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Why We Lack Trust in Our Climate Scientists: The Weatherman and Religion

I have been trying to figure out why the public does not understand climate science since the early 1990s. From my perspective, steeped in the academic works of the scientists, it just does not make sense. We trust our scientists in every other area but climate. What is it about climate that allows us to not faithfully follow those who have demonstrated that they are trustworthy, who fundamentally seek truth? Why do we not trust those whose lives are dedicated to this knowledge and who we know understand the science so much better than us?

Why should a climate scientist deserve any less trust than any other scientist? Do we not generally trust those other scientist implicitly? Do we not trust the scientists at the Environmental Protection Agency who tell us how much lead is bad for us, the scientists at the Food and Drug Administration that tell us the safe levels of pesticides in our foods, the scientists at the Federal Communications Commission that tell us that our cell phones are safe, or the scientists at the Federal Energy Regulatory Commission that tell us that their electrical transmission lines are safe?

Why are these scientists (and engineers) any different from climate scientists? Why do we not trust the climate scientists when they say CO2 is an atmospheric pollutant capable of extreme destruction? When the ozone hole was discovered, the people of this planet reacted very quickly to what the scientists said was an atmospheric pollutant capable of extreme destruction. Ozone depleting chemicals were out control, but we stopped their production in time to save the planet. Our scientists have been warning us that CO2 is a dangerous air pollutant for decades and EPA has been attempting to regulate it since 1999.

Today, CO2 emissions are out of control. Scientists are telling us that tipping points are here or near, that catastrophic global impacts not only could occur but have already started. They are telling us that these events could happen much more quickly that we have understood in the past and the effects could be much more extreme than we have previously understood.

Why Don't We Believe The Scientists?

For society and its leaders to be able to support climate change initiatives appropriately they have to understand their beliefs, fears, ignorance, prejudices and just exactly why it is that they are mistrusting the climate scientists.

Of course there are those citizens that do not trust any scientist, or those citizens who have a reason not to spend money on the future when, based on their “present value economic models” they show that money is worth so much more spent on today’s issues, and future money really has no significance today because of inflation. There are those out there who would try and persuade us to believe something contrary to the scientific understanding of climate change because of their vested interests. There are those citizens who believe what they believed based on other innocent beliefs, ignorant or not. These people may never change their minds. But if enough of us understand the reality of the problem, and if enough of us understand the present value of preventing impacts from climate change, we can start having a meaningful impact on stopping the climate crisis.

I will only talk about two of the most overlooked reasons for our society’s lack of trust in climate scientists in this article and leave the rest for later.

The weather may be the number one cause of the all of the confusion. The weather is a part of our every day lives. We are immersed in the weather: winter, spring, summer, fall - our fashions, food, football and farms. Climate is the common thread of the weather that connects us all. The climate in the Northeast is cool and pleasant. The climate of the Midwest is cold in winter and hot in summer. In the northwest it rains all the time. The south is steamy and hot. Florida has those afternoon thunderstorms that run by the clock. California is climate paradise except for the fires that are just as much a part of their climate as snow is a part of the climate in Aspen, Colorado.

But wait a minute. Is this what climate really is? Why is everything I have just said in the above paragraph dramatically wrong in the discussion of climate change? Climate change is not about the weather. It is not about the five-day forecast with ever changing chances of rain. It is not about the large swings of regional weather from pleasant to harsh, hot to cold, windy to calm, blue to gray.

Climate change has almost nothing to do with the climate that we all know about. It is not about the weather in Phoenix being hot all the time, or the humidity in Mobile. It’s not about moving from Minnesota to Orlando to have a change of climate from the cold to the sublime. It is not about the tornado-ridden Great Plains or the hurricane infested Gulf Coast. We hear climate discussed like this every single day of our lives, sometimes multiple times per day. But this is only a very small part of what climate change is all about.

Climate change is about all of these things put together. It is about the immense planet wide ecosystems that are bigger than the Great Plains, the Gulf Coast or the Rocky Mountains. The “climate” that we are talking about in the climate change discussion is about all of the weather everywhere, for long periods of time. Weather forecasters talk about the long term forecast being 10-days. Climate descriptions of geographical places (like the climate of New England, or the West Coast) consider 30-years of regional weather patterns. Climate change assumptions start at 30 years. The discussion about climate change today basically starts where our traditional understanding of “climate” stops.

Two Climates

Another aspect of the two-climate conundrum deals with scale. We humans can deal with climate changes that are dozens of times or even hundreds of times greater than our planet can deal with. For example, if our planet warmed up just 20 degrees, there is the possibility that our

oceans would evaporate into space. If it warmed up 40 degrees, it is a certainty that this would happen. Our planet would become like Venus – hot beyond imagining. There is no water on Venus. There is no life on Venus.

