

The language of alarm and the irrelevance of science

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pdf of these slides available upon request from rlindzen@mit.edu

Climate alarm belongs to a class of issues characterized by a claim for which there is no evidence, that nonetheless appeals strongly to one or more interests or prejudices. Once the issue is adopted, evidence becomes irrelevant. Instead, the believer sees what he believes. Anything can serve as a supporting omen.

Three very different previous examples come to mind (though there are many more examples that could be cited):

- Malthus' theory of overpopulation,
- Social Darwinism, and
- The Dreyfus Affair.

Although each of these issues engendered opposition, only the Dreyfus Affair led to widespread societal polarization. More commonly, only the 'believers' are sufficiently driven to form a movement.

We will briefly review these examples (though each has been subject to book length analyses), but the issue of climate alarm is somewhat special in that it appeals to a sizeable number of interests, and has strong claims on the scientific community. It also has the potential to cause exceptional harm to an unprecedented number of people. This has led to persistent opposition amidst widespread lack of interest.

However, all these issues are characterized by profound immorality pretending to virtue.

Malthus' peculiar theory wherein the claimed linear growth of food loses out to the exponential growth of population has maintained persistent popularity in the faculty lounge for about two centuries. It is, therefore, worth noting that Malthus had no evidence that food supply would increase only linearly. Nor did he have evidence for exponential population growth. Malthus initially went so far as to estimate an e-folding time for population of 25 years, based on the population of North America, and ignoring the role of immigration. Although Malthus, himself, eventually acknowledged these problems, the enthusiasm for his anti-human conclusions remains strong. Neither the green revolution nor the diminution of famine amidst increasing population dissuades them. The fact that Chad is poor and the Netherlands is rich never strikes the believer as odd. Apparently, the growth of cities, the movement of workers from the farm to the city, and, for much of the developed world, immigration, all served to convince people of means that there were too many other people around, and Malthusian theory formed a framework for something they were (and are) eager to believe.

Social Darwinism and its corollary, eugenics, represents another case of a theory without support that was widely accepted with, at times, horrid consequences. Darwin's "The Origin of the Species" had immense influence. It presented a theory whereby natural selection and what were essentially mutations could account for biological evolution. While it offered valuable insights into the development of finch beaks, it was hardly meant to describe societal evolution. Nevertheless, the notion of 'survival of the fittest' applied to society had obvious appeal to those who perceived themselves to be the fittest and who naturally regarded the application as scientifically justified. It was a small step to eugenics which was the counterpart of modern day environmentalism during the first third of the twentieth century, and was supported by all the 'best' people (including George Bernard Shaw, Margaret Sanger, Alexander Graham Bell, and Theodore Roosevelt) despite the fact that there actually was a mathematical theorem (the Hardy-Weinberg Theorem) that showed that the impact of eugenics on the gene pool would be negligible. Needless to add, mathematics is of no importance to the 'best' people. Malthusian population fears continue to the present, but eugenics was rendered unfashionable by the obvious implications presented by the Nazis.

While science is a common vehicle for such misuse, the Dreyfus Affair shows that other vehicles exist. In 1894, Captain Alfred Dreyfus was accused of passing secret French military information to the Germans. There was, in fact, no evidence to support this accusation. Nevertheless, there was again a strong desire on the part of many people in France to believe the accusation. To be sure, there was the endemic anti-Semitism in France. However, there was also the humiliation of France's loss in the Franco-Prussian War, and the desire to blame such loss on the perfidy of a group that some considered to be 'outside'. (The Nazis' 'stab in the back' theory for the German loss in WW1 represents a similar instinct). Dreyfus was tried (several times) and sentenced to Devil's Island. Prominent Frenchmen (Emile Zola in particular) , incensed by the obvious injustice campaigned for Dreyfus, and the issue literally split France in half (partly because the conflict between Catholics and Secularists also entered the Affair). Dreyfus was eventually exonerated after the identification of the actual spy became undeniable.

The current issue of global warming/climate change is extreme in terms of the number of special interests that opportunistically have strong interests in believing in the claims of catastrophe despite the lack of evidence. In no particular order, there are the

- Leftist economists for whom global warming represents a market failure,
 - UN apparatchiks for whom global warming is the route to global governance,
 - Third world dictators who see guilt over global warming as providing a convenient claim on aid (ie, the transfer of wealth from the poor in rich countries to the wealthy in poor countries),
 - Environmental activists who love any issue that has the capacity to frighten the gullible into making hefty contributions to their numerous NGOs,
 - Crony capitalists who see the immense sums being made available for 'sustainable' energy,
 - Government regulators for whom the control of a natural product of breathing is a dream come true,
 - Newly minted billionaires who find the issue of 'saving the planet' appropriately suitable to their grandiose pretensions,
- etc., etc.

