

## Paul Sirvatka's Personal Statement on Climate Change

I have studied the atmosphere for over 25 years. Its complexities have intrigued me, perplexed me and humbled me. When I thought I knew something, the atmosphere showed me something new and unexpected. The scientific community has words for its nature: chaotic, non-linear, unpredictable.

Climate change is one of the most controversial subjects with which I have been associated. I am by no means an expert in climatology, statistics, data analysis or even meteorology. Experts don't exist – there are only varying levels of understanding. What I have come to believe about climate change is not the truth. It is only the truth as well as I understand it. It will change, just as the weather itself changes. The following statements are things I have come to believe. And in deference to a good friend of mine, I will try to state some of these beliefs using terms of confidence or uncertainty, both bespeaking of a language that meteorologists use best.

Humans affect weather and climate. There is no doubt that humanity impacts the natural environment. What is uncertain, perhaps unknowable, is the true extent of our impact on the natural world. This may be expressed in the conundrum: “What would the atmosphere/climate be like in the absence of humanity?” Certainly, climate records a great deal of variability of change in the time epochs before humanity. We have some idea of what happened in the past, even though we do not know the details. This leads to a second, and more subtle, point

What is the current state of the climate? What is the “average” temperature of the earth? There are various methods that attempt to monitor the earth's temperature. Some of the methods are more reliable than others. Some have extremely limited histories which muddies the waters of climate records. The data that is used is also subject to manipulation to make it sensible. I have come to believe that there are significant problems with the data record as we receive it. Our so-called “analysis” is actually a highly manipulated data set where various assumptions are used. This is not to say there

is something nefarious going on. Data manipulation is mandated by the types of understanding we require. We just do not have a completely adequate method of ascertaining the true state of the atmosphere.

Now, couple that over a time span of 100 or 1000 years. If we do not know what that temperature of the planet is now, we do not know what it has been. We may know trends, but even they are based on various assumptions. We do know a few things that are certain: temperatures change both spatially and temporally. When we speak of normal, we can only speak of normal within some time-averaged states of the atmosphere. So what is normal? We can define normal as a range of temperatures that provide for an adequate sustenance of life over a vast majority of the planet. Within that range, there are warmer times and cooler times. We are living in a time of “above normal” temperatures, but as with all climate-type statements, there is variability within that range.

I have come to believe that temperatures have increased in recent times (say since the 1950's or 1970's) on a world-wide scale. And although I do not believe this is outside of what might be possible, it does contribute to affected weather patterns on the global and regional, and ultimately, local scales. There are widely defended reasons for this temperature change that range from natural variability (though even that phrase still necessitates a “reason”) to solar activity to anthropogenic forcings, such as CO<sub>2</sub>. I am apt to believe that all of these reasons have some impact on global temperatures to some extent. The controversial aspects contend with the anthropogenic reasons of climate change. That carbon dioxide has increased since the onset of the Industrial Age is not controversial. The extent to which that governs world-wide temperature is more uncertain. I must admit that I am unable to reason out any understanding of the role that greenhouse gas plays in the global air/sea energy budget. Does it have some consequence? Most likely. However, I believe that its significance is not without question. Much research and numerical models have added evidence to its role, but I have seen reasonable evidence to suggest otherwise, or in the very least, to a lesser extent. Nonetheless, it is very likely that carbon dioxide has some impact on the global environment and the changing of the heat budgets of the atmosphere and oceans.

The next question is linked to the possible future outcomes of an increased CO<sub>2</sub> environment. This is where science begins to offer less than adequate forecasts. Global Climate Models (GCM's) are predicated upon some assumptions that are referred to above. As a result, the models may have some skill but will suffer with the same biases that our temperature *analysis* data sets suffer with. As a result, I have a considerable amount of doubt in their efficacy. Like all numerical guidance, they offer insight, but should not be misconstrued as true forecasts.

