



## Underground Nuclear Testing: The Leading Cause of Global Warming

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### Key words

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### Abstract

*This paper aims to document a scientific linkage between the underground testing of nuclear weapons and global warming using methods in Statistical Process Control. An empirical analysis of CO<sub>2</sub> and fossil fuel data post-1945 suggests that global warming is not clearly attributable to greenhouse gas emissions alone. Our data indicates beyond statistical doubt a direct linkage between the rise in CO<sub>2</sub> levels and underground bomb testing; rendering adverse consequences like global warming, radioactive contamination of terrestrial and marine ecosystems, and major disruptions to temperature patterns around the world. The derivative carbon footprint of underground nuclear testing is colossal and can bring about devastating human-induced climate changes which are not just massive but potentially irreversible.*

### Introduction

A British study published in the Physical Review Letters journal documented that nuclear bomb testing during the 1960s may have played a significant role in altering climate patterns around the world. The study concluded that nuclear bomb testing during the cold war caused large-scale radioactive fallouts up to several thousand miles from the testing sites. This fallout altered the rainfall distribution patterns and increased the cloud thickness; thereby leading to global warming and irregular temperature distributions [1,2]. While the consequences of radioactive fallouts have been documented by researchers from time to time; one significant by-product of the energy emission of nuclear tests has largely been overlooked by the environmental academia. The energy by-product in question is CO<sub>2</sub> (Carbon Dioxide). A significant amount of CO<sub>2</sub> can be disgorged from the energy released by explosions of nuclear testing. If all the energy released by a 1 Kiloton nuclear bomb (an explosive force equal to that of 1000 tons of TNT, Trinitrotoluene), were to be absorbed by water; the CO<sub>2</sub> released would be the equivalent of 1250 people for 75 years (using the lifetime footprint of 20 tons). In 1971, a five megaton explosion was detonated more than a mile below remote, windswept Amchitka Island in Alaska [3]. It was the most powerful underground bomb test conducted by the US to date, or perhaps by any nation on the face of the planet.

This notorious explosion was 250 times more powerful than the bomb dropped on Hiroshima. If measured on the Richter scale, the explosion would return a result of 7.0; equivalent to the earthquake that destroyed Haiti in 2010 [4]. That energy had the potential to release more CO<sub>2</sub> than the entire city of Los Angeles, which has 4 million people. A study published in the Energy & Environmental Science journal has documented that using 1/1000 of the total capacity of a full-scale nuclear war weaponry would induce 690m tonnes of CO<sub>2</sub> to penetrate the earth's atmosphere. This is more than the annual carbon footprint of the United Kingdom [5]. There is insurmountable evidence to suggest that the indirect carbon footprint of nuclear testing; both underground and overground, is drastically high; enough to crank up global temperatures by scores of degrees and disrupt climate patterns forever.

### History and consequences of underground NB testing

The PTBT or the Partial Test Ban Treaty was signed by the erstwhile USSR, the UK, and the US in 1963, before being laid open for all countries to sign. The treaty banned the testing of weapons-grade nuclear detonations in the atmosphere, space, and underwater. The treaty however made an explicit exclusion of underground testing [6,7].

The objective behind signing the PTBT was to prevent signatories from carrying out NB explosions in any setting which threatened the passing over of the radioactive debris beyond

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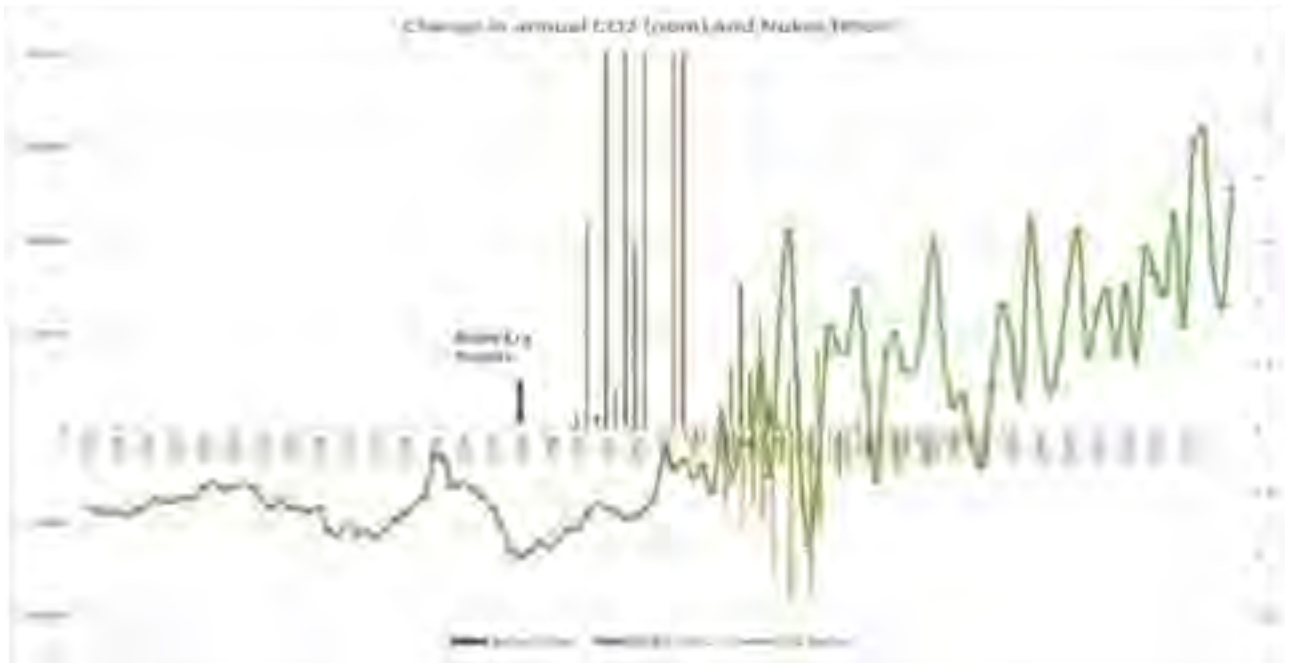


