Both Catastrophic and Skeptical CO2 Climate Science are Defective

A Proposed Scientific Measurement of CO2 Greenhouse Gas Capacities as a Substitute for Computer Simulations

Lawrence Dawson
Paradigm Publishing
email: communications@srnrl.com

Lawrence Dawson is the innovator of quantum-dimensional mathematics, a mathematical system designed to reformulate quantum mechanics. He has written five science texts based upon these mathematics, all of which are published by The Paradigm Company.

Orthodox climate science proposes temperature changes due to increases in atmospheric carbon dioxide. However, this hypothesis is not and has not been supported by recognize scientific methodology. Computer simulations of the greenhouse gas capacities of carbon dioxide are, at best, mathematical hypotheses of atmospheric processes. As with any hypotheses, the computer simulations must propose an empirical test by which they might be proved or disproved. Instead, the computer simulations have been accepted *"by fiat"* with no serious effort to prove their accuracy. This has reduced climate science to a "belief system" without authentic scientific foundation.

The capacity of the atmospheric trace element, carbon dioxide, to block the earth's thermal off-radiation is estimated by computer simulations [Houghton et al.1996]. There has been no direct measurement of atmospheric CO2's capacity to actually block the earth's off-radiation. Carbon dioxide as a greenhouse gas has been established only as a hypothesis by computer simulation and not as an empirical fact.

The scientist Pieter Tans of NOAA's *Earth Systems Research Laboratory* wrote an article in *Scientific American* explaining how such a small carbon dioxide trace element (400 parts per million parts of atmosphere) could have such a large impact upon the climate. Tans claims that computer simulations of the atmospheric carbon dioxide increases since industrialization have predicted a 1% increase in the blockage of the Earth's off-radiation. The computer simulations proposed that atmospheric carbon dioxide blocks the earth's off-radiation at the rate 50 times atmospheric density. The increase in atmospheric carbon dioxide since industrialization is estimated as 200 parts

per million. An atmospheric increase of 0.02% CO2 is said to increase radiation blockage by 1%, or 50 times atmospheric density. Again, this hypothesis that carbon dioxide blocks off-radiation at 50 times its atmospheric density is supported only by computer simulations, not by empirical measurements.

An example of the use a computer simulations without rigorous testing for accuracy is the study of the Phoenix, Arizona CO2 dome and its impact upon the Phoenix heat island.(Robert C. Balling, Jr., *et.al.* GEOPHYSICAL RESEARCH LETTERS, VOL. 28, NO. 24, PAGES 4599-4601). Phoenix, Arizona demonstrates a shallow CO2 dome at the city center with nearly 200 PPM greater CO2 concentrations than on the city's periphery. This CO2 dome coincides with increased temperatures in the city center. An unproved computer simulation was used to determine the amount of heat the CO2 concentration contributed to the increased temperatures (COMPUTER MODEL: "one dimensional infrared radiation simulation model, Chow and Suarez, 1994").

The authors state *"the shallow dome situated over the Phoenix Metropolitan area creates a 0.12° C warming of the surface."* The Chow and Suarez computer simulation was chosen over a competing simulation model which gave another simulated temperature increase. The model was chosen instead of the *"three-dimensional general circulation models (Houghton et.al. , 1996)."*; The Houghton model assumes a two-times feedback from water vapor and thus supplies a higher surface warming estimate from simulation of atmospheric blockage by CO2. The warming numbers chosen by the researchers were determined solely by which computer simulation model was chosen.The alleged warming was not determined by empirical measurement.

The computer simulations which hypothesize blockages by as much as 50 times density are supported` by so-called "climate skeptics" as well as orthodox climate catastrophism. This unproved mathematical hypothesis is not restricted to climate change orthodoxy. The primary governmental organization furthering orthodox catastrophic climate change is the United Nations' Intergovernmental Panel on Climate Change (IPCC). The primary organization which questions orthodoxy's catastrophic climate change is the Nongovernmental International Panel on Climate Change (NIPCC). Just like like NOAA's orthodox Dr. Pieter Tans, the NIPCC accepts up to 50 times density simulations.

> *" NIPCC estimates a doubling of CO2 from preindustrial levels (from 280 to 560 PPM) would likely produce a temperature forcing of 3.7 Wm^{-2} In the lower atmosphere for about approximately 1° C prima facie warming."* (The NIPCC Report On Scientific Consensus; p.xx).

That is, the skeptics' accepted computer simulations are the equivalent of the computer simulations proposed by catastrophic orthodoxy.

