Tom Kurz transcript PDF 3/5/24

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Introduction and Background

My guest today is Tom Kurz. First, I want to thank you, Tom, for having me on the podcast. I'm certainly a fan of yours, and I've learned a lot about climate from your podcast. But, uh, just a little background. 31 years ago, I moved to Ithaca, New York.

to start a science based company with a Cornell professor who was a scientist and eminent in the field of mass spectrometry. Um, our company was focused on science and I always took as much time as I could to learn the science. I've always enjoyed the science, but living in an Ivy League college town, I found I'm surrounded by a number of very smart people.

Climate Change Concerns and Personal Journey

But also a number of distressed people, and they're quite distressed over climate change. In fact, one of my friends who's a Cornell professor, he told his children not to have children of their own. And a little shocking to me, but I thought, wow, this, this is a pretty important topic. So I thought I'd want to learn all about it.

And so I started [00:01:00] looking into it. And even though again, I'm not a scientist, I have found that between the Internet and chat GPT, you can find out a lot about what's going on in the climate and, uh, you know, it certainly has been an interesting path that I've taken. I've written a paper and in writing that paper, I found that everything on the Internet isn't true.

You have to be able to vet that very carefully, but you can get to the bottom of the truth. And I think that I have. And so that's kind of been my, my, my journey. Um, and you know, when I first started writing the paper, I was mostly parroting what I'd heard from other scientists, but as I've gotten deeper into it, I found a couple of concepts that I haven't heard anyone talking about.

So we'll discuss those, uh, during the session.

The Impact of Climate Change on Society

And I think they're very important in terms of climate change., I have, uh, always enjoyed the outdoors. I've always, uh, felt that the environment is [00:02:00] extremely important. And my number one love in life is my family. I feel it is our sacred duty to protect our earth for our children and our grandchildren and future generations.

And I do feel strongly about that. I think it's important for us to eliminate pollution and, uh, to, uh, implement recycling and, and certainly to protect, uh, our forests and endangered species. So, um, preserving the beauty of nature is very important as well. And then helping, uh, people out of, uh, Poor nations, getting them out of poverty.

But one thing that I've seen in recent years is that the climate crisis has hijacked all of these very important objectives. And it's interesting because if you, if you go back several years ago, I always thought climate was part of the environment and so I thought I'd do my part. For years I spent extra money buying solar and wind power for my utility, but I came to realize that, uh, the climate crisis, uh, [00:03:00] Really is maybe diverting energy from where we should be.

The Misallocation of Climate Change Funds

So let's just look at following the money. If we look at all of the money that's been diverted away from some of these great causes of environmental and conserve and conservation, etc. You can see the Inflation Reduction Act that was just signed into law. Um, the Congressional, uh, Office of Budget has mentioned that, uh, 391 billion of that is targeted for climate and related energy areas.

That's a lot of money. Um, think The good that we could do if that money were spent elsewhere and the EPA, who's tasked with pollution and getting rid of toxins, they recently announced a grand of 4. 6 billion to reduce greenhouse gases, which basically means co2, which is not a pollutant, which is not toxic at all.

And then if you look at the foreign aid, this is quite a travesty. I think 20 percent of all foreign aid has been diverted to [00:04:00] climate change, and the United Nations recently reported that 89. 6 billion of funds in 2021. We're devoted, uh, specifically to climate change. That's a lot of money that and think how we could have helped these poor countries if we use that money in other ways.

Um, there was a recent study that suggested 44. 6 billion has been spent on climate research between 1990 and 2018. That's a lot of money. And no wonder universities are very much in favor of climate change research because it does fund them. And comes to mind the statement by Upton Sinclair, It's difficult to get a man to understand something if his salary depends on him not understanding.

So I think one of the classic examples of the diversion of a, uh, conservation effort is the Audubon Society. And Tom, I know, uh, you're a bird watcher, so this might be of interest to [00:05:00] you. But if you go to the website for the Audubon Society, I mean, their original goal, of course, is to protect birds. That's the mission of the Audubon Society.

But on their website, it says that they support windmills to fight climate change. And they even admit in the website, That windmills kill 140, 000 to 679, 000 birds each year. And many of those birds are endangered species. So what's going on here? Um, you know, I, I can only presume that they have bought into the narrative that climate change is going to lead to, um, mass extinction.

Um, but if you look at the data that doesn't support that, I mean, if you look at endangered species, they've been declining recently as temperatures have formed, and there's a number of peer reviewed papers that talk about the past mass extinctions, and those are really, um, almost all of them are because the world has gotten colder, not because it's gotten warmer.[00:06:00]

And then we also know biodiversity increases in warm climates. So, um, when I look at this, you can see that the Audubon Society is willing to, in fact, sacrifice, um, and it's a certain sacrifice of hundreds of thousands of birds, uh, based upon a theory that seems to go against the data. Just seems crazy to me.

I have a friend from Sri Lanka. And he mentioned that the president of Sri Lanka was very corrupt. Um, he was embezzling money, um, living a life, uh, style that was, uh, quite high on the government. And he ran out of money, and so he was looking for loans from, uh, Western banks. Uh, Western banks required that the environmental, social and governance score be high in order to get those loans and to qualify for them.

And, you know, it sounds good on the surface, but, uh, climate change has become a very big factor in the [00:07:00] ESG scores. And so he eliminated, uh, synthetic fertilizers from the country. Um, now, synthetic fertilizers, uh, they take a lot of energy to produce, they have a high carbon footprint in their production.

And when you use them, they emit, uh, nitrous oxide, which is a powerful greenhouse gas. So, uh, Sri Lanka was able to get an ESG score of 98, which is quite remarkable, because 70 is considered good. But what was the impact of this? Well, the impact was crop yields declined by as much as 50%. And food scarcities and starvation was the result of that.

So many people suffered. There was increased food prices, and eventually the overthrow of the president. This is the picture of the of the bobs that were storming the palace and he had to leave the country. But again, well intended. But didn't work out.

The Misconception of Green Energy

Well, I see that the climate crisis is also [00:08:00] focused on no fossil fuels.

But then people have to have alternatives. So wood burning is the main alternative. But we know that about 3 million people die each year from indoor air pollution by burning wood and dung for cooking and for heating. And that the wood burning leads to deforestation and here's this nice image from Brian Griffiths who was on your podcast that shows on the left hand side Haiti that uses wood for fuel and it's been deforested as people are gathering their fuel and on the right hand side is the Dominican Republic where they do use fossil fuels.

So there's really a lot of impacts here. You've got the indoor pollution, you've got the deforestation but The deforestation also brings with it the loss of endangered species, and that's why the developing countries have more of a loss of endangered species than you'll find in other countries. Air pollution is a big [00:09:00] problem, especially in India and China.

Many of the cities there have levels of pollution that are much higher than is acceptable by the World Health Organization. That air pollution, you can see it there. That means it's not CO2. CO2 is odorless, colorless, it's non toxic, and it's the staff of life for plants. Um, I like Will Happer's comment, he says if you can see it, if you can spell it, it's not CO2.

This is not CO2. What we should be focused on is the pollution footprint, not the carbon footprint of these countries, but instead we're focused on the carbon footprint. And even the carbon footprint, I think, is a misnomer because what we're really talking about is CO2, but carbon sounds black and dirty and sooty.

But carbon dioxide, I mean, that's the clear bubbles that we drink in our carbonated beverages. It's very harmless. So, uh, you know, I, I, I see that what we should be doing is putting more [00:10:00] research dollars into fighting pollution. There's catalytic converters, there's scrubbers, there's chemical processes. Um, we should be conducting research to really work on pollution, but instead we're diverting all of those funds to CO2 reduction.

And even the manufacturer of the so called green energies, including the solar panels and windmills, most of those are made in China, and many of the, uh, power plants in China don't have the modern, uh, equipment for scrubbing the, uh, pollutions, and so, uh, we're contributing to the air pollution in China because of the green energy push.

The Cost of Energy and Its Impact

Cost of energy is also an issue, and you can see here that, uh, in Germany, which has been the most aggressive, um, country that we have in implementing, uh, the cost was 5 Euros, um, per kilowatt, and that's gone all the way up to 40 Euros. Um, so it's, it's become very [00:11:00] expensive, because Everyone had the promise of the green energies are going to be cheaper because they don't use fuel, but it turns out we need power 24 7.

And if you look at, uh, the sun doesn't shine at night and the wind usually doesn't blow at night, so we need backup alternate systems and that's very expensive. And if we look at implementing, uh, EVs, um, they need to be charged overnight primarily and that's only going to, uh, uh, make more of a burden on, uh, uh, electricity that's at night.

So if we look at who that hurts, um, it really is hurting the poor and middle class because if your income is 50, 000 or less, 10 percent of your budget's on energy. But if it's 20, 000 or less, 40 percent of your budget is on energy. And the developing countries are energy poor. This is one of the problems that we actually need to fix.

1. 3 billion have no electricity at all, and 3 billion have minimal electricity, about the amount [00:12:00] of electricity to run one refrigerator. But the World Bank and other Western banks, they will not loan money to build coal and power plants, which is the most efficient and cost effective means of bringing power to these countries.

So, they continue to be energy poor.

The Effect of Climate Change on Nature

Um, the beauty of nature is another aspect of this, uh, fixing the climate crisis that, uh, tends to be wrecking the beauty. Um, these are a couple of examples and it, it, it annoys me when I see the sour note of windmills in a beautiful, uh, countryside and now even the seascapes are being destroyed, um, by windmills and, and, and solar farms.

The Importance of Understanding Climate Change

So, really, if we look at the important question of our time, it's how serious is this climate crisis? Because I'll admit, if it is as serious as people are saying, then okay, sure. Um, it does have all these costs that I've talked about and maybe they're worth it. But if it's not, then we're really [00:13:00] spending money in the wrong place, our focus of attention should move, and, uh, we're doing a real disservice to the world.