Strange as it may seem, even the fossil fuel industry is generally willing to go along. After all, they realize better than most, that there is no current replacement for fossil fuels. The closest possibilities, nuclear and hydro, are despised by the environmentalists. As long as fossil fuel companies have a level playing field, and can pass expenses to the consumers, they are satisfied. Given the nature of corporate overhead, the latter can even form a profit center.

Of course, there will always be the temptation to not only 'go along' but to actually tilt the playing field by 'greenwashing.'

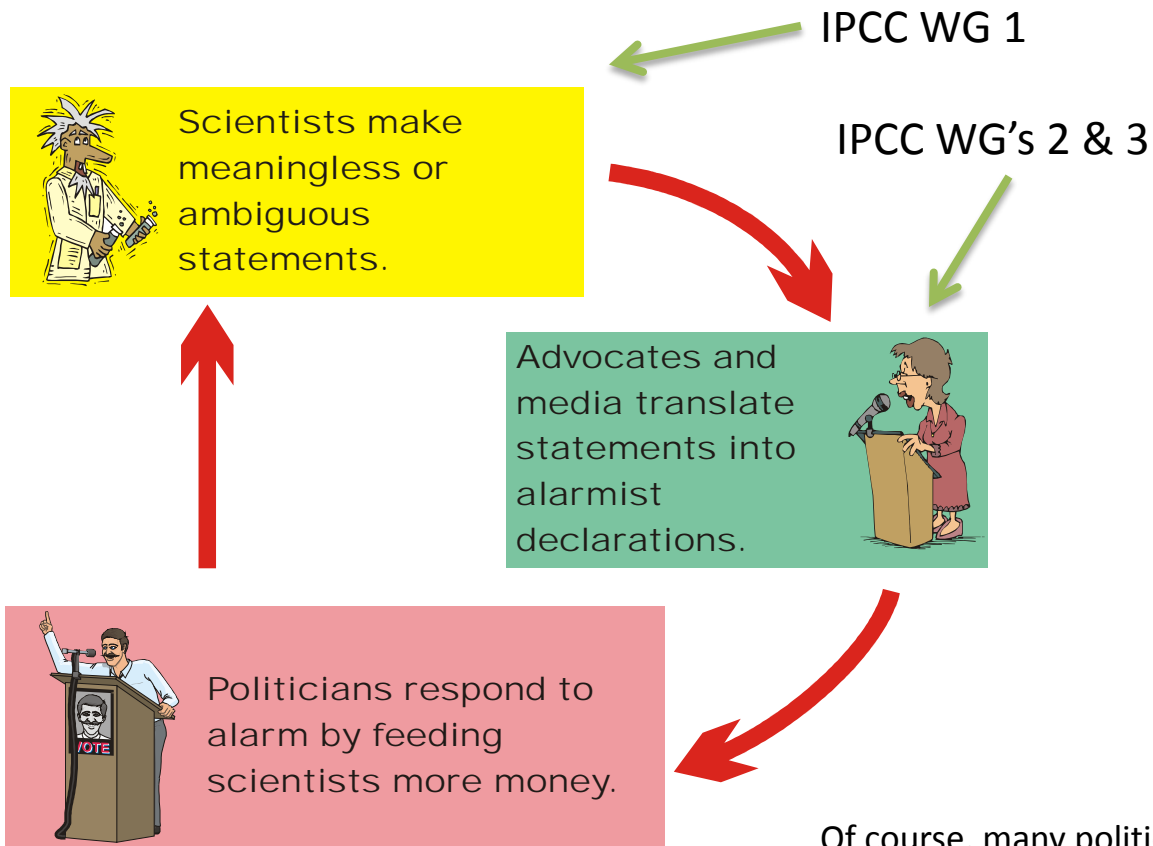
The situation within science itself is equally grim. Huge sums of government and private funding have become available to what was initially a small backwater field. Science becomes easy when emphasis is on malleable models supported by hugely uncertain data that can be readily found 'consistent' with the models supplemented by fervidly imagined catastrophic 'implications.' Indeed, uncertainty is often exaggerated for just this purpose. Opposition within the scientific community is immediately met with ad hominem attacks, loss of funding, and difficulty in publishing. For young scientists, questioning global warming alarm is suicidal.

