

‘Global warming’, painting your roof white, and the Chattanooga Chu-Chu

A science-based answer by The Viscount Monckton of Brenchley
to a science-based question from Rush Limbaugh

Chu’s ‘Texas Longhorn’ (a point here, a point there, and a whole lotta bull in between)

Steven Chu, entertainingly described as an “Energy Secretary”, says we can Save The Planet from “global warming” by painting our rooftops and roads white. He says making roofs and roads paler would have the same effect as taking every automobile in the world off the road for 11 years.

The Limbaugh question

Rush Limbaugh, entertainingly as always, but pointedly, asks –

“Now, would somebody explain to me how he knows this? ... If we can do something that will effectively remove the carbon emissions of every car on the road for 11 years, then why are we doing anything else? Why are we doing cap and trade? Why are we getting rid of SUVs? ... How much paint is this going to take, by the way? How much of a footprint does paint manufacturing leave? ... I need a scientist to answer this for me. I understand how clouds at altitude can help reflect the heat, but I want to know ... where does that reflected heat go? ... Are we being told here that reflected heat is not damaging at all, but direct heat is? It seems to me that, if we had ‘global warming’, wouldn’t we want dark roofs to absorb the heat?”

His Lordship's elegant answer

Steven Chu, like the Chattanooga locomotive whose name he proudly bears, is all steamed up about nothing, exists in a previous century, goes slowly and pointlessly backwards and forwards over the same ground, pulls a lot of fellow-travellers along with him, makes scary hooting and howling noises from time to time, keeps on missing points, is invariably late, and needs massive Federal subsidies to keep the whole show on the rails until his gravy-train hits the sand-trap.

Rush Limbaugh is really asking three questions:

- Does the Chu-Chu's science make the grade, or is he off track?
- Does his proposal make any more economic sense than your average steam railroad?
- Is "global warming" a global crisis rather than a signal failure of prediction?

I'm happy to answer all three questions. No, No, and No. Let's do the science one first.

The sexual life of heteroatomic molecules

When radiant energy such as sunlight meets a planetary surface, one of three things happen. The surface *transmits* the energy to a body with which it is in intimate contact, or it *reflects* the energy as though it were a mirror, or it simultaneously *absorbs and emits* the energy. Transmission doesn't really come into it much at this stage, so reflection and absorption/emission are what we're talking about.

"Global warming" happens, so the theory goes, because, though the Earth's atmosphere is more or less transparent to *short-wave* radiant energy (ultra-violet and visible light), that accounts for about half of all incoming solar radiation, it is not transparent to *long-wave* (infrared) radiant energy, that accounts for the other half.

The *long-wave* half of the incoming solar radiation interacts with what scientists call "heteroatomic" molecules and socialists call "greenhouse gases". Roughly speaking, these are red-blooded gaseous molecules made up of three or more atoms. They like to interact with long-wave radiation. Water is the commonest and therefore the most important heteroatomic gas. Each water molecule has two hydrogen atoms combined with one oxygen atom. Carbon dioxide, though there is very little of it in the atmosphere, is the next most important heteroatomic gas. Each carbon dioxide molecule has two oxygen atoms combined with one carbon atom.

Short-wave radiation does not get intimate with heteroatomic molecules. It disdainfully ignores them. But those sexy little photons of *long-wave* radiation like to interact with heteroatomic molecules and have a good time, setting up what is known as a "quantum resonance" that generates heat. This is where "global warming" comes from.

About one-third of the incoming *short-wave* radiation that passes through the atmosphere hits the Earth's surface, bounces off, and is *reflected* straight back up through the atmosphere and, harmlessly, into space. It doesn't warm the atmosphere

because, on the whole, short-wave radiation is far too grand to say hello to the heteroatomic molecules it meets. It cuts them dead and goes on about its business. No warming results.

However, two-thirds of the *short-wave* radiation that reaches the Earth's surface is simultaneously *absorbed and emitted* by the surface in obedience to Kirchhoff's radiative-transfer law. But, in the process, the temperature at the Earth's surface changes the incoming *short-wave* radiation into outgoing *long-wave* radiation. This is called "displacement" – like being kicked out of bed. And the long-wave radiation, unlike its short-wave cousins, isn't stand-offish at all. It's happy to say a warm Howdy-doo to any heteroatomic molecule it meets. What's more, heteroatomic molecules have the hots for long-wave radiation. So warming results from their meetings with it.

Just as some gentlemen prefer blondes and some prefer brunettes, each type of heteroatomic molecule resonates with particular wavelengths of long-wave radiation. And carbon dioxide resonates with wavelengths in the near-infrared. The average temperature of the Earth is around 59 degrees Fahrenheit, which is 288 degrees Kelvin. Wien's displacement law dictates that it is solely the temperature of the absorbing/emitting surface that determines the peak wavelength of the resultant outgoing radiation. As a rule of thumb, the peak wavelength, measured in microns, or very tiny fractions of an inch, will be 2897 divided by the temperature (in degrees Kelvin) of the absorbing/emitting surface.

This means that, regardless of whether the *incoming* solar radiation that meets the Earth's surface is long-wave or short-wave, friendly or stand-offish, the peak wavelength of the *outgoing* long-wave radiation from the Earth's surface will be around 10 microns. And that's in the near-infrared, just about where it's very likely to meet some very friendly carbon dioxide molecules.

That's enough molecular sex.

Enter the Chu-Chu

The Chu-Chu's notion is that painting some of the Earth's surface white will increase what scientists call its "albedo". And, for all those energetic photons, albedo is the opposite of libido. It's a turn-off, big-time. The Earth's albedo is the fraction of all incoming solar radiation that will be reflected straight back into space, so that none of those photons gets to date any of the heteroatomic molecules. No dating, no warming.

The Chu-Chu hopes, in a Puritanical sort of way, that if he can increase the Earth's albedo he'll reduce the photons' libido, so that fewer of them get to interact socially with the heteroatomic molecules they meet on their way back out into space, and less "global warming" will happen. Or, to put it another way, he hopes that he and his mates can get huge Federal subsidies to study the idea before anyone notices that it's what polite scientists call "hogwash".

Is he wrong or is he wrong? Will painting the town white be a cool thing to do? Scientists answer questions like this by doing a little math. As we'll see, it's a pity the Chu-Chu didn't get his taxpayer-funded abacus out before tooting his whistle. Here's the

math he didn't bother to do. It's not difficult, and – unlike most math – it's kinda fun, particularly when you see the answer.

About 75% of the Earth is covered in water or ice. Not even the Chu-Chu can paint water, though he probably thinks that with enough taxpayer subsidy he can walk on it. And there's no need to paint ice because it's white already. That leaves 25% of the surface.

Let's cautiously assume that 2% of the land is covered in roads or buildings with roofs: 2% of 25% is 0.5% of the Earth's surface. That's how much of it we have to paint.

About 40% of the atmosphere is covered in clouds. They're white too, so they already reflect a lot of those glamor-puss photons right back into space where they came from. Then we have to allow for the fact that most buildings and roads are not in the tropics, where most of the sunlight comes in. We also have to allow for the fact that white paint is not a perfect reflector. And up to 30% of the land surface of the Earth is covered in snow for up to six months of the year. These factors bring us down to the equivalent of just 0.2% of the “global warming” at the Earth's surface. Maybe.

Then we have to divide that by 2, because half of the incoming radiation from the Sun is long-wave already, and – however much white paint we throw around – it gets all up close and personal with those hunky heteroatomic molecules on the way in from space. So, if we paint every road and every roof whiter than white, we'll reduce “global warming” by 0.1%. That's all.

How much warming, in Fahrenheit degrees, will we prevent with the Chu-Chu's cunning plan? Let's pretend that the UN's climate panel is right in assuming that “global warming” caused by humans is going to warm the world by 7 Fahrenheit degrees this century. Actually, it will probably be more like 1 Fahrenheit degree, but let's clamber aboard the Chu-Chu's bandwagon even as the wheels are noisily falling off. Seven Fahrenheit it is, then.

All that roof-painting will reduce that global warming by seven thousandths of a Fahrenheit degree. That's 0.007 Fahrenheit degrees. Yup, that's all. The world's temperature monitoring stations won't even be able to measure it.

And at what cost? That's the question that gravy-train drivers like the Chu-Chu never bother to ask, because they'll be passing the check right along the line to the taxpayer. That's you and me, and I don't want to pay, so it's just you. I hope you're rich. You're going to need to be. Which brings us to the economics of the Chu-Chu's madcap scheme for world domination.

The junkonomics of “global warming”

To achieve the 0.007 Fahrenheit reduction in “global warming” that the Chu-Chu's grand design might bring about, we're going to have to paint 0.5% of the Earth's surface, and keep it painted every three years for a century. That won't come cheap.

The Earth's surface covers 510 million square kilometers, and 0.5% of that comes to about 2,550,000 square kilometers, or 2550 billion square meters. We're going to need

two coats of white gloss every three years: that's 66 coats this century, times 2550 billion square meters, which is 168 *trillion* square meters of paint. Don't you love it when big government thinks big? At your expense, of course.

We won't be able to cover more than about 10 square meters for every liter of paint, because we're painting rough exterior surfaces. Trust me on this: I've checked with the head gardener, and he hasn't been wrong since 1963. Let's call that 40 square meters per gallon. So, during the coming century, we're going to get through 4.2 trillion gallons of paint.

At Walmart, if they're selling bin-ends of low-grade paint, they occasionally charge as little as \$5 a gallon. But we need high-quality gloss-white exterior-grade paint, which is more expensive than most paints – often as much as \$80 a gallon. But we're buying in bulk, so we'll get a gummint discount. Let's call it \$4 a gallon. So, Mr. Taxpayer, it's going to cost you \$17 trillion to reduce global temperature by just 0.007 Fahrenheit degrees. You may not think this is a particularly sound investment.

The Chu-Chu says painting the roads and rooftops white would have the same effect as taking all the world's autos off the roads for 11 years. He may or may not be right about that, but, even if he is, our simple calculations demonstrate that it would have practically no effect on temperature. So there's no point. Leave the autos alone.

So to the real question. Forget the paint. Chu-Chu only made up that story to keep the dead horse of "global warming" in the news for another few months, in the hope that the hated nations of the free West can be hornswoggled into giving up their independence to a new world government at the upcoming Copenhagen climate conference in December.

The real question is this. How much difference will the Waxman/Markey climate Bill make to the climate, even if it passes the Senate, and even if anyone gets round to implementing it fully? It's not likely to pass the Senate: they have too much common sense in that House. And no one's going to implement it fully anytime soon. Waxman and Markey carefully decided how many free carbon-emission allowances they were prepared to give away to their favorite campaign donors – er, make that "key industrial stakeholders". And then, in the very first draft of the exemption list, they gave away 153.5% of the maximum they'd decided to give away. Well, socialists never were very good at sums. As Margaret Thatcher used to say, "Socialism is all very well until the money to pay for it runs out, which it always does, sooner rather than later." Now Waxman and Markey are deferring full implementation of their American Political *Hara-Kiri* Bill for 20 years, by which time they'll both be retired or dead, and safely out of the firing line.

Here's why they've decided to go through the motions of bringing forward a ration-and-tax Bill to shut down five-sixths of the US economy without actually implementing it.

To prevent a "global warming" of only 1 Fahrenheit degree, we must forego the emission of approximately 1-10 trillion tons of carbon dioxide. The Waxman/Markey Bill currently before Congress declares that CO₂ emissions in the US in the year 2050 will be cut by five-sixths of today's 5 billion tons. So the annual amount of "global warming"

that would be prevented even if the Waxman/Markey Bill were fully implemented would be 0.0005-0.005 Fahrenheit degrees a year.

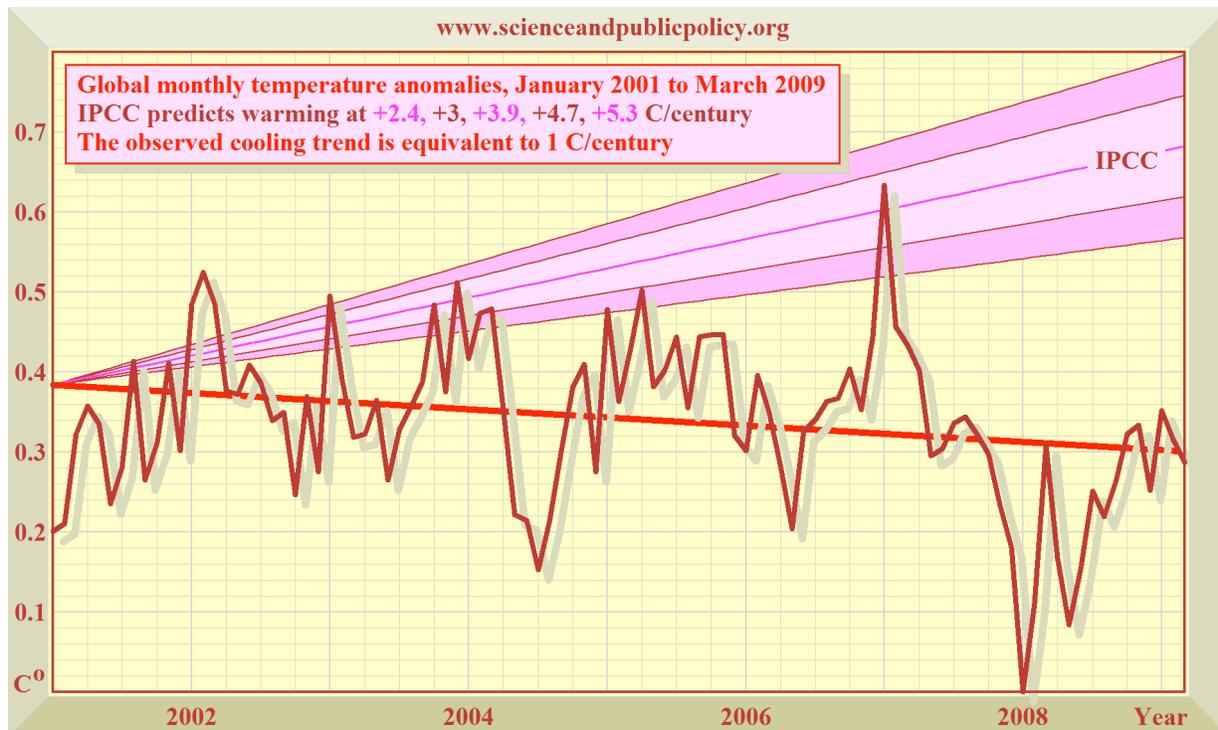
The Democrats' threatened shutdown of five-sixths of today's US economy, which would in effect allow taxpayers to use electricity and automobiles use for just one day a week, would reduce mean global surface temperature by 1 Fahrenheit degree in 200-2000 years. Maybe.

The Obama White House has estimated the cost of implementing the Waxman/Markey Bill at \$1.8 trillion over the next decade. That's \$180 billion a year to reduce global temperature by 0.0005-0.005 Fahrenheit degrees a year. The cost of reducing mean global surface temperature by 1 Fahrenheit degree via the Waxman/Markey Bill would accordingly be \$36-360 trillion. At least it will be spread over the next 200-2000 years. By that time, we could be in the next Ice Age anyway.

What the media aren't telling you about the real climate

Now here's the really good part. Not only is all of this pointless. None of it is necessary. "Global warming" hasn't been happening for almost 15 years, and even before that it wasn't happening any quicker than it had happened before. In fact, in the past eight and a half years the planet has been cooling rapidly (but don't tell MSNBC) –

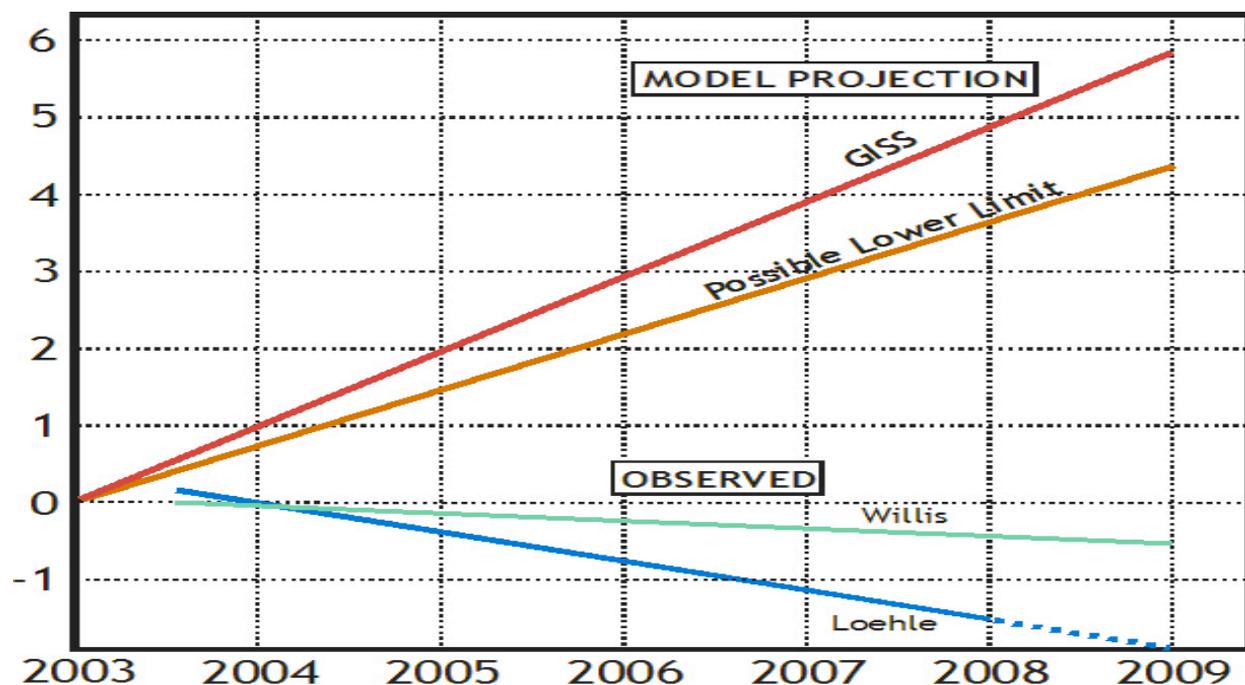
8 years' global cooling at 1.8 °F / century



For eight and a half years, global temperatures have exhibited a pronounced downtrend. The IPCC's predicted warming path (pink region) bears no relation to the global cooling that has been observed in the 21st century to date. **Source:** SPPI global temperature index.

Even the oceans are now cooling, and that's really bad news for the true-believers in the New Religion. Because the oceans are where at least 80% of all "global warming" is supposed to end up. Since they're not warming, there's something very seriously wrong with the "global warming" theory –

Five years' ocean cooling: UN wrong again



Projected ocean warming vs. observed ocean cooling (x 1022 Joules: left scale): During the 5+ years since the deployment of 3300 automated bathythermograph buoys throughout the world's oceans, the oceans have not warmed as predicted by NASA/GISS: they have cooled, as shown in papers by Willis (2008), and also by Loehle (2008). In short, the models overestimate the anthropogenic effect on ocean heat sixfold to eightfold, in line with similar model-driven exaggerations of the diminution in outgoing long-wave radiation owing to additional atmospheric carbon dioxide, and in line with calculations (e.g. by Monckton, 2008) of the IPCC's overestimate of climate sensitivity. The ocean cooling, when steady warming would be expected, proves the "high-climate-sensitivity" hypothesis false. **Source:** William DiPuccio.

And all this atmospheric and oceanic cooling has happened before a single pot of Walmart's finest white paint has been splashed on anyone's rooftop. Have your mainstream news media reported the eight years' global atmospheric cooling, or the five years' global oceanic cooling? Thought not.

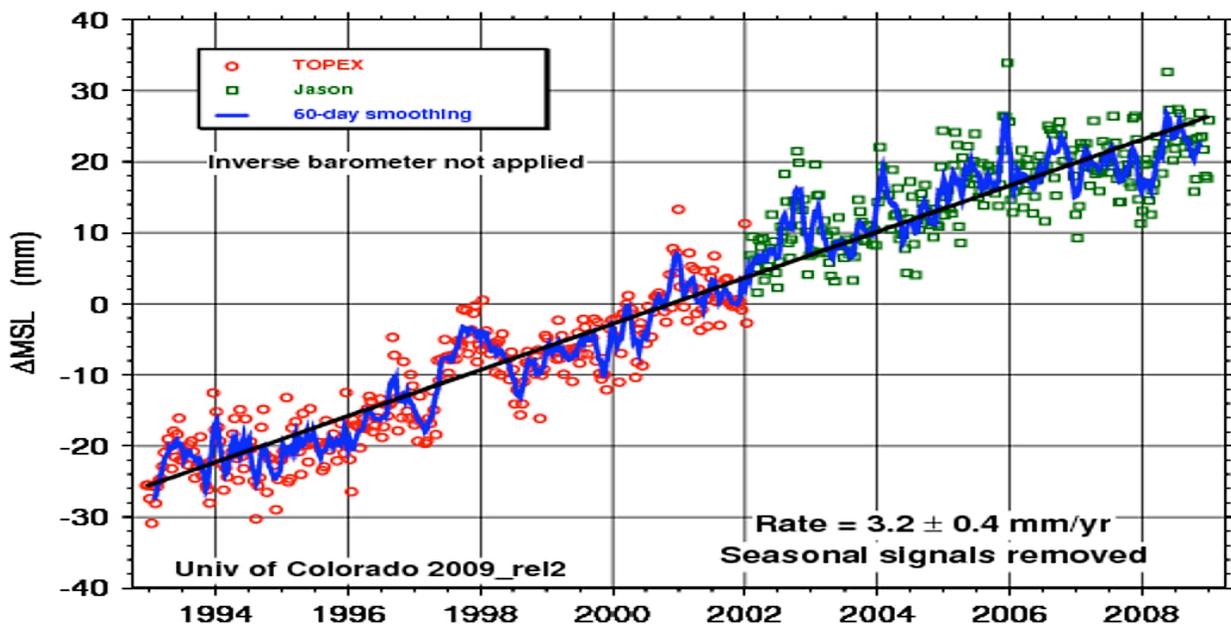
But they've probably told you all about "ocean acidification". That's the new scare that the Socialists and fellow-travellers on the Chu-Chu gravy-train have come up with, to

keep us paying out for “climate change” even when it’s blindingly obvious to everyone that the one thing missing from “global warming” is “global warming”.

All you need to know about “ocean acidification” is that it isn’t happening (just like “global warming”). Suppose “global warming” were actually to happen. Then the oceans would get warmer. And what happens when water with carbon dioxide in it gets warmer? Open a bottle of Coca-Cola and put cling-film over the mouth of the bottle. Stand the bottle in a pot of water and bring it gently to the boil. Notice how the carbon dioxide fizzes out of the Coke, making it less acid? What you’re looking at is Henry’s Law in action. The warmer the sea gets, the *less* carbon dioxide it can hold. Have the so-called science correspondents at your local TV station explained that? Er, nope.

But the real biggie in the New Religion’s litany of scares is sea-level rise. That’s the one that Al Gore makes a McMeal of in his sci-fi comedy horror movie. He says sea level is imminently going to rise by 20 feet, flooding Manhattan, San Francisco, Bangladesh, so forth, and displacing millions of hapless coastal dwellers from their sea-front cottages from the Hamptons to Phuket. Just one problem. Since 1993, when satellites first started to measure sea level, it’s been rising at only 1 foot per century. That’s less than an inch per decade. In the last three years, sea level hasn’t really risen at all –

Sea level has stopped rising: UN wrong again

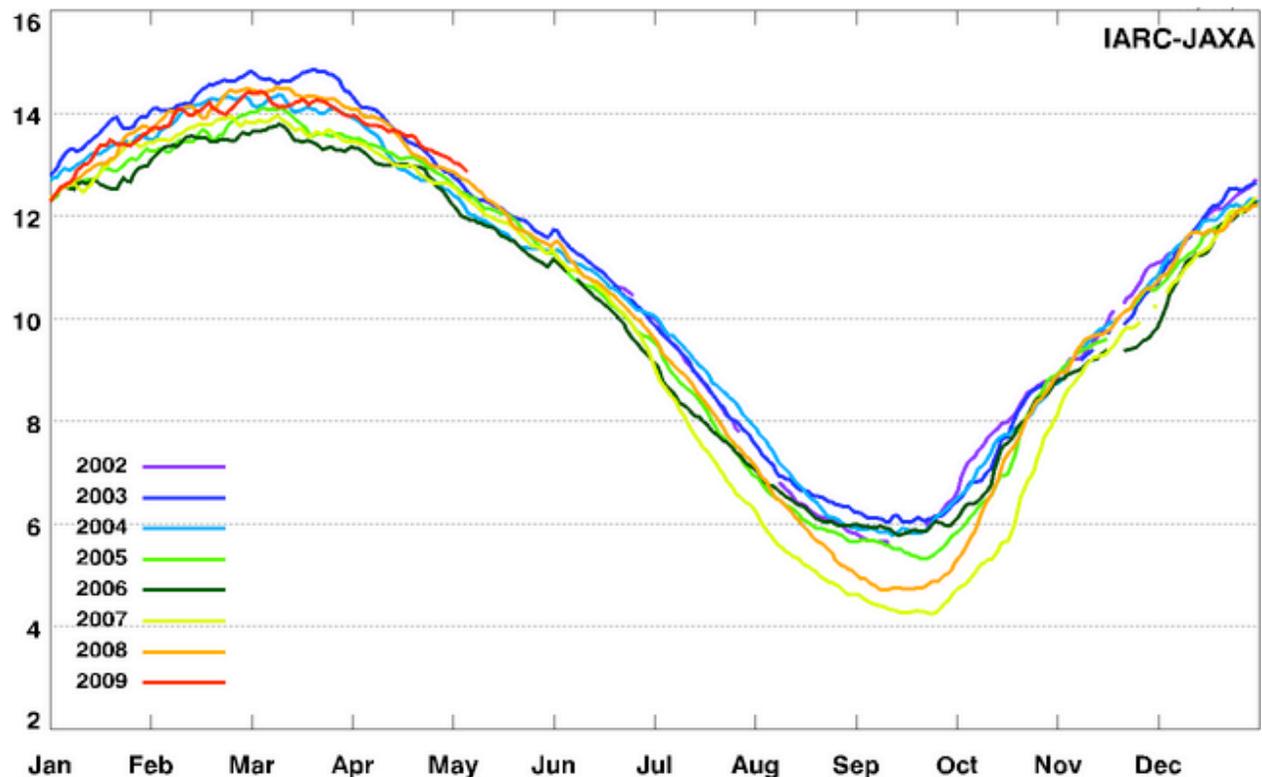


Sea level is scarcely rising: The average rise in sea level over the past 10,000 years was 4 feet/century. During the 20th century it was 8 inches. In the past three and a half years, sea level has scarcely risen at all. As recently as 2001, the IPCC had predicted that sea level might rise as much as 3 ft in the 21st century. However, this maximum was cut by more than one-third to less than 2 feet in the IPCC’s 2007 report. Moerner (2004) says sea level will rise about 8 inches in the 21st century. Mr. Justice Burton, in the UK High Court, bluntly commented on Al Gore’s predicted 20ft sea-level rise as follows: “The Armageddon scenario that he depicts is not based on any scientific view.” *A fortiori*, James Hansen’s prediction of a 246ft sea-level rise is mere rodomontade. **Source:** University of Colorado.

In 2005, the year Gore first made his prediction of an imminent 20-foot sea-level rise, he spent \$4 million buying a luxurious condo in the St. Regis Tower, San Francisco, just feet from the ocean at Fisherman's Wharf? Has your local newspaper contacted Al Gore to ask him what this costly purchase says about whether he really believes his own prediction? Must have missed that edition, somehow.

Let's have another scare. Arctic sea ice would melt away within five years, said Al Gore in 2007. Two and a half years later, it's at an 8-year record high for the time of year –

Arctic sea-ice extent: an 8-year record high

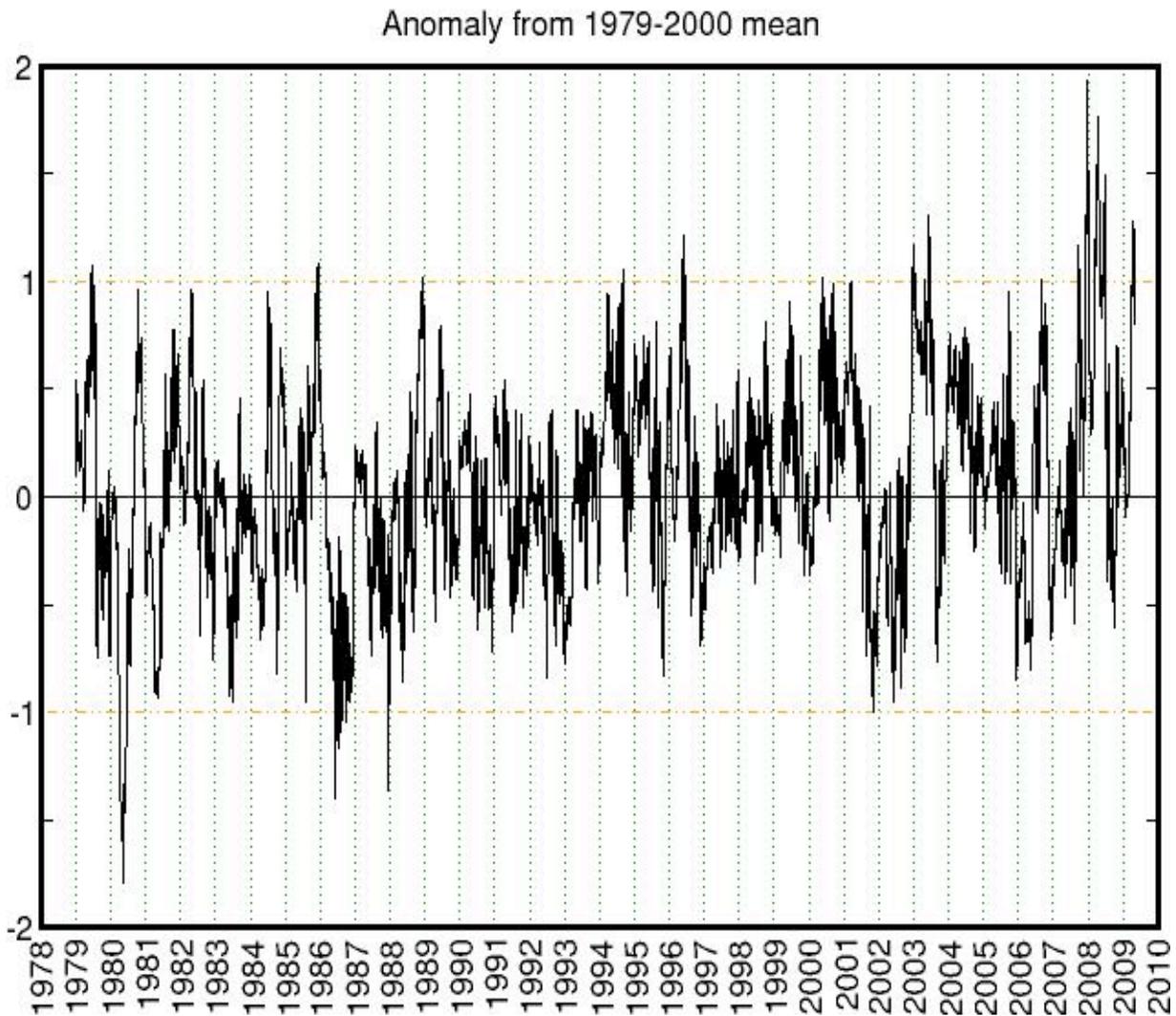


Arctic sea ice (millions of square kilometers: left scale): The **red** curve shows that the extent of sea ice in the Arctic is currently at an eight-year record high for the time of year. This fact has not been reported in any mainstream news medium: it is to be found only in the SPPI Monthly CO₂ Reports. For comparison, sea ice covered almost the same area of the Northern Hemisphere in April 2009 as it had done 29 years previously in April 1980. Summer sea ice covered its least extent in 30 years during the late summer of 2007. However, NASA has attributed that sudden decline to unusual poleward movements of heat transported by currents and winds. The decline cannot have been caused by “global warming”, because, as the SPPI Global Temperature Index shows, there has been a cooling trend globally during the past seven and a half years. At almost the same moment as summer sea-ice extent reached its 29-year minimum in the Arctic, sea-ice extent in the Antarctic reached its 29-year maximum, though the latter event was very much less widely reported in the media than the former. **Source:** IARC JAXA, Japan.

And has your local weather station announced how well the Arctic ice has been doing recently? Why not, one wonders.

Ah, well, there's always Antarctica. Gore made great play with the collapse of seven ice-sheets with a combined area the same as Rhode Island. Or, to put it another way, less than 2% of the area of Texas. Sea ice in the Antarctic has actually been growing. It reached a record high in October 2007. Did you hear about that from your local environmental campaign group? Perhaps they failed to slip it into the conversation –

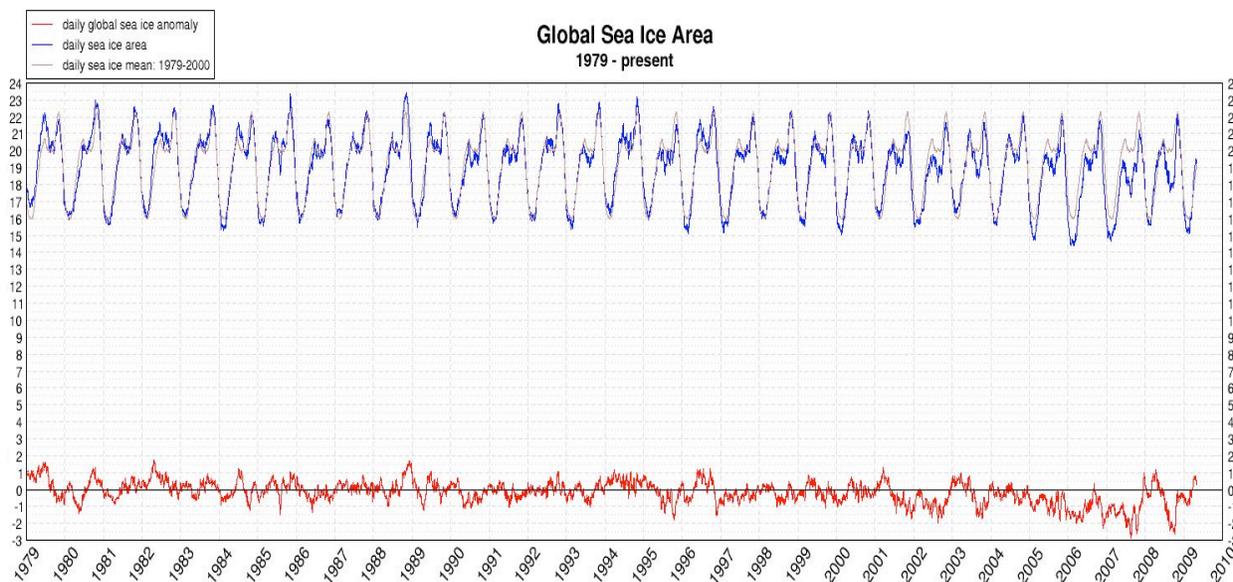
Antarctic sea-ice: third-greatest in 30 years



Antarctic sea-ice extent (millions of square kilometers: left scale) shows a gentle but definite uptrend over the past 30 years. The peak extent, which occurred late in 2007, followed shortly after the sharp decline in Arctic sea ice in the late summer of that year. Antarctic sea-ice extent is currently at its third-highest since satellite records began. **Source:** University of Illinois, April 2009.

And what about total sea ice around the globe? If the oceans were warming, it would be declining quite rapidly. Here's what's really been happening –

Global sea-ice extent: a regular heartbeat



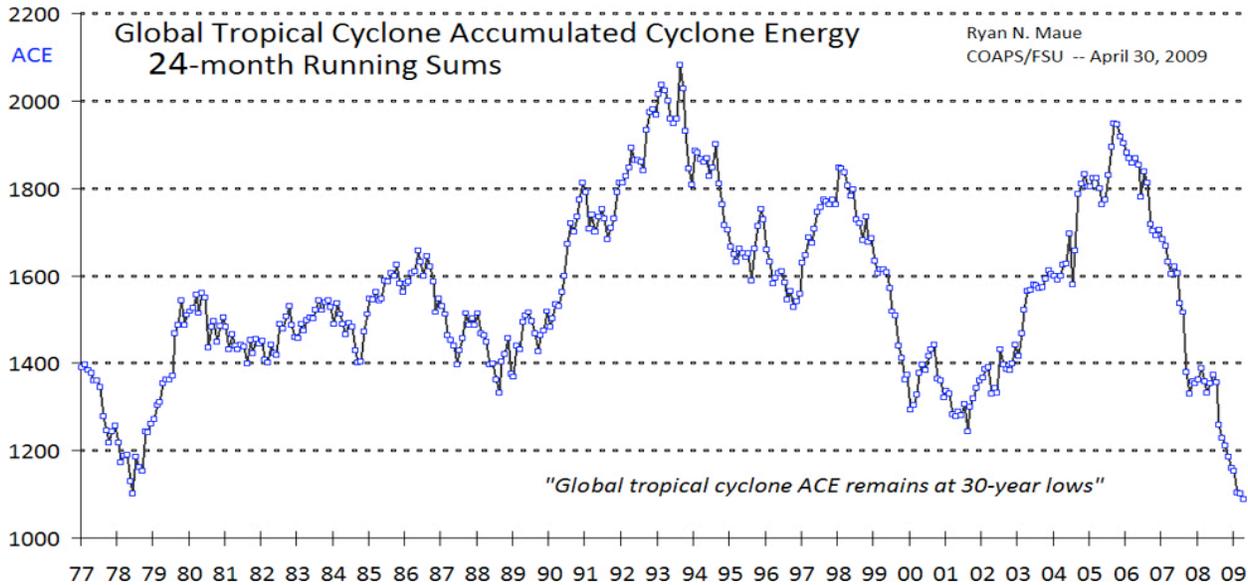
Planetary cardiogram showing global sea-ice area (millions of square kilometers): There has been a very slight decline in the trend (red) of global sea-ice extent over the decades, chiefly attributable to loss of sea ice in the Arctic during the summer, which was well below the mean in 2007, with some recovery in 2008. However, the 2008 peak sea-ice extent was exactly on the 1979-2000 mean, and current sea-ice extent is a little above the 1979-2000 mean. The decline in summer sea-ice extent in the Arctic, reflected in the global sea-ice anomalies over most of the past eight years, runs counter to the pronounced global atmospheric cooling trend over the same period, suggesting that the cause of the regional sea-ice loss cannot have been “global warming”. Seabed volcanic activity recently reported in the Greenland/Iceland gap, with seabed temperatures of up to 574 °F, may have contributed to the loss of Arctic sea-ice. **Source:** University of Illinois, April 2009.

And what did your regular news anchors say about that? Sea-ice extent steady for 30 years? Sorry, bud, but that's not a story.

Ah, well, there's always Greenland for the Greenies to groan about. Or is there? The average thickness of the vast Greenland ice sheet actually *grew* by 2 inches *per year* from 1993-2003. That's one of the reasons why sea level is no longer rising. Greenland was warmer in the 1930s and early 1940s than it is today. The biggest of the Viking settlements in Greenland was at Hvalsey on the south-west coast. The Viking burial-ground is under permafrost to this day. It certainly wasn't under permafrost when the Vikings buried their dead there. Did your history channel tell you that? No way.

Gore has also made a lot of noise about Hurricane Katrina and Cylcone Nargis. He now blames each new natural disaster on “global warming”. But what about the real evidence? The fact is that tropical cyclone activity, which includes hurricanes, is at a 30-year low. Did Gore mention that? Somehow it got dropped from the TelePrompTer –

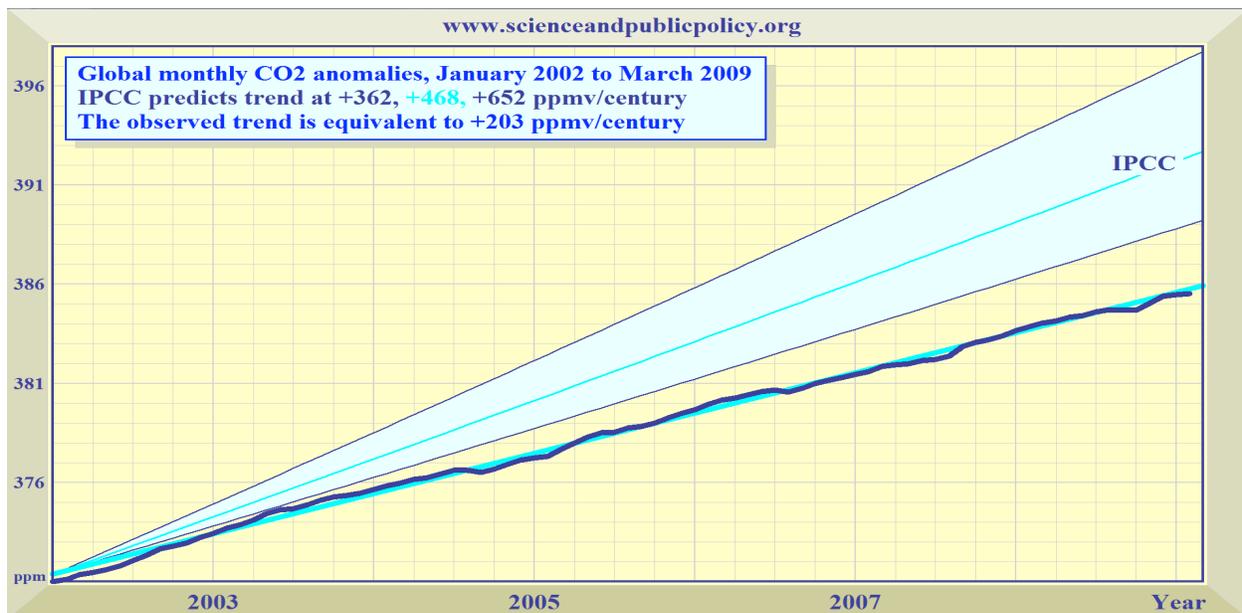
Hurricane activity is at a 30-year record low



Hurricanes, typhoons, and other tropical cyclones have declined recently. Global activity of intense tropical storms is measured using a two-year running sum, known as the Accumulated Cyclone Energy Index, now at its least value in 30 years. **Source:** Ryan Maue.

And one more thing. Carbon dioxide is accumulating in the atmosphere at less than half the rate predicted by the UN's climate panel. That's a big story. Bet they didn't tell it –

CO₂ concentration well below UN predictions



CO₂ is rising in a straight line, well below the IPCC's projected range. There is no sign of the exponential growth predicted by the IPCC. **Data source:** NOAA.

The bottom line: “It’s not about climatology, it’s about freedom”

Even if there were a “global warming” problem (which there isn’t), and even if we could do anything to prevent it (which we can’t), painting your rooftop white and covering the roads with slippery white paint would cost tens of trillions to achieve more or less exactly nothing. Don’t buy paint shares yet.

Likewise, the Waxman/Markey Bill is a non-solution to a non-problem, and the correct policy response to the non-problem of “global warming” is to have the courage to do nothing.

What is really going on? The world’s governing elite has decided to try to scare the people into giving up democracy, freedom, and prosperity to a newly-empowered organization, to be established by binding international treaty in Copenhagen in December 2009. Details of the organization’s new powers will not be released until the Copenhagen summit: until then, there will be endless diversionary stories in the media about how China and India are at loggerheads with the US and Europe about carbon emissions cuts.

Don’t expect a deal on emissions cuts at Copenhagen. That’s not the real objective. The real objective is “world government”. And world government won’t be democratic government. You heard it here first. It will be a bureaucratic-centralist dictatorship, elected by no one, accountable to no one, and sackable by no one, just like the dismal and corrupt European Union, but on a global scale.

The world’s “leaders” will gladly cede their nations’ constitutional independence to the new global dictatorship, glibly reciting the pretext that “pooling” of sovereignty is necessary to save us from ourselves and to Save The Planet from destruction through our folly. Like the short-sighted statesmen of Carthage, who eagerly sold out their nation to Rome and were duly killed in the streets by their own justifiably-enraged citizenry as the walls of their citadel fell to the stamping legions, they will be willing to desert their own populations, and ignore their oaths to uphold their national constitutions, because, just as “leaders” of European nations now do, they hope that one day they will pass comfortably from the “leadership” of their nations to “world leadership” as front-line members of the new ruling junta of the entire globe.

In short, the “global warming” scare is not about climatology. It’s about freedom, as the President of the Czech Republic has rightly said. Will you let President Obama ignore the oath of office he never quite took, and sign away the US Constitution he is supposed to defend to the new, dark, global tyranny that will come into being at Copenhagen? Yes, you will, because you elected him, and now you’re powerless to stop him.

Farewell, America! Your love of freedom, your “athletic democracy”, your governments of the people, by the people and for the people, were beacons of hope to us all, before they perished from the Earth. Thank you, and goodnight. There will be no electricity tomorrow. But there will be lots and lots of shiny whitewash.