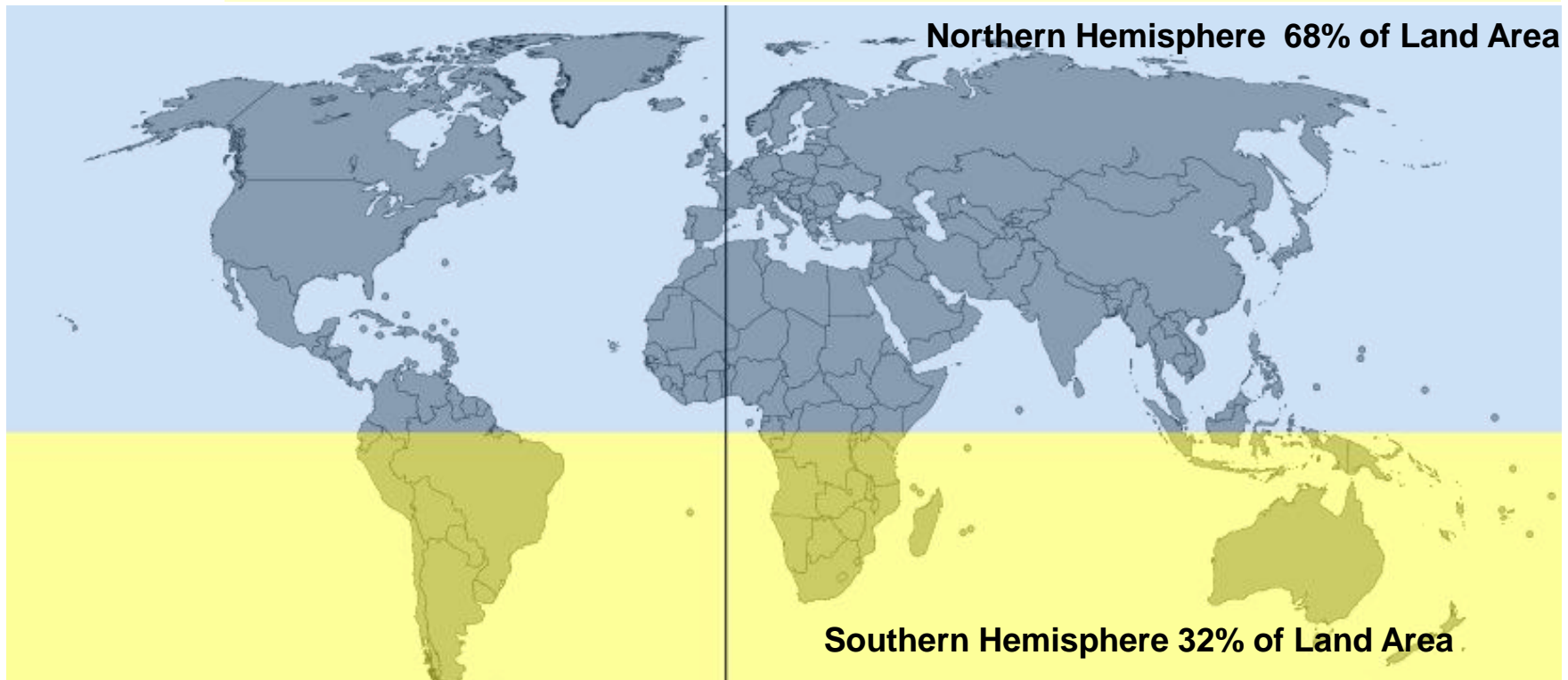
Similarities—both use O16/O18 ratio to determine the temperature of the water which evaporated, later fell as snow

Travel distance of atmospheric water falling as snow depends on Gulf Stream's location and Water Temperature, which is related to Global Temperature

Differences--see the graphic:

Oceans have 71% of all of earth surface area
Land has 29% of all of earth surface area

Northern Hemisphere's Land Area drives Annual Earth Temperature Cycle

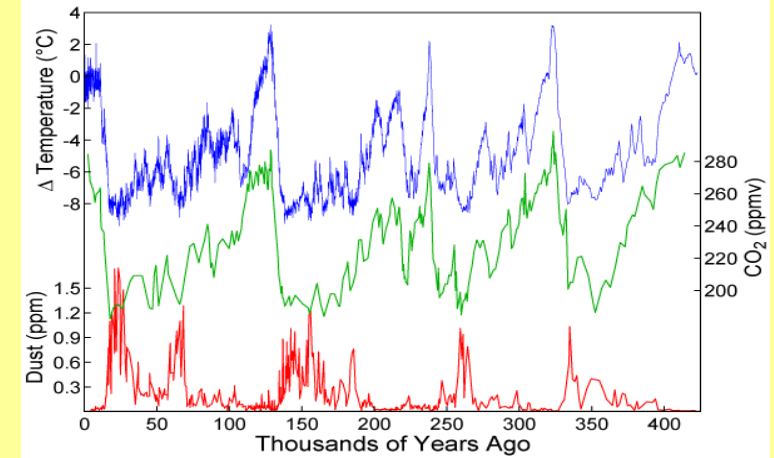


Next Graphics pertain to Vostok Ice Cores, Antarctica

Basic data from the *Petit et al, Science* 1999 article and plots:

Temperatures are in Blue. <CO₂> in Green, <Dust> in Red

There are five interglacials in the last 400,000 years...peaks in the Blue Curve



Glacial Period names in Blue are from old Geologic names from from “type sections” of geologic naming practice. The irregular valleys of temperature represent “glacials,” *much colder* conditions!

