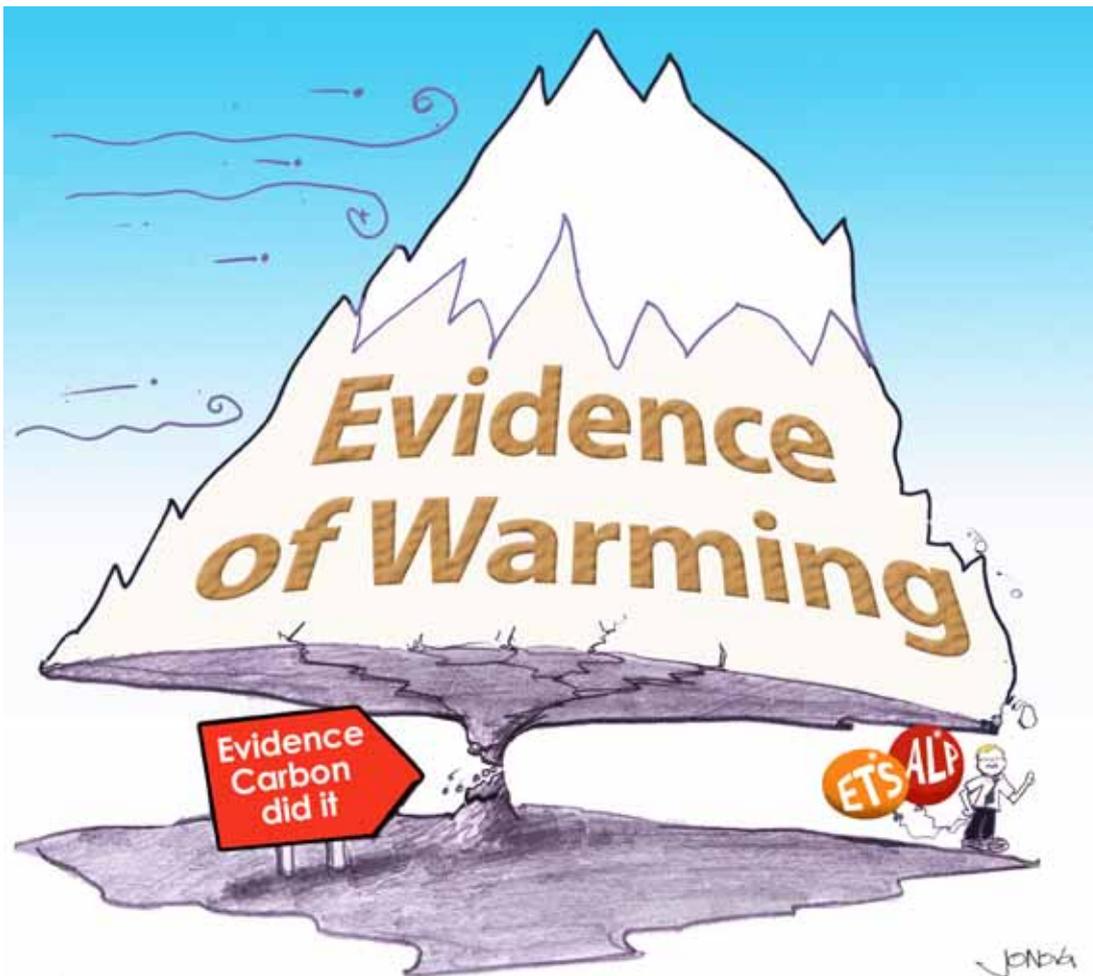


The Skeptics Handbook

Rise above the mud-slinging in the Global Warming debate. Here are the strategies and tools you need to cut through the red-herrings, and avoid the traps.

[skeptic: person indisposed to accept currency or authority as proving the truth of opinions.]



The Bottom Line is Simple

Don't fall for the 'complexity' argument, or accept vague answers. The climate is complex, but the only thing that matters here is whether *adding more CO₂ to the atmosphere will make the world much warmer.*

Everything hinges on this one question. If carbon dioxide is not a significant cause, then carbon sequestration, cap 'n trade, emissions trading, and the Kyoto agreement are a waste of time and money. All of them divert resources away from things that matter—like finding a cure for cancer, or feeding Somali babies. Having a real debate IS the best thing for the environment.

“What evidence is there that more CO₂ forces temperatures up further?”

The Surgical Strike

1: Stick to the four points that matter

There is only one question and four points worth discussing. Every time you allow the conversation to stray, you get stuck in a dead end, and miss the chance to definitively expose the lack of evidence that carbon is 'bad'.

2: Ask questions

Non believers don't have to prove anything. Skeptics are not asking the world for money or power. Believers need to explain *their* case, so let them do the talking. As long as the question you asked doesn't get resolved, repeat it.

There are so so many points to debate on global warming, it's tempting to tackle them all. But the surgical strike means cutting to core of what matters.

3: Greenhouse and global warming are different

Don't let people confuse **global warming** with **greenhouse gases**. Mixing these two different topics has confounded the debate. Proof of global warming is not proof that greenhouse gases caused that warming.

4: Deal with the bully-boy

It's entirely reasonable to ask for evidence. If you are met with dismissive, intimidatory, or bullying behavior, don't ignore it. Ask them why they're not willing to explain their case. In scientific discussions, no theory is sacrosanct. Taboos belong in religions.

Proof of global warming is not proof that greenhouse gases caused that warming.

NOTE: 'Carbon', 'carbon dioxide' and 'CO₂' are all used interchangeably here for the sake of simplicity, as with public use (but not in scientific practice).

AGW: Anthropogenic Global Warming, the theory that human CO₂ emissions are the main cause of global warming (GW).

Draft 1.4: Sept 2008

Updates and notes will be posted on <http://joannenova.com.au/wp/global-warming/>

Oops. The Global Warming Gravy Train Ran Out of Evidence

Here's how the facts have changed since 2003, to the point where *there is no evidence left*. (*That's None, Nada, Zip, Zero*).