The Misinterpretation of Climate Change Data

Well, when I ask my friends who believe in climate change, um, you know, what, uh, why do you believe in that? And they say, well, because the science is settled, and 97 percent of scientists agree. I tend to be a little more skeptical, and I wonder, well, what do these scientists agree upon? They say, well, climate change is causing severe weather.

Well, Let's look at the data. Let's see what that says. We're saying temperatures today are unprecedented. Well, I'd like to look at the historical record. And then they say temperatures will increase by 3. 2 degrees centigrade by the year 2100. Well, how is this number derived? So I'm curious about all of these, you know, and as Mark Twain said, the best way to get a sure thing on a fact is to go and examine it yourself and not.

Take anybody say so. And so that's exactly what I did. And as I looked into the climate crisis, I was [00:14:00] shocked because everything I'd been told was wrong. And, uh, as you start to look in the data and the paper that I wrote, I, I titled it examining climate change by the scientific method, which is basically you've got theories, but you need to prove them by data.

So I've looked at the observational data to really drive what is the reality about climate change. Well, you certainly hear that, uh, um, if you don't believe in climate change, um, then you're a dummy. I know, um, we have, uh, President Biden just said earlier this month that you're a Neanderthal if you don't believe in climate change, what he really meant, if you don't believe in the climate crisis.

So as I started looking, I've I found there's a number of great scientists who say there is no climate crisis. This is just a small snapshot of the many of the scientists that have said that. , Edward Teller, who is the, um, uh, the father of the hydrogen [00:15:00] bomb. Um, he was once a climate alarmist, but later in life, he, uh, figured out that that was not, uh, that was not true, and he signed a statement saying there is no climate crisis from anthropogenic, uh, global warming.

Ivar Gavir, the, uh, Nobel Prize winner in physics, um, he has said that, uh, climate, uh, change is a non issue. Uh, John Klausner, also a Nobel Prize in physics. Um, he has said there is no climate crisis. We know William Happer, who's been one of your guests. Um, he has repeatedly said there is no climate crisis.

Richard Linson is one of the most respected atmospheric scientists in the world.

And, uh, he has said that, uh, uh, climate crisis is one of the greatest mass dilutions of our era. Um, then Stephen Coonan is interesting. Not only is he a physicist, but he was the provost of Caltech [00:16:00] and the undersecretary for science in the department of energy. And, um, he, uh, was, uh, uh, formerly, uh, for the climate crisis.

And you can see videos, uh, in the early days where he talked about the climate crisis, uh, but the physical society asked him to. Uh, write a statement on climate change, and he pulled together a panel of physicists and climate scientists, and he said, I came out of that panel absolutely shocked. He said, I learned that climate science is not settled.

And he said, furthermore, that man contributes only a minimal amount of warming. And so, um, that, uh, uh, led him to finally, uh, write his book, which is called Unsettled, where he uses a lot of the data to support those. Uh, those beliefs. So I would mention that those are just a snapshot of [00:17:00] scientists. There's many, many more.

So let's move to this concept of 97 percent of scientists agree.

The Misconception of Climate Change Consensus

So we know Obama said 97 percent of scientists agree. Climate change is real is man made and it's dangerous. Well, that came from the cook study. The cook study looked at published papers. Now I want to mention that there's a little bias just by looking at published papers.

Patrick Brown from John Hopkins. Yeah. Has said recently that editors of these journals have made it abundantly clear, both by what they publish and what they reject, that they want climate papers to support a certain pre approved narrative, and that narrative is the climate crisis. And a couple examples of that, uh, Richard Linson, when he published his, uh, uh, one of his papers, uh, Um, the, uh, editors was basically showing how the cloud feedback when the temperature warms, the cloud feedback reduces the temperature.

And [00:18:00] after publishing that paper, um, the editors of that journal were fired. Um, and then there's, uh, Hendrik Spenmark, which we'll talk about later in my presentation. Um, he discovered what I think is one of the most significant findings and discoveries of climate science in the, in our generation. And yet, uh, it took him a year and a half to find a publication that would publish his work.

I'm absolutely astounding how that has, uh, has, has occurred. So there is a bias in terms of looking at published papers, but nevertheless, there were about 11, 000 papers in the Cook study that they looked at the abstracts. They threw out two thirds of them because they didn't, uh, say anything about their opinion about, uh, climate change and, but of those that are left, the most you could say is that they agreed that, uh, that humankind contributes to warming.

There was only about a hundred of them that said that most of the warming is caused by man, and none of them said that it was dangerous. [00:19:00] There's other studies, there's the Hagen study, where they did ask the question, Is 50 percent or more of the recent warming caused by, um, uh, humankind and 66 percent of those scientists, but again, they were, uh, authors of climate papers.

So there's a little bias there, but you know, 66 percent is a majority, but it's not a consensus. A consensus is an overwhelming opinion on a matter. And that's certainly not overwhelming. Um, and the, the, the same as with the, uh, ASIS study, which was meteorologists who were surveyed 52%. Again, a majority, but not a consensus.

Said that most of the warming, uh, was for man. And then the most recent paper, the linis, uh, uh, survey where 99%, uh, agree with the consensus, but really what the consensus was is that. Man contributes to warming. Well, I think it's interesting to look at the question of where is most of the warming. And by the way, none of these said they were [00:20:00] dangerous, but most of the warming, um, all we know from those surveys is that 50 percent to a hundred percent.

So is it 51%? Is it a hundred percent? That makes a big difference. Um, I have, uh, found reference to nine peer reviewed papers that attribute 40 to 87 percent of the warming to natural variation. And, uh, one of those papers, um, uh, has, has been authored by 37 respectable scientists, and they claim that 70 to 87 percent of the warming since 1850 is from natural variation.

So I don't think this tells us a whole lot in terms of what the consensus is. All we know is that man contributes, and we don't know if it's dangerous. So if we look at the United Nations, um, they're ~always~ talking about extreme weather conditions are increasing in frequency and intensity. And this is also found on the, on NASA, the NASA website.[00:21:00]

And so what are those areas? It's floods, it's, uh, hurricanes. It's droughts and wildfires. So, um, I, I think if you look at the media, they've jumped right on this and we're always hearing about how things are getting worse and worse. And I think, uh, you can't really blame the media as, uh, William Randolph Hearst, the newspaper tycoon said, bad news is good news.

And good news is no news. And so this is certainly bad news that they're reporting on.

The Impact of Climate Change on Weather Patterns

But it's certainly the narrative that everyone seems to believe in. Well, I like Edward Deming's comment, in God we trust, everyone else bring data. And so if we look at the, um, these various events, we find that most of them are actually less severe than they were in the past, or there's no trend.

And so let's take a look at those. First and looking at [00:22:00] hurricanes. So if we look at hurricanes, we can see that this is the accumulated cycle of energy, which really tells us about the frequency and the intensity of the hurricanes. And you can see how that's declined. This is from Colbats in the geophysical research letters where he's taken all of the satellite data, and you can see it's on a global basis, it has the entire globe.

You can see how that has declined. Also, there's been a decline in the number. Of hurricanes as well. And so I'm saying that the hurricanes are more intense and more severe. It's just simply not true. This is a view of tornadoes, and you can see that the trend is actually significantly down for tornadoes.

Now, if you look at just small tornadoes, the low intensity, we probably have seen more of those because we now have Doppler radar that we didn't have in the 1960s, more stations to be [00:23:00] monitoring for tornadoes, and people live in more places as well. But what's important is looking at violent tornadoes, those that are Category three and above.

That's what's really important. And that trend has definitely been down. Well, there's actually a scientific reason for that. As Richard Lindzen has pointed out, severe storms are caused when, when warm moist air collides with cold air. And the reality is global warming has not been evenly distributed. Arctic has been warming twice as fast as the tropics. ~The Arctic has been cooling at twice the rate as the tropics.~

So it's actually moderating. So we don't have as severe of a temperature contrast between the two. So this is exactly what we see in the data, and it's exactly what we would expect from the science.

The Historical Perspective of Climate Change

~I think, can you say that again? Uh, the Arctic has been cooling, you said? You mean Arctic has been warming?~

~Go ahead. Oh, yeah. The Arctic has been warm. I'm sorry. The Arctic has been warming. Thank you for catching that. Good, good. ~ ~ Okay, good.~ If we look at heat waves, we can see that heat waves are significantly down from the Dust Bowl days of the 1930s. And, um, one thing that I think is interesting to look at as we look at some of these trends is that you can kind of see an oscillation of up and down [00:24:00] and up again, and that actually matches the Atlantic multi decadal oscillation.

The Atlantic, the Atlantic Ocean, it actually oscillates between cold temperatures and warm every 30 to 40 years. And you can kind of see an echo of that in the 70s when it was very cold in the Atlantic Ocean, we got. And the temperature is going to be higher. And we're going to get, uh, you know, less of these heat waves.

So I think that's also interesting to see now if we look at droughts, droughts have declined.

The Impact of Climate Change on Biodiversity

As the temperatures have warmed, and that's actually not surprising because as the temperature warms, the atmosphere holds more moisture. We have more cloud formation and more rain, and that is exactly what we have seen.

There has been more rain in recent years. Um, as we've had higher temperatures. And historically, there's a lot of archaeology that has shown that many of these. temperature cycles we've had in the past. The cold times were the times when it was very arid. So, um, you know, if you were to look at the media, you would think the earth is burning [00:25:00] up and that the earth is getting browner, but that's exactly opposite of what's happening.