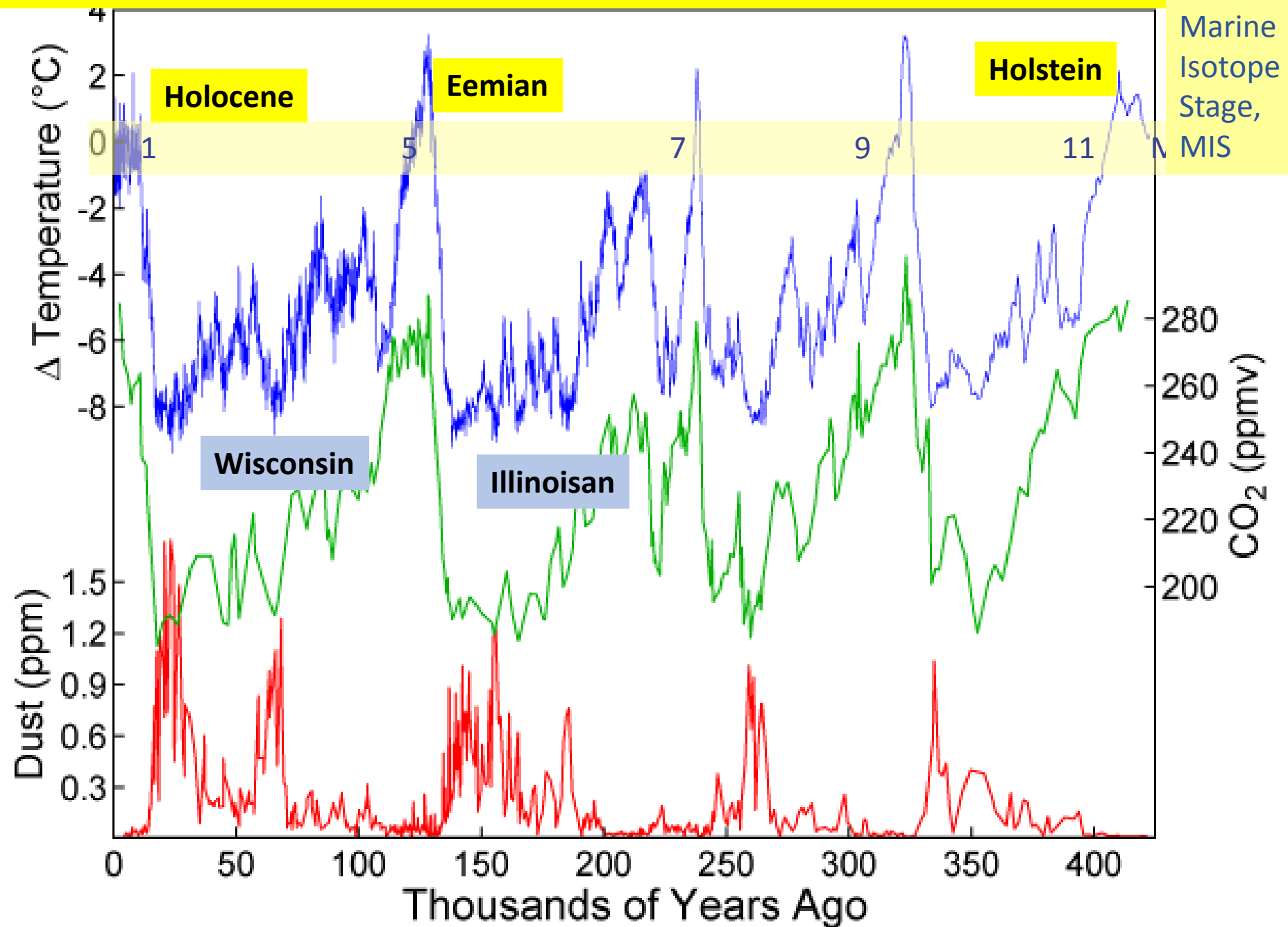
Interglacial Period names in Yellow follow the same (geologic) practice.

“Marine Isotope Stages,” pale yellow band, are from a later practice by Liesecki and Raymo, “*A Pliocene-Pleistocene stack of 57 globally distributed benthic D18O records*” PALEOCEANOGRAPHY, VOL. 20, PA1003, 2005

Glacials were cold, windy and dusty. The age of the dusty snow (now ice) deposits in Antarctica matches loess deposits in the “Loess Hills” of Iowa across Missouri River from Omaha...“Council Bluffs,”

Al Gore incorrectly says that increasing <CO₂> drove higher temperatures of interglacials. **However,**

Today's interglacial has the highest <CO₂> in 400,000 years yet is the COOLEST of the five interglacials. And, today is not even close to the warmest part of the Holocene despite ~412 PPM CO₂. Al Gore's assertion is plainly wrong.



During depths of the Wisconsin, Junipers from La Brea Tar Pits were CO₂-starved @180-220 PPM.

"Carbon starvation in glacial trees recovered from the La Brea tar pits, southern California"

<https://www.fs.usda.gov/treesearch/pubs/22081>

Humans, animals, depend on plants for carbohydrates to sustain themselves. If plants die, we and animals die.