The fact that both catastrophic orthodoxy and climate skepticism accept unproved

computer simulation of CO2's greenhouse gas characteristics reveals that the issue between the two cannot be resolved by science. Neither camp has proved that atmospheric carbon dioxide blocks thermal off-radiation at many times its atmospheric density. The difference between the catastrophists and the skeptics is not the use a computer simulations but a disagreement about feedbacks from water vapor and other atmospheric gases upon CO2 greenhouse capacities. The skeptics' NIPCC Report identifies this.

> "Doubling the concentration of atmospheric CO2 from its preindustrial level, *in the absence of other forcings and feedbacks,* would likely cause a warming of approximately 0.3° C to1.1° C……..." .(NIPCC Report, p. 3).

The skeptics question the assertion that feedback from other atmospheric elements will increase the off-radiation blockage from CO2. Therefore, the temperature increases are not so great as orthodox climate catastrophism believes.

This skeptic distrust of orthodoxy's use of feedback from other gases to increase CO2's greenhouse effect is shown in the study of the Phoenix CO2 dome and its impact upon higher inner-city temperatures. The study chose the Chow and Suarez computer simulation which did not include water vapor feedback to estimate CO2 temperature increases. The non-feedback simulation was chosen over the Houghton. *et al.* computer simulations which did include water vapor CO2 feedback and therefore higher temperature impacts. Among the authors of the Phoenix Study was Craig D. Idso. Idso is an *Arizona State University* Ph.D who is also an author of the skeptic's *NIPCC Report on Scientific Consensus.*

According to his biography from the webpage *"CO2 Science:"*
"CRAIG D. IDSO is the founder, former president, and currently chairman of the Center for the Study of Carbon Dioxide and Global Change. The Center was founded in 1998 as a non-profit public charity dedicated to discovering and disseminating scientific information pertaining to the effects of atmospheric carbon dioxide enrichment on climate and the biosphere."

Dr. Idso's background in general carbon dioxide studies as well as well as his involvement in the original Phoenix CO2 dome study would qualify him to oversee the greenhouse gas measurement study being proposed, although he has not been contacted about the possibility.

The Controversy between Catastrophism and Skepticism cannot be Resolved by Computer Modeling

The contemporary debate between climate catastrophism and skepticism cannot be resolved scientifically because both rely upon unproved computer simulations. Neither the catastrophists feedback model for atmospheric CO2 nor the skeptics non-feedback model have been empirically tested.

What would an empirical test of atmospheric CO2's greenhouse capacity look like? The test would require that different levels of atmospheric CO2 be measured for off-radiation blockage. Such a test is possible using current instrumentation and a known climatological location. That location was alluded to previously. The Phoenix Arizona environ provides a CO2 dome with the city center measuring nearly 200 PPM greater atmospheric CO2 than the periphery of the city. While the dome does not extend to a great altitude, it was considered deep enough for researchers to estimate a temperature impact by using computer simulation. Dr. Craig Idso participated in the original Phoenix CO2/ heat-Island study. As chair of the Center for the Study of Carbon Dioxide and Global Change, Dr. Idso and his center would be ideal to manage this study.

Instrumentation does exist which can directly measure and gauge the actual capacity of off-radiation blockage by the atmospheric carbon dioxide. A "radiation frost detector" has that capacity.

> *Apogee Instruments' radiation frost detector is an innovative temperature sensor designed to mimic leaves and flower/fruit buds, which can sometimes drop well below the ambient air temperature due to long-wave radiation loss* [thermal radiation loss] *on clear, calm nights*.
>
> **Monitor Radiation Frost Events**
>
> *"On calm, clear nights surface temperature, including leaf and bud temperatures, can drop well below air temperature due to a net loss of long-wave radiation to the clear sky. A radiation frost occurs when frost forms at the surface before the air temperature reaches freezing (0 C). Under cloudy and/or windy conditions, radiation frost events do not occur. The Apogee radiation frost detector is a combination of two high accuracy thermistors mounted in a single housing. One sensor is designed to mimic a leaf and sensor is designed to mimic a bud, providing estimates of leaf and bud temperatures and a direct means of monitoring radiation frost events."* **www.apogeeinstruments.com/radiation-frost-detector/**

For the Apogee Instruments' radiation frost detector, the variance between air temperatures and the lower temperatures of radiation-cooled earth elements (buds and leaves in this case) is an exact measure of greenhouse gas blockage of thermal radiation. Instrumentation with high enough temperature resolution could determine the actual thermal blockage advantage for the Phoenix CO2 dome. Variances in temperatures between the air and radiation-cooled Earth elements, as measured on the city's periphery versus the Phoenix dome center, would identify the actual temperature increase due to the 200 ppm advantage in the center.