Of course, science is not the only victim of this situation. Affordable energy has been the primary vehicle for the greatest advance in human welfare in human history. This issue promises to deny this to the over 1 billion humans who still lack electricity. For billions more energy will be much less affordable leading to increased poverty. Poverty, itself, is a major factor in reduced life expectancy. It requires a peculiarly ugly obtuseness to ignore the fundamental immorality of this issue.

Although all these issues have strong political consequences, it is by no means clear that their origin is, itself, political. I would suggest that a more likely situation is that politics is always opportunistically seeking some cause that fits its needs. However, once an illusory issue becomes a passionate belief, it becomes impervious to argument. Given how dangerous some illusory positions are, it is an important problem to know how to avoid them. Although I will now go over some of the examples of how science has been misrepresented, I doubt that these will change many minds. Belief seems to inevitably trump objective reality when one is free to choose ones narrative.

Global Warming: Political or Scientific Issue?

Unfortunately, the two have become highly intertwined. Even in 1989, I was told that as a Democrat, I should not take my position. Moreover, what I have sometimes referred to as the iron triangle of alarm has kept the issue from being resolved.



Should the scientist ever feel any guilt over the matter, it is assuaged by two irresistible factors:

1. The advocates define public virtue; and

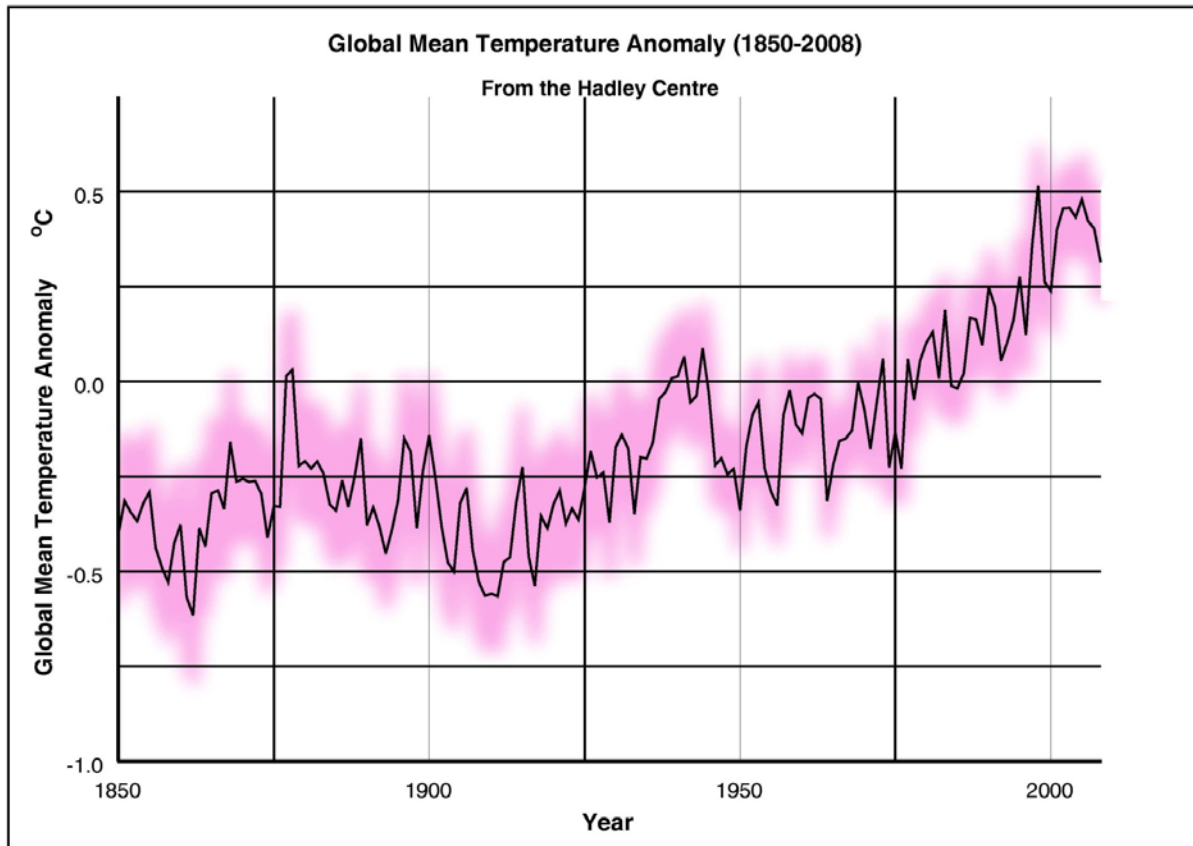
2. His administrators are delighted with the grant overhead.