Figure 1. Change in annual CO2 (ppm) vs nuclear weapons (Kton)

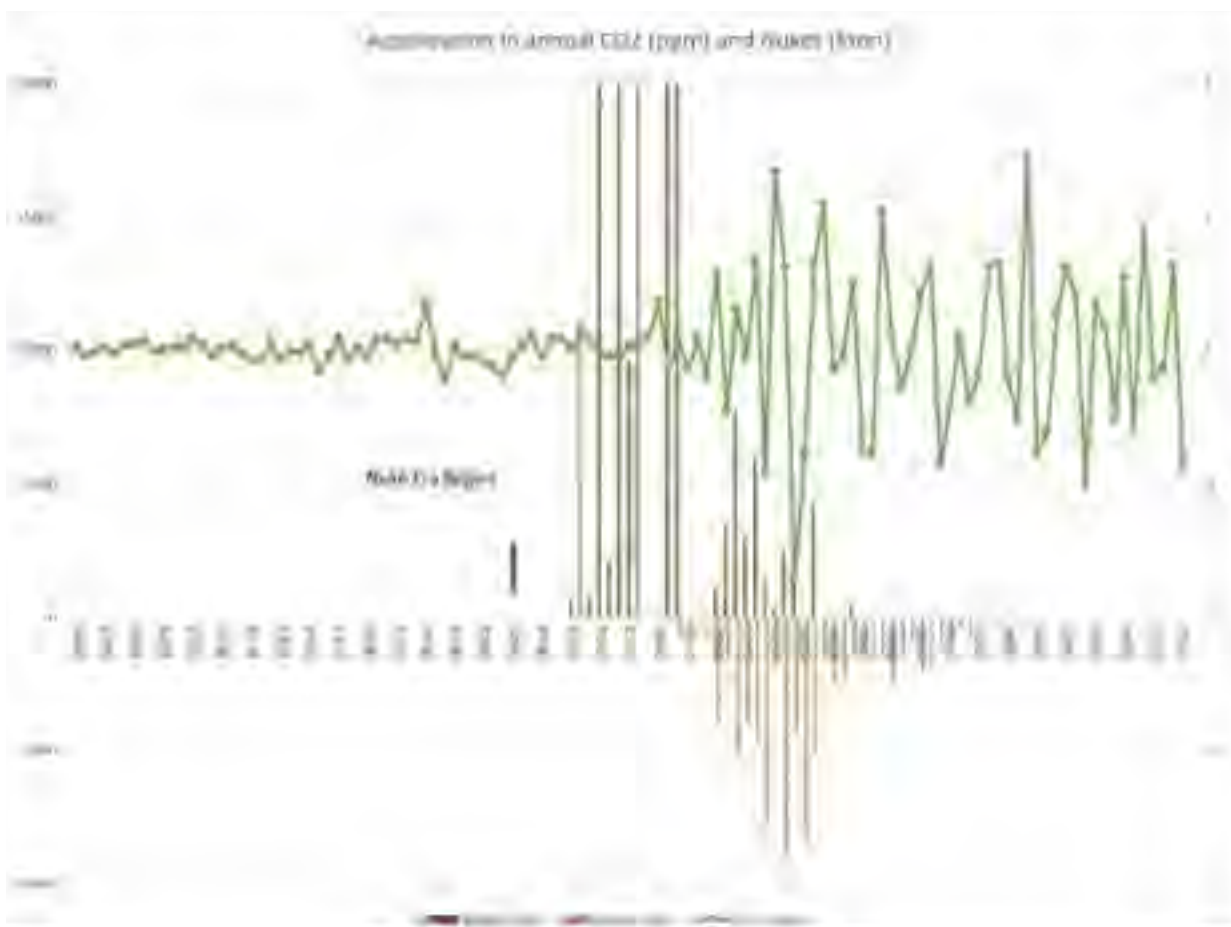
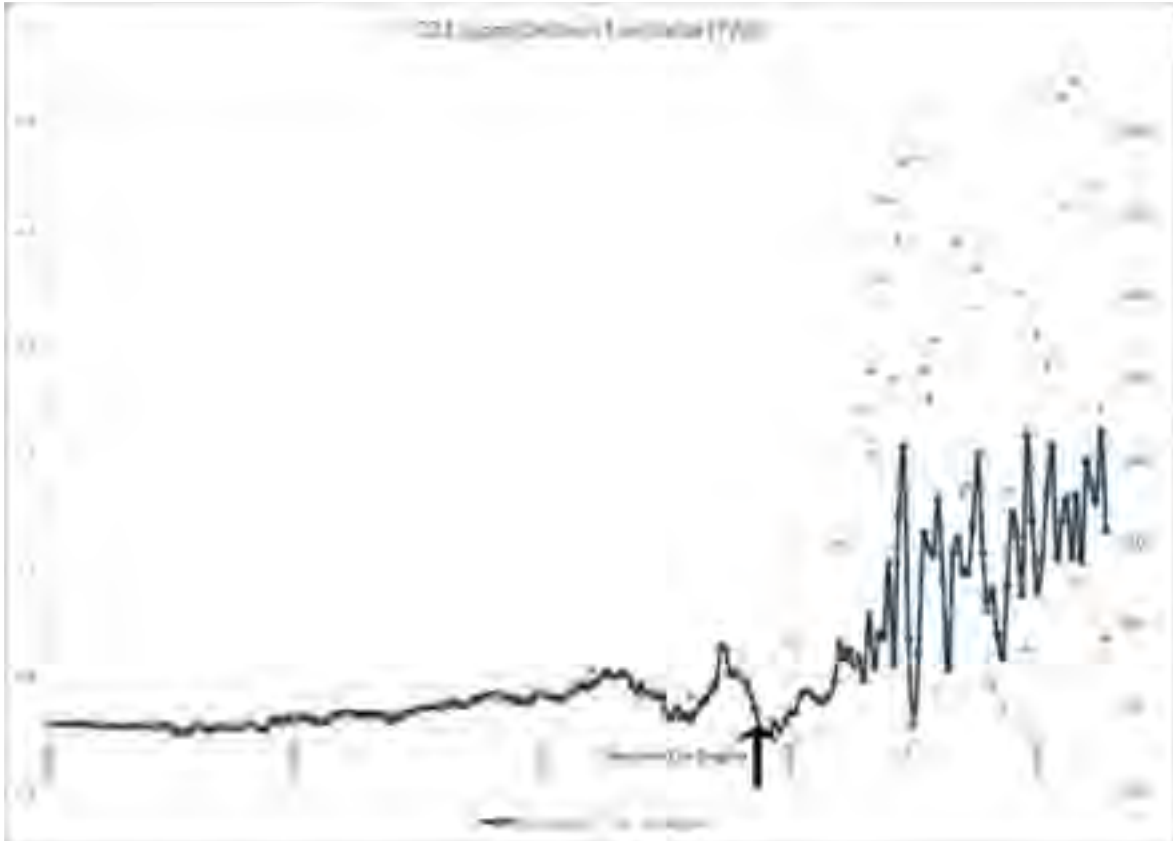