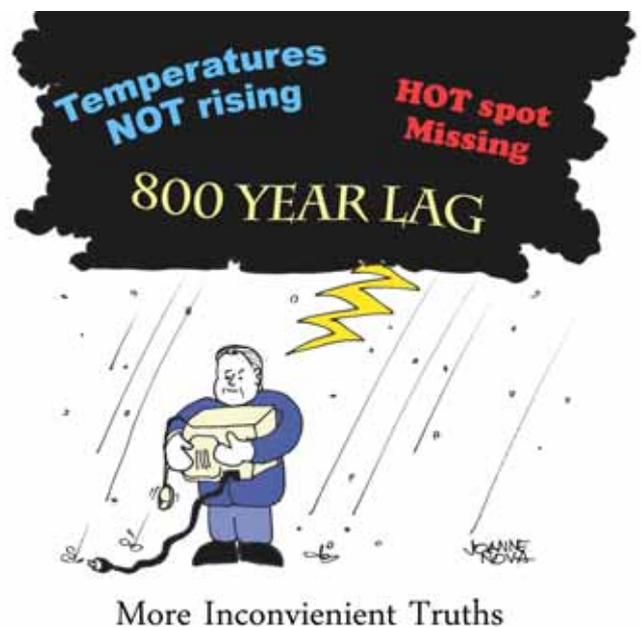
The only 4 points that matter

1 The greenhouse signature is missing
Weather balloons have scanned the skies for years but can find *no sign* of the telltale 'hot-spot' warming pattern that greenhouse gases would leave. There's not even a hint...
Something else caused the warming.

2 The strongest evidence was the ice cores, but newer more detailed data turned the theory inside out
Instead of carbon pushing up temperatures, for the last half a million years temperatures have gone up *before* carbon dioxide levels. On average 800 years *before*. This totally threw what we thought was cause-and-effect out the window.
Something else caused the warming.

3 Temperatures are not rising
Satellites circling the planet twice a day show that the world has not warmed since 2001. How many more years of NO global warming will it take? While temperatures have been flat, CO₂ has been rising, BUT *something else has changed the trend*. The computer models don't know what it is.

4 Carbon dioxide is already doing almost all the warming it can do
Adding twice the CO₂ doesn't make twice the difference. The first CO₂ molecules matter a lot. But extra ones have less and less effect. In fact carbon levels have been ten times as high in the past, but the world still slipped into an ice age. Carbon today is a bit-part player.



Something out there affects our climate more than CO₂ and none of the computer models knows what it is.

1

The greenhouse signature is missing

These graphs from the IPCC show what the fingerprint of greenhouse heating should look like—the first signs of warming will happen in the patch of air ten kilometers above the tropics. All the computer models agree that other causes of global warming will warm the planet in different patterns. Weather balloons have searched for years and can't find any sign that this patch of air or so called 'hot spot' is getting warmer.

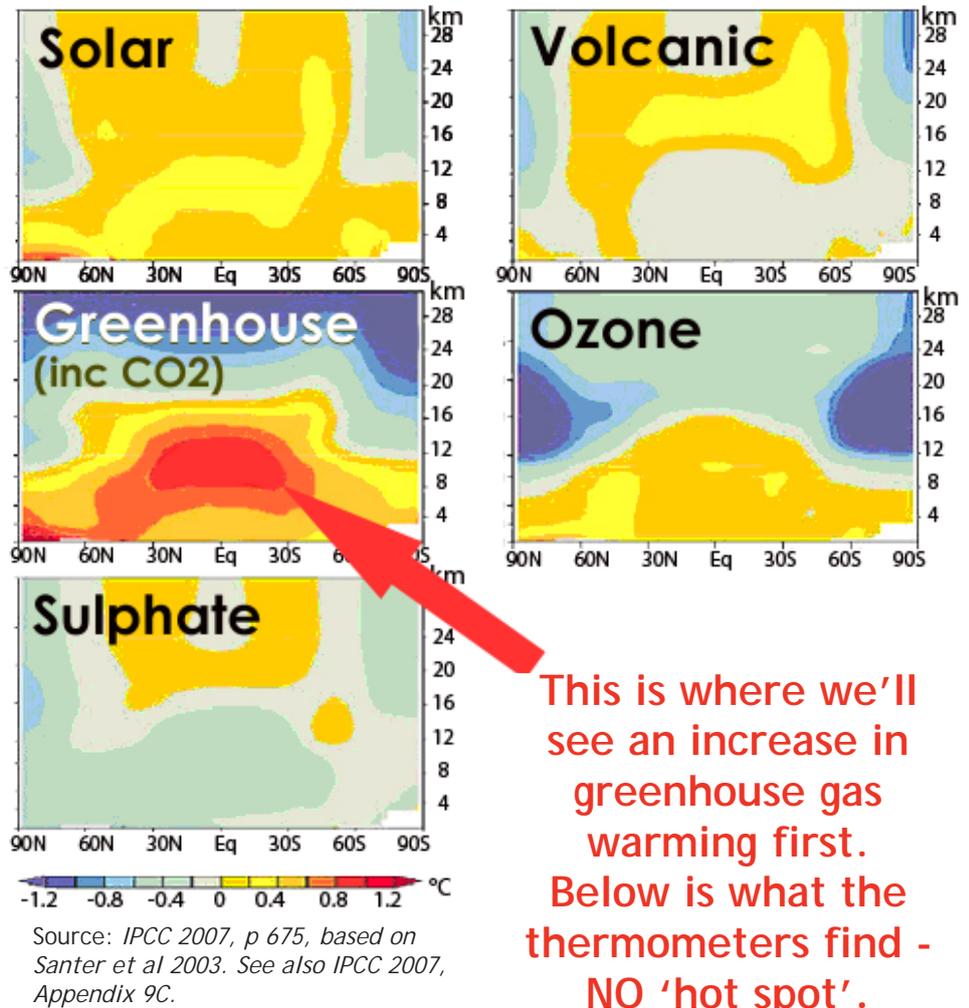
Thermometers are telling us, "*it's not greenhouse gases*".

Conclusion: Something else was causing most or all of the warming.

