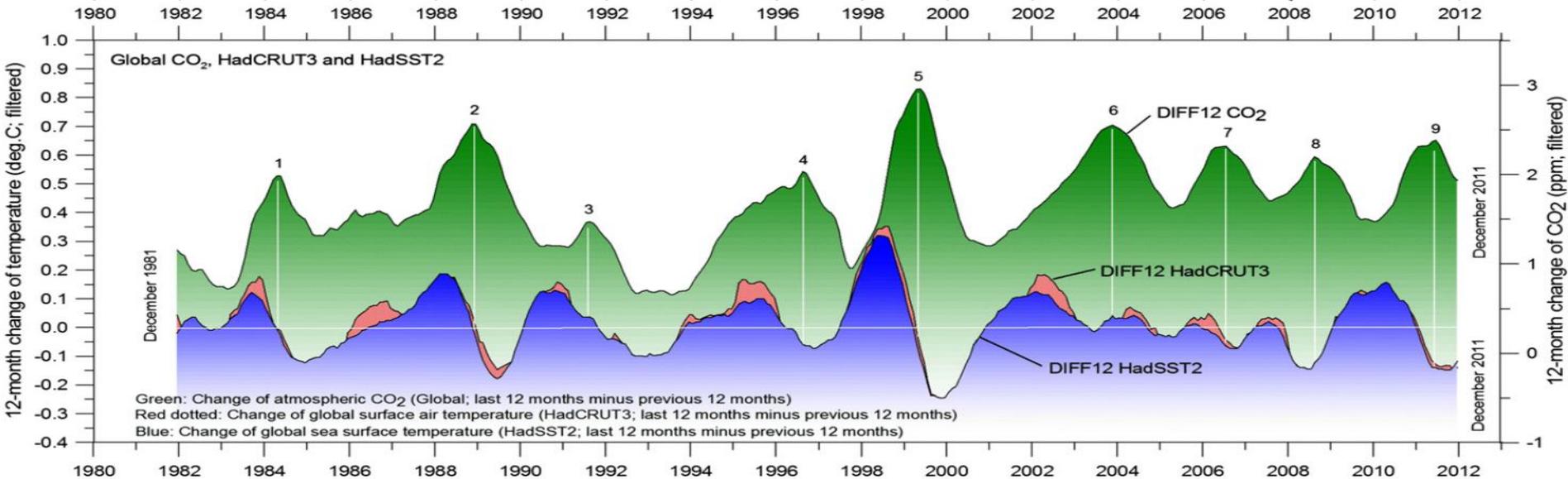


Climate Short

Henry's Law, from 175 years ago: Temperature Controls <CO2>



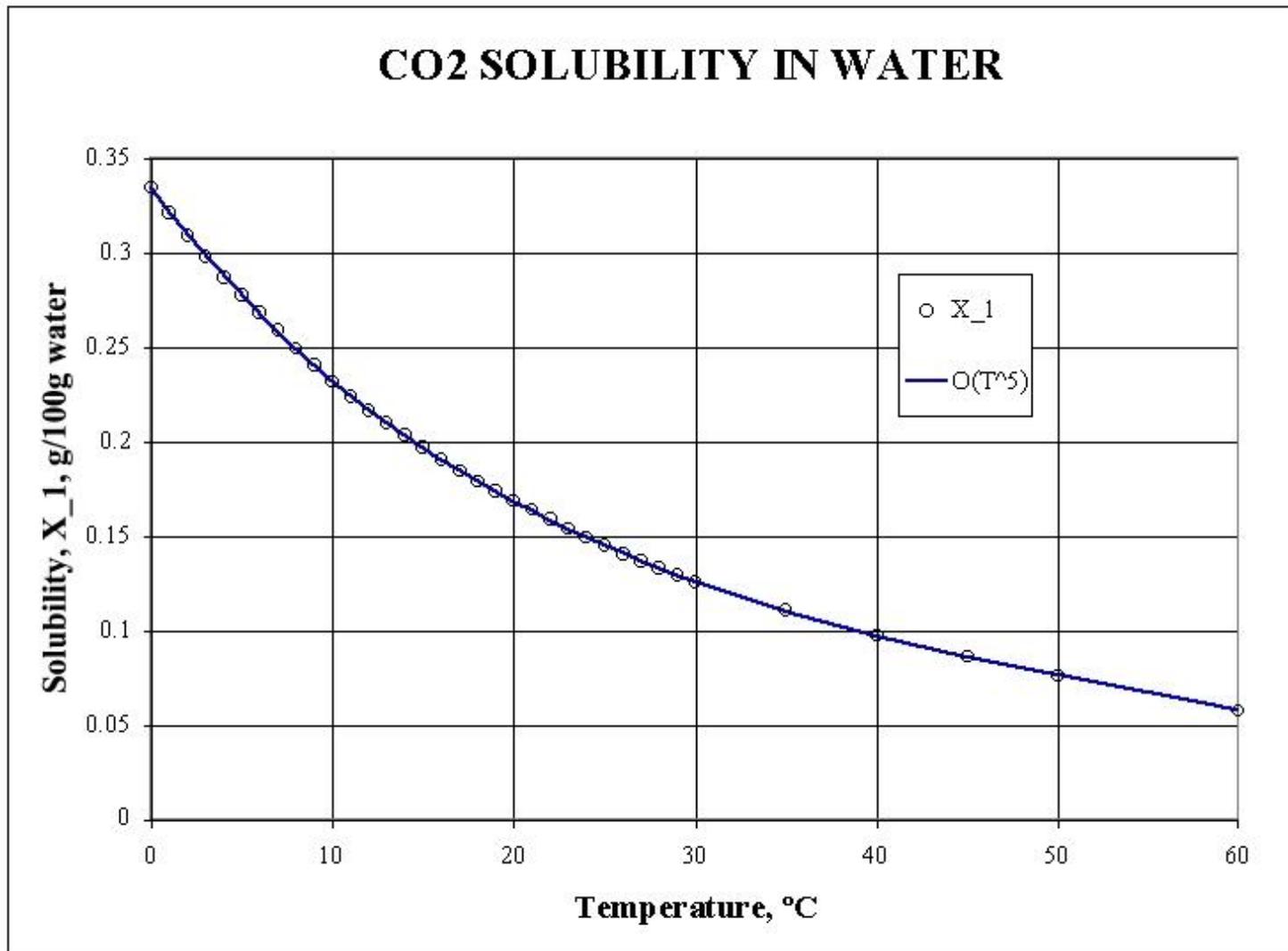
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15 Sep 2017

Weather, Climate and Climate Change—What the Data Say

Henry's Law applied to CO₂ and Water: As the **temperature of the water increases**, water's ability to hold CO₂ in solution **decreases**; => CO₂ goes into the atmosphere.



X-Axis: Water Temperature

Y-Axis: CO₂ Solubility

Henry's Law, named for William Henry, British chemist

Loosely, where temperatures and pressures in the water and air are those commonly found at Earth's surface.

“In aqueous solution, as the temperature of the solution increases, dissolved gases in the solution are driven into the air until the partial pressure of the gas in the air matches its pressure in the solution, ” and conversely.

Ocean, lake and river waters contain dissolved air.

Air is: 78% Nitrogen, 21% Oxygen, 1% Argon, and now, 407 parts/million CO₂.