Figure 2. Acceleration in annual CO2 (ppm) vs nuclear weapons (Kton)



**Figure 3.** CO2 (ppm) concentration delta vs fuel delta (TWh)



**Figure 4.** Delta CO2 vs delta fuel (ppm, TWh)

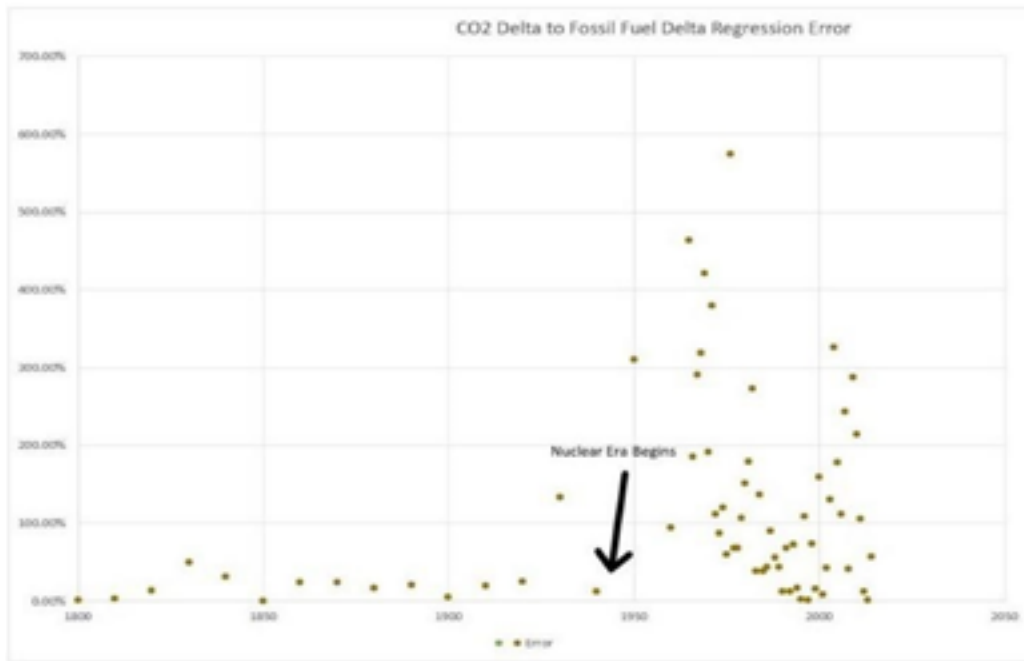


Figure 5. CO<sub>2</sub> delta to fossil fuel delta regression error

the boundaries of that country [8]. Energy cannot be created or destroyed. It can only be changed from one form to another [9]. Before the PTBT was signed, NBTs (Nuclear Bomb Testing) were conducted on land and most of the EMP, electromagnetic pulse, released was sent into space. The EMP released from underground bomb testing (UBT) however, cannot find its way directly into space. The EMP has to take the shape of some other form of energy like thermal energy; which manages to find its way to the rocks on a quantum level. The energy of a 1 KTon from a nuclear explosion has the potential to evolve 25 KTONs of CO<sub>2</sub> (heat of solution of carboxylic acid) when it's absorbed by the ocean. It is interesting to note that there has been a significant rise in global CO<sub>2</sub> levels since the start of underground bomb testing (UBT) in 1958 [10]. The rise observed has been three times more than fossil fuel emissions indicating a drastic change in carbon emissions post-1958. Researchers have documented the atmospheric carbon content to have nearly doubled and increased to 100% above normal levels between 1963 and 1965 [11].

### Statistical analysis of CO<sub>2</sub> and fossil fuels

Carbon-dioxide concentration is directly proportional to fossil fuel consumption (Prentice). The change in CO<sub>2</sub> in PPM (parts per million) using NOAA (National Oceanic and Atmospheric Association) data alongside the change in fuel consumption can be observed from the figures. The rise of the two events is mutually exclusive till 1945 after which the graph demonstrates irregularities, indicating the presence of an alternate source to fossil fuels for the surge in global carbon emissions. We went ahead and performed a linear regression on the data before 1945 and graphed the resulting error. The error in predicted CO<sub>2</sub> change based on fossil fuel consumption is relatively low pre-1945 but irregular post-1945. The CO<sub>2</sub> change in delta ppm per year = 0.00138 \* (indicating a change in fossil fuel use in TWH) per year + 0.0802 with a 91% correlation.