Satellites prove that the earth is green by 20 percent. Um, and it's Over the last number of years and it's actually accelerated recently, so it's not browning and there's actually some reasons for this plants use their stomata which are pores on their leaves in order to breathe in the CO2, which they need to sustain life to grow and those pores.

Also, they are. Um, they, that's where they lose water and they lose quite a bit of water out of these pores. And so as there's higher levels of CO2 in the atmosphere, they partially close their stomata and over time they evolve with less stomata. And so that means there's less loss of water and they become more drought resistant.

Um, actually, uh, studies have shown that if you increase, uh, CO2 from [00:26:00] current levels of around 400 parts per million to 800 parts per million, that the amount of water used by plants is halved. They lose half of the water that they would normally use because of closing their stomata. And there was a Since, uh, you know, 90 to 95 percent of the water in these plants comes from their roots, they're basically pulling that water at that extra water out of the soil.

There was a good study of the fires in California showed a very good correlation between soil moisture and fires. And in fact, the USGS top fire system tracks soil moisture to monitor fire risk. So in fact, the increase in CO2 has reduced fire risk, and it has also allowed the soil to be much moister than it would be.

So let's look at fires. If we look at wildfires, again, this is dramatic. One fifth [00:27:00] of the fires, uh, this is in terms of acreage burned that we had during the dustful years of the 1930s and 40s. Um, and once again, you can kind of see a cycle. I mean, this is extreme, but there certainly is a cycle here of seeing how the Ocean oscillation where it got colder in the 70s and that the fires declined and now it's come up a little bit because of the difference in temperature, but still it's dramatically less than it was in the past.

Floods is actually a surprising area because we have seen more rain. There is more moisture in the atmosphere as it's warmed, but we haven't had more floods. Um, I'm not sure the reason for this, but I would speculate this may actually be because we, we have better flood control than we had in the past.

And to me, that's a great example of adapting to climate that To the climate that we should be in fact putting money in adaption rather than trying to change the [00:28:00] climate, but not not a not a problem with floods and the IPCC agrees with that there has been no trend in floods Well, there's other climate crisis trends that you always hear about in the press and I think if you looked at all of these Um, most people wouldn't believe that they are less severe or there's no trend in any of these because they keep hearing that it's a disaster But as Mark Twain said, it ain't what you don't know that gets you into trouble.

It's what you know for sure that just ain't so. So let's look at the data. Let's first look at the sea level rise. So if we look at sea level rise, we can see that, um, using the tide gauges and the GRACE satellite data, Um, at that to continue the rate of sea level rise we have today to the end of this century would be seven more inches and using the Jason satellite data, it would be about 10.

6 inches by 2100. Certainly not a crisis what we're [00:29:00] saying is it's about a foot a century. And it's been a foot a century for the 50 years so there's not a problem. But one thing that's interesting is just looking at. the sea level rise rate, and this is from a paper by Thomas Frederick. Um, this actually shows in black, this is sea level rise, and you can see that it oscillates.

Um, and this is the ocean oscillation of the Atlantic Ocean that I said, where it has cold temperatures in the Atlantic Ocean, and then warm, and then it cycles to cold every 30 to 40 years. We can see here, sea level rise occurred Starting here in the 1920s and going to, uh, the 1940s to the 1960s, that's exactly the same time we had the warm period of the, uh, ocean oscillation.

And then it got cold during the 1970s with this ocean oscillation, and we see how it got cold here. Um, as the same time that the sea level declined and now we're in the warm [00:30:00] period of this oscillation and once again we see sea level rising again. Now you can't tell me when this declines again that this isn't going to start declining because this is historical and it's going to do the same pattern that we've seen before.

The problem that everyone is saying is that we're going to extrapolate on off the top of this curve and that sea level rise is just going to keep rising like you. But you can see from this that that's just unbelievable. You never extrapolate off the top of a curve in a cyclical system. So it makes it a little bit unbelievable.

Endangered species. Everyone thinks that endangered species is a problem because of climate change, but the documented extinctions, and this is by the international union for conservation, nature's red list of threatened species. Um, they have shown there's been a tenfold decrease in the last hundred years.

Now, it's difficult to see in this trend, certainly there was more hunting that was allowed in the [00:31:00] in 1870 than today. I think a lot of this is because of the protections that we put in place, so you can't really tease out, um, uh, is warming better and how much better has that been, but you certainly can't show a trend that the warming has caused a problem.

And actually, if you look at, uh, uh, historical extinctions, you can see that, uh, most of the writings, there's a number of peer reviewed articles, and most of the mass extinctions were because of it getting colder, not because of it getting warmer. And the biodiversity, uh, is generally higher in warm climates.

So this seems to go against all of the data. That there is extinctions because of climate change polar bears. Um, I know you've had Susan Crockford on your podcast a couple of times, and you can see how with this is her research to show that polar bear populations have increased. But if you don't [00:32:00] believe Susan Crockford.

Let's go to the definitive source which is the International Union for Conservation of Nature's. 15 red list and they, they show the number between 22, 000 to 31, 000 today. So it really does agree with the numbers that Susan Crockford has. I would mention that in fact, just going back here, you know, you can go on the internet and you'll find wild claims of hundreds of extinctions, but if you dig into those, they're from computer models, their guesses, um, really the definitive source.

Is this international union of, uh, of conservation. Um, that's where you need to go because those are documented. Well, uh, polar bears, which of course were, uh, uh, certainly a poster child for climate change. Another one is the Great Barrier Reef. And I know that you've had Peter Ridd, who's spoken to this.

Um, we [00:33:00] know that there was some damage to the reef that there was some bleaching that occurred between 1998 2002. And we also had a decline. Um and we know that hurricanes or cyclones are very damaging to coral and cyclone Hamish was no exception to that. So there was a decline. And of course, this fit right into the climate narrative, and that's all we heard about.

But it's really. Reversed, and it's bounced back because we know that coral grows well and even faster in warm water. Some of the most beautiful coral we have is in the Red Sea, and so if we look at what's happened in 2021, we had record coral, and it was even higher record was set in 2022, ever since we began keeping records back in 1985.

It's the most coral growth we've ever had, and I haven't seen the final numbers on 2023, but I understand it's. Uh, similar to 2021. So it's still quite high. So that once again, [00:34:00] that's not a catastrophe as we're hearing that it is. What about deaths from heat? Well, deaths from heat is is a reality, and, uh, but cold kills nine times more people each year than heat.

This is from a article in The Lancet in July 2021, and the other important thing to see here is not only does it kill more people the cold, but it kills more people in developing countries of Africa and the developing countries of Asia. So, in fact, If we want to help the people of Africa and Asia, we really need to warm the planet a bit, because cold is really the enemy, not, not heat.

If we look at climate related deaths, that's declined by 50 fold from 1920, from 250 to 5. So I think actually this is not all due to the warming. Certainly the [00:35:00] warming has contributed. I think the larger implication here is that we are much better at adapting to climate. We have warning systems. Um, we have, uh, better safeguards, better dikes for floods and whatever it would be.

We have air conditioning in, uh, when we have heat waves and we have better heating systems in the cold. Um, what's interesting is that the Many of these saving adaptions have been possible because of fossil fuels. And I think this just goes to the, um, the philosophy that we shouldn't be wasting our money on the vain possibility of controlling the climate.

We should really be spending our money on adapting, and I think this clearly shows that. Well, once again, the earth is not browning as climate alarmists would have you believe. The satellites show that it's increased by 20 percent by the leaf coverage. The greening since 1982 is much larger than it was.

That's about the size, twice the size [00:36:00] of the United States. And there's a paper that was published in January 2024 that shows that the greening accelerated since 2001. And the reasons for that, 78 percent of that is based upon more CO2, which is plant food, and also warming, which is better for, for plants.

And it occurs to me that it's really a ridiculous irony that we call green energy the very energy that will result in less greening. Getting rid of CO2 is not how to green the world. Well, because of this greening, we know some commercial greenhouses, they triple the amount of CO2. Today it's at 420 parts per million, and this experiment shows from 385 moving to 835, you can see they doubled the growth of these trees, and the impact of that.

Is that we have a tremendous increase in agriculture to feed a growing population. [00:37:00] This is very good news.

The Impact of Climate Change on Agriculture

You can see that even though we haven't planted a lot more acreage, the amount of productivity and the size of the harvest has increased in line with our CO2 emissions. So this is very good news.

And the thing that I find frustrating is that these climate alarmists will never accept even this good news. They say, Oh, this is so bad that. CO2 is making plants grow because they don't have the nutrients that they need to grow faster. But that's ridiculous. The greenhouse, um, CO2 enhanced greenhouses have worked out for years how to fertilize their plants.

Oklahoma State has a great website on CO2 enhanced greenhouses that will tell you all of the fertilizers that you need. So it's not a problem for agriculture. This is an important slide and quite an interesting one because climate alarmists will tell us about how the average temperature has increased.

And isn't this [00:38:00] alarming? But if you get into the details, you find that it's actually a moderating of temperatures because most of that average has come from the moderating of winters. You can see how cold spells have dropped considerably. That's actually good news because most people that are It's not killed from the cold, it's from the severe cold, and also plants will have longer growing seasons, and less early frosts.

So this is actually quite good news for us. If you look at the heat spells, they're increasing a little bit, again, in line with those, uh, Atlantic oscillations, temperatures in the ocean, but it's only increasing by a modest amount overall, um, temperatures are moderating, and that is good news. Okay, I'd like to get into some of the past climate change that we've had, so we'll get into paleoclimate.

This is an oxygen molecule. It has a new, it has [00:39:00] a molecular weight of 16 from 8 protons and 8 neutrons. There is a naturally occurring isotope of oxygen that weighs 18 because it has 8 protons and 10 neutrons. So water that contains oxygen 18, it's heavier. And then oxygen 16 water and so it evaporates slower than oxygen 16.