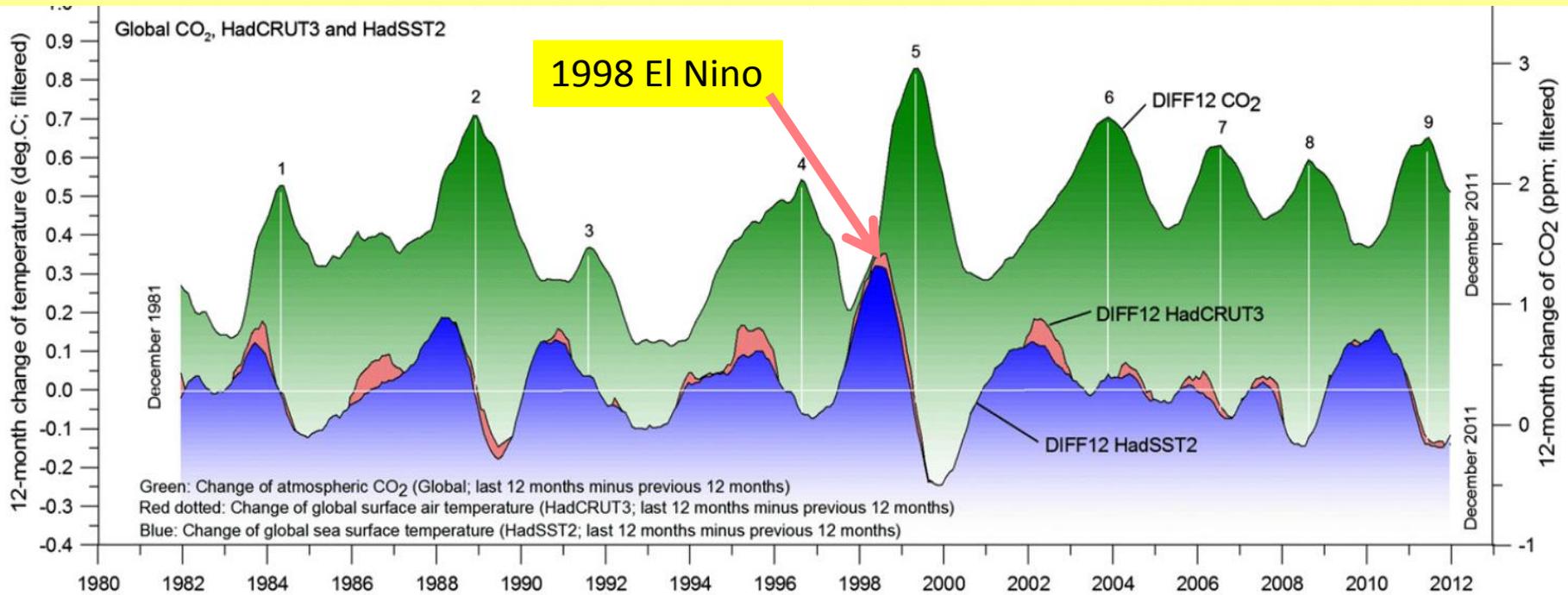
This means the TEMPERATURE of WATER bodies at Earth's surface containing dissolved air determine, to first approximation,

whether CO₂ goes from the water into the air <increasing water temperatures> for instance, Warm Western Pacific El Nino waters displacing cooler Pacific waters.

or,

whether CO₂ goes from air into the water <decreasing water temperatures> for instance, strong upwelling of cold water from West Coasts of North and South America.

the data show Henry's Law : FIRST ocean temperatures change, THEN atmospheric <CO2> responds



X-Axis: Time, Years, starting 1980

Y-Axis: 12-month Change of **global atmospheric <CO₂>** (NOAA; green)

Y-Axis: **Global sea surface temperature (HadSST2; blue)**

Y-Axis: **Global surface air temperature (HadCRUT3; red dotted).**

Thin white horizontal is the Zero Change Line, from which 12-month differences are displayed.

Filtered values: (DIFF12, the difference between the average of the last 12 months and the average for the previous 12 months for each data series).

<https://www.researchgate.net/publication/257343053> The phase relation between atmospheric carbon dioxide and global temperature

Next Chart:

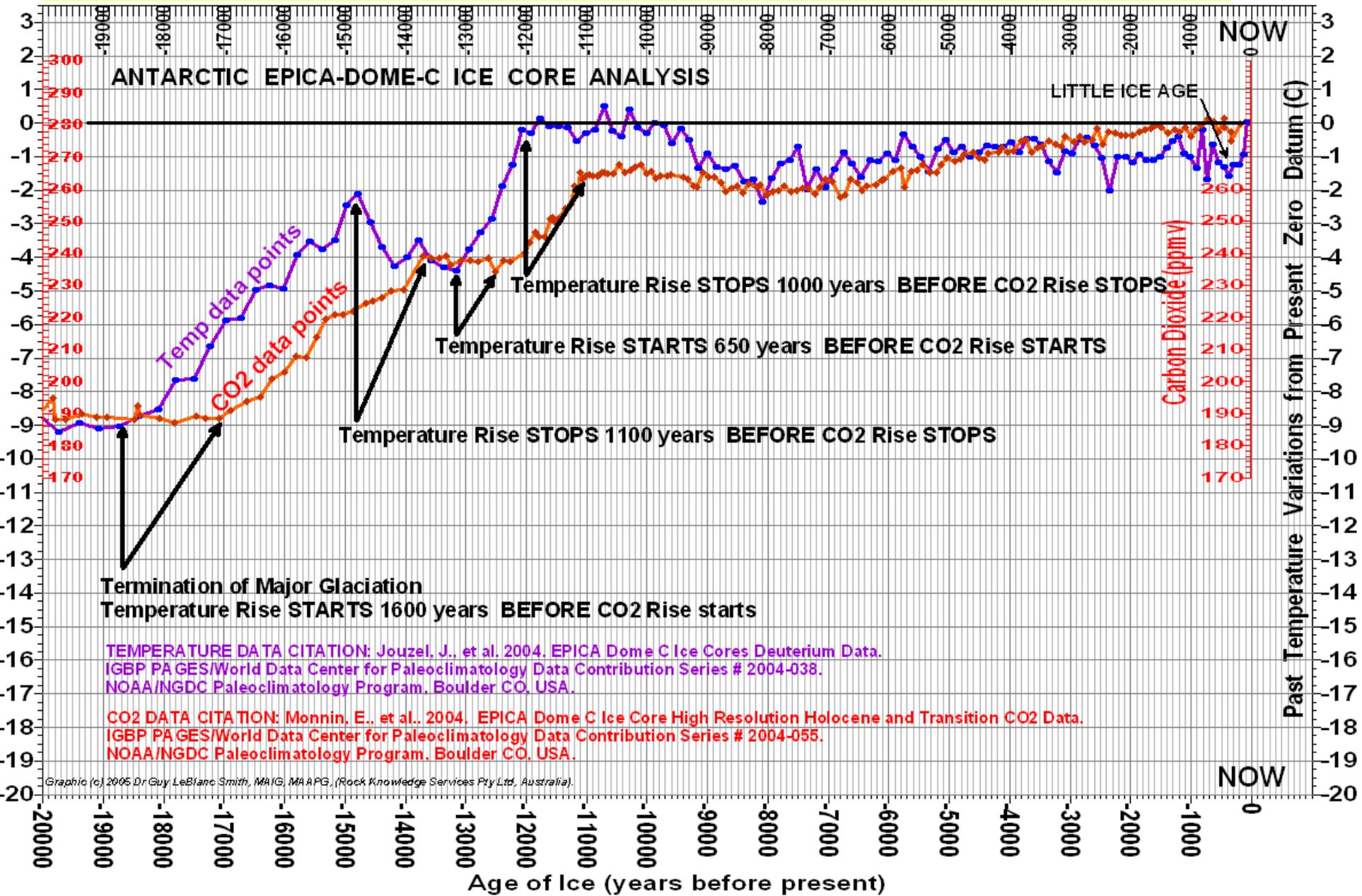
**Antarctic Ice Cores showing Temperature
and Carbon Dioxide over Time:**

X-Axis is time, from 20,000 years ago to NOW

Y axis, (purple) is Temperature over time

Y-Axis, (red) is Carbon Dioxide over time

Henry's Law explains the correlation between Temperature and CO2



Anther demonstration that atmospheric CO2 does NOT control temperature:

Next chart is of Temp, CO2, and Dust over time from the Vostok Ice Cores in Antarctica

X-Axis, Time ~400,000 years, 4 glacials, 5 interglacials.

Y-Axis (Blue) Temperature. Present interglacial warm period, the Holocene, also called Marine Isotope Stage 1, MIS 1, is the coolest of the past 5 interglacials.

Y-Axis (Green) Atmospheric <CO2>

Present CO2 has risen from ~280 to over 400 PPM; this is off the chart.

If CO2 controls temperature, this would be the hottest interglacial, but it is the coldest

The reason for this is Henry's Law.

Briefly, Temperature of the solution, sea water, controls amount of dissolved gases (N2, O2, Ar, and CO2) (air) in the solution

(we are concerned about sea water and atmospheric pressures at sea level, not in the soft drink or beer processing plant)

Catastrophic Global Warming posits that atmospheric <CO2> controls air temperature, clearly falsified by the data.