Of course, many politicians are also advocates.

There are numerous examples of the issuance of unalarming claims that are immediately interpreted as demanding immediate action. Perhaps the most striking example involves the iconic statement of the IPCC: *Most of the warming over the past 50 years is due to man.*

Is this statement actually alarming?

First, we are speaking of small changes. 0.25C would be about 51% of the recent warming.

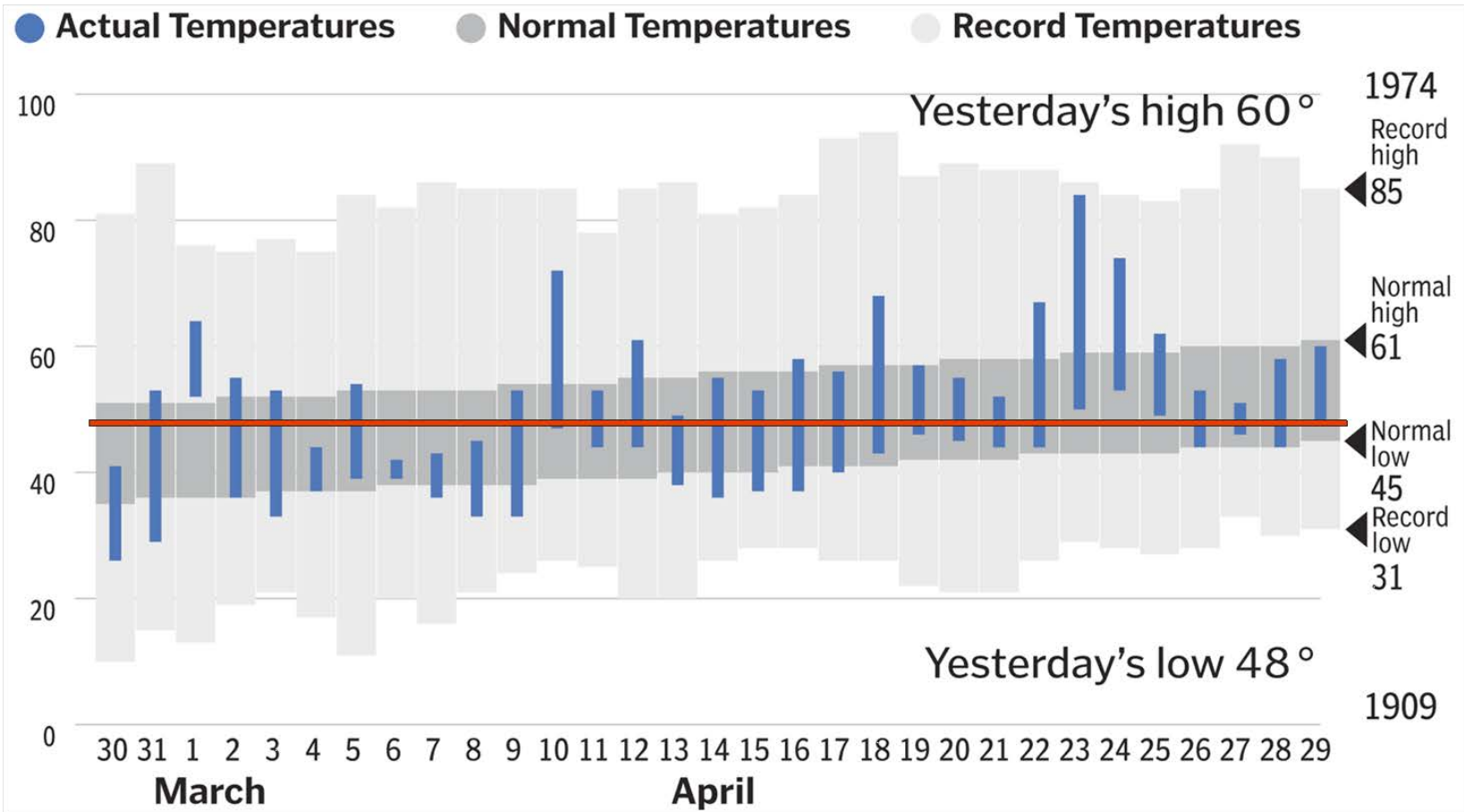


When looking at a graph, always check the scales.