So the ratio of oxygen 16 to 18, which can be measured by mass spectrometry. That's an area that I do know. And that's a proxy of the water temperature in the layers of a sample. So you can take a Uh, stalactite or a sediment sample in the ocean or a lake, or you can take an ice core and you can look at the individual layers in that sample, and it will tell you the temperature by that ratio.

It will give you a proxy of what that temperature was when that layer was deposited so we can actually dig [00:40:00] back and find using this technique, what the temperature was in prior ages before there were thermometer readings. This can also be used to determine, in those same levels, the amount of CO2, because you can look at the ratio of carbon 13 to carbon 12.

And it can also tell us the solar cycles, because the solar cycles are, in fact, um, a magnetic field is part of the solar cycle when it's, the magnetic field is stronger. It limits the amount of cosmic rays that can, uh, enter, um, our solar system. From outer space. And so if you look at carbon 14 and beryllium 10, when cosmic rays enter our atmosphere and enter the earth, they cause a nuclear reaction in carbon and in beryllium that creates carbon 14 and beryllium 10.

So we can look again at these particular isotopes. And by those we can [00:41:00] determine how many cosmic rays Had been, uh, uh, reached the Earth, and then that will tell us about the solar cycles. More about that later. So now let's look at the climate cycles using these, uh, proxies. So, this is, uh, looking at Greenland ice cores, and you can see that Greenland was much warmer in the past than it is today.

But something else is interesting that pops up. Every thousand years you get a warm period, so it's warm today. We had the medieval warm period. We have the Roman warm period and the Minoan warm period. So every thousand years you get this cycle. Um, you also have a cold period every thousand years. You've got the Little Ice Age, you've got the cold period of the Dark Ages, and then the Greek Dark Ages, which was cold as well.

Well, it just so happens that these warm periods, they correspond, um, with, 1000 year eddy solar cycles. [00:42:00] And so you can look at the beryllium and carbon 14 to see those cycles and they do match up, but they don't match up and correspond with co2. In fact, co2 were lower during this period and this is the During the Holocene Optimum, which was the warmest period, was two degrees warmer than we are today, and CO2 levels were much lower then.

So, um, it tells us something else is happening here, and it looks like it has some relation to these solar cycles. Well, we see these climate cycles not just in Greenland. Um, this is the Pacific Ocean. This is the study by Rosenthal where he took, uh, sediment samples under the Pacific Ocean near Indonesia.

And you can clearly see the Little Ice Age, the Middle, the Medieval Warm Period, the Roman Warm Period. So you see these same trends that occurred.

The Misrepresentation of Climate Change in History

Um, this is the study in nature by [00:43:00] Moberg and you can clearly see the Cold Dark Ages, the Warm Medieval Warm Period, and then the Little Ice Age. Um, this is the study of of Lindquist using other proxies where you can see the Roman warm period, you can see the dark ages that was cold, the medieval warm period, the little ice age that was cold, and then again modern warming that we are in today.

So you can see all of these trends and there's literally hundreds of papers that have been written to show these various trends. But if you don't believe these, uh, proxies work, well, there's other things we can look at. Here's a study by Moberg where he looked at, uh, tide gauges. We know tide gauges go back to the Egyptians.

Uh, many, uh, nations have been, uh, measuring the tide and, uh, and ocean levels. And you can see that coming out of the Dark Ages, there's sea level rise during the medieval warming period, [00:44:00] sea level decline in the Little Ice Age, and now we're back up to this point where we have warming again and sea level rise once again.

Um, if we look at glaciers, this is one of the great glaciers. Oops. This is one of the, the great glaciers that we have in the Alps. Um, and you can see from this, here's the middle medieval or the Minoan warm period, and there were no glaciers at that time. This is when the Bronze Age occurred. And then we had the Greek Dark Ages that was cold, and the, and then the glaciers grew, this glacier grew, and then it declined again during the war, the, the Roman warm period.

And you can see the glacier grew once again during the, the dark ages that was cold. And then we have the medieval warm period where there were no glaciers where it had disappeared and a little ice age where glaciers grew once again, and then back down to modern warming. So you can see this period clearly.

And, you know, you might say, [00:45:00] well, maybe those, uh, proxies aren't accurate, but Ice and sea level, they don't, they don't lie. But there's other indications as well. We can see that during this, uh, Manoan warm period, millet was grown in Scandinavia. You can't grow that today, so it was warmer than today. In the Roman warm period over here, there was mines in the Alps that are today under permafrost.

Presumably they weren't under permafrost when they were being mined. Citrus was grown in England. Grapes were grown in northern England, and you can't do that today. And over here in the medieval warm period in China, they cultivated citrus several hundred miles or kilometers north from where they can do that today.

And Germany, um, grew grapes 200 meters higher in altitude than can be done today. Um, the monasteries in Japan reported that cherry blossoms came early during the medieval warm period. Barley was grown in Greenland and wheat [00:46:00] in, uh, northern Norway, which, uh, is not possible now. And in the Baltic, grapes were grown 500 kilometers further north than today.

Um, the Vikings were able to settle Greenland because it was warm during this period, and the graveyards of many of these, uh, Vikings is now under permafrost, which suggests it was warmer back then. And then, of course, the Ontario tree line was 130 kilometers further north, which certainly suggests it was warmer at that period as well.

And, uh, even looking at, uh, entomology, you've got, uh, the Nettle ground bug in York. Um, that's been found in archaeological digs. That's pretty north, pretty far north in England. Um, and you don't find that today. In fact, you only find that bug now in the southern parts of England, where it's very sunny. And so we've got all of these additional, uh, aspects that collaborate that there certainly was, uh, These various warm periods.[00:47:00]

If we look at the cold periods, we've got additional evidence as well. We've gone through the glaciers that show that, but also we know that during the Greek Dark Ages, that it was cold and arid conditions, and it was very dry and that's what led to the collapse of agriculture. And if you look at the Alps, the tree lines move three to 400 meters lower in the Alps because of the cold.

In the Dark Ages, the Yangtze and Danube rivers froze over. They froze solid enough that they were able to use carts to move over the rivers. And Roman passes that were open through the Roman period, they had to be closed because the glaciers filled them in. Tree lines fell by 200 meters in Central Europe during that period.

So we can see that it's definitely a cold cycle. And the Little Ice Age? Dubois Glacier swallowed up two villages and there was a third that was in imminent danger. The Delaware River and Boston Harbor froze over. Can you imagine if those froze today what people would be saying? There was a winter market [00:48:00] held on the Thames River where they had all sorts of carts and exhibits and the last time that the river froze over solid enough to hold this kind of weight.

It was in 1816. Um, you found that there was, uh, in Amsterdam, the canals in Amsterdam and in Venice froze over, and Egyptians were recorded to wear fur coats for the first time in recorded history. This was a very cold time, and the Vikings had to abandon Greenland. So there's certainly so much evidence to show these periods.

And if we look at these periods, one of the lessons of history is that warm is good. During this Menomine Warm period, Uh, there were plentiful harvests, and that allowed for the division of labor, because everyone wasn't focused on food, you could now have the royal court, uh, professional armies, merchants, tradesmen, and this is what built the Bronze Age civilization in Egypt, Mesopotamia, and China, because of the plentiful harvests, [00:49:00] because the weather was warm.

We find the same thing in the Roman period. There were bountiful harvests and growing populations. Uh, Rome's population grew to 30 million. The Han dynasty grew to 60 million during that time. It was a great time of cultural advancement with architecture because of the harvest, they weren't all focused on just getting food.

And during the medieval warm period, there was also increased food supplies, more cultivated land, because you could now, um, grow things in higher altitudes and, and uh, higher, higher in the north, you had the explosion of new towns and populations, and you had the cathedrals and, uh, being built because there was, again, plenty of food, so they didn't have to focus just on survival.

Um, there was the emergence of the Nordic nations, because now it was, uh, habitable further, further north, and in fact, even Iceland and Greenland settlements were established at this time, [00:50:00] so it was a, it was a good time. Um, Winston Churchill has said, those who do not learn history are doomed to repeat it, and I think, uh, climate alarmists should learn a little bit about history to appreciate the warmth that we have today.

On the other hand, history teaches as cold as bad. It's very bad. During the Greek Dark Ages, there were poor harvests and there was migrations. There's a lot of historians that think the Sea Peoples who attacked many of these civilizations were climate migrations. The Bronze Age collapsed and for centuries there was no writing and no palace building because everyone was focused just on getting food.

In the dark ages, it was cold again, there were frosts, crop failures, we also found epidemics, that seems to, uh, whenever you have famines, people are malnutritioned, and then there's more disease, um, a lot of, there's been a lot of speculation of why Rome fell. Um, but in recent years, there's more [00:51:00] publications and more studies that suggest climate had a big thing to do with it.

Uh, the population of Rome fell from 30 to 15 million. Many of the Roman cities fell into decline. Cities north of the Alps were abandoned because of the climate. And, uh, there's a number of authors who suggest that the Huns and Goths who attacked the Romans, these were climate migrations. We also see even in America, the classic Mayan civilization collapsed because the dark, cold, period that they were in led to more arid conditions and their crops failed because of the, because of the dryness.

The Little Ice Age is a period where crops failed once again. You had agrarian societies that collapsed. There was malnutrition plagues including the Black Plague and many of the bodies of the Black Plague that they've been examined and it shows signs of malnutrition. Um, disease, there was rebellions and riots, wars, the Ming dynasty was, was, uh, destroyed at that time [00:52:00] because of rebellion.

