

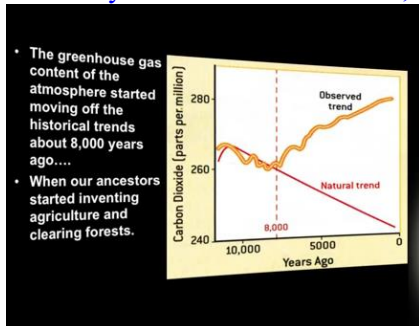
**The Keeling Curve and Nature's Necessary Roles** For a hyperlinked version go to <http://nswildflora.ca/norris-whiston-guides/>

6 October 2023 3:07 PM Version Norris Whiston. Blue-colored videos are almost all short and blue links informative.

**Earth's temperature is affected by the closeness and visibility of any particular point to the sun's rays.** As the northern hemisphere has more heat-sensitive land, its location particularly matters to Earth's temperature. The Earth's movements - its daily rotation, yearly orbit, 23,000-year cycle in wobble, 41,000-yr cycle in tilt, and its 100,000-yr orbital cycle - all affect visibility and closeness, and, consequentially, temperature. Earth cycles are explained by Dr. Paul Merrell, electrical engineer, computer scientist and astronomer at UN-approved Youtube-posted [How Ice Ages Happen: The Milankovitch Cycles](#) and [The Milankovitch Cycle Timeline: Where are we now?](#), and by Dr. Dan Britt, U. of Central Florida, in the UN-approved [Orbits and Ice Ages – The History of Climate Change at 22:58](#). Atmospheric carbon levels followed Milankovitch Cycles until about 8000 ya. The yellow graph below shows that change. [What happened?](#)

**In 1856, Eunice Newton Foote discovered that atmospheric gases hold in Earth's temperature.** Her experiments are explained or re-performed in UN-approved Youtube videos - the Goldsmith University-produced [Eunice](#), at the beginning of the BBC-produced [Climate Pioneers](#), and in [Eunice Newton Foote - Research Experiment - Women in STEM](#). In the 1930s, Guy Stewart Callendar began collecting temperatures throughout the world. When correlating that to human CO<sub>2</sub> emissions, Callendar noted a relationship. His discovery is shown in [Climate Pioneers at 1:40](#). Beginning in the 1950s, Charles Keeling's part in measuring world's atmospheric gas is shown in [Climate Pioneers at 2:29](#).

**Nature particularly has had its effect on Earth's temperature.** 4.567 billion years ago (bya), Earth's atmosphere would begin with 100,000 times its current level of carbon dioxide and the surface temperature would have exceeded 400°F / 204.4°C. 2.5 bya, cyanobacteria began affecting Earth's atmosphere. 500–450 million years ago (mya), moss and fungi's collaboration dramatically altered Earth's air. Around 150 mya, flowering plants evolved, collaborated with fungi, and insects. 76 mya, flowering plants overtook ferns and combustible conifers, and forests became more complex. 65.3 mya, legumes made proteins more accessible and 50 mya, azolla fern rescued a hot Earth. Throughout, as plant, insect, and animal species found niches, coevolved, and became more efficient, Earth was ready for humans to evolve. Dr. Suzanne Simard of U. of British Columbia explains nature's collaboration in [Finding the Mother Tree](#) and Youtube videos. Tom Wessels of Antioch University explains [The Ecology of Coevolved Species](#) on Youtube. Nature, moss, and soil, when allowed, have recycled Earth's fresh water, cooled forests, altered Earth's thickness of atmospheric gases, and purified air



Dr. Dan Britt: [Orbits and Ice Ages after 29:55](#)

	Venus	Earth	Earth w/o Life
Carbon Dioxide	98%	0.03%	98%
Nitrogen	1.9%	79%	1.9%
Oxygen	trace	21%	trace
Surface Temp	477°C	13°C	290 °C
Atm. Pressure (bars)	90	1.0	60

Dr. Dan Britt: [Venus, Earth \(with life\), and Earth w/o \(without\) life, slide #19](#)

**The Keeling Curve is a daily record of global atmospheric carbon dioxide concentration** maintained by Scripps Institution of Oceanography at UC San Diego. Readings have been taken at Mauna Loa continuously since 1958. Based on Keeling readings and [British Antarctic Survey's](#) analysis of Antarctic snow cores, the alarming graph below, of the last 800,000 yrs, was taken from the website, <https://keelingcurve.ucsd.edu/>. At that site, one can get today's reading.

Those Carbon Dioxide (CO<sub>2</sub>) levels as well as Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O), and Sulfur Hexafluoride (SF<sub>6</sub>) atmospheric levels are found at National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratories <https://gml.noaa.gov/ccgg/trends/weekly.html> and [US EPA Overview of Greenhouse Gases](#).