There are additional shortcomings in the models, which include the inability to parameterize everything correctly. These would include vapor and clouds, larger scale oscillations such as the Atlantic and Pacific Multidecadal Oscillations, ENSO's, and presumably others, as well other non-linear effects. Positive and negative feedbacks are also another uncertainty. Although our ability to model is improving, I am yet convinced that we should accept any model simulations as truth.

I fear that the biggest problem in climate science is politicization. Unfortunately, there are agendas that are not driven by the quest for scientific understanding. Climategate, as it is called, does speak of an unwillingness of scientists to let facts persuade them of the truth. Truth exists and will do so even when challenged. If we in science are unable or unwilling to stand up for the challenge of others, then we are holding to something for reasons other than the pursuit of truth. With that said, I am also not willing to say there is a conspiracy to cover the truth. Nothing greatly insidious is needed. Simple human blindness is sufficient to explain how we got into this situation. We start with a desire for knowledge. We are, for whatever reasons, led to believe certain things. As success and pressures to be correct build, the ability to admit error wanes. Couple this with political or philosophical leanings, and we quickly lose the ability to see the forest through the trees. Scientists forget to challenge what they have come to believe as basic truths. They lose objectivity despite their professed desire to be objective. Houses are built on shaky foundations.

I am certainly not beyond the knowledge that I suffer from the same things. I have always seemed to come up on the short side of a larger consensus. But I also believe that my ability to see weaknesses in arguments makes me a stronger candidate to be skeptical inasmuch as I see error in argument. I have no larger political agenda to support. It is my independent analysis and knowledge of the scientific process that guides my thinking. Extremists, in my opinion, actually make me less inclined to believe. Propagation of blatant lies within the media and in movies like “Inconvenient Truth” and attempts to draw on emotion rather than reason do very little to affirm catastrophic global warming and thus I reject them summarily. Even though I know those propagandists exist on both extremes of the spectrum, I am more inclined to be against the more popular version of this story. I cannot stand either side when climate statements are bandied about haphazardly. However, the best voices of reason seem to be against alarmism, and perhaps, my reaction truly is more visceral than cerebral. I guess that I am more impressed with the character of these scientists and reject those whose protests are insulting or vociferous.

I am completely against anyone who says the “science is settled.” That kind of thinking reflects the very worst that science has to offer. The deepest held truths must always be challenged and polished. The more they withstand, the more truth is revealed. In the case of carbon dioxide related extreme global warming, truth is lacking. What is more, fear-mongering seems to be rampant as well based on what is *forecast* to occur.

I do not agree with cataclysmic anthropogenic global warming and I am not stupid, ignorant or close-minded. I am uncertain of the future and my views will always be changing and challenged. Even though I am uncertain and am skeptical to just how much influence we have on the climate, it does not mean I think we should stand idly by. The knowledge of whether or not we are drastically affecting the environment with CO<sub>2</sub> does not justify my actions. We should act as if we were ignorant and not confident of the future. We do not know one way or another and thus we should act appropriately. There are good things to do and limiting CO<sub>2</sub> is a good thing. Using energy, unfortunately, comes at a cost. Until we can find better solutions, we cannot cut drastically our usage of

energy. We need it because this is the evolution of the world. Natural evolution and not evolution prescribed by politicians. It is up to the entrepreneurs to find the solutions many desire. At least, that is how I see it. Conservation and alternate fuel sources are important and should be sought, but we cannot, without significant cost, change drastically how we live life. And given the uncertainty of future projections, I am not sure we have to. Improving efficiency is a no-brainer, and with a little governmental nudging (some regulation) we should be able to find adequate limits.

I must say that I also have a belief in purpose – that the world is here for a reason and that reason is to support human life. We are to be guardians of the environment. We should not feel like our existence threatens a more important ecosystem. We are to live in balance with nature because nature is a gift for us. Appreciate the gift but never forget that without us here, nothing matters.

I think climate scientists ought to take a page from the meteorologist notebook. People often say that meteorologists are always wrong. We are not lesser scientists. Our mistakes are more noticed and remembered. Every other science is as wrong as we are. Meteorology makes me humble. Climate scientists need to learn the same humility before espousing views that are this uncertain.