The Aztecs had rebellions in Europe, the 1600s was the time of most wars that they have ever had or have since. The populations in Germany and Bohemia and Finland declined by half during that period, and more than one third of the population died in Asia and Europe, and Greenland had to be abandoned.

And so, again. Cold is very bad. Why we'd ever want to go back to a cold period, uh, is just beyond belief. And now as we look at modern warming, we're in a time of great prosperity again. If, if we look at famines, um, we can see that famines are almost non existent. Um, who would believe that today India is a net exporter of food?

Um, we are in good times, and climate certainly has been part of that. Technology clearly is a big part of that, but technology has helped. If we look at the cost of, uh, climate, There's a great study that was done by Richard Toll. He [00:53:00] was an IPCC author and he published in 2018 where he reviewed 22 economic papers, and he showed that the mean of these papers show that climate change is actually positive.

until we get to 1. 7 degrees since 1850. Well, we've already warmed by about nine tenths of a degree, so we've got about eight tenths of a degree to go that it's still going to be positive to the economy. But he also says that the impact of climate doesn't significantly deviate from zero until we see temperatures increase above three and a half degrees.

Uh, keep that in mind, because if you subtract the 0. 9 that we've already experienced, that means that we've That's the temperature that we've got about 2. 4 degrees from today before things get bad. Okay, so we've looked at these historical climate trends that we've had over history, they're firmly established, [00:54:00] but they don't meet with the anthropogenic climate change narrative.

And so there is an email from one of the IPCC researchers who wrote, we have to get rid of the medieval warm period. Well, Michael Mann did just that, uh, in the, uh, assessment report three from the IPCC was, uh, this, uh, uh, uh, infamous, uh, uh, Michael Mann, uh, hockey sticks called the hockey stick, because for 1000 years, there was basically no change in temperature until the modern day.

And this is like, uh, uh, this is like Part of the hockey stick that goes up significantly during this time. Well, we know that the hockey sticks been Criticized there's four peer reviewed papers that show the statistics the proxies the thermometer data mixing it with proxy data There's a number of problems with this paper.

But what's surprising is that although [00:55:00] This has been criticized heavily the IPCC came out with a new hockey stick by the pages 2k members, um, and it's very similar to the Michael Mann hockey stick. Now it appears that scientists that were in the pages 2k group Had a falling out because a number of them uh did not support the Um, hockey stick that was published, and they created their own publication that showed a different, uh, uh, history, and that history showed that there were times back in history where the temperatures were as warm as today, but because the IPCC is, uh, biased, they only reported the hockey stick that showed what they wanted to show, and they didn't show the other pages to group members, which, in fact, were more scientists than in the hockey stick paper.

Well, um, what about all of this historical data? [00:56:00] Now, it is undeniable that Greenland and Europe had the medieval warm period, and even China. So Michael Mann and the IPCC, they argue, Oh, well, the medieval warm period was just a regional event in Greenland, Europe, and perhaps in China in the northern hemisphere.

But we're talking about global warming.

Understanding Regional Warming

Well, that's really a strange argument because the warming today is not global warming. It is also regional. This up here is, is data from the UH. This is a U A H satellite data set that shows that the North Pole has been warming 25 times faster than the South Pole.

We also had talked about the fact that even the tropics. You can see how the tropics is warming, but only half the rate that we can see from the North Pole. So we talked about that earlier. But now you can see this is certainly not global. [00:57:00] Um, it's happening in the northern hemisphere. So just because this happened in the northern hemisphere, and it seems especially in Greenland and Europe is where we've seen in these past past climate cycles where most of that warming occurred.

Well, that seems like that's what's happening today as well. So, nothing unusual. So we got to figure out why is that warming taking place.

CO_2: A Driver of Temperature?

Well, if we look at CO_2, it is a driver of temperature. It does warm the atmosphere, but it's certainly not the only driver. This, oops, uh, using, uh, paleo records, you can look at the CO_2 levels and the concentrations, uh, historically, and this is what this shows.

Today, we're now at about 420 parts per million, and you can see we were down very low at about 277, 000 years ago. This is during the Holocene climate optimum, when temperatures were two degrees warmer than today. So you can see CO2 was not responsible for that warming. You can also [00:58:00] see that there's little blips for the medieval warm period and the roman warm period.

Oh, we're talking about four or five, uh, parts per million. So very small, um, but certainly not the driver of the temperature changes that we could see during those periods. So this is clearly not the driver. Of these past climate cycles. We can also look at the 1970s. Again, this was a time when the ocean oscillation was in a cold period, and we could see the temperatures were actually declining.

That's a period where CO2 increased by fivefold. So that's quite a contrast. If CO2 were the driver, it would you would think that the temperatures would be increasing with a five fold increase in CO2 emissions, but instead it declined.

The Role of Oceans in Climate Change

This does suggest the oceans have a very powerful influence on the climate, that they were able to overcome any of the warming from CO2.

Debunking the CO2-Temperature Correlation

This is one of my favorite graphs, [00:59:00] favorite because Al Gore, in his An Inconvenient Truth, used the Antarctic ice core to show that, look, here is temperature in blue and we have the CO2 Levels in red don't you see there's a correlation here and you tried to use this to say that co2 is driving the temperatures Well, that's actually a very ridiculous argument and one thing that's surprising to me is I still find uh posts on the internet Of supposedly climate scientists who are making this argument, but they know better than that because everyone knows that these hundred thousand year temperature declines were due to the Milankovitch cycles.

This is where the elliptic orbit became more elliptical, and during those periods we had less solar energy that came to the earth, [01:00:00] and so because of that we had the ice ages. So everybody knows that, the ice ages. But another thing to look at is Okay, now let's look at the changes in, um, CO2 concentration.

So the changes are from about 180 to a high of about 300 parts per million. So that's 120 part per million change. Um, you can actually do the radiative forcing on that and, uh, it's 2. 2 watts using the Stefan Boltzmann law. That comes up to six tenths of a degree, but the temperature change, as we can see, is actually 11 degrees between the top and the bottom.

It is impossible to get 11 degrees. From CO2 radiative forcing from 2. 2 watts per square meter. That just is absolutely impossible. So what's driving these, this correlation? Well, if you look closely, you can see that the CO2 is actually [01:01:00] following, not leading. And that makes sense because colder CO2. And warmer water expels CO2.

We all know that if we have a Coca Cola, if we leave it in the refrigerator, the carbonation stays, but if you leave it on a warm table, it goes flat. And, in fact, that's pursuant to Henry's Law. And you can look at Henry's Law, and you can look at a change of 11 degrees centigrade, and that's in line with the absorption and emission of 120 parts per million in water.

So, in fact, it actually makes sense.

Cosmic Rays and Climate Cycles

Let's talk about solar and climate cycles. So we've talked about cosmic rays, that these cosmic rays are caused by the, um, well actually we haven't talked about what that causes them. Cosmic rays are actually, um, they, they come from the sun. So, um, Um, uh, stars that are exploding calling called supernova that are out in outer space.

[01:02:00] And, um, these particles are coming at very high speed and they collide with carbon and beryllium molecules and create the carbon 14 and the beryllium 10. And if we look at the reconstruction and now we're looking at from low to high, um, we can see that, um, here where we have a low amount of cosmic rays.

This is when we have the medieval warm period, and then we have very high Uh, cosmic ray flux, and this is where we had the temperatures decline in the Little Ice Age. So you can see the correlation, that in fact, this correlates, and this would correlate with a strong magnetic field that keeps those cosmic rays from hitting the Earth, and a very weak magnetic field, where in fact this, the cosmic rays are not able to to hit the earth.

And you can see that they correspond with all of these climate cycles that we've talked about. [01:03:00] Um, so we have these solar cycles that are in sync with these climate cycles. And I might mention that the warming that we're in now, the modern maximum is the strongest solar cycle we've had in 10, 000 years.

So, uh, no wonder we're in a warming period.

Arctic Amplification: A Closer Look

Want to talk a little bit more about this Arctic amplification, which is what they call the fact that the Arctic is warming much faster than any other part of the world. Well, um, this is of course the, uh, uh, University of Alabama Huntsville, uh, satellite record.

This is the Trios satellite record. Uh, the Huntsville record shows that the warming is about 1. 1 degrees over this period from 78 to 2022 in the Arctic. But it shows even faster warming in the Trios satellite. This is about 1. 5 degrees. And we have in Antarctica, there's hardly any, um, warming at all. Um, so quite a contrast.

Now we know that CO2 is pretty [01:04:00] usually, uh, pretty uniform around the globe. It's about the same in, in the Arctic as it is, uh, down in Antarctica. Um, so that doesn't explain the amplification. It's certainly not CO2. Some people have said it's the polar vortex, the ice melt, permafrost. Um, I've looked at those in more detail in my paper.

None of them have enough power to create, uh, this great change in temperature. But what does have the power to do that is ocean currents transporting solar heat to the atmosphere near the Arctic. And that can explain what this Arctic amplification is all about. So if we look at the transfer of heat, it occurs both through the atmosphere and through the water.

And you can see this is a good chart that shows the transfer of heat. So this is showing heat as it's transferred in red through the atmosphere. And actually more heat is transferred to the southern hemisphere than the northern initially. But then you can see That, that flattens out pretty [01:05:00] quickly, but more heat is actually now in the northern hemisphere, and that's because of the oceans, because in blue is the amount of heat that's being transferred to the southern hemisphere, and you can see much more heat is transferred to the northern hemisphere, and as that heat dissipates out into the atmosphere, That's transferred and that atmospheric heat becomes larger.

And here's the circulations of why that's happening. This is the meridional overturning circulation and you can see that heat that the oceans that are heated by the sun, they take all of this heat and they transport them up here to Greenland and Europe. Hey, we've kind of heard that warming in Greenland and Europe repeatedly, haven't we?