Now think about what a 40-degree change means to you and me. Forty degrees is the difference in temperature between a frosty early spring morning and the following warm sunny afternoon. It is the difference in average temperature between winter and summer in most places. What does that mean to us humans? It doesn't really mean much. Now think of the difference in temperature between winter and summer in Minnesota, or even Texas. A cold winter day is likely to be 60 or 70 or even 100 degrees colder than a hot summer day, maybe more. We use the air conditioner in the summer (those of us in the south at least) and the heater in the winter. We wear shorts in the summer and long underwear in the winter. No big deal.

But change our global climate by just a tiny fraction of this amount and chaos arises. The last time our planet was just a few degrees warmer than it is today, sea level was 80 feet higher than now. The last time the planet's temperature was four or five degrees warmer than today, sea level was 200 feet higher and there was no ice on the planet. The average global temperature difference between the depths of an ice age and the warmest periods between ice ages is just 9 degrees F.

The Intergovernmental Panel on Climate Change says that their super computer climate models predict that our climate will warm four or five degrees by the year 2100 under their "likely" scenario. This includes the reduction in our CO2 emissions that will probably happen. This change in temperature is not even as much as we get with a weak cold front in the fall. Yet, in our planet's history, when climate across the globe is considered, four or five degrees is enough to melt all of the ice in the world and submerge Houston under 150 feet of ocean; Washington D.C. under 90 feet, New York City under 160 feet, Boston 60 feet, London 120 feet, Shanghai 180 feet, Tokyo 140 feet, Manila 150 feet, Sydney 190 feet, Athens 130 feet, Beijing 60 feet, Bangkok 190 feet, Singapore 150 feet, and Berlin 85 feet.

Traditional climate wisdom says this will take thousands of years; traditional as of the late 20th century. Today's computer models are becoming widely recognized as being conservative. Ice is melting faster than the worse case scenarios. CO2 is increasing faster than the worse case scenarios, and many unexpected things are happening that the models do not even consider.

The worst case scenario predicts that our average planet temperature in 2100 will be about eleven and a half degrees warmer than today. This prediction is partly based on carbon dioxide concentrations in the atmosphere. Today's carbon dioxide concentration has unexpectedly increased to what the Intergovernmental Panel on Climate Change was assuming for their worse case scenario in the 2007 report. This is a huge departure from conventional climate wisdom and the scientists know it (this just one of the reasons why the IPCC projections are considered conservative). Today, these models are predicting that the eleven-degree temperature rise is not the worse case scenario any longer.

The last time the temperature was 2 to 3 degrees higher than today was about 3 million years ago. The last time that temperature was 4 to 5 degrees higher was 20 million years ago. Sure it has been warmer, but not much. And our planet was a vastly different place then. Much less oxygen was in the atmosphere, and the continents were in vastly different positions to where they are now, creating a completely different way that the Earth soaks up heat from the sun. It is this fundamental reaction – the way that heat energy from the sun is absorbed and stored on this planet – that is climate. Not Duluth's weather.

The Weather is Not Climate

Weather forecasts, discussions, theory, etc. are only concerned with days, or weeks, maybe several months, maybe 18 months at the longest. Seasonal forecast exist, but their accuracy is not very good beyond the current, or maybe the next season. The accuracy of these forecasts taints our every day trust in what the weather person says our climate will be like tomorrow, or next week. How many times has the weather person predicted a sunny Saturday that has been then rained out at the ball field or the beach? Climate considers time spans one hundred to one thousand times greater, at the minimum, than weather forecasts. The shortest climate discussions are based on 20 or 30 years worth of weather, all added up and averaged out. There is a crossing of definitions here that completely confuses the situation where the assumed definition of climate (Duluth's weather) is not the definition needed for an understanding of the climate crisis.

Remember back in the 1980s when the scientists said the it would be 20 years before we knew if mankind was responsible for changing our climate? That wasn't because we would have to wait and see if the number of us humans on the planet was big enough to actually change our climate. It was so that enough data could be accumulated, so that the warming being felt in the 1980s could be proven statistically to be valid, and not just a fluke of nature – a natural weather cycle. For a scientist to prove something, for that scientist to be able to come out and say that climate change is real, they have to have data. It takes about 20 years to get that data, or around 30 years to be sure. So what of today's even warmer temperatures than in the 80s? Technically, 20 years needs to elapse before enough statistical information can be accumulated to say with mathematical certainty that today's warming too, has been created by climate change.

The confusion exists because there are two definitions for climate. The climate in the travel brochures, the one that describes a city's climate for vacationers or job seekers is vastly different from what the climate crisis is about.