The greatest development of the Phoenix CO2 dome exists during the early morning hours of the Phoenix frost season. During radiation frosts, the temperatures of earth elements fall below air temperatures due to off-radiation of their heat. However, the temperature differentials between earth elements and air approaches " 0° " when all off-radiation into space is blocked by atmospheric conditions such as full cloud cover.

The Apogee radiation frost detector can measures the variance between air temps and earth element temps during radiation frosts. However, the temperature resolution of the existing instruments are not refined enough to measure the temperature variations across the Phoenix dome. The instrument can only measure with an accuracy of a 10th of a degree Centigrade (± 0.10°C) which is too crude to measure reduced temperature variations between air and Earth elements caused by the CO2 increases in the shallow dome center . The Balling, *et.al.* computer model for the dome center estimated a 0.12° variance between the dome center and the dome periphery. With an accuracy of ±0.10°, the existing instrumentation thermometers would have a low probability of detecting these temperature variations between the dome periphery and the dome center.

The existing instrumentation will need to be modified by a specialized type of engineering known as *"Measurement Systems Engineering."* In the 1970s engineers discovered new techniques for making precise measurements. Specifically, it was discovered that a "systems approach" increased measurement efficiencies.

"[Precise instrumentations] are designed around a small group of precision components. If these basic components are brought together and arranged for convenient interconnections, it is possible to have versatile systems that are the equivalent of having a very large number Instruments immediately available." FROM: "*Experimental Backgrounds for Electronic Instrumentation,"* p. iii; Erickson and Wells, 1969. Laboratory Systems Research, Inc.

Existing temperature probes will need to be refined to a thousandth of a degree centigrade (±0.001°) accuracy. Measurement systems engineering makes this possible. However, there have been severe restrictions upon the field of measurement systems engineering (MSE) in recent years period

MSE was introduced by such pioneers as Arizona State University's Peter Stein and Colorado University's Chester Wells during the '70s. However, MSE was analog based. With the advent of a digital take-over of instrumentation, there occurred a substitution of computer modeling for precise analog measurement. Analog-based MSE was pushed into the background. With Stein's retirement, his respected lab disappeared from ASU. Chester Wells moved to Nampa Nazarene University where he was able to keep his MSE lab until he retired two years ago. The NNU Lab is now the only functional MSE lab in the continental United States.

Wells is currently an Engineer Emeritus for this MSE lab. He explained how an MSE lab could bring the radiation frost instrumentation to the resolution required to measure CO2 blockage variations across the Phoenix dome. Wells points out that the temperatures which would be measured during a Phoenix CO2 dome study are very close to the triple point in water (0.008° C according to Wells) [SEE: http://www.dictionary.com/browse/triple-point]. Variances between air and Earth element temperatures in the Phoenix study would be measured at or around "0° C" or very close to the triple point. The resolution of the triple point in water is 2 millidegrees (± 0.002°). If the triple point were

used to calibrate temperature measuring instruments, such as high-resolution replacement thermistors in a radiation-frost detector, the resolution of the instrument could be brought close to the required "± 0.001°" resolution. Wells believes that further decay of thermal measurement could be to another "±0.001°" depending upon choice of components for the measuring system.

This instrumentation can be used to measure thermal radiation blockage at the dome center and its 200 PPM greater CO2 density versus the dome periphery. Thermistors, with accuracies of nearly "± 0.001°," used on the periphery and the dome center could collect sufficient radiation-frost data to empirically determine CO2's "greenhouse gas" capacity. Multiple measurements rendering a sufficiently large data set could determine the dome CO2's thermal radiation blockage capacity versus the less-dense periphery and is radiation blockage capacity.

Once we know the density blockage temperatures, as measured to dome height, calculations for the earth's CO2 density to the height of the atmosphere can be made. For the first time, an actually measured greenhouse gas capacity for CO2 can be made.

The Specific Proposal

It is being proposed that Federal funding establishes a set of climate stations in and around Phoenix Arizona. These stations would further the research which has previously been conducted on the Phoenix CO2 dome and the Phoenix heat island. The personnel responsible for the past research should be incorporated into the management of the Phoenix climate stations.

The primary purpose of the Phoenix climate stations would be to empirically measure the greenhouse gas capacities of atmospheric CO2 and to replace computer simulations with accurate measurements. The cost of a Permanent Phoenix Climate Station cannot be estimated because the primary instrumentation would have to be engineered.