The AI Gore Equation is in the linear form of  $y = mx + b$ . Here,  $y$ : CO<sub>2</sub> change in ppm,  $x$ : change in fossil fuel consumption  $b$ : change from solar cycle.

Before the onset of atomic bomb testing, the fundamental reason behind the global rise in temperatures was fossil fuel consumption. This was followed by the period of above-ground NBT making use of more fuel, leading to a cooling effect (Nuclear winter). On the contrary, UBT induces a reverse effect by propelling tremendous CO<sub>2</sub> into the atmosphere, leading to a warming effect (nuclear summer).

### Pure Speculation

Every process on the planet follows a cyclic pattern. The natural cycle which occurs inside the sun involves the breaking and mending of subatomic bonds [13]. This systematic joining, structural reorganization, and breaking away of combined atoms and bonds are symbolic of the Quantum cycle. Likewise, inside the earth, the movement of particles and matter is a continuous process and can be associated with a kinetic cycle. The natural climate system of our planet ensures that it is always in a homeostatic energy balance with the sun. The earth receives energy from the sun, uses this energy, stores this energy, and emits excess energy.

The earth stays here at homeostasis, being only a function of quantum energy. The harmony in the climate system is centered around radiation from the sun, of which 49% is soaked by the Earth's surface, and 20% is taken up by the atmosphere [14]. The earth is not designed to deal with any tertiary quantum reactions which run contrary to the natural climate system. Due to nuclear explosions, heat is induced into the earth's atmosphere from the fission reactions. This heat has to be absorbed by the kinetic cycle. Also, the released energy cannot go back to its original quantum state. This naturally forces the temperature of the closed system to go up; causing the release of excess energy, and returning the system to the homeostatic condition. If we closely examine a nuclear explosion, we will notice that there's an intense flash of light (bomb) followed by a combination of radioactive fallout, heat, and pressure [15]. A nuclear test conducted on the ground causes the light to go away from the planet into the atmosphere and then space. However, during an underground nuclear test, the light doesn't go out. When the tests are conducted underwater,

a bright stream of light is visible. This is followed by the intense heating of the water causing it to release tremendous amounts of CO<sub>2</sub>. Since this is a lot of energy released in a small amount of time, the waters become unstable and shaky. The concentration difference causes a change in the overall CO<sub>2</sub> levels as natural heat and mass transfer return slowly back to equilibrium.

The natural balance of the water body is destroyed causing abnormal warm spots, and unfitting high and low tides. 2/3 of the earth's surface is covered by water. Due to underwater bomb testing, a huge share of energy and radionuclide particles has accumulated in the marine environment over the years. These radionuclides get indirectly transferred into the geosphere and in human beings via the food chain causing monumental levels of radioactive contamination of terrestrial ecosystems besides global warming [16].

The question remains: how did the energy get through the rock? Electric lightning travels through non-conductive air to equalize its energy potential between the earth and the thunderstorm. A millisecond prior to the lightning strike, streamers are sent out, finding the path of least resistance. Nature copies itself. Therefore, it is within reason that a large photonic potential is akin to a large electric potential. I believe that the photonic potential is so incredibly powerful when the underground nuclear explosion occurs, that photonic streamers are disbursed as the fireball grows. The photonic streamers burn their way through the rock, forging a path for the massive photonic energy to escape. Once the heat sink (cold water) is reached, the growing fireball now discharges the remainder of the energy through the rock, into the cold water.

On the bomb side, all we'd see is that the bomb chamber grew to a certain size and suddenly ended (the same results we see with a conventional bomb test. However, there would be a very large error in the theoretical energy and the calculated energy. The evidence suggests that the energy left the system and entered the water. This would explain deviation from theory during the bomb tests.

**Statistical analysis of CO<sub>2</sub> data from NOAA**

The SPC (Statistical Process Control) charts attached to this section highlight the change in CO<sub>2</sub>. The charts are sought to separate normal variations from anomalies. The normal statistical parameters; mean and standard deviation are first established. That sets the limits, plus or minus three standard deviations. Over 99% of the normal data variation lies inside the established two limits. Data that lies outside the established limits are caused due to fresh disturbances. In order to perform the analysis, I found the least noisy area, post 1958, at January 1994 to June 1995 for the acceleration SPC analysis. I used these data to establish the statistical limits. I am not using the data pre-1958 since the way we calculated the global average CO<sub>2</sub> concentration changed in that year.

First, I looked at the annual acceleration Statistical Process Control Chart, Figure 6. This chart easily picked up the 1971 Cannikin test in Alaska and the tests conducted by China and the US in 1998. The annual velocity Statistical Process Control Chart, Figure 7, shows the two moments found in the Acceleration SPC chart and also the two large North Korea underground nuclear tests in 2016-2017.