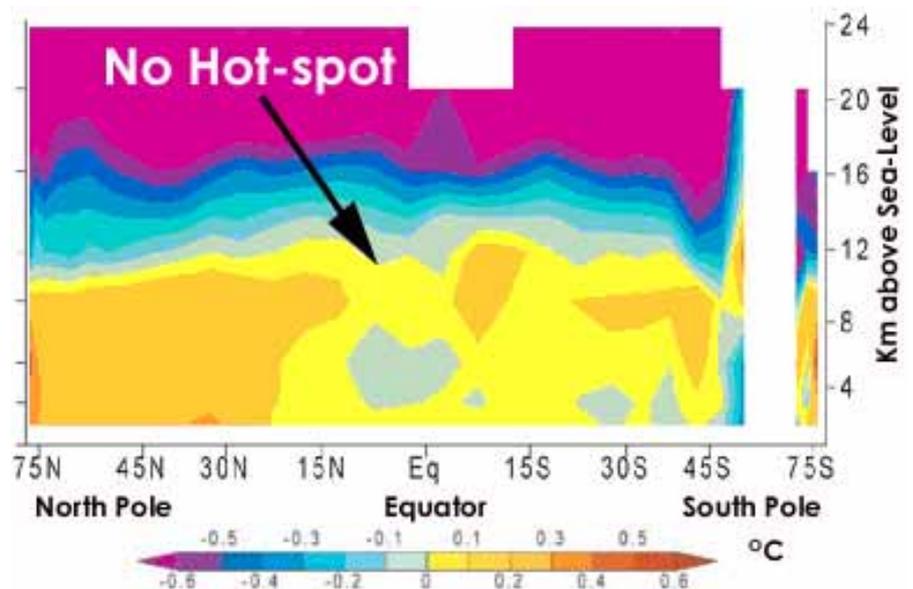
AGW replies: The 'hot spot' is the kind of fingerprint we should see if greenhouse gases are to blame. But it's possible the weather balloon thermometers are wrong. Peer reviewed researchers have proposed that if you re-analyze the temperature readings using computer models of 'wind-shear' effects, it shows there *could be a hot-spot*.

Skeptics say: Those researchers rely on wind-shear to calculate temperatures. It could be the first time anyone has tried to use an anemometer to measure the temperature instead of a thermometer.

If we can't get good results from a simple thing like a weather balloon, what chance do we have with a computer model?



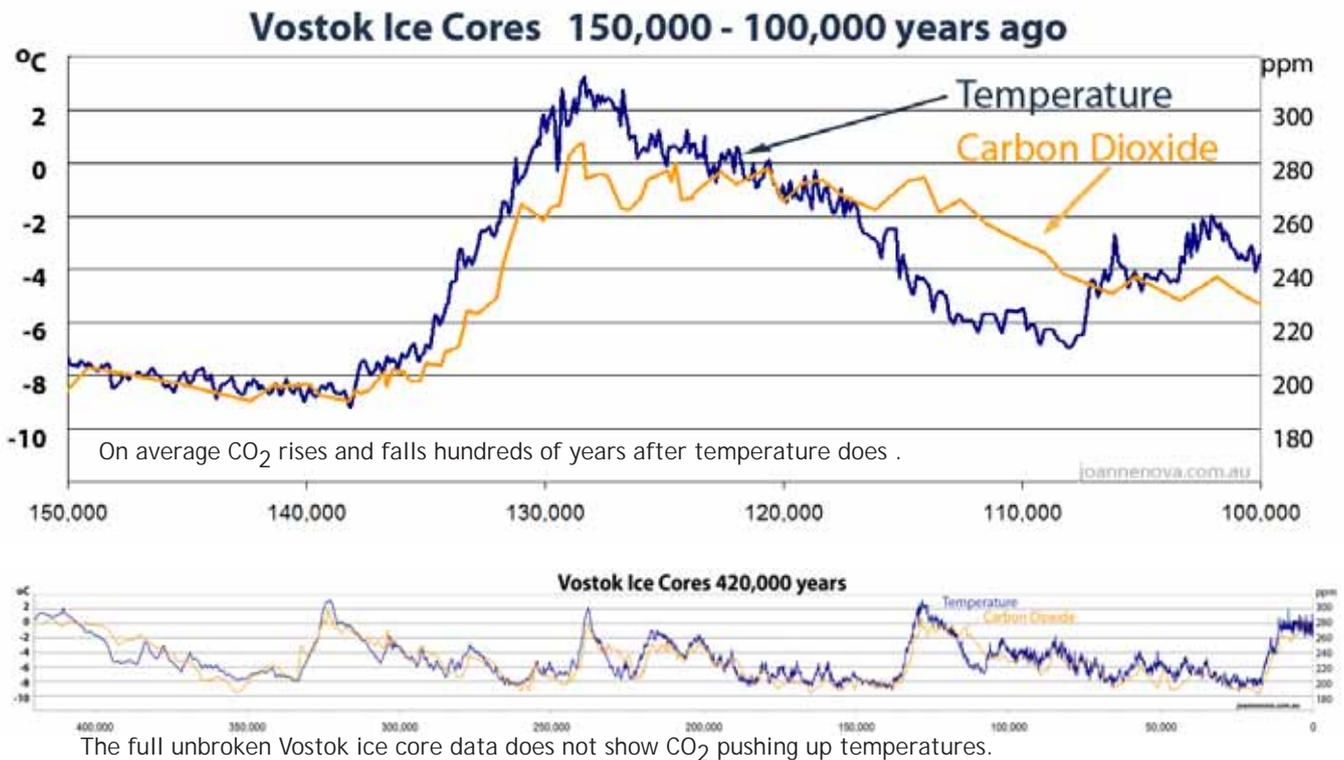
This is where we'll see an increase in greenhouse gas warming first. Below is what the thermometers find - NO 'hot spot'.



Source: HadAT2 radiosonde observations from CCSP (2006) p116,fig 5.7E.

2

The Ice Core surprise. Oo-err it turns out *temperature leads carbon*, not the other way around



The Vostok Icecores stunningly showed temperature and CO₂ locked together. But by 2003 we had better data, more points, and it became clear that instead CO₂ was in the back seat.

AGW replies: There is roughly an 800 year lag. But even if CO₂ doesn't start the warming trend, *it amplifies it*.

Skeptics say: If CO₂ was a *major* driver, temperatures would rise indefinitely in a 'runaway greenhouse effect'. *But something else stops this, so that's more powerful than carbon, yet the models don't know what it is.* Amplification is a lab-theory with no evidence that it matters in the real world.