Currently available radiation frost detectors will require modification of their thermometer resolutions by Nampa Nazarene University's Measurement Systems Engineering Lab as well as the Snake River N- Radiation Lab (SRNRL). The NNU lab is under the tutelage of Chester Wells, one of the original pioneers of MSE technology. Wells proposed the triple point of water as the calibration means to gain the temperature resolution required to measure CO2 greenhouse capacities within the Phoenix dome. His MSE lab would supply this stable triple point sample. The SRNRL would supply the high resolution thermistors and calibrate them to the triple-point sample.

The triple point in water is the pressure and temperature at which water can exist as liquid, as ice, and as water vapor. The required temperature for the triple point to exist is accurate to ±0.002°. The NNU Measurement Systems Engineering Lab will provide the triple point calibration sample. The Snake River N-radiation Lab will provide thermistors

for the radiation frost detectors with an after-calibration resolution of ±0.003° C.

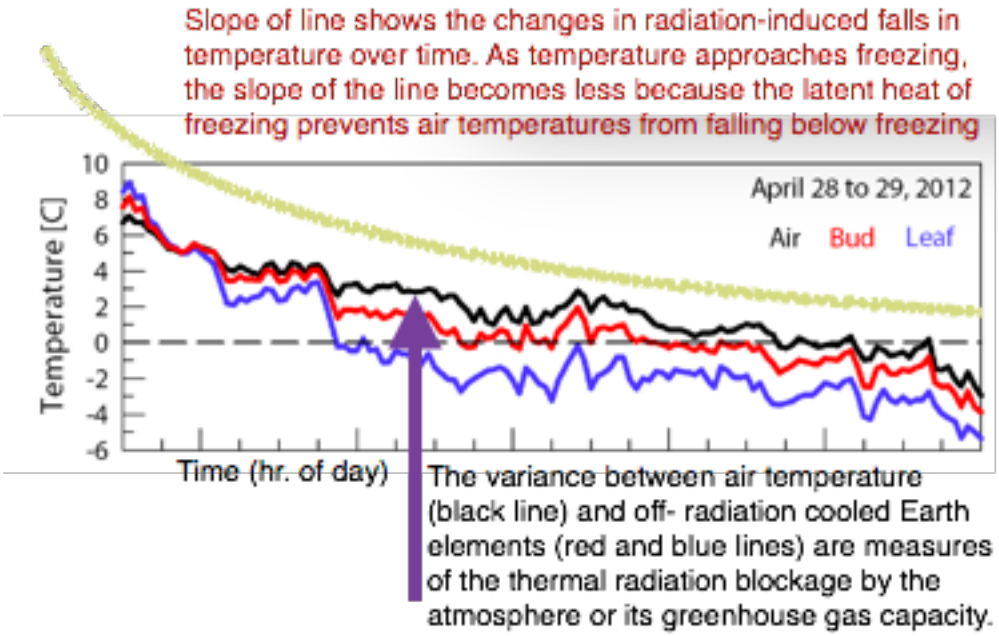
A Secondary Check upon the Accuracy of Temperature Variation Data

The slope of the line for temperature drop in the radiation-frost graph below shows that the rate of drop in temperature becomes less as air temperature approaches freezing. The latent heat of freezing (SEE: https://climate.ncsu.edu/edu/k12/.lsheat) prevents the air temperature from falling below "0° C." However, the temperatures of Earth elements do fall below freezing by radiating off their heat. The below freezing temperatures of the Earth elements are still influence by heat exchange with the air. The slope of the line showing Earth element temperatures tends to follow the slope of air temperatures.

When the air temperature spikes up, the freezing Earth element tends to follow upward. Similarly, a downward temperature trend is followed by the Earth Element temperature downward trend. Notice however that with upward spikes the Earth Element temps move closer to air temperature. With downward trends, Earth Element temperatures move further away from air temps. This is due to the natural inclination of atomic nuclei to give up more of their heat as radiation emissions at higher temperatures and less of their heat at lower temperatures. When contact heat exchange with the air is increasing, the power output of the nucleus becomes greater and nuclear temperatures incline towards the contact heat source.

These thermal radiation inclinations toward air temperature spikes are measurable. There will be less variations between spikes and temperature falls under conditions of greenhouse gas blockage of off radiation. At "±0.003° C" resolution, variations between spikes and falls should be explicitly measurable for comparisons between CO2 densities across the dome.

Actual graph of temperature variations in radiation frost record



Lawrence Dawson, Director, The Snake River N-Radiation Lab