Um, this is amplified by There's the additional Gulf Stream and the Gulf Stream takes heat from the Caribbean and adds it to this circulation. So that [01:06:00] only only adds that only adds to the circulation there. And then we have over here. We see that, you know, glaciers are melting in Alaska. Well, there's a reason for that.

You've got the Curious show circulation in Japan that takes warm waters, uh, from the Philippines and takes that up past Japan and then over to Alaska. And that joins then the meridional overturning circulation. So you've got a lot of warm water up in the North Pacific and up in the North Atlantic. And that, of course, is where we're seeing most of this global warming.

It's interesting to look at London. It's on the same latitude as Moscow. It has an average temperature of 50 degrees Fahrenheit. Moscow's average temperature is 39. Um, over here in Winnipeg, the same latitude, uh, 28 degrees Fahrenheit and in Siberia, 21 degrees Fahrenheit on the same latitude. So you can see the impact that [01:07:00] the oceans is making in terms of transferring that heat.

Well, let's focus a little bit more on the, uh, uh, the Atlantic, uh, multi decal, decal oscillation, because here we have in some detail, and you can actually see this, um, um, Okay. it certainly impacts the temperature. Um, we have, it was cold in 1910, and then we have this warm period, which was the, the Dust Bowl.

Um, there's plenty of documentation of how warm it was during the Dust Bowl, the Grapes of Wrath, which is a novel about how warm it was in America, and all these other books that were written. So we see that very warm period. And then you've got Time Magazine had three cover articles about how cold it was getting, and even Science News felt there might be an ice age that we were dropping into and was wondering if that was going to happen.

Well, you can see that oscillation, it got cold during that period, and now we're in a warm period once again, and that oscillation is [01:08:00] warm as we see that. Now this should end at about 2034 and then we'll be moving into a cold period once again. So, um, you know, if you just look at the ice age, what did they do?

They extrapolated off the curve, thinking there would be an ice age. You never do that. And now people are extrapolating off of that curve.

The Impact of Solar Radiation

So let's turn to why is there ocean warming? Well, uh, 99. 9 percent of all of the energy input to the earth, which is 173 terawatts, comes from the sun. So most of that is from the sun.

Um, you can look at the ocean as a big solar collector. It represents

70 percent of the area of the globe. But it has a low albedo. In other words, it's not very reflective. The, uh, ground is much more reflective than the ocean. So because of that, some of the, uh, Um, if it hits the earth, much of that radiation is just reflected right out to space.

[01:09:00] But 90 percent of the world's solar heat is absorbed into the ocean, and that's quite significant. So what are the impacts on this solar radiation?

The Role of Clouds in Climate Change

Well, perhaps the biggest impact is clouds, because clouds, although they do provide a greenhouse effect of reflecting some radiation back to the earth, The biggest impact is low clouds are very white because they're white, they reflect a lot and they reflect about 70 to 90 percent of the sunlight back out into space that never reaches the earth.

So clouds over the ocean. are extremely important in terms of what those ocean temperatures are going to be. And in fact, over the ocean, there's 10 to 15 percent more clouds than there is over, over the earth or over ground. So, um, you can see that's a very powerful mechanism. This is one of the concepts that I want to discuss that I have not seen anyone talk about.

Um, I'm not a [01:10:00] scientist, so I could be wrong, and I would hope that others would dig into this. Um, but I think this is, uh, insightful to take a look at. I propose the theory that CO_2 has no warming effect on the ocean. In fact, it has a cooling effect because it amplifies evaporation. Well, there's a few facts to talk about.

The first is most people don't realize that the oceans on average are two degrees warmer than the atmosphere. The second theory of Their principle of thermodynamics states that, uh, basically warmth always moves from a warmer object, which is the oceans, to the cooler object and cannot go the other way.

And the cooler object being the atmosphere. So we know that heat is not directly transferring. Um, on average, um, from the atmosphere to the oceans. But I think the argument, um, for global warming, [01:11:00] um, warming the oceans is that it slows the cooling. Because the oceans continuously, um, have additional, um, warming from the sun.

And so, if they weren't able to cool, then they would continue to warm. And so, does the atmosphere, if you warm the atmosphere from CO_2, does that slow the cooling? Well, as I've looked at the mechanisms of how the atmosphere, um, warms the ocean, it becomes very clear that, that the atmosphere doesn't warm the ocean.

And here's why. The, the atmosphere can only warm the ocean through radiation, conduction, and convection. And each of these only hurt only heat the very surface of the ocean, so that leads to cooling from evaporation evaporation is very powerful. Now I lived in Utah, where we had a, we call the swamp cooler and evaporative cooler, where we took [01:12:00] air from the outside that was 100 degree weather.

Um, that hot air was blowing over these pads that had water on them and we'd blow that hot air into the house. But by the time it reached the house, it was cold air. Evaporation is so powerful at taking energy, that latent heat, um, out of the atmosphere. And, and, and, and, and so that's what happens, uh, in heating just the surface.

It turns into evaporation. So let's look at this in more detail. If we look at CO2, the radiative forces from CO2, because there's radiation that comes back to the earth from CO2, but effectively it can only warm in the 13 to 17 micron infrared spectrum. In that particular spectrum, the coefficient of absorption is very high, which means over 90 percent and maybe much more of that heat is absorbed in the water in the first hundred microns.

That's the width of a human hair. So, it is lost to evaporation. And if you look [01:13:00] at conduction, air is a very poor conductor. Um, if you look at, uh, insulation batting. The reason that works is because it has air in the pockets. The insulation is actually much, the air is a much better insulator than the fiberglass.

The fiberglass is not as good. It is the air and so conduction is very poor. So there's not much conduction at all. And even if there is any, that again is just on the surface that leads to evaporation. Convection is wind, but wind, in fact, yeah. Actually really aids the evaporation because what happens is when evaporation occurs, the layer just above the water is saturated with humidity and that inhibits the evaporation.

But when blows that saturated, um, uh, atmosphere away. And it replaces it with dry air, and that accelerates the evaporation. And we all know that if you take a wet rag and you [01:14:00] put it in front of a fan, it dries very quickly. So I suggest that evaporation more than takes more heat out than is added by a warm ocean.

And so if you warm the atmosphere by CO2, you do not cool the ocean. And let's now look at what is the data that would suggest that. Well, let's, let's think about this. If the combination of radiation, conduction, and convection, um, were more than the evaporation, then the surface of the ocean would be warmer.

than just under the surface. But if the evaporation were stronger than the combination of radiation, conduction, and convection, then the surface would be cooler than just under the ocean. Here are the measurements of the ocean. The ocean has a sea skin, and that sea skin is known to always be cooler than it is just under the surface.

At night, It's about 20 microns in depth, and it's about [01:15:00] two tenths of a degree cooler on the surface than it is under the water. And in the daytime, where the atmosphere is even warmer, it's down to about a millimeter depth, this sea skin, where the temperature is, again, cooler on the surface. To me, this suggests this cooling is all because of evaporation.

Therefore, The CO2 cannot warm the oceans. Now, I know this goes against you fine. Everyone is saying, oh, the oceans are warming to, um, terrible, uh, temperatures, um, because of greenhouse gases. Um, I suggest this doesn't happen. This has major implications. The major implication is, as we've seen, if the ocean temperatures are driving many of the temperature increases that we're seeing, and that's not coming from CO2, then that must be coming from the sun, because the sun is what is, is heating the oceans.

[01:16:00] Let's look just a little bit about greenhouse gases. I'm not going to spend a lot of time here, but this just shows a chart that has the Incoming radiation from the sun, and then the sun, um, warms the earth, and the warmth from the earth is emitted out to space in infrared radiation. Now, you've got a number of greenhouse gases.

You've got water at 400 parts per million. Oops. And you've got, uh, CO2 at 420 parts per million. Methane and nitrous oxide are measured in parts per billion. And CFS and HFCs are measured in parts per trillion. They are so small, they have very little impact. So really, the major giants of changing the temperature is water vapor.

And then carbon dioxide. Well, carbon dioxide, as I said, it has, of course, um, a number of areas where it can radiate, absorb, and radiate heat. You see, there's no [01:17:00] heat being radiated from the Earth in these spectrum. So really the only effective area where it can radiate heat is in the 13 to 17 micron spectrum, but you can see it overlaps with water and because water is 10 times higher concentration on the surface than is carbon dioxide, most of that is absorbed by water.

What's very interesting to see is that the first 10 meters from the surface, 99. 4 percent of all the heat in the spectrum. is absorbed between water and CO2. So it doesn't matter how much more water or how much more CO2 you add on the surface, it's not going to change the heating. And because of that, what happens is the CO2 only makes a difference high in the troposphere, because that's where the temperature is colder and the water condenses, the water vapor condenses, and there CO2 actually makes a difference.

So that's where the global warming is occurring, is high in the troposphere. [01:18:00] And that becomes very important in our discussion.

One of the aspects that is one of those stubborn facts of physics is that the increase in CO2, the power for it to increase temperature, declines dramatically. In fact, it declines exponentially. And that's because the equation, driving radiative forcing is the temperature is the multiplied by the, uh, the natural log of the original temperature.

divided by the new temperature. So if we're looking at increasing from 400 parts per million to 800 parts per million, that would be 400 divided by 800, which would be two. And the natural log of two is 0. 693. Now you can see we have to double that to four in order to get just an increase of one unit.

And we have to double the four to eight to get another one and 16. [01:19:00] So to increase, um, the temperature, By four times we have to increase the carbon dioxide by 16 times. And this example might illustrate it a little better if we're increasing temperature from 400 parts per million of CO2 to 800 parts per million.