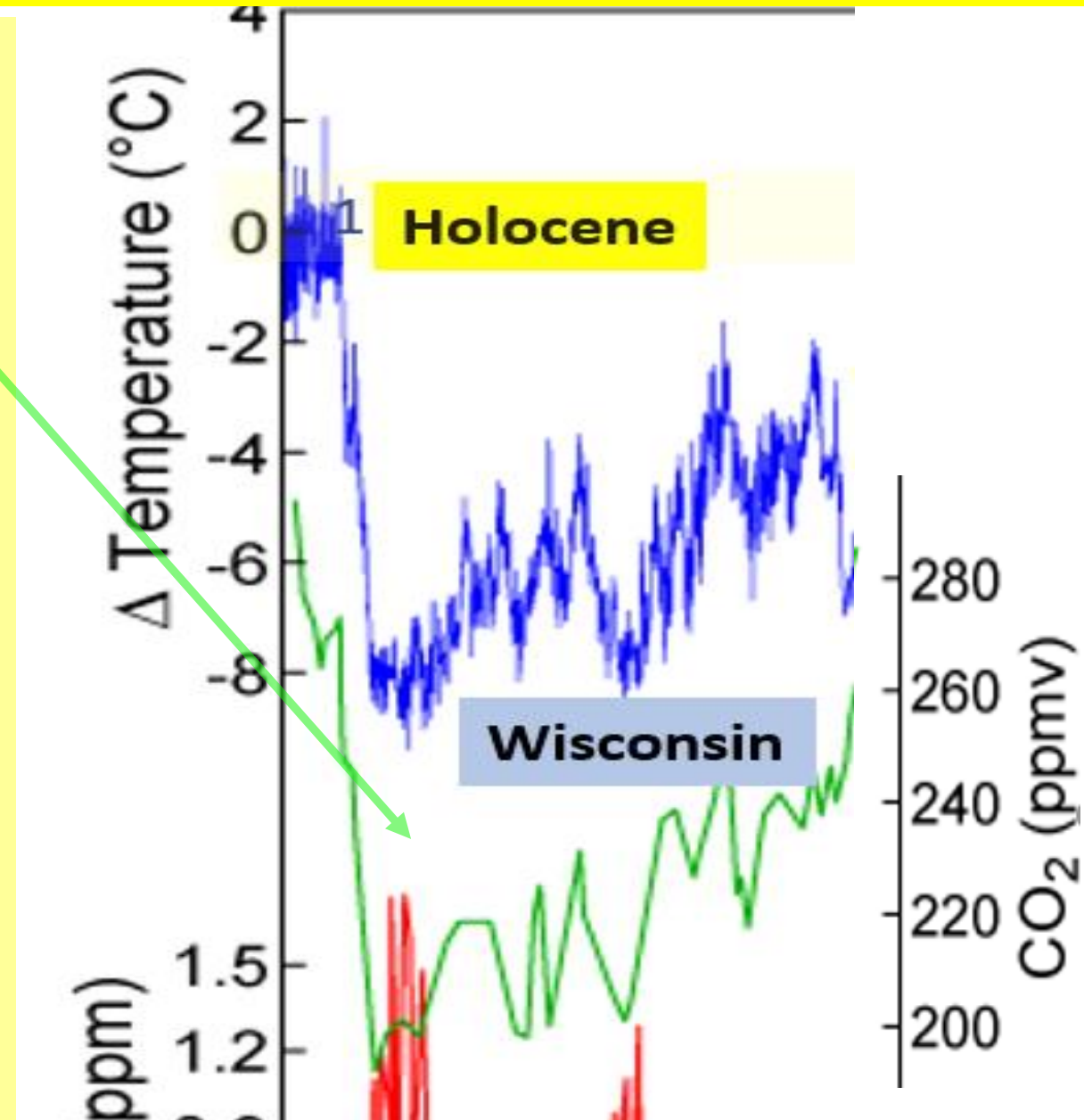
Natural variations of +/- 2C occurred in the Holocene.

In Antarctica, temperature change +/-1.5 C commonly occurs; was 2C warmer than today earlier in the Holocene.

We're not today nearly as warm as we were in earlier Holocene.

Peak <CO₂> in the Holocene was ~280 PPM.

At 412 PPM CO₂ today, temps are far from the warmest of the Holocene.



We're way colder today than the four earlier Interglacial peaks in MIS 5, 7, 9 and 11. **CO₂ Theory fails.**