Conclusion:

1. Ice cores don't prove anything either way. The simplest explanation is that when temperatures rise, more carbon enters the atmosphere (because as oceans warm they release more CO₂).
2. Something else is causing the warming.

This information was published in 2003, yet is almost never mentioned in the media. Al Gore's movie was made in 2005. His words about the ice cores were, *'it's complicated'*. The lag calls everything about cause and effect into question. There is no way any investigation can ignore something so central.

Source: CDIAC, Carbon Dioxide Information Analysis Center <http://cdiac.ornl.gov>

A complete set of expanded graphs and images are available from <http://joannenova.com.au/wp/global-warming/ice-core-graph/>

3

The world is not warming any more

Satellite data shows that the world has not warmed since 2001, even though carbon dioxide increased.

As it happens, global warming didn't occur in half of the world anyway. Look at the Southern Hemisphere, temperatures recorded by satellites since 1979 show things are flat. The Northern Hemisphere definitely warmed from 1979 - 2001. What's that, Demi-Global Warming?

AGW reply #1: We've had record high temperatures (measured by thermometers on the ground).

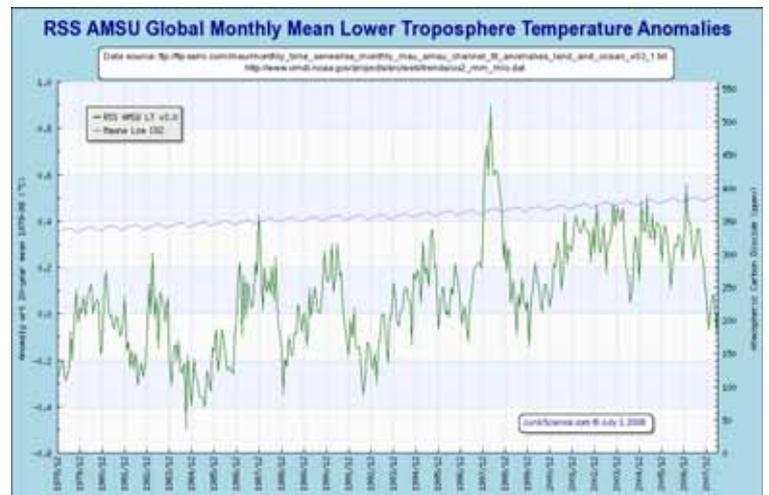
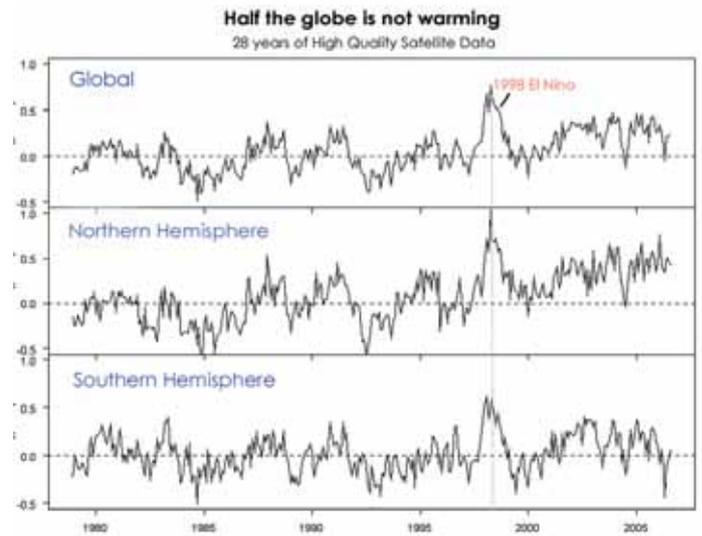
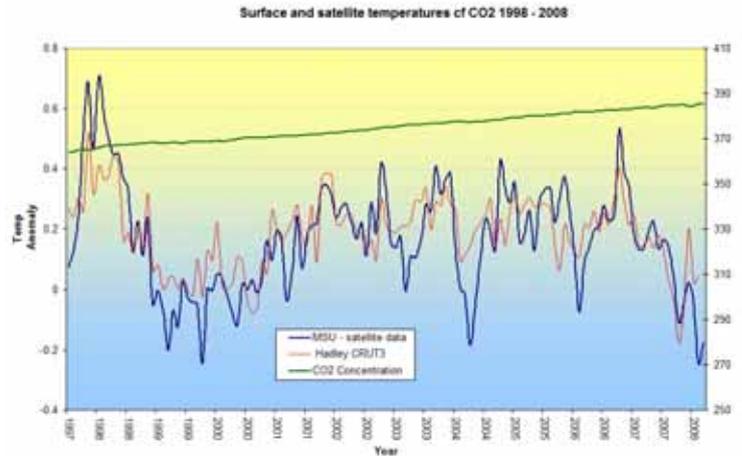
Skeptics say: True, but thermometers on the ground can't be trusted (see the next page). The Urban Heat Island effect means that thermometers in cities are really measuring urban-development-warming, or car-park-climate-changes, not global warming. Satellites have circled the planet 24 hours a day measuring temperatures continuously for nearly 30 years. If the temperatures were still rising, they would see it.

AGW reply #2: This flat patch is just 'noise' and natural variation.

Skeptics say: 'Noise' is caused by *something*. And it's more important than carbon. Even if the trend continues upwards sometime soon, the flat trend for seven years tells us the models are missing something big.