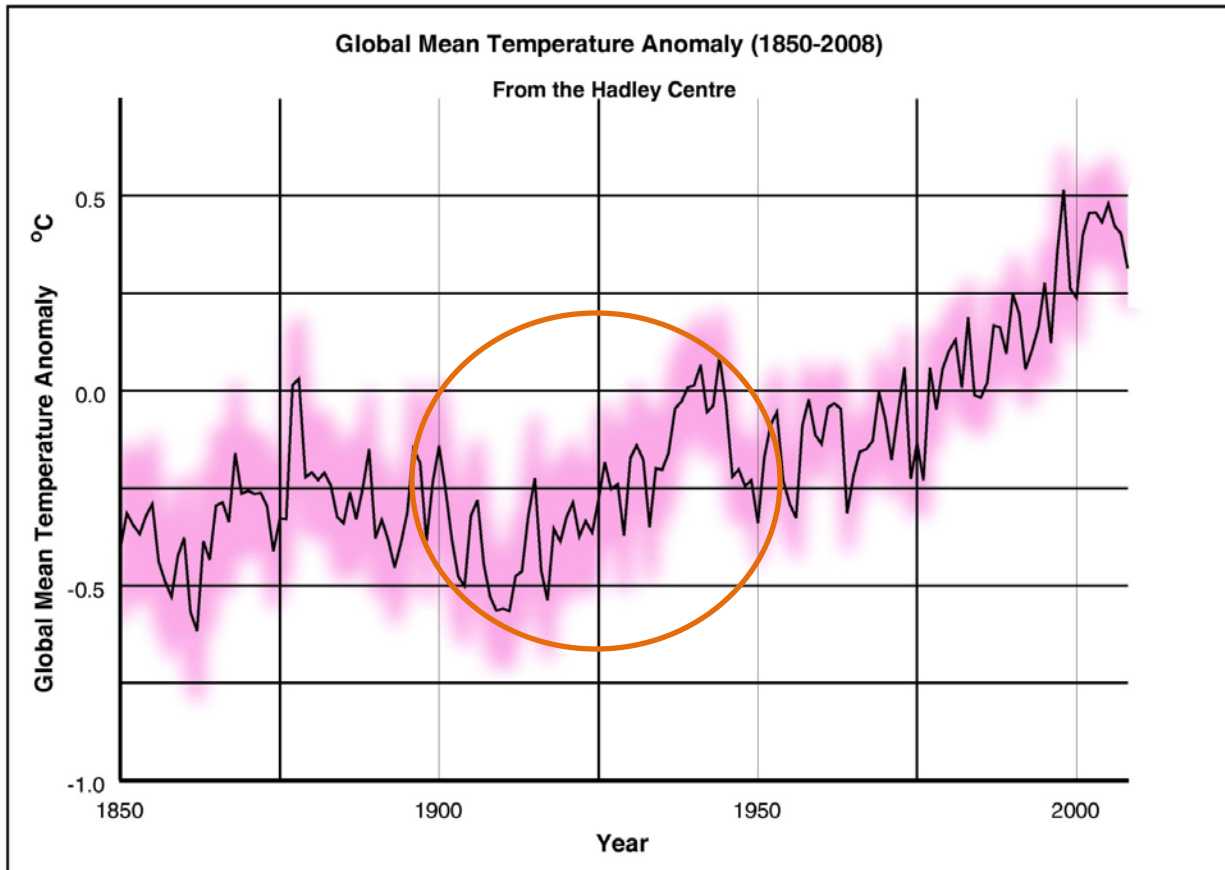
Also, the pink fuzz on the graph is an estimate of the uncertainty.

The thickness of the red line represents the range of global mean temperature anomaly over the past century. We see that we are talking about changes that are much smaller than the changes we normally experience.