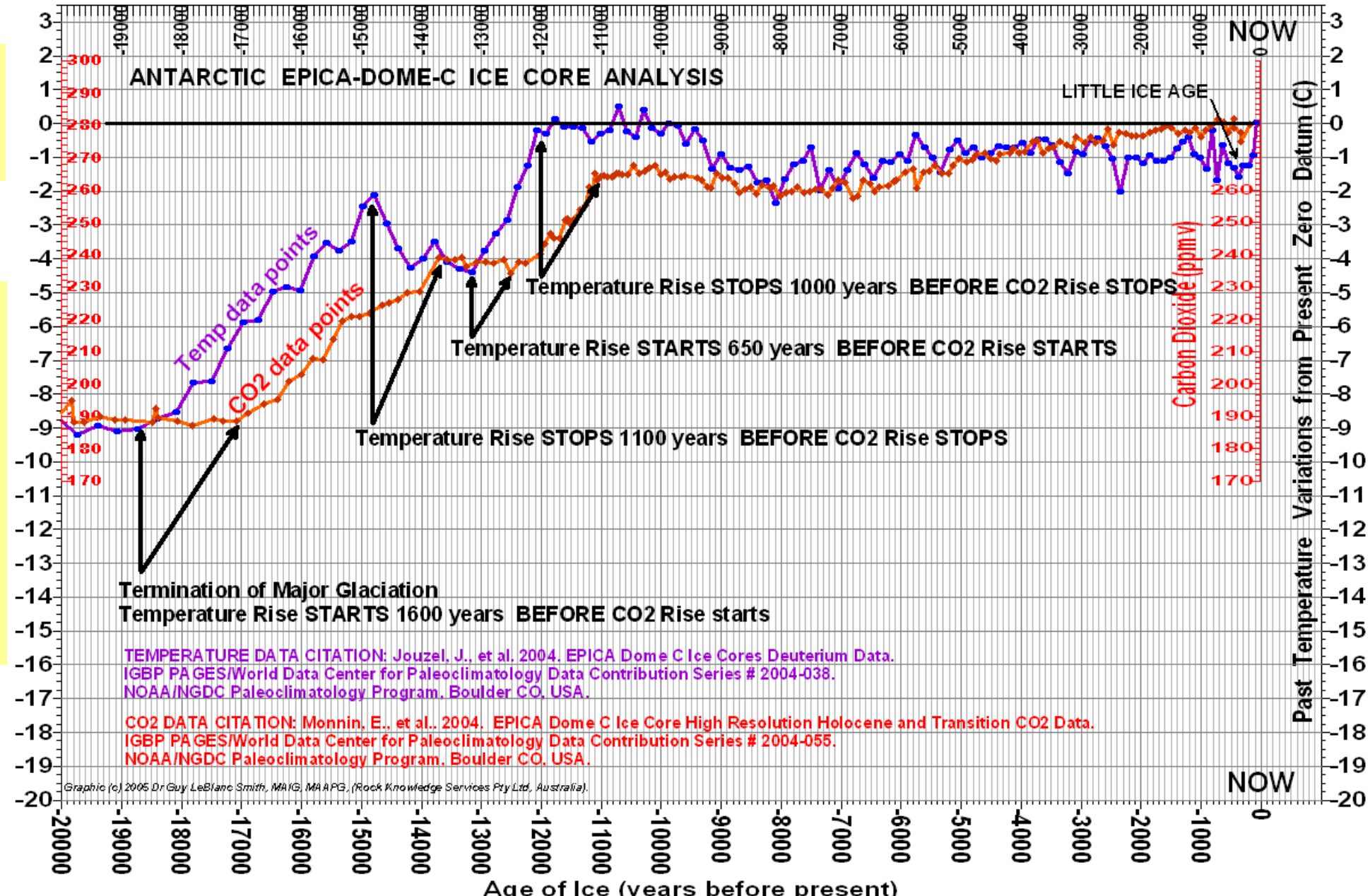
EPICA Dome C, Antarctica...Henry's Law explains the correlation between Temperature and CO2

Examine the temperature trace (purple) and the CO2 trace (red)

The data show temperature changed first, then CO2 changed.

TEMPERATURE CONTROLS <CO2>.

The Alarmist claim is false.



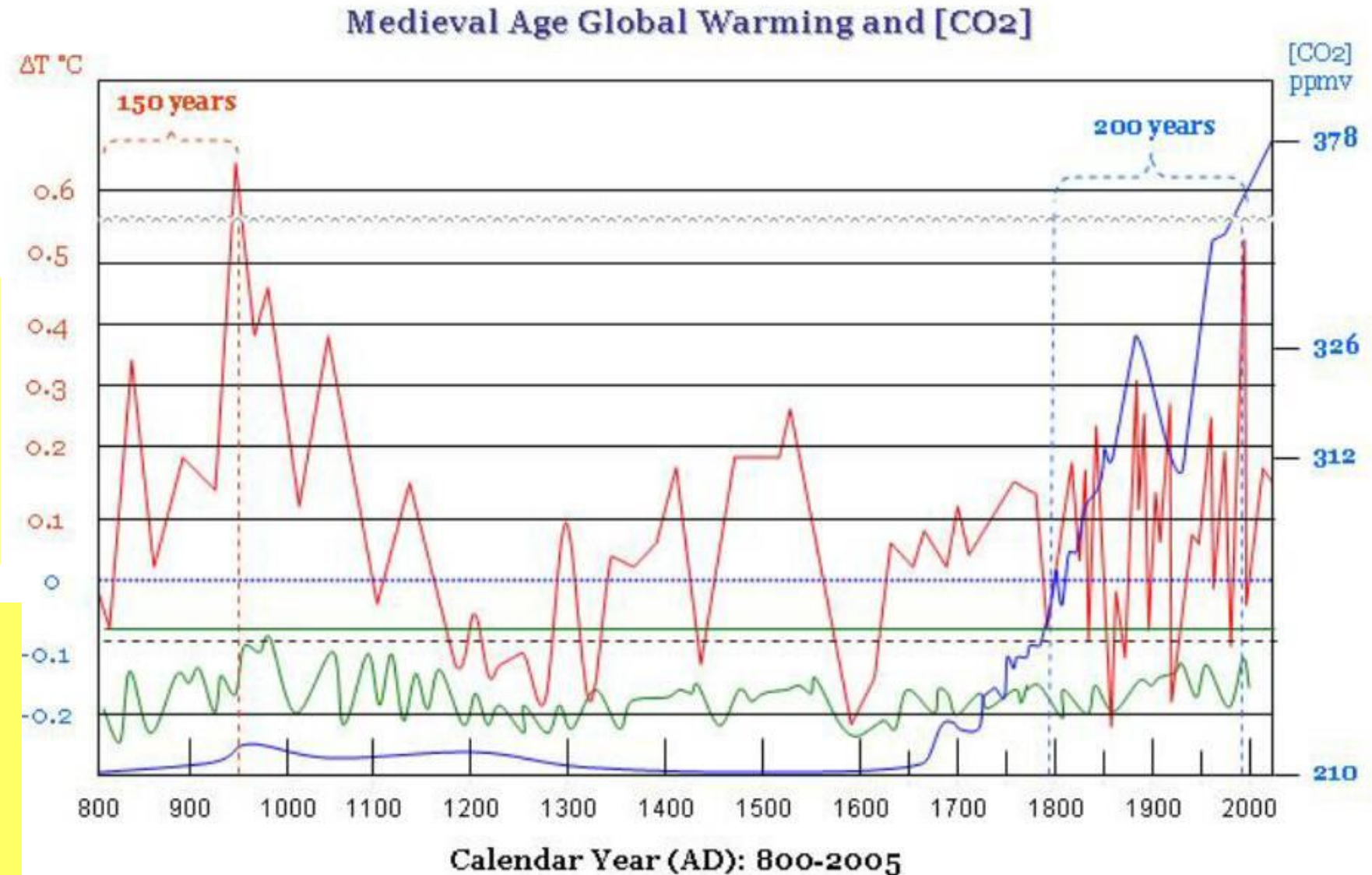
This plot appears in the WUWT
Paleoclimate Page, also