Conclusion:

This doesn't prove global warming is over, but it proves that carbon is not the main driver. Something else is, something that the computer models *don't include*.



http://www.junkscience.com/MSU_Temps/RSSglobe.html

“The main ‘cause’ of Global Warming is air-conditioners”

LOL

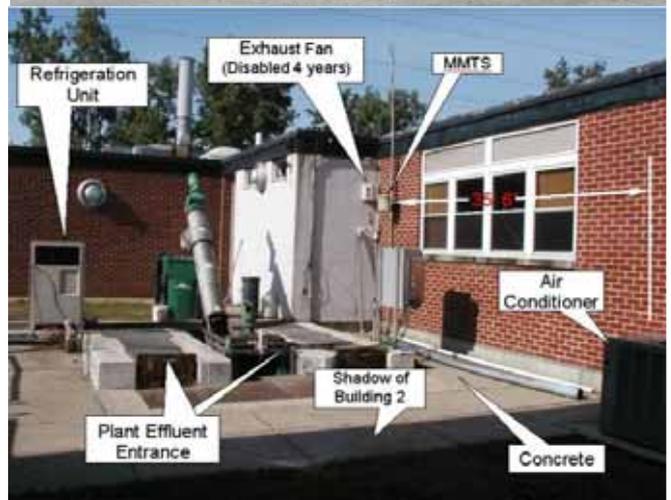
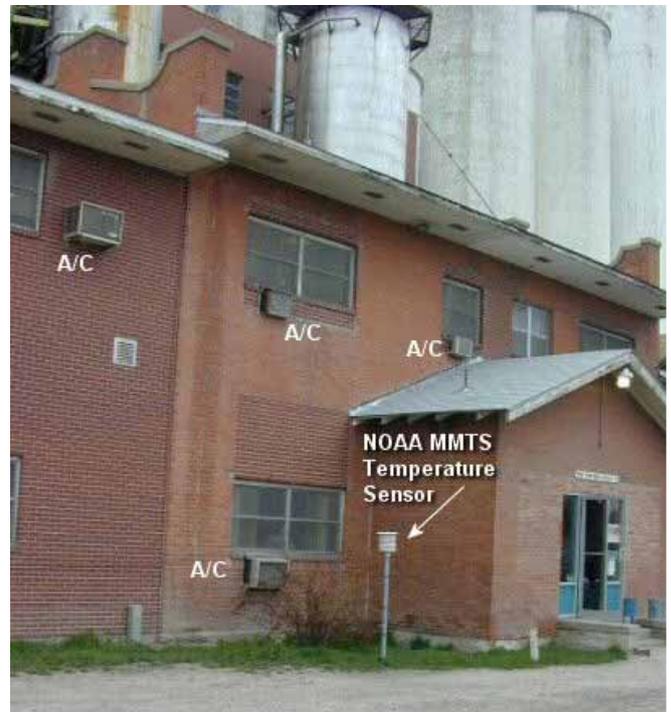
Look at the pictures of US weather recording equipment. Thermometers on the ground have recorded faster temperature rises than thermometers on satellites and weather balloons. Would you put a sensitive thermometer in a carpark, surrounded by concrete, beside busy roads, and within meters of airconditioning outlets? NASA does.

In Melbourne, one important historic temperature collection point is on the sidewalk on La Trobe St. That’s the same road that 40,000 cars a day drive on.

Is it possible the temperature *would not rise* under these circumstances?

We can’t trust thermometers in cities that are surrounded by engines, concrete and airconditioners.

Source: For dozens of other examples like this http://www.surfacestations.org/odd_sites.htm



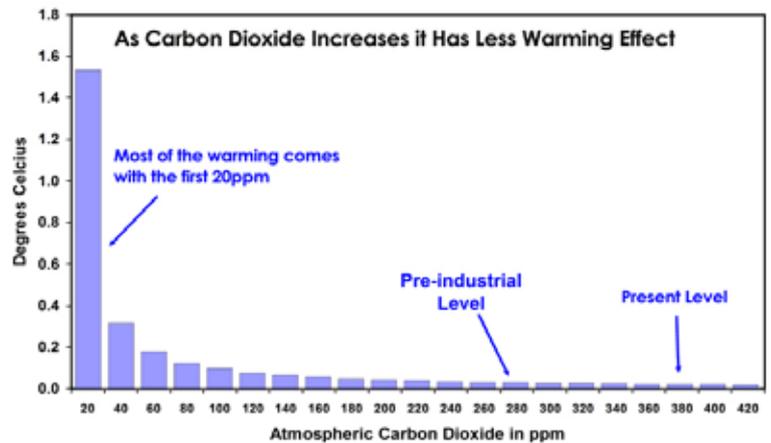
4

Carbon dioxide is already absorbing almost all it can

Here's why it's possible that doubling CO₂ won't make much difference.

The carbon that's already up in the atmosphere absorbs most of the light that it can. CO₂ only 'soaks up' its favourite wavelengths of light and it's close to saturation point. The natural greenhouse effect is real, and does keep us warm, but it's already reached its peak performance. Throw more carbon up there and most of the extra gas is just 'unemployed' molecules. They manage to grab a bit more light from wavelengths that are close to their favourite bands but they can't do much more, because there are not many left-over photons at the right wavelengths.

Reality trumps theory (again)



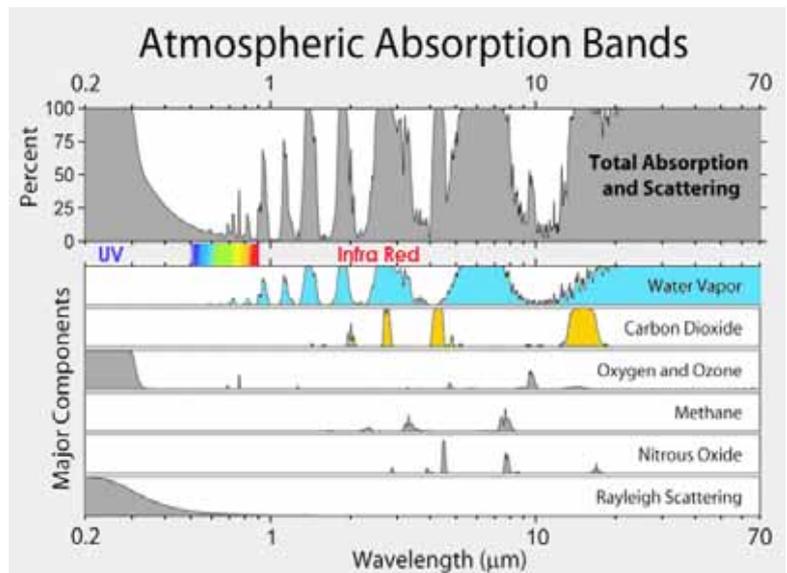
Archibald 2006. Modtran calculations.

The sun won't put out more light because we put out more carbon.

AGW says: The climate models are well aware of the logarithmic absorption curve and use it in their calculations. This is not news, it's been known for decades.