Um, that increases from 400. By 400 parts per million, it increases the temperature by eight tenths of a degree. If we want to increase it by another eight tenths, we have to double that. We have to increase by another 800 parts per million. And so, in other words, to get 1. 6 degrees increase, we have to actually increase CO2 concentrations by 1, 200 parts per million.

And this nice chart shows that we're at 420 today. Adding additional CO2 doesn't have really a lot of power. This is one of the charts by William Happer, and I think it's a really good chart. What it's showing is the black [01:20:00] line It's showing the radiation that would go to space if there were no clouds, and that's 277 watts per square meter.

That's at 400 parts per million. If you double that to 800 parts per million, you change the 2 77 to 2 74. The difference between the two is just three watt. per square meter. So in doubling CO2, again because of that exponential decline in the power of CO2, you only get three watts per square meter, which is about one percent of that.

And, um, I've, if you use the Stefan Boltzmann law, which is what you need to do to convert watts per square meter to temperature, you get about 0. 8 degrees centigrade. At least that's the calculations I've got. I know, uh, William Happer. He was able to get 0. 7 degrees, so I'm not sure what my calculations, how they differ from him.

But I think what's interesting is Will Happert has shown us that it's, uh, you know, less than a degree. Brad [01:21:00] Marston from Brown University, he's a climate alarmist, and he has a, uh, he's a physicist and has a nice, uh, video showing the calculations of global warming, and he comes up with about one degree.

So they're both in line, it's about one degree of warming. But that's certainly not a climate crisis. And if you look at our fossil fuel emissions today of 2. 4 ppm per year, it would take about 159 years to increase from 420 today to 800 parts per million so A lot of time.

The Future of Fossil Fuels

Um, let's look at the end of fossil fuels because this is quite interesting to see.

The Global Carbon Project estimates the remaining fossil fuel reserves to be around 2, 795 gigatons. If all of that were burned, CO2 would be about 2890 parts per million or an increase of 8. 5 watts per square meter. Using the Stefan Boltzmann law, that's 2. 2 degrees, hardly a crisis. In fact, that's less than the [01:22:00] 2.

4 degrees that the toll articles told us. We would not be significantly negative economically until we reached that. So if we chart this out, we're at 420 parts per million today. By the end of the 21st century. If we hit 700 parts per million, and that's the number that the IPCC gives if we do nothing to curb our current, uh, um, fossil fuel emissions.

Um, there is another estimate that I got of fossil fuel reserves that's lower than the carbon, the global carbon project. So I Included that which would be a 1.8, uh, uh, centigrade degree, increase in temperature and the 2.2 degrees end of fossil fuels from this high estimate. Um, it's still only 2.2 degrees, and it would take about a thousand years that the current rate of what we're using fossil fuels, so hardly a car, a climate, uh, crisis.

And we have plenty of time, uh, to implement solutions. [01:23:00] Well, if that's not a climate crisis, how come everyone's speaking about this crisis? It's all based upon one theory, and it's a theory that if you increase the temperature, there's an amplification of warming, um, by three times. by water vapor. Um, and so that is in all of the IPCC models, and that's where all of this scare comes from, is these models showing these high temperatures because it has this assumption.

But it evidently has two false assumptions in it. The first is that it believes that humidity will remain constant, relative humidity will remain constant, and also that the Clausian Caperon principle will remain constant. And that principle says that for every degree centigrade increase in temperature, there's a seven degree increase in humidity.

Now that has been proven in laboratory experiments, and you can do that in the laboratory. And that is true. But the earth is [01:24:00] much more complicated. For example, the polar regions of of Antarctica and the North Pole. It's very cold there. Um, too cold to hold much moisture. So if you increase the temperature from 50 below in Antarctica to 49 below, it's not going to change the humidity.

Um, also deserts could be have 110 degrees in the desert. They don't hold much moisture in that type of a climate. If you change the temperature from 1 10 to 109, you're not going to have much change. So in fact, that's doesn't hold. In real life. So that that principle is incorrect. Now, if we look at what is actually by keeping relative humidity constant, what would be the water vapor feedback?

Well, um, William, uh, wind garden. Um, had his podcast on, on your podcast, uh, Tom, and, and he showed that it was a 1x [01:25:00] amplification, but that assumes that relative humidity stays the same. But if we go to the chart, we see that relative humidity has actually declined. Um, over time. And so, in fact, that is not true, that it's going to be far less than one degree because of that decline.

Now, this chart is from NOAA, and it shows this is on the surface of the earth, but this really doesn't matter here, because remember, all of the greenhouse gases are saturated. It doesn't matter if you add more water vapor, there's nothing, there's no more energy to add. It's up here in the higher troposphere, this is where it matters.

If you add water vapor up here, it makes a big difference. But as we can see, That's actually not happening. Well, one of the, probably the best papers on this topic is from Soden et al. In the Journal of Climate. And their calculations is 1. 8 meters squared for each degree increase in temperature. That happens to be a feedback of about one half x.

So one half x instead of three x seems to be what's probably appropriate. However, one half x [01:26:00] is easily more than compensated by the negative feedback of clouds. So let's look a little bit more at this water feedback. According to these IPCC climate models, there is a Hot spot high in the troposphere. So this chart shows this is the equator.

This is 30 degrees north latitude and 30 degrees south latitude. If you go up to an altitude of about 12 kilometers, you see this hot spot and that hot spot is caused by the fact that Water evaporates, and most of the water that evaporates is in the tropics, and that evaporates, and when it reaches the top of the troposphere, it condenses, and when it condenses, it releases the heat that it took out of the ocean, and, uh, so that's what's showing the water vapor.

feedback. Um, but actually this is reality. This is from weather balloons. There is no hot spot. [01:27:00] So because there is no hot spot, obviously these climate models, um, they, um, have, um, they, they do not have the water vapor feedback correct. They certainly are overemphasizing what that is. And then a paper by McKintrick and Christie in 2020, um, has IPC models and shows that The average of all these models, um, from 1979 to 2019, uh, they showed a warming of 0.

4 degrees per decade. But actual measurements from weather balloons and satellite, the reality is 1. 7. So in fact, these models run about two and a half times warmer than reality. And that's because the models have the water feedback wrong. Um, and that's why, uh, Richard Linsen said these positive feedbacks, which is primarily the water feedback in the climate models, are assumed, not derived, or [01:28:00] observed.

They're just not correct. Okay, let's talk about cloud impact. The IPC's models also assume that 1. 7 watts per square meter is radiated out to space for each one degree temperature increase. But, satellites show us that that's not correct. There's actually 2. 4 watts per square meter. Which means there's more of a reflection from clouds than are put in these models.

The albedo of clouds is 0. 7 to 0. 9, which means they're very reflective and they reflect 70 to 90 percent of the solar energy back into space. Um, that's about 216 Watts per square meter for 90 percent of that going out to space. I mean, you can feel this on a hot day when low cloud covers the sun, it gets, uh, it gets colder and you can feel that.

Well. If we look at the actual observations, we can actually see that as the cloud cover has increased from [01:29:00] 63 to 70 percent, that the temperature has declined by half a degree. And that's why the Nobel laureate, John Clausen, has said the radiative forcing from CO2 is nearly two orders of magnitude or a hundred times smaller than the effective stabilization of the input power provided by the low cloud.

Okay, here's another slide, which is an area I don't hear anyone talking about. And, uh, I thank Tom for, uh, having, uh, Gerald Pollack on your, uh, podcast, uh, to introduce me to this topic. So, Gerald Pollack has talked about the fact that, uh, When water evaporates, and he is shown by experiment, it creates H3O2 molecules, and you can see this is the structure of the H3O2 molecule.

Um, it has actually a negative charge, and when water evaporates, it forms, oh gee, when water [01:30:00] evaporates, it, it, it forms kind of a bubble of vapor that's encapsulated by a skin of this H3O2. And of course, Gerald does talk about how the charge of water is important. Um, but what's missing is talking about aerosols, because we know that to condense the water you need these, uh, nucleating aerosols as well.

And we know that the dominant cloud nucleating aerosols over the oceans are sulfates, nitrates, and dust, particularly the sulfates. But these aerosols are all negatively charged. So what you have now is you've got in the air, you've got negative charged water vapor and negatively charged aerosols. So they're all repelling each other and none of them stick together.

Now, just talking about these sulfate ions and how important they are, there's studies that have shown in the South China seas that there's a substantial amount of sulfate aerosols because of algae blooms. [01:31:00] And they have resulted in increased cloud cover. And that's why the ocean smells like it does. It has a little bit of a sulfury smell.

It's because of the sulfate, um, aerosols that are over the ocean. Now, uh, Gerald, uh, Pollack mentioned that using the Richard Feynman concept of like, likes, like, and that's been proven experimentally, that positively charged protons act like glue. to stick these negative recharge ions together. So now the aerosols will stick together, because you can use the protons to form larger aerosols to become, um, nucleating aerosols.

cloud nucleating aerosols, and the water vapor will now stick to the aerosols because of the protons. So you need three ingredients to create clouds. Water vapor, aerosols, and protons. And that's what creates clouds. And [01:32:00] again, I've not heard anyone else talking about this, but it makes perfect sense. And you'll see that.

Okay, so where do those cos, where do those positively charged protons come from? Well, from cosmic rays.

The Impact of Cosmic Rays on Cloud Formation

It turns out 85 percent of cosmic rays are positively charged protons. An astrophysicist, Hendrik Svendmark, proposed that cosmic rays increased cloud cover by helping aerosols from sulfate ions to form cloud nuclei.

So he created a cloud chamber and he was able to show that he could from sulfate gases form small aerosols of sulfates. They weren't that large. And so, um, mathematicians used mathematical models to show that they could never grow bigger. Um, the press had a heyday because, uh, this again went against the climate alarmist's viewpoint that clouds are [01:33:00] important.