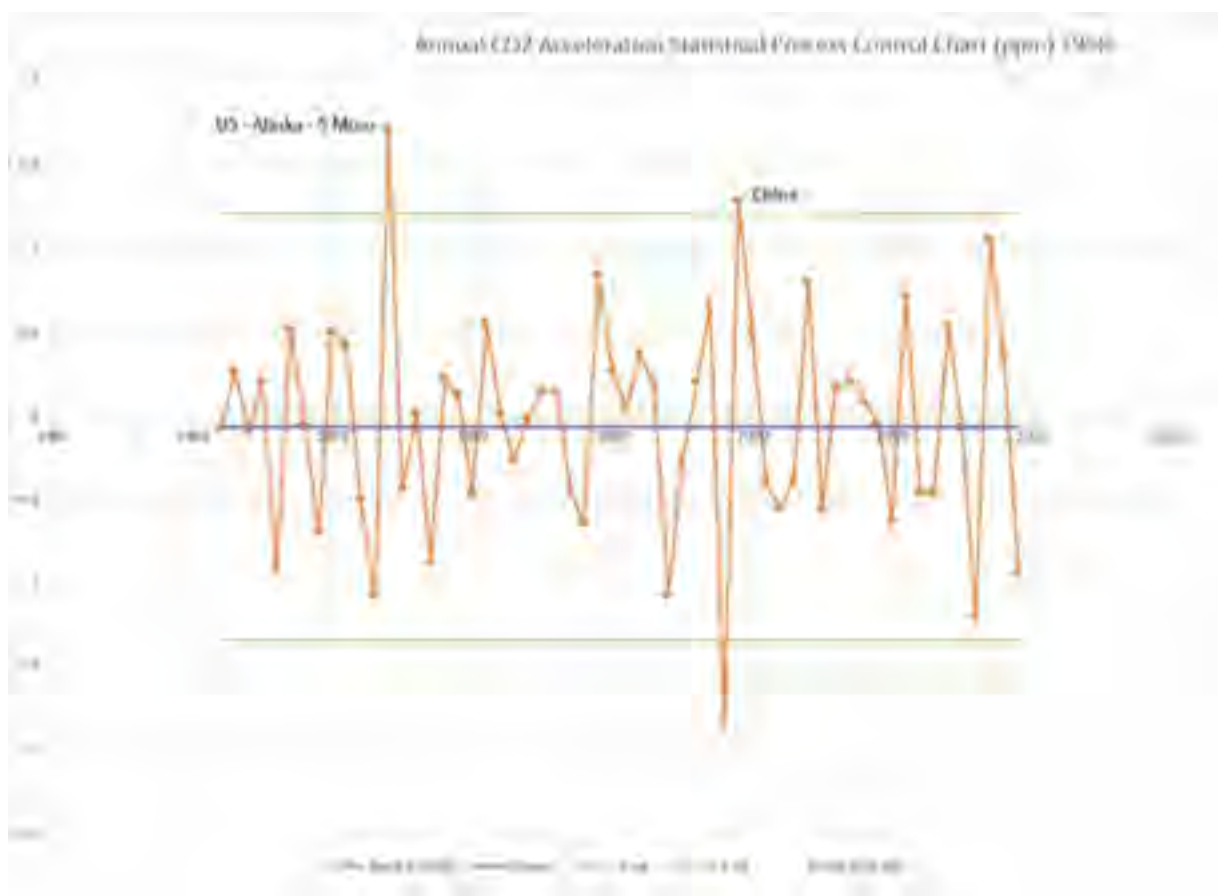


Figure 6. Annual CO<sub>2</sub> Acceleration SPC Chart

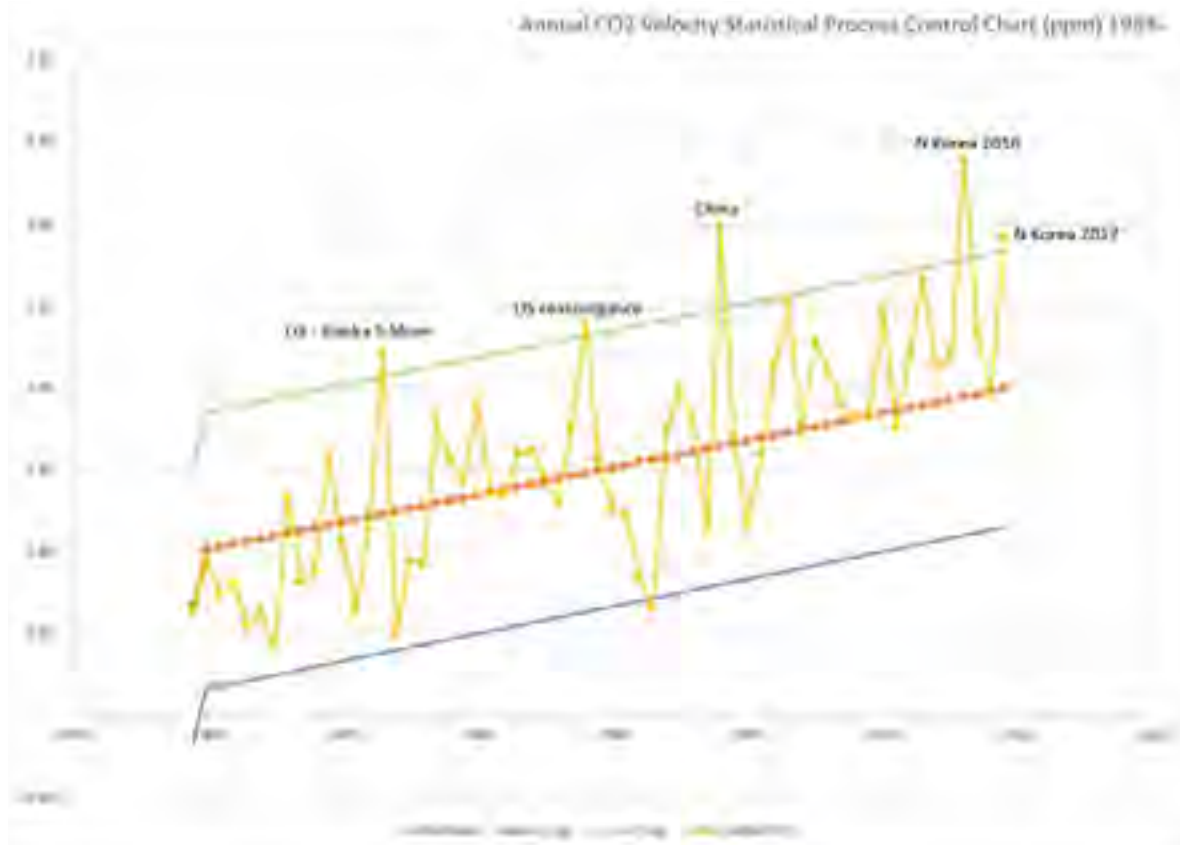


Figure 7. Annual CO2 Velocity SPC Chart

I then performed the Statistical Process Control Analysis on the Monthly CO<sub>2</sub> derived data. These data are shown in Figures 8-11. In each, a hypothesis analysis was conducted on the derived data (the monthly change in global CO<sub>2</sub> concentration (the velocity) and the change in the change in CO<sub>2</sub> concentration (the acceleration). With all the residual noise generated from the energy impulses, it is strongly conceivable that the signals were generated by underground nuclear testing or some huge weather event. Looking at the signals themselves, the North Korea nuclear tests seem to give a repeatable, oscillatory signal. This leads credence to the oscillatory nature of the energy impulse.

In all, the monthly acceleration SPC data yields 64 three sigma data points, 37 of which could be directly linked to underground nuclear tests. As for the monthly velocity SPC data, there are 38 three sigma signals with 24 linked to underground nuclear testing. Therefore, in both the monthly acceleration and monthly velocity SPC data, about 60% are attributed to underground nuclear testing. These results of the statistical analysis demonstrate beyond a reasonable doubt that nuclear testing caused a change in CO<sub>2</sub> levels. The data also indicate beyond any empirical uncertainty that nuclear testing was not conducted in a closed system as was initially conceived, but in an open system that allowed the energy to channel directly to the deep, cold, and dissolved gas-rich water.