Skeptics say: This is theory versus reality. We've proved the theory in the lab, but that doesn't mean it makes a big difference in the real world. In the atmosphere, other factors also impact on the outcome. Things like convection, radiation, magnetic influences, cloud cover, other gases, orbital effects, turbulence, temperature, flora and fauna, and an imponderable number of feedback loops. **If adding more CO₂ to the sky mattered, we would see it in the ice cores, or we'd see it in the thermometers.**

It boils down to computer models. We know carbon makes a difference, but we're only guessing how big that difference is.



http://www.globalwarmingart.com/wiki/Image:Atmospheric_Absorption_Bands_png

Believers are becoming skeptics

These notable people all felt global warming should be taken seriously until new evidence changed their minds. These are just a few.

NOTE: This is a curious aside and potentially distracting. No matter how qualified, how green, or how dedicated, their names and opinions prove nothing about carbon because *'argument by authority'* never can. But it proves that the debate has moved on from 'believers' and 'deniers'—there's a new group, those who used to believe and have changed their minds. *Their numbers are growing.*

Geophysicist Dr. Claude Allegre, a top geophysicist and French Socialist who has authored more than 100 scientific articles and was one of the first scientists to sound global warming fears 20 years ago, now says the cause of climate change is "unknown."

Geologist Bruno Wiskel of the University of Alberta recently reversed his view of man-made climate change and instead became a global warming sceptic. Wiskel was once such a big believer in man-made global warming that he set out to build a "Kyoto house" in honor of the Kyoto Protocol. Wiskel recently wrote a book titled *"The Emperor's New Climate: Debunking the Myth of Global Warming."*

Astrophysicist Dr. Nir Shaviv, one of Israel's top young award winning scientists, recanted his belief that manmade emissions were driving climate change. "Like many others, I was personally sure that CO₂ is the bad culprit."

Atmospheric Scientist Dr. Joanna Simpson, the first woman in the world to receive a PhD in meteorology declared she was skeptical of man-made climate fears – February 27, 2008 - Excerpt: "Since I am no longer affiliated with any organization nor receiving any funding, I can speak quite frankly." Dr Simpson, formerly of NASA, has authored more than 190 studies.

Mathematician & engineer Dr. David Evans, devoted six years to carbon accounting, building models for the Australian Greenhouse Office. He wrote the carbon accounting model (FullCAM) that measures Australia's compliance with the Kyoto Protocol, in the land use change and forestry sector. David became a skeptic in 2007.

Botanist Dr. David Bellamy, a famed UK environmental campaigner, former lecturer at Durham University and host of a popular UK TV series on wildlife, recently converted into a skeptic. Bellamy said *"global warming is largely a natural phenomenon. The world is wasting stupendous amounts of money on trying to fix something that can't be fixed."*

Dr. Richard Courtney, a UN IPCC expert reviewer and a UK-based climate and atmospheric science consultant: *"To date, no convincing evidence for AGW (anthropogenic global warming) has been discovered. And recent global climate behavior is not consistent with AGW model predictions."*

Climate researcher Dr. Tad Murty, former Senior Research Scientist for Fisheries and Oceans in Canada, and former director of Australia's National Tidal Facility and professor of earth sciences, Flinders University reversed himself from believer in man-made climate change to a skeptic. *"I started with a firm belief about global warming, until I started working on it myself,"*

Climate scientist Dr. Chris de Freitas of The University of Auckland, N.Z., converted from a believer in man-made global warming to a skeptic.

Meteorologist Dr. Reid Bryson, the founding chairman of the Department of Meteorology at University of Wisconsin (now the Department of Oceanic and Atmospheric Sciences, was pivotal in promoting the coming ice age scare of the 1970's and has now converted into a leading global warming skeptic.

Consensus? What Consensus?

How many scientists does it take to prove the debate is not over? Over 30,000 scientists have signed The Petition Project. Over 9,000 of them have PhD's (not that that proves anything about carbon, but it does prove something about the myth of 'consensus').

The wording is unequivocal: *"There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gasses is causing or will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth."*

Source: <http://www.petitionproject.org/>

The Real Consensus



"Hands-up. Who thinks greenhouse gases have no effect and we all need new jobs? Anyone?..."

The Petition Project is funded by donations from individuals and run by volunteers. It receives no money from industry or companies. In late 2007, The Petition Project redid the petition to verify names again.

AGW says: *Everyone knows the petition is bogus and filled with duplicate and fake names.*

Skeptics say: Name 10 fakes.

NOTE: Watch out, this is potentially distracting. Science is not democratic. The numbers and qualifications on either side don't matter except to put an end to the statement that 'the debate is over'. Science is not done by consensus.

The climate does not respond to boatloads of scientists, no matter how much hot air they produce.

When did scientists vote anyway?

What is Evidence?

Science depends on observations, made by people at some time and place. Things you can see, hold, hear and record.

This would be evidence that carbon is a major cause of global warming

- If temperatures followed CO₂ levels in the past. (They didn't)
- If the atmosphere showed the characteristic heating pattern of increased greenhouse warming. (It doesn't).

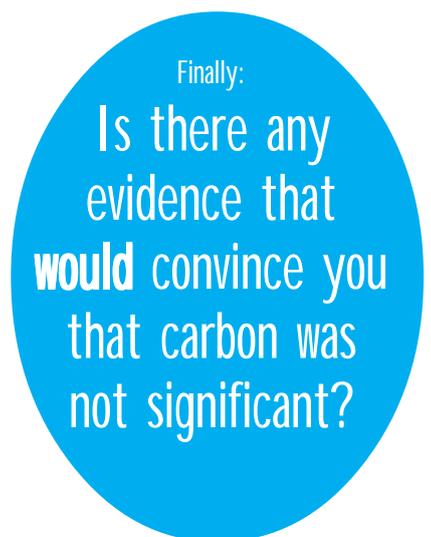
This is NOT evidence:

- Arctic Ice disappearing
- Glaciers retreating
- Coral reef bleaching
- Mt Kilimanjaro losing snow
- Madagascan lemurs doing anything
- Four polar bears caught in a storm
- Pick-a-bird/tree/moth facing extinction
- A change in cyclones/hurricanes/typhoons
- Droughts
- Dry rivers
- Computer models*
- There is no 'better' explanation.
- Some guy with a PhD is 'sure'.
- 2,500 scientists mostly agree.
- A government committee wrote a long report.
- Government spending on 'Emissions Trading Plans' tops \$100m.
- Geri Halliwell signed a sceptics petition.
- A failed theologian, ex politician made a documentary.