April 30, 2008



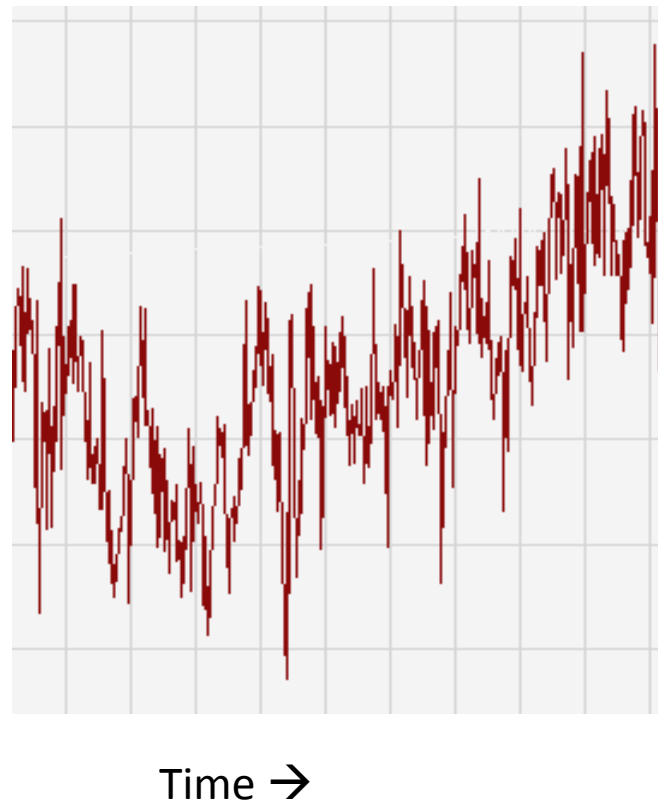
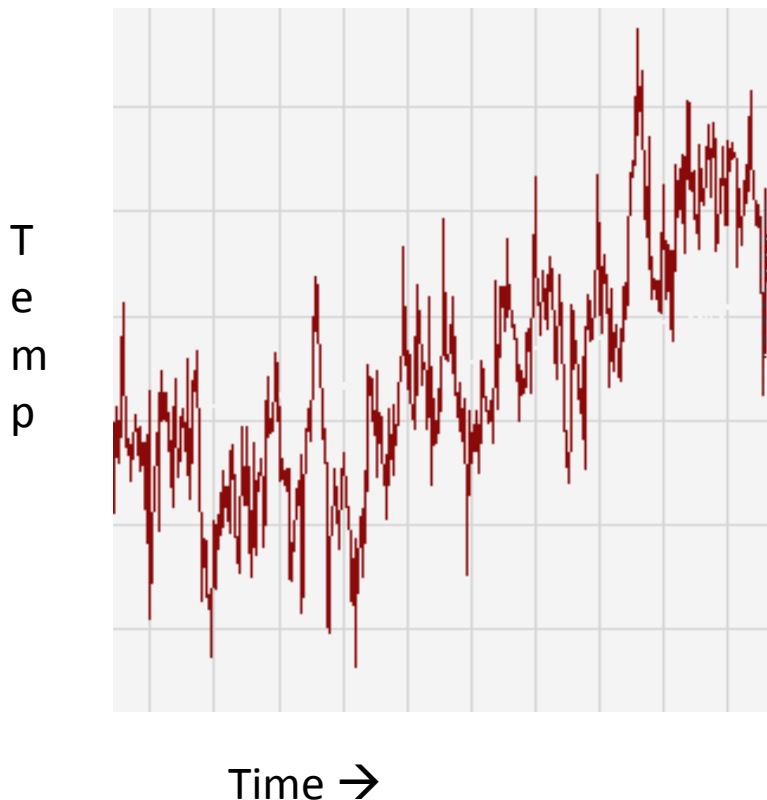
One month's record of high and low temperatures for Boston.



Second, the recent warming episode is not at all unprecedented. The almost identical episode from about 1919-1940 could not be attributed to man.

Just for fun: You've been told that earlier warming was natural but recent warming is due to man. Can you tell which is which?

*Global Average Temperature in Two Half Century Periods:
Which is 1895-1946 (Nature); Which is 1957-2008 (Us?)*



Global average temperature and time scales are identical

Third, the observed warming is completely consistent with low climate sensitivity. Alarm requires, at least, high sensitivity.

By sensitivity, we refer to how much warming we expect for each doubling of CO₂. High sensitivity is generally regarded as 3C or more.

If we were to assume that **ALL** warming over the past 50 years were due to added greenhouse gases, we would conclude that the sensitivity was about 1C. How do models with much higher sensitivity manage to replicate the past 50 years?

They do so by subtracting from the greenhouse warming essentially unknown aerosols which they then include as due to human emissions.