The data in Table 1 show my SPC three sigma point (from either SPC analysis) and the actual underground nuclear test date. Fortunately for us, during this period of time, there was only one nation performing underground nuclear tests. My SPC analysis of the change in global CO<sub>2</sub> concentration indeed picked up every test.

Table 1. SPC First Signal Date And Nuclear Test Date Comparison

SPC Analysis Trigger Date	Actual Nuclear Underground Test Date
5/1/2007	9/10/2006
2/1/2010	5/25/2009
5/1/2013	2/12/2013
2/1/2016	1/6/2016
1/1/2017	9/9/2016
11/1/2018	3/9/2017

**Discussion: Earth's process control system – Radiant energy and greenhouse gases**

A five (5) megaton bomb only yields 2924 Ktons of TNT. Taking energy conservation into consideration, 42% of the Ktons of TNT in energy are missing in an open system. But the system in question is closed with multifarious parameters like convulsive forces, heat, and radiation. The energy that is missing from the calculations left the blast site as electromagnetic pulses (EMP) and discharged into the water where it evolves CO<sub>2</sub>. It's interesting to note that the irradiation of the planet is a direct function of its outer skin temperature. The temperature in turn is controlled by the regulation of CO<sub>2</sub> within the marine ecosystems. The massive quantity of EM entering the earth will cause CO<sub>2</sub> to evolve. This causes an energy pull from the water (by the heat of the solution of carboxylic acid). The pulled energy is distributed

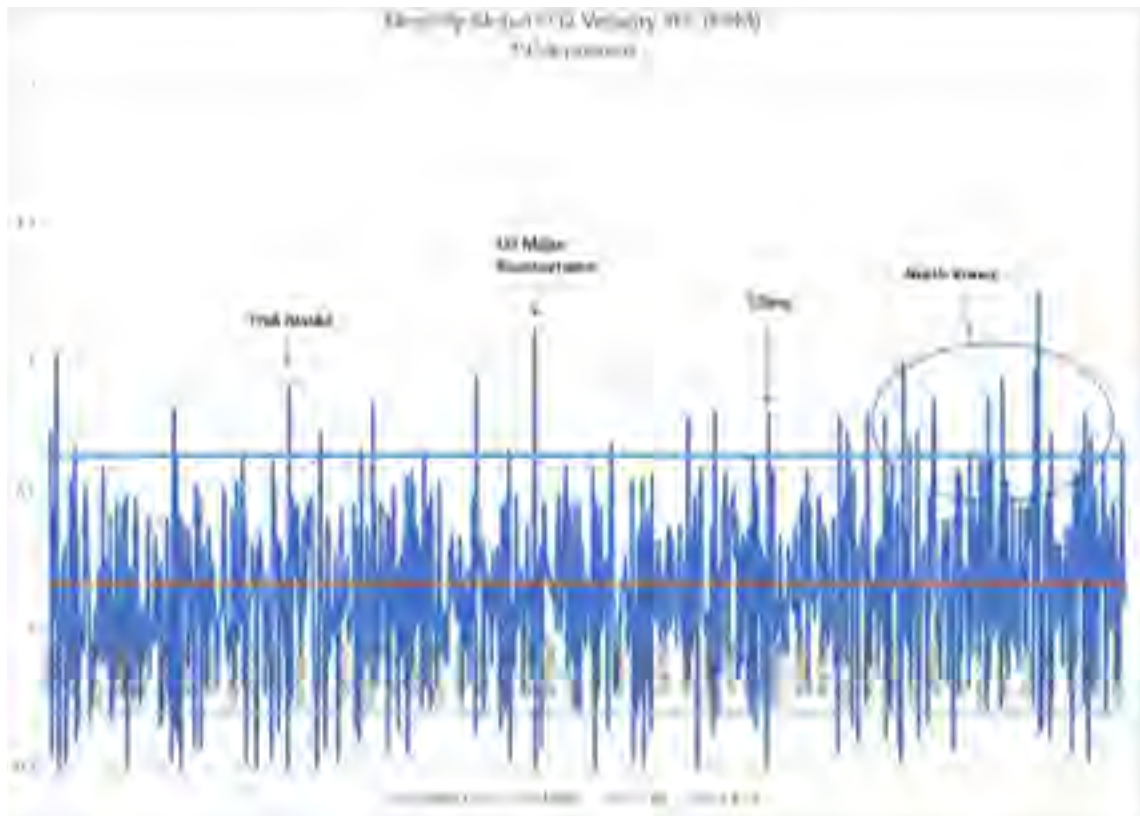


Figure 8. Monthly global CO2 velocity SPC, 1958-present (PPM)