*Why are computer models NOT evidence?

They're sophisticated, put together by experts, and getting better all the time. But even if they could predict the climate correctly (they can't), even if they were based on solid proven theories (they aren't), they still wouldn't count as evidence. Models of complex systems are based on scores of assumptions and estimates piled on dozens of theories. None of the current models forecast that temperatures would stop rising from 2001 – 2008. So there is at least one other factor that is more important than CO₂ and *the models don't know what it is.*

Anything that heats the planet will melt ice, shift lemurs, and cause droughts. None of these things tell us WHY the planet got warmer.



How can you call your belief scientific if there *is no* evidence you would accept?

Theories must be falsifiable to qualify as scientific. Anything else is faith based.

Cutting through the Fog

“There’s a mountain of peer reviewed evidence that says we need to reduce carbon emissions”.

“There is a mountain of evidence on the *effects of global warming*, that’s not the same thing”.



“Can you name a single piece of evidence showing higher CO2 means significantly higher temperatures today?”

Common Responses

(no attempt to talk about ‘evidence’)

A. Refer to an authority

The IPCC says...

The IPCC is an international committee, it’s not evidence.

Argument by authority is not proof of anything except that a committee paid to find a particular result can produce a long document.

But the IPCC reports are based on hundreds of peer reviewed papers. You can’t ignore that.

A committee report is not evidence itself. Can you name any observations that show that CO₂ causes significant warming at it’s current levels? (The IPCC can’t.)

That’s the consensus of mainstream science.

It only takes one scientist to prove a theory is wrong.

Science is not democratic.

Natural laws aren’t made by voting.

- The sun doesn’t shine because the National Academy of Science says so.
- The clouds don’t read David Suzuki.
- The ocean doesn’t care what Al Gore thinks.

When did scientists vote... did I miss it?



B. Distractor

The debate is over.

What debate? Did I miss it?

Who says? (The media; politicians; celebrities?)

Have you got any evidence for that?

It’s time to act now.

What, before we uncover more reasons not to act? :-)

We make too much pollution anyway, we should be doing more research on renewables anyway.

So lets do those things for the right reasons. Random policy because it ‘feels good’ is government-by-accident. Taxing the wrong thing is a lousy way to ‘solve’ something else.

What about the precautionary principle?

Precaution against a problem that doesn’t exist?

How much should we spend to fix something that isn’t a problem?

What’s causing the warming then?

We don’t need to know what **IS** changing the climate to be able to say ... *carbon didn’t do it.*

Believers need to tell us why we should pay for carbon emissions.



C. Ad hominen attack

What would you know, you’re not a climate scientist?

So. Neither is Al Gore.

I know what evidence is. (Do you?).

You’re a denier/sceptic/oil company shill?

Name-calling is the best you can do?

I could be a frigid fascist or an Oil Sheik, that doesn’t change the satellite temperature record. My opinions don’t affect ice core data.

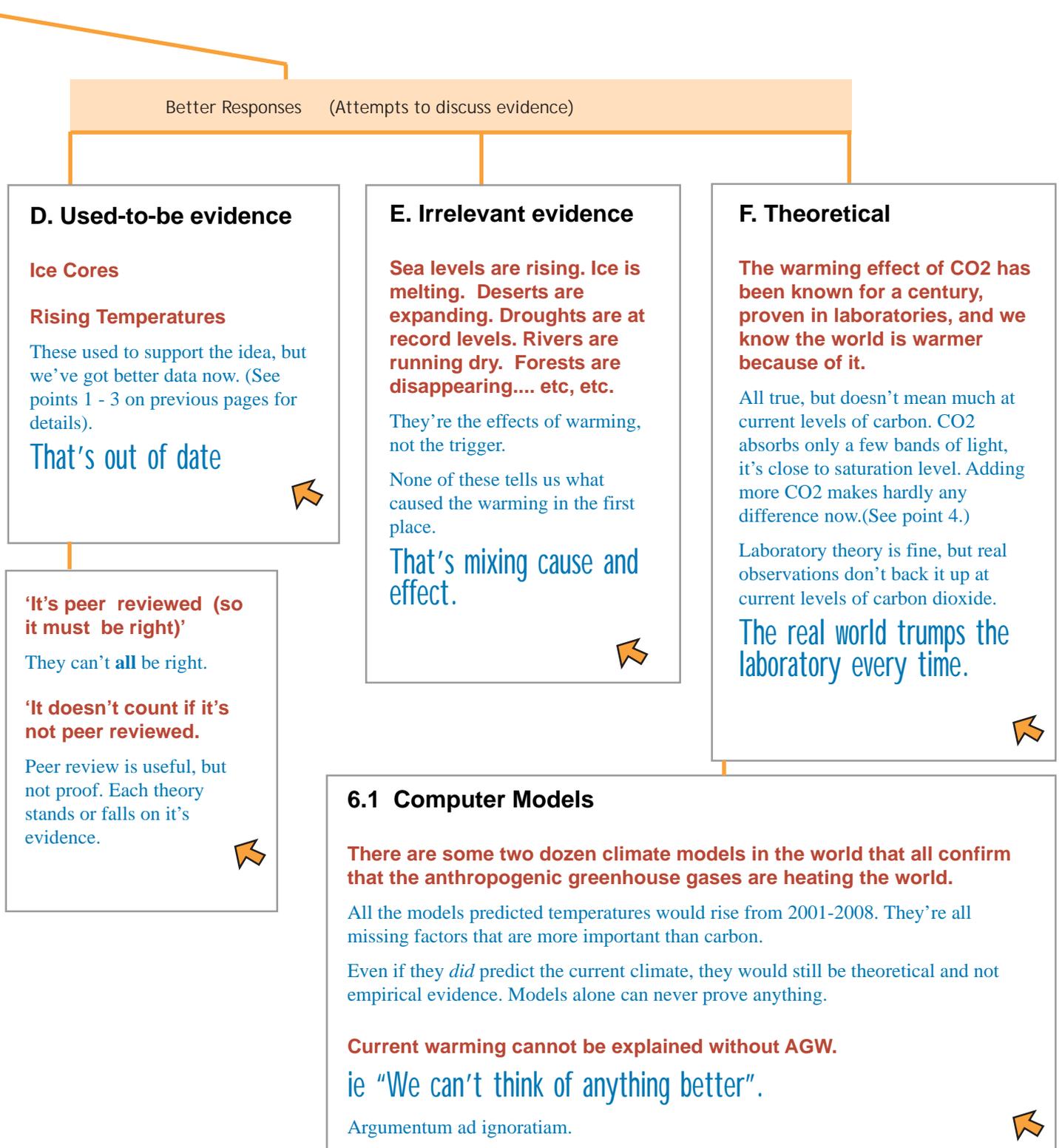
Big Government spends more money buying climate scientists than Big Oil does. (US Govt: \$50b vs Exxon:\$19m, at last count).