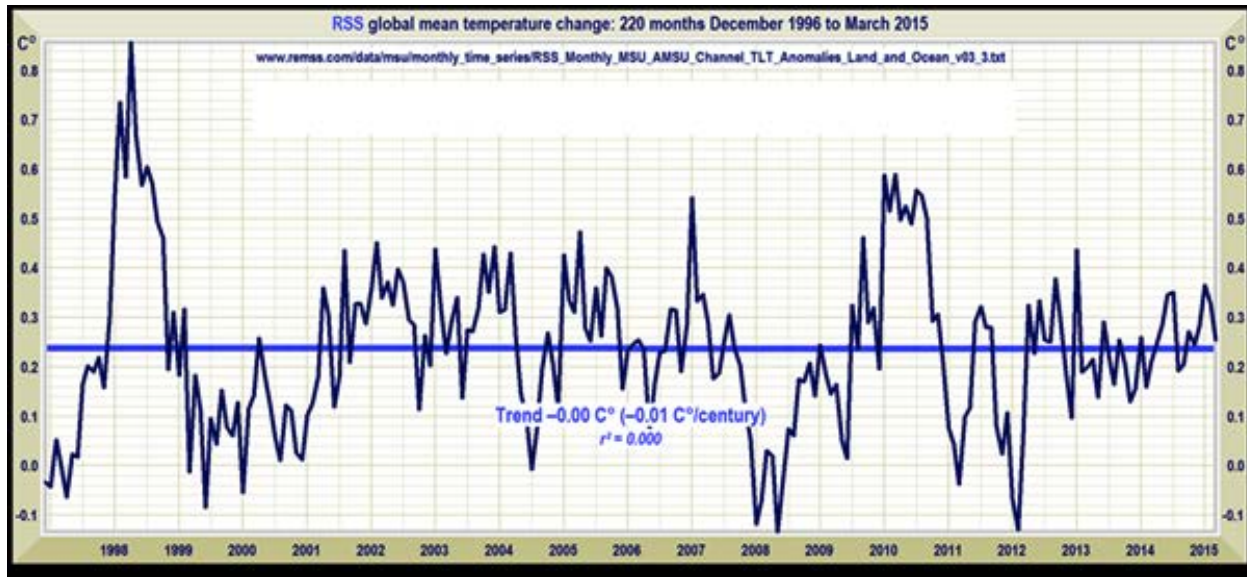
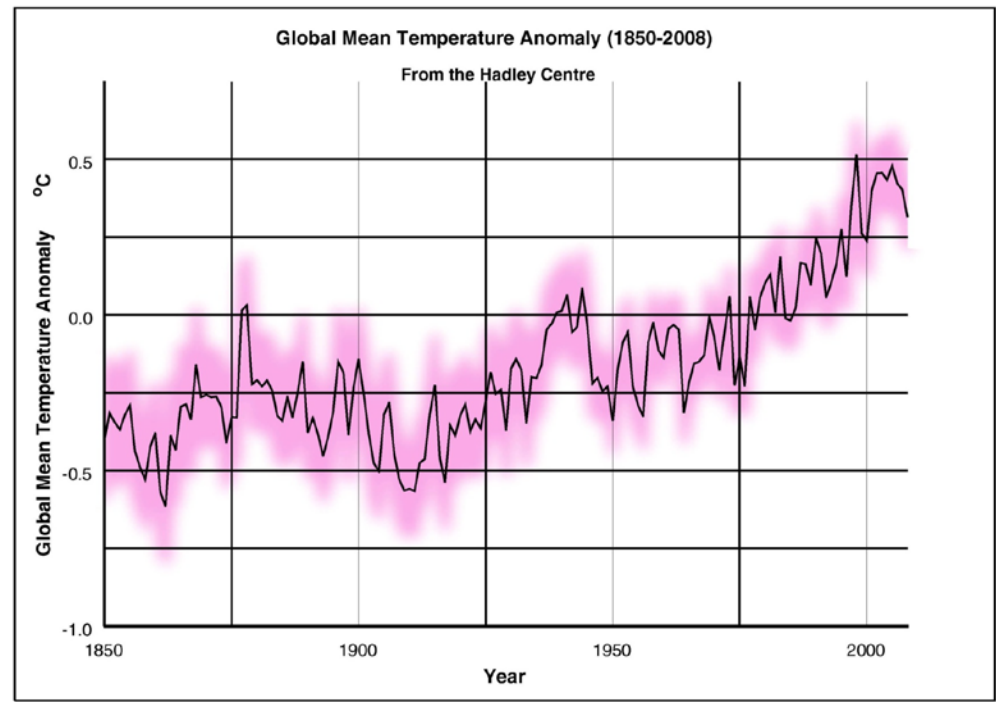
Sensitivity in °C (for doubling of CO ₂)	Fraction of GHG forcing cancelled by 'aerosols'
0.75	0
1.5	0.25
3.0	0.481
4.0	0.525
5.0	0.543

However, in a recent paper from the Max Planck Institute, Stevens (2015) finds that aerosols are limited and unable to compensate for the higher sensitivities. If man accounts for only 51% of the warming, then even modest warming becomes implausible.