The same thing goes for the cold winters that we have had lately. Cold? Well, how about a little below average in some parts of the US? Globally, the last two years have been in the top ten warmest years ever recorded. In my hometown too, the last two winters have been in the top ten warmest winters ever recorded.

Climate change is about the big picture. Just a few degrees of change can radically alter this planet. Any more than that and all bets are off. To us at home though, a few degrees is a very small change in climate. It doesn't matter to us one bit.

Religion?

The other big issue is surprisingly, or maybe not surprisingly: religion. There is a very large proportion of society that believes that the Earth has been around for 6,000 or 10,000 or 20,000 years. These are the Creationists who believe the literal account from the Bible of the creation of the universe, mankind, Noah's flood, etc.

A Pew Research Center poll in 2005 (*Conflicting Views on the Origins of Life*,) found that 40% to 50% of Americans believe in the Creationist theory of the origin of life. The results of the poll show the belief in the Creationist theory of life where Man was created more or less in their present form about 10,000 years ago. Of the persons participating in the poll, nearly half appear

to follow the Creationist philosophy. This is evident from the 44 to 47 percent of respondents who answered the last question about God creating the Earth and the Heavens in their current form 10,000 years ago. Even more telling is the poll history at the bottom of the table. Since 1982, six separate polls have shown virtually the same beliefs with very little change.

Conflicting Views on the Origins of Life

Some people think that humans and other living things have evolved over time. Others think that humans and other living things have existed in their present form since the beginning of time. Which of these comes closest to your view?
(If 'Evolved'...) And do you think that humans and other living things have evolved due to natural processes such as natural selection, or do you think that a supreme being guided the evolution of living things for the purpose of creating humans and other life in the form it exists today?
Source: Pew Research Center July 7-17, 2005

	Evolved ----- **over time** -----			
	Through natural processes	With guidance	Existed in present form only	DK
	26	18	42	14

Which do you think is more likely to actually be the explanation for the origin of human life on earth: evolution...or...the biblical account of creation?
(If 'The biblical account of creation,'...) And by this do you mean: that God created the world in six days and rested on the seventh as described in the Book of Genesis or that God was a divine presence in the formation of the universe?
Source: NBC News March 8-10, 2005

		--- Biblical account ---		
	Evolution	God was a divine presence	God created world in six days	DK
	33	13	44	10

Which one of the following statements comes closest to your views on the origin and development of human beings?...
(1st and 3rd options are rotated)
-- Humans developed over millions of years from less advanced forms of life, but God guided this process.
-- Human beings have developed over millions of years from less advanced forms of life, but God had no part in this process.
-- God created human beings pretty much in the present form at one time within the last 10,000 years or so.

		Evolution, God had no part in process	Evolution, God guided the process	God created in present form	DK
Source: Gallup	November 7-10, 2004	13	38	45	4
	February 19-21, 2001	12	37	45	5
	August 24-26, 1999	9	40	47	4
	November 6-9, 1997	10	39	44	7
	June 18-21, 1993	11	35	47	7
	July 23-26, 1982	9	38	44	9

Reference: Public Divided on Origins of Life, Religion a Strength and Weakness for Both Parties, Pew Research Center for the People and the Press, The Pew Charitable Trusts, August 2005. This poll was a telephone survey of 2,000 adult individuals of diverse backgrounds.

What the poll shows us that nearly half of the respondents understood that the Earth was created in its present form within the last 10,000 years. One can not really say that these results

are scalable to the rest of the population of the U.S. But one can not say that these results *are not* scaleable to the rest of the U.S. either.

There are many religions that have a dualistic approach to creation, not at all like the Creationist approach. This view is that the bible is an ancient and very wise document and that we as society have learned many things since the bible was written. This philosophy allows for the understanding of Earth and the Universe as things that are billions of years old. With this understanding, it is easy to see hundreds or thousands or millions of years of climate records from ice and sediment and other sources. Understanding that these climate records are real, and they come from a period of Earth's history that is more than 10,000 times longer than the entire Creationsists' history of the Universe, is profound in orders of magnitude of philosophical as well as scientific thinking.

How does this large proportion of our society make valid decisions on science if that science is based on hundreds of thousands of years of climate information? The creationist understanding of geologic stratigraphy (the way the layers of rock are created by the slow accumulation of sediments over hundreds of thousands and millions of years) is that these layers were created in the big flood. How can these good folks understand climate science? No offense, honestly… But how can the accumulation of hundreds of thousands of years of sediment, from which climate scientists can derive detailed records of our Earth's past climate, be reconciled in the creationists' minds?

In order to truly understand the misunderstandings about climate change, we have to know why they exist.

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