http://www.biocab.org/GWMA-002_op_987x740.jpg

L. Khandekar, et al, (2005). *The Global Warming Debate: A Review of the State of Science*.
Pure and Applied Geophysics.
162. 1557-1586. 10.1007/s00024-005-2683-x.

NB, The CO₂ remains in the 215 range until 1650, then increases ~80 years after temperature starts to increase.

It was warmer in the Medieval Warm Period than the Current Warm Period



Source of Data: M. L. Khandekar et All. *The Global Warming Debate: A Review of the State of Science*. Pure appl. geophys. 162 (2005).
K. J. Kreutz et al. Bipolar Changes in Atmospheric Circulation During the Little Ice Age. *Science*, Vol. 277, Issue 5330, 1294-1296, 29 August 1997. Keith R. Briffa and Timothy J. Osborn. *PALEOCLIMATE: Blowing Hot and Cold*. *Science*, Vol. 295, Issue 5563, 2227-2228, 22 March 2002. NOAA, NASA, TIROS-N: <http://www.science.nasa.gov>



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DO PLANTS LIKE
MORE CO₂?



CO₂-Temperature Correlations

Material in this section originates from the following categories in our Subject Index:

Carbon Dioxide (*Correlations with Temperature*)

Climate Change (*CO₂-Temperature Correlations*)

Climate History (*CO₂-Temperature Correlations*)

CO₂-Temperature Correlations

Temperature (*Correlations with CO₂*)

The CO₂ Science web site is a marvelous resource for those interested in this subject. ...an excellent source to find out whether <CO₂> drives temperature as alarmists claim, or whether TEMPERATURE drives <CO₂>, what Henry's Law teaches, from 1803.



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These studies say temperature changes first, then <CO2> changes.

Ice Core Studies Prove CO₂ Is Not the Powerful Climate Driver Climate Alarmists Make It Out to Be

Volume 6, Number 26: 25 June 2003

“Petit et al. (1999) reconstructed histories of surface air temperature and atmospheric CO₂ concentration from data obtained from a Vostok ice core that covered the prior 420,000 years, determining that during glacial inception “the CO₂ decrease lags the temperature decrease by several thousand years”

Fischer et al. (1999) found that “the time lag of the rise in CO₂ concentrations with respect to temperature change is on the order of 400 to 1000 years during all three glacial-interglacial transitions.”

“Mudelsee (2001) concluded that variations in atmospheric CO₂ concentration lagged variations in air temperature by 1,300 to 5,000 years.

These are three of ~dozen such references that say temperature changes first, then <CO₂