Although it has become commonplace to fear warming, it is worth noting that the approximately 1C warming since the 19th Century has been accompanied by the improvement of all indices of human welfare (including environmental quality).

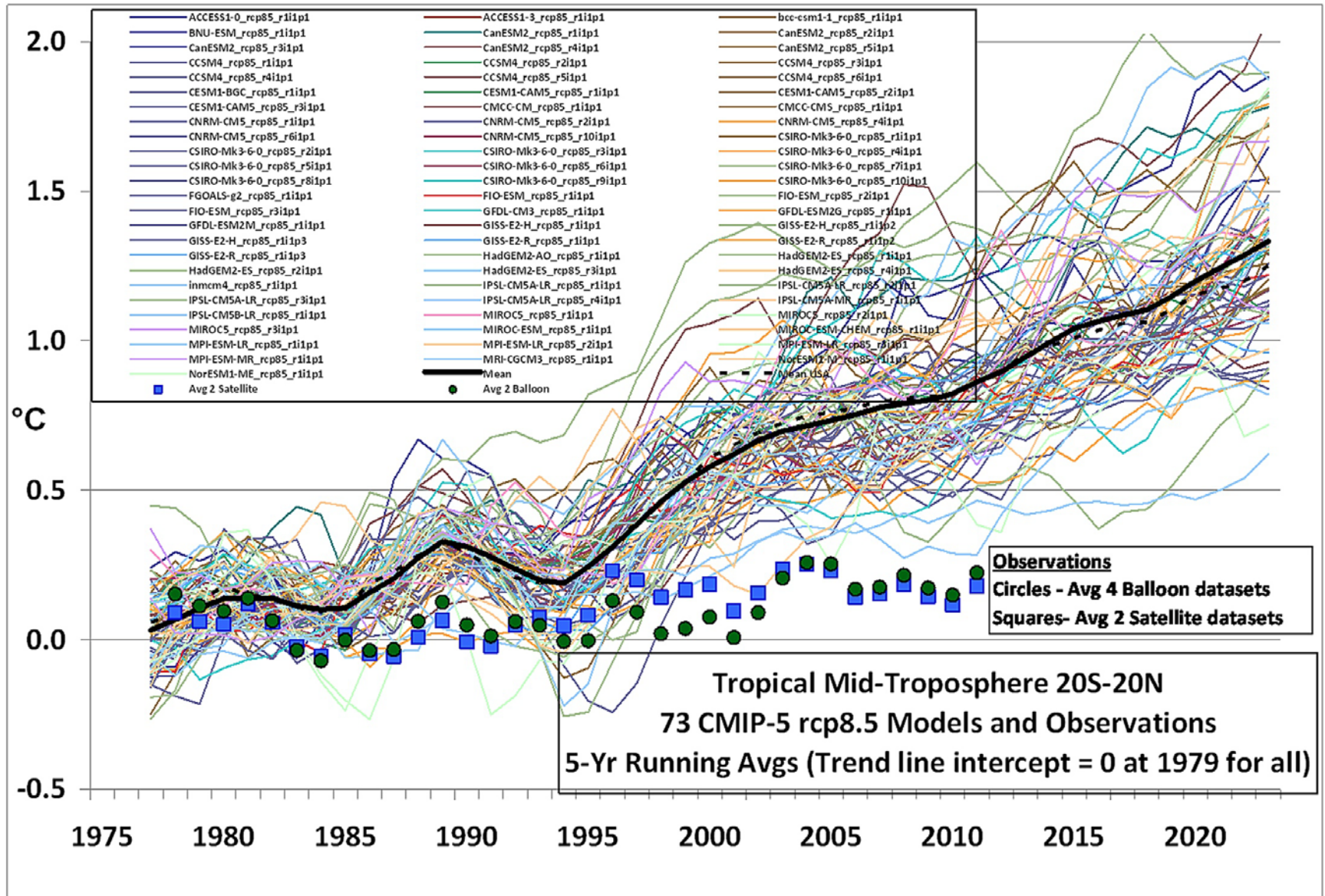
But is the IPCC claim of attribution even correct?

The IPCC attribution argument assumes, on the basis of model results, that natural variability is small. However, the absence of warming over the past 18 years implies that natural variability has to be at least as great as greenhouse warming.