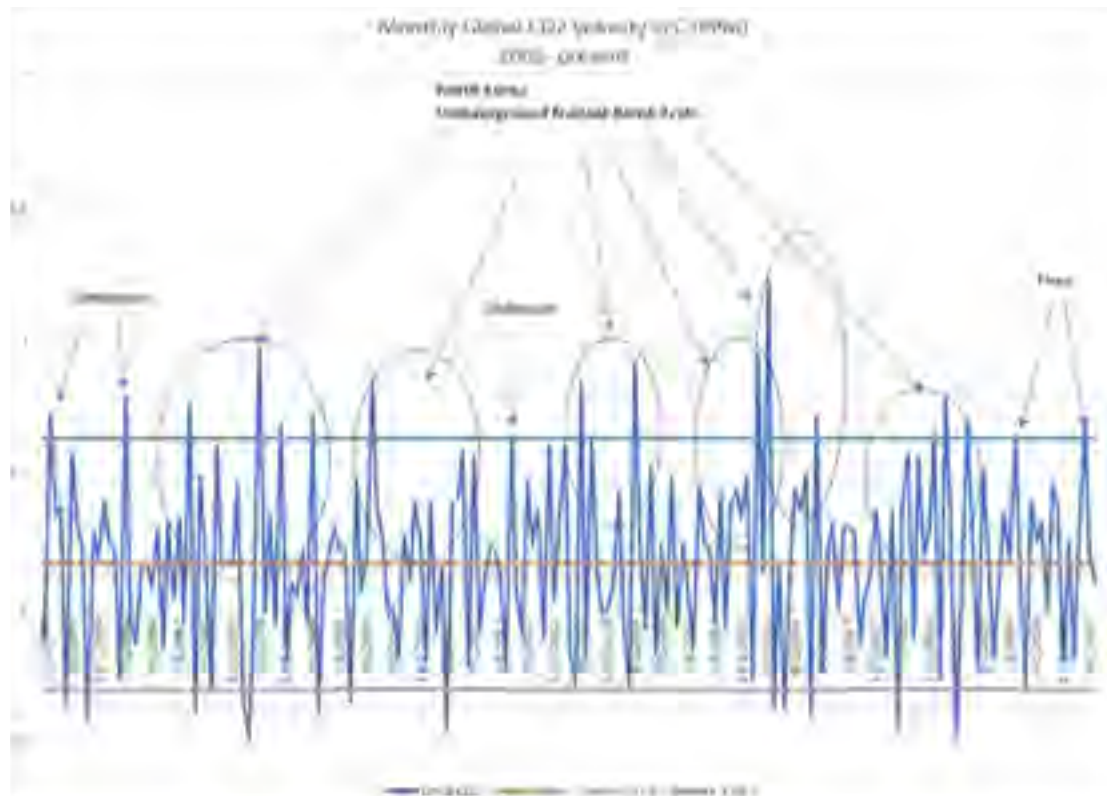
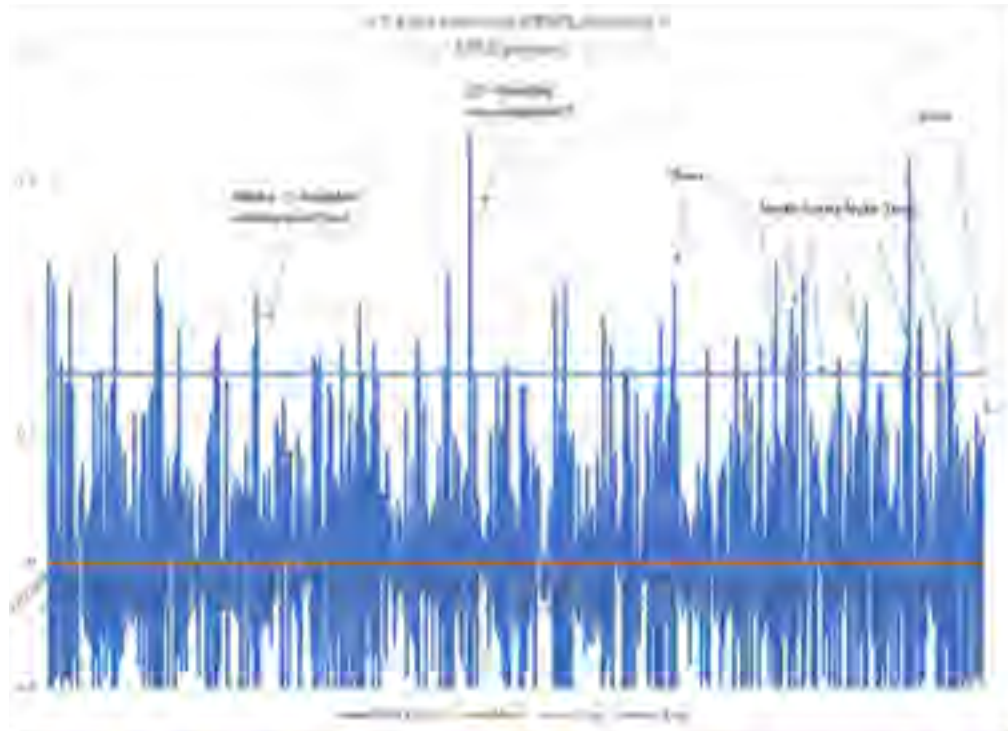
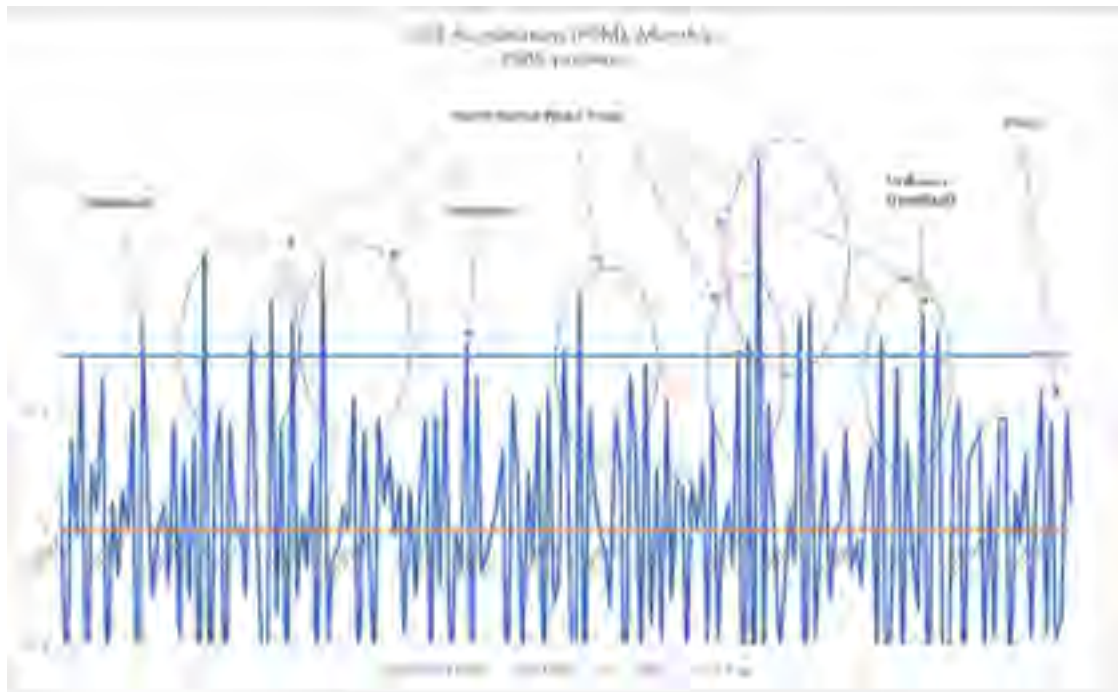