Proxy temperature time series

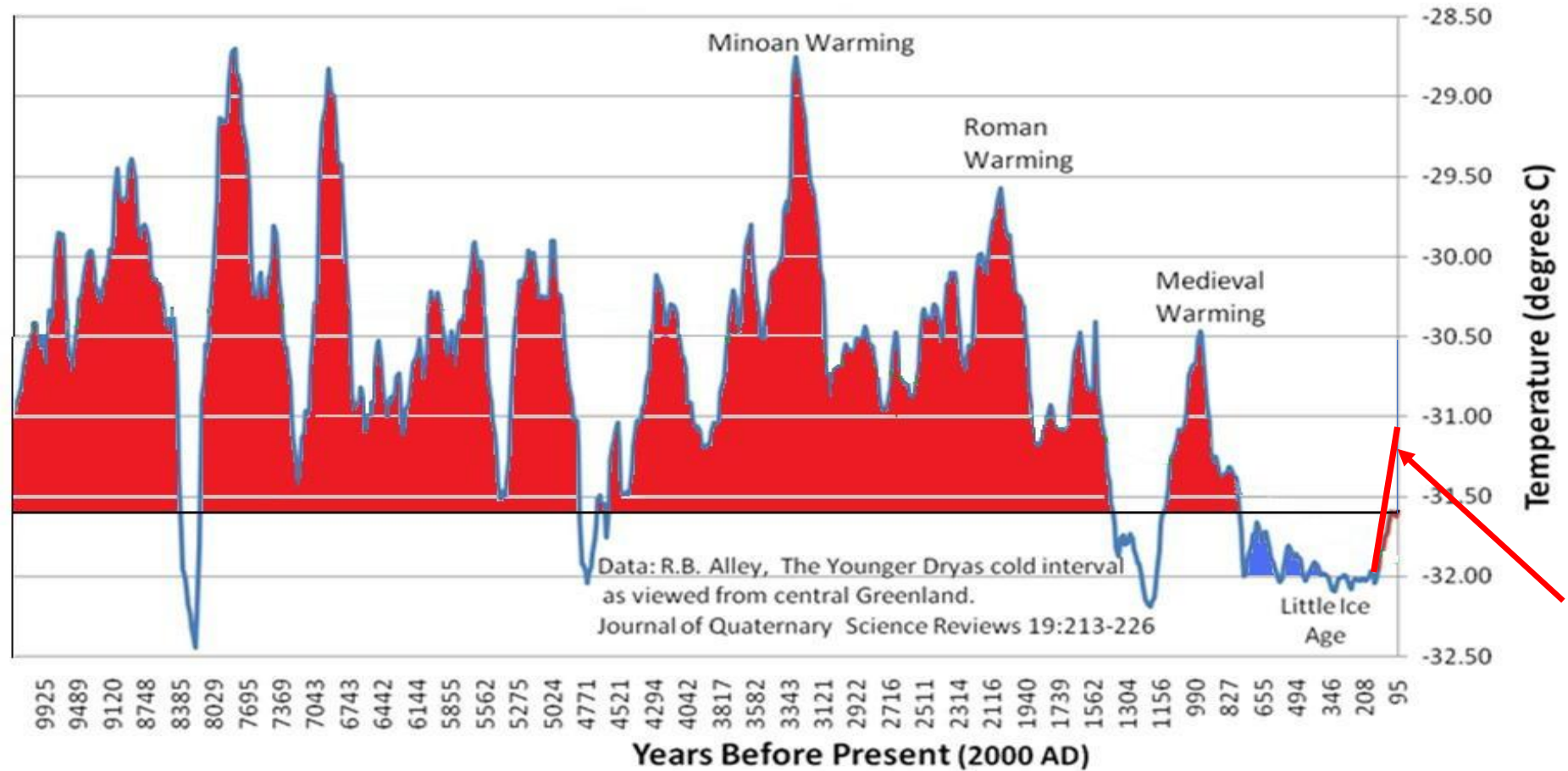
Climate in the Holocene is always changing, no stasis.

~1000 year “Bond Cycles” dominate.

Add 0.8-0.9C since the depth of the Little Ice Age
(Red line, Red arrow, at right)

Most of the Holocene has been warmer than at present.