And so, um, they said that the cosmic gray theory is dead. But Sven Mark, um, he wasn't deterred. He actually continued experiments in his cloud chamber and in fact he took it down into a mine two miles underground so there would be no interference from cosmic rays on the surface of the earth. And what he found is that he had these small sulfate ions and when he put protons with them, um, after five days these aerosols grew to become cloud nucleating aerosols.

And so this paper is the one that he tried to publish and it took a year and a half before anyone would publish it. And that was actually a very significant finding. Well, um, Spence Mark, an astrophysicist near Shabib, They recognize that the earth provides a perfect experiment because we have solar flares and during a solar flare, which is called a four bush event, [01:34:00] the magnetic field of the sun is extremely strong.

And so we have a dramatic drop in cosmic rays. So they started looking at various satellite data sets that occurred during these four bush events. So you can see here, the red dotted line is the significant drop in cosmic rays during this four bush event. These events take place around ten days. And what did they find with the satellite that measures aerosols, that five days later, There were more aerosols, there were less aerosols that were formed.

And you find that we had this, the same thing with looking at cloud formation and the liquid in the various satellite data sets, that you had a drop in cosmic rays. Five days later, you could see the water forming and clouds forming and the number of low clouds, um, reduced during that same period. As the [01:35:00] cosmic rays reduced as well so you can see the direct correlation and the fact that they were both five days I find quite remarkable.

Well, you can look historically, I've already talked about all of these various climate cycles that correspond to the solar cycles and the cosmic rays. You can see the cosmic rays also matches the whole scene. Here's a study that was done from stalactite and in Oman. And those layers of the slag type were showing that here is the cosmic ray flux, and you can see the temperature is matching and following the cosmic ray flux, so there's certainly a close correlation there.

One of the more interesting studies was, uh, Jan Wieser. He analyzed 24, 000 calcium carbonate fossil shells, um, and he looked at the isotopes to reconstruct temperatures over 500 million years. And he found that the temperature [01:36:00] would swing by 10 degrees every 140 million years. He looked at CO_2, there was no correlation.

He looked at the Milankovitch cycles, there was no correlation. So he was wondering what was going on. Well, independently. Uh, astrophysicist Nir Shaviv studied meteorites, and he reconstructed from isotopes in the meteorites. And he was able to look at 500 million years of cosmic rays. And here's what we found.

So here we have the sea surface temperature is in red, and you can see every 140 million years it drops. And the cosmic rays We also see how those cosmic rays increase during that same period, and that's because they're going through, um, many of the spiral, spiral arms of the Milky Way, and each of these spiral, spiral arms is where we have lots of supernova.

And that's of course, where in [01:37:00] fact, we would have a lot of cosmic rays. So you can see that correlation is over days. With cosmic rays, thousands of years, and millions of years. Well, because of this, the climate crisis apologists have had to fight against Spenmark. Um, it's not even included in the IPCC report, they just dismiss it.

We have Richard Alley, who shows this chart, and he says, well let's look. We see that 40, 000 years ago, there was a big spike in cosmic rays. This was caused because the polarity of the magnetic field of the Earth switched. And during that time, we did, we're not protected from cosmic rays from the Earth's magnetic field.

And so what he shows here is that temperature. Did decline rapidly by four degrees, but it didn't continue to increase as you would expect, um, the fact that we had, um, uh, the, all of those cosmic rays hitting the earth. [01:38:00] So what's happening here? Well, you have to look at this. This was during the Ice Age.

This was when, um, there was a glacier that covered all of Northern Europe, and a glacier that covered all of Canada, and Chicago, and went as far south as St. Louis. It was very cold. And what happens during cold? Water vapor in the atmosphere is very limited. You need the warmth to force the evaporation to get the water vapor, and you don't have the algae blooms, so you don't have these sulfate aerosols as well.

It doesn't matter how many cosmic rays you have if you don't have water vapor and aerosols to stick together by those protons. So that's what's happening here. And there was another paper by Agri et al, where they noticed that between 1982 and 2005, the correlation between cosmic rays and low cloud formation and temperature was in fact excellent.

It was amazing. But, [01:39:00] um, in the early 2000s, uh, suddenly, uh, that correlation wasn't as good. Well, there's a paper by Jenkins et al. in 2022 that shows how aerosols dropped dramatically in the early 2000s. Uh, and in fact, uh, in this paper, he concludes that the warming that we've had since the early 2000s is not because of CO2, but because of a decline in aerosols.

And once again, If you don't have the aerosols that you need to nucleate the clouds, it doesn't matter how many protons you have from the cosmic rays, you're not going to get, you get the cloud formation, and that would explain that.

The Coming Cold: Predictions for the Future

Okay, so cold is coming. If we look at, uh, these, uh, um, solar cycles that we've had every 11 years, there's a solar cycle.

We're currently in solar cycle 25. 24 was actually much lower than it's been. And we talked about the modern maximum. [01:40:00] So you see these individual solar cycles, when you have a number of them in consecutive order that are very, Strong. That's a solar maximum. When you have a bunch of these solar cycles that are weak.

That's a solar minimum. This is the solar minimum in a little ice age. This is the Dalton minimum when we had the year without summer. Um, so it was cold in that period as well. And this is where we have the solar maximum. Well, NASA predicts that the 25 that we're in right now is going to be lower, um, than 24.

But, uh, I look at, uh, Valentina Zarkova, who you've had as a guest, Tom, and, um, she, uh, has looked at the magnetic field, um, of the sun and what causes it, and it's because of two dynamo magnetic fields, the poloidal and the toroidal fields, and when those two fields are in resonance, that's when we have these strong, um, magnetic, uh, or strong solar fields.

of [01:41:00] cycles. But when they're in antiphase, that's when we have very weak solar cycles. And so she's done component analysis and she's accurately reproduced historical grand solar minimums and maximums. And so, um, her data looks very good. Now she disagrees with NASA. She says that cycle 26 will actually be similar, or I'm sorry, 25.

That we're in right now will be similar to 24. And actually, the data seems to suggest that and certainly, I think her data is good. But what she says is that cycle 26, which is coming in 2030, that that is going to be similar to the monitor minimum. So that's going to be very low. And that means it's similar to what it was in the little ice age.

So we should expect That if that happens, we're going to have colder weather. So, just in terms of my conclusions, There is no climate crisis. This is [01:42:00] primarily driven by two issues. The climate models ignore this cooling impact of clouds on the oceans, and that is clearly a very important factor in climate change, and also this water vapor.

Feedback of three X. It's not supported by any of the data. It simply is not true. So we should see CO2 warming will continue, but we could use all of the carbon in our fossil fuel, and we'd only see two and a half 2. 2 degrees warming, but it has hundreds of years. So we have plenty of time to plan for that.

We are in global warming period. Clearly, we're in the warming phase of the Atlantic Multidecadal Oscillation and the Pacific Decadal Oscillation as well, and the modern solar maximum. And we have modest warming from greenhouse gases, so of course we do have global warming today, but we should expect cooling.

In the 2000 thirties because, um, in [01:43:00] 2034, the A MO will move into the cold phase and so will the PDO will is moving into the cold phase probably later this year. Um, we will be in solar cycle 26 after 2030, and so we will have increased cosmic rays, more clouds. And I just don't think greenhouse gas warming is going to be enough to upset offset all of that cooling.

Concluding Thoughts: No Climate Crisis

So the implications that we have is that we should expect to continue moderating of temperatures. We will have global warming, but it's really moderating the temperatures. It's mostly in the Arctic. We'll have increased warming and co2 this decade, which will give us a net benefit of agriculture to feed a growing population and the world is going to be greener.

We have time, we have many years to implement a rational energy transition. And that's, you know, been one of the problems is trying to move too fast and implementing solutions that are not good. So instead of providing. [01:44:00] trying to prevent climate change, which is a total boondoggle. We should focus our investments on adapting, protecting the environment, eliminating pollution and fighting poverty.

And I think that climate alarmism will fade and be discredited. So my final words are from Winston Churchill. Truth is incontrovertible. Malice may attack it, ignorance may deride it, but in the end, there it is. And that's, uh, my thoughts around the climate. Thank you, Tom. Okay, fantastic work. I really enjoyed that.

, so I want to say again that I'm going to put a link to your 133 page paper in the show notes so people can look through that and I'll put a link. I'll put a link also to all of your slides there. And later on, there will be a transcript out on my sub stack as well so they can see they can read everything you said here.

Okay. Anything else that you'd like to say before we wrap it up. Well, I guess just a couple things. [01:45:00] I mean, one is, um, the, these two areas that I've introduced, um, I would hope that some scientists might look at that, that CO2 cools the ocean. CO2 warming of the atmosphere, I, I view does not warm the ocean at all, that it actually cools it.

So, um, I would be great if some scientists could look at that and see what their opinions. And, uh, the other, uh, item is it would be great to get, uh, Svenmark, uh, and, uh, Pollack and, uh, Shabib together. Um, I think they each have piece, pieces of the equation, but they don't have it all. And if they could work together, I think it fits so nicely together.

It's a beautiful theory when all of that comes together. Okay, yeah, I hope that happens. Maybe that will happen. We'll see. Yeah. Anything else? Well, I guess just, uh, um, certainly if anybody has input, I certainly would appreciate that. I'm just searching for the truth. So I really appreciate anybody who reads my paper, um, and [01:46:00] has any thoughts about that.

That would be most appreciated. Yeah, and you just included your email address in one of the last slides, and I think it's in, uh, in your paper as well. You put your email address there so people can contact you. Yes, it is there. All right. Very good. Thank you very much for all the great work you've done. I really appreciate it.