Figure 9. Monthly global CO2 Velocity SPC, 2005 – present (PPM)



**Figure 10.** Monthly CO2 Acceleration, 1958-present (PPM)



**Figure 11.** Monthly CO2 Acceleration, 2005-present (PPM)





Figure 12. Earth's Climate Timeline

to the air concurrent with a small temperature increase in water. The air temperature rises as a result of the  $\text{CO}_2$  concentration and thus, the earth's irradiation increases. If the air cools, the water cools; and  $\text{CO}_2$  gets re-absorbed back into the water, and the cycle restarts. This systematic regulation with varying solar activity causes the earth's temperature to be maintained. This is how the cycle operates in near-perfect conditions. Now let's add the detrimental constraint of underground nuclear testing. The energy that is released from these tests is considered an impulse function in process control terms.

It involves the dissemination of huge portions of energy, over a short time, in a small area. These are the direst circumstances for a control loop to operate. Followed by this, the heat transferred and immediate mass release of  $\text{CO}_2$  exceeds the normal mass transfer/heat transfer rates in marine ecosystems. This will in turn cause an imbalance in temperature regulation and provoke instability in the earth's process control system rendering life-threatening consequences.

A global blanket ban on nuclear testing is not just necessary but absolutely mandatory to control the horizontal and vertical proliferation of nuclear technology and safeguard the world from global warming viz rising  $\text{CO}_2$  levels. Unless such a blanket ban is imposed, nations will continue to maintain their unilateral moratoria on nuclear testing which would serve as a blow to any hopes of lessening environmental menaces caused due to abnormal  $\text{CO}_2$  concentration. The energy control system of the planet is destabilizing. Even though reaching a monumental decline in  $\text{CO}_2$  concentrations is impossible without a global ban on nuclear testing, we cannot undermine the positive contribution that can be rendered by reducing carbon footprints on primary, secondary, and tertiary levels. A global test ban cannot offer a panacea, but it can serve as a fundamental barrier to the persistent rise of  $\text{CO}_2$  levels which are expected to reach 75 billion tons per year or more by the end of the century. At such a state, the atmospheric carbon dioxide could be 800 ppm or higher — conditions not seen on Earth for close to 50 million years. Supercharging of the natural greenhouse effect at this stage could render serious, irreversible alterations to the climate system of the planet bringing about unquantifiable levels of devastation. Alternatively, we could reflect the energy back into space thereby preventing it from getting into the oceans; while allowing the oceans to permeate their gases.

### Conclusion

Through the statistical analysis of change in  $\text{CO}_2$  and fuel consumption, we detected irregular and asymmetrical patterns after 1945 indicating the presence of an alternate source for the

surge in global carbon concentrations. The genesis of this uneven pattern was the underground testing of nuclear weapons which commenced post-1945. The chart that we plotted from the statistical analysis of  $\text{CO}_2$  data from NOAA picked up significant energy emission events like the 1971 Cannikin test in Alaska and every underground nuclear test 2006 to present. Most signals were generated by underground nuclear testing, and the results of the statistical analysis demonstrate beyond doubt that nuclear testing caused a change in  $\text{CO}_2$  levels thereby inducing global warming. This timeline (Figure 8) shows all the forces that are currently or have affected climate change. Had all the climatologists and scientists known about these data, I'm sure that a different conclusion, other than hitting a  $\text{CO}_2$  threshold, would have emerged.

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