Greenland GISP2 Ice Core - Temperature Last 10,000 Years



X-Axis, Time

Y-Axis, Temperature

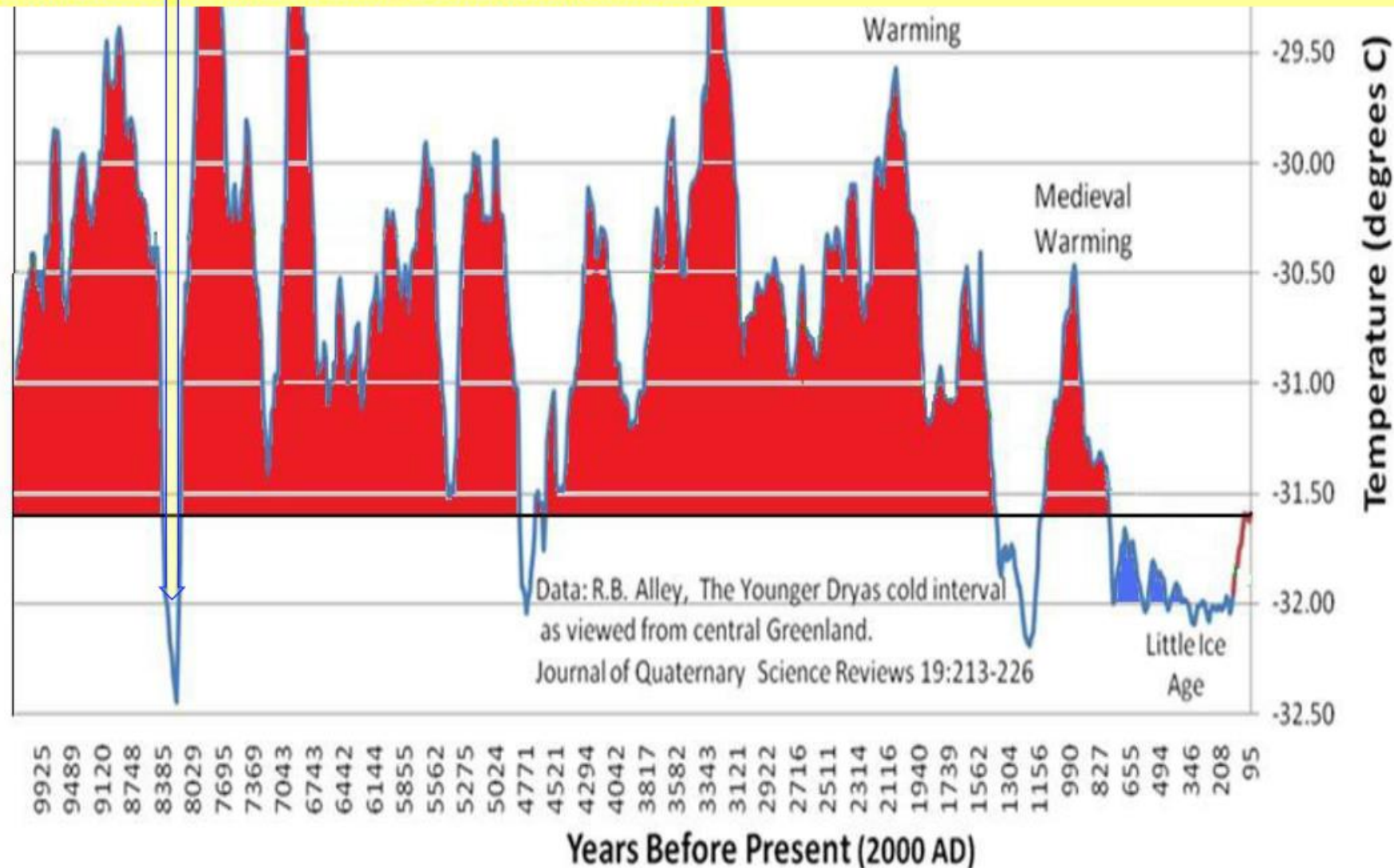
Oldest on Left,

from the O16/O18 ratio , Greenland GISP2 Ice Core, Coldest Down, Warmer Up.

Present on Right

6181 BC: Sudden cooling kills numerous trees, trunks of which are found by Swiss Geologist Christian Schluchter at the base of the Mont Mine' Glacier, Switzerland, about 5 miles north of the Italian border and 10 miles west of Zermatt.

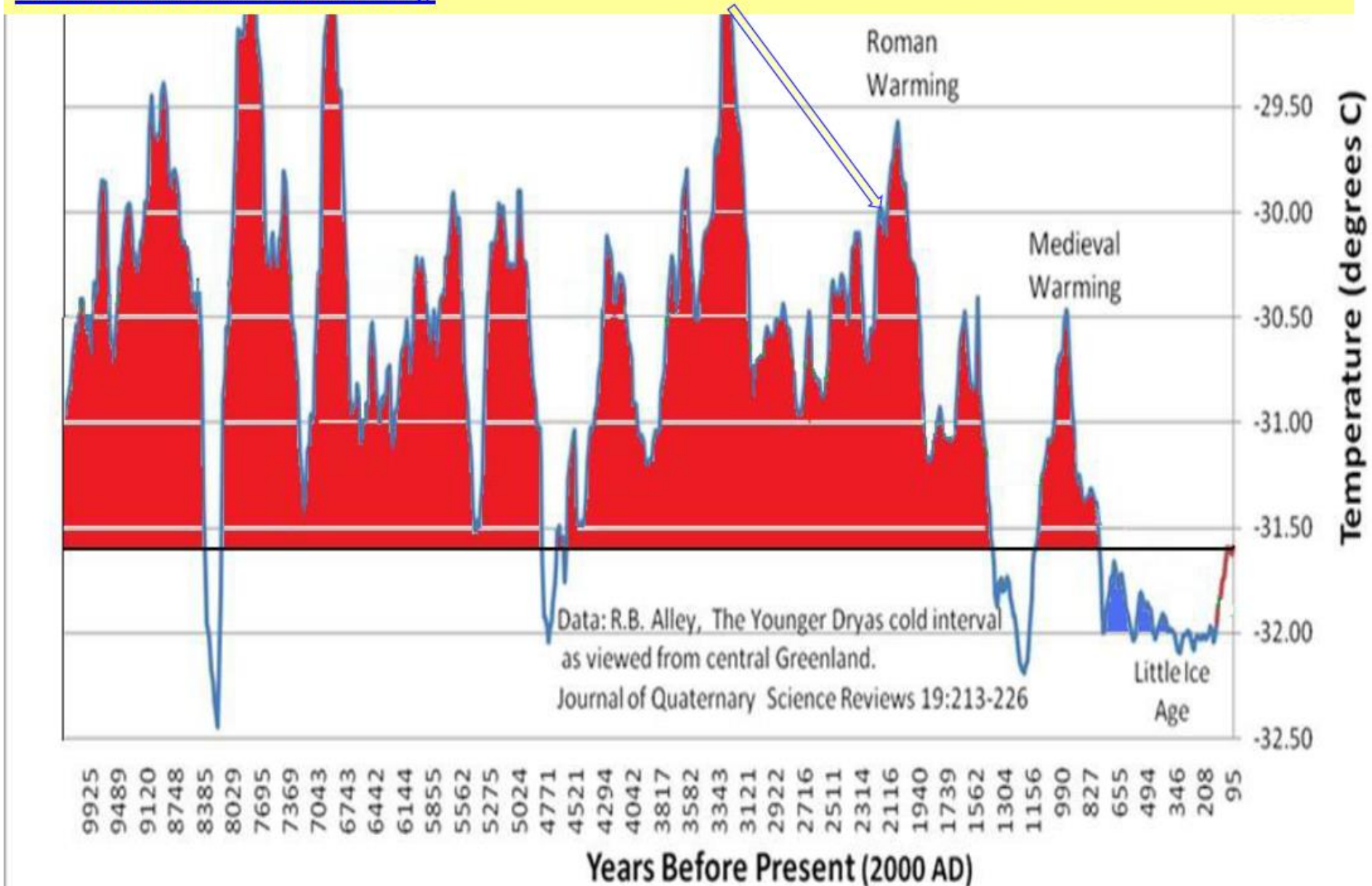
<http://notrickszone.com/2014/06/09/giant-of-geologyglaciology-christian-schluechter-refutes-co2-feature-interview-throws-climate-science-into-disarray/>



218 BC: Hannibal crosses the Alps but does not encounter glaciers, reporting...only nuisance snows

<http://www.derbund.ch/wissen/natur/Unsere-Gesellschaft-ist-grundsatzlich-unehrlich/story/24948853>

<http://notrickszone.com/2014/06/09/giant-of-geologyglaciology-christian-schluechter-refutes-co2-feature-interview-throws-climate-science-into-disarray/>

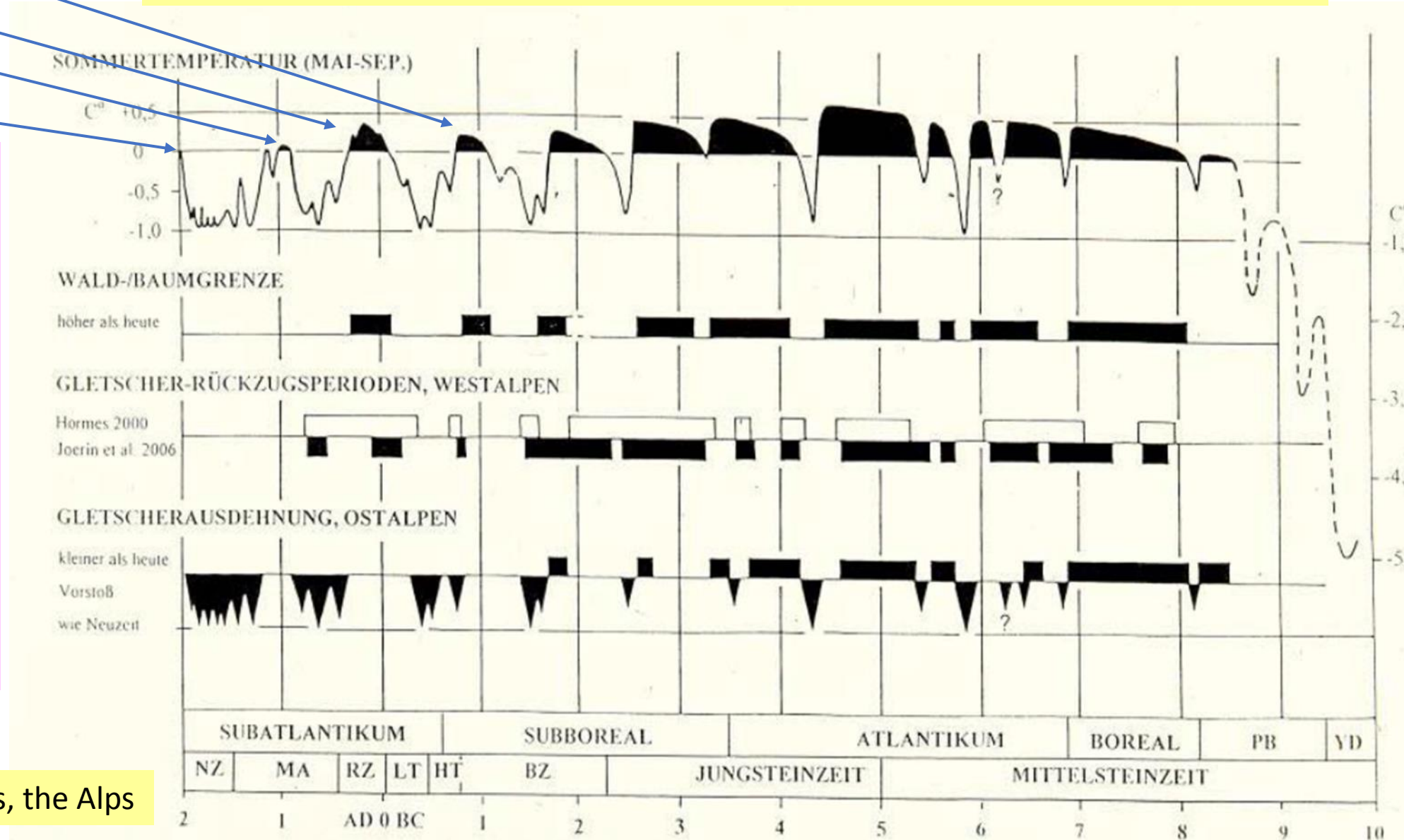


These are tree-ring-derived “proxy” temperatures from the Alps.

Minoan
Roman
Medieval
Present

http://www.iuf-berlin.org/wm_files/wm_pdf/prof._patzelt_berlin_4.12.2009.pdf

Top line of the graph below is the May to September temperature time series



Top line shows ~thirteen separate warm periods since the last glacial maximum.

Present Warm period (...with more CO2..) appears weaker than almost all previous Holocene Warm Periods

Time Line last 12,000 years, the Alps

Think of it:

Ice Cores from Greenland show ~13 warm periods last 10,000 years, from the proxy O16/O18 ratio.
The Present Warm Period is Notably Weaker than past such periods.

Ice Cores show dramatic cooling, “8.2 K year” event, https://en.wikipedia.org/wiki/8.2_kiloyear_event

Christian Schluchter shows same cooling event...jumble of trees on Mt Mine' glacier, Switzerland

Ice core proxy temperatures match up with Roman Warm Period and Hannibal's crossing of Alps

Ice Cores match up with Medieval Warm Period and the history of England and Europe

Austrian Alps Dendrochronology also shows ~13 Warm Periods last 10,000 years

The Present Warm Period is Notably Weaker than past such events

Fundamentally Different Proxies show the same pattern, but separated by
Thousands of Kilometers. **The data send a distinct message:**

**For all of the CO2 in the air today, it was much warmer in the recent past
than today, with a lot less CO2 in the air back then. CO2 theory fails.**