You can end up bogged down in endless detail. It's better to step back and focus on the process, on the basics of science, lest the conversation become a bottomless tit-for-tat point scoring exercise. This is not to say we don't want debate, but unless you keep the debate tightly focussed on the one question that matters, you can waste days on irrelevant (albeit interesting) sidelines.

It's also better NOT to bother defending

irrelevant evidence (even if you know that sea ice is actually increasing, or that there is global warming on Mars). It's usually not worth defending qualifications, or trying to prove you or anyone is independent (i.e. unfunded), or that scientists on one side outnumber scientists on the other. *This plays into the false logic that those points matter.* Argument by Authority, or ad hominem attacks, and questions about your motivation, show that the other party doesn't understand what evidence really is.



For open minded people who want more info...

“How can so many scientists be wrong?”

1. Most scientists are not wrong, but they're not studying the central question either. Instead they're *researching the effects of warming* - not the causes. Whether the Gorillas in Borneo are facing habitat loss tells us nothing of what drives the weather. Likewise: wind-farm efficiency, carbon sequestration, and insect borne epidemics. *Warm weather changes these things, but these things don't change the weather.*

2. Consensus proves nothing. It only takes one scientist to prove a theory wrong. Theories fit the facts or they don't. Instead of saying "*Which side has more PhD's?*" a better question is "*Where's the evidence?*". Once upon a time, the masses thought the world was flat, that no machine could fly, that the sun went round the earth.

The only thing we know for sure about Climate Change is that big government funded committees will keep going long after their use-by date.

“This cooler spell is just natural variation”

That IS the point. Natural variation, or ‘noise’ is due to **something**. And at the moment, whatever that is, *it's more important than greenhouse gases*. In this case, ‘noise’ is not some fairy force, it's affecting the planetary climate. If we can figure that out, and stick it in the computer models, they might have more success.

Here's a Good Idea: Let's base an economic system and global taxes on fifty year forecasts from computer models that can't tell us the weather next summer. If we're lucky they might work as well as the mark-to-model software did for Bear Stearns.

“Carbon dioxide is a pollutant”

Carbon dioxide feeds plants. It's a potent fertilizer. We can thank the extra CO₂ in our atmosphere for increasing plant growth by about 15% over the last century. Market gardeners discuss how much extra CO₂ to pump into their greenhouses to increase their crops, and they're not talking 2ppm extra a year. It's like, *Will we double CO₂, or increase it five-fold?* In other words, there are people alive today who wouldn't be if we had cut back on burning fossil fuels a century ago. It's scientifically accurate to say:

“Burn oil—help feed the world”

“What about the precautionary principle?”

What about a plane falling on your house?

More people have died due to plane impacts than can be proven to have suffered due to man-made atmospheric carbon dioxide. Isn't it negligent *not to build* an underground bunker with a early warning radar alarm to protect your children? (Even though those radar systems are unproven, won't give you enough warning to make it to the bunker, and the bunker won't be deep enough if you score a direct hit?) Better yet, let's install a national

Flight Risk Taxation System, and use the money to subsidize steel reinforcing in ceilings of poor families who live under flight paths (it sends the message that we care). We can attach a special levy for frequent flyers. User pays is only fair.

There's a point about cost-benefit here. How many people are we willing to starve in order to protect us from the unproven threat of CO₂?

“Shouldn't we be looking for greener alternatives to fossil fuels anyway?”

Hoping for a good outcome while acting on something for all the wrong reasons is called policy-by-accident. Oil is expensive and finite, so ‘Yes’ we *could* adopt a national taxation system based on a false assumption, employ more accountants and lawyers, and if we don't cripple the economy too badly, there *might* be enough money left to research greener alternatives, (except we're not sure what ‘green’ means anymore, since carbon dioxide feeds plants). It's true, *it could* work.

Here's the campaign slogan for that kind of government: “Vote for us, we confuse cause and effect, mix up issues, and solve problems by tackling something else instead.”

Good policies need good science. Everything else is random government.

“But carbon dioxide is at record levels”

Atmospheric carbon is at higher levels than any time in the last 650,000 years. But go back 500 million years, and carbon levels were not just 10-20% higher, they were ten to twenty *times* higher. The Earth has thoroughly tested the runaway greenhouse effect, and *n o t h i n g* happened. Indeed the earth slipped into an ice age while CO₂ was far higher than today's levels. Whatever warming effect super-concentrated-CO₂ has, it's no match for the other climactic forces out there. Further, it doesn't matter if it's man-made-CO₂ or ocean-made-CO₂. They are the same molecule.

At the current rate we are increasing CO₂ each year, we will hit historic record levels in just 3,300 years.

I'm scared, are you?

“The temperature is rising faster than ever before”

Last century temperatures rose about 0.7°C (and most of that gain has been lost in the last 12 months). But around 1700, there was a 2.2°C rise in just 36 years. (As measured by the Central England Temperature record, one of the only reliable records of the era). It was three times as large and three times as fast as the last century. Natural variation has been much larger than anything mankind may or may not have induced recently.

“This weather is extreme”

For 90% of the last 1.5 million years the world has been iced over and about 10°C colder. That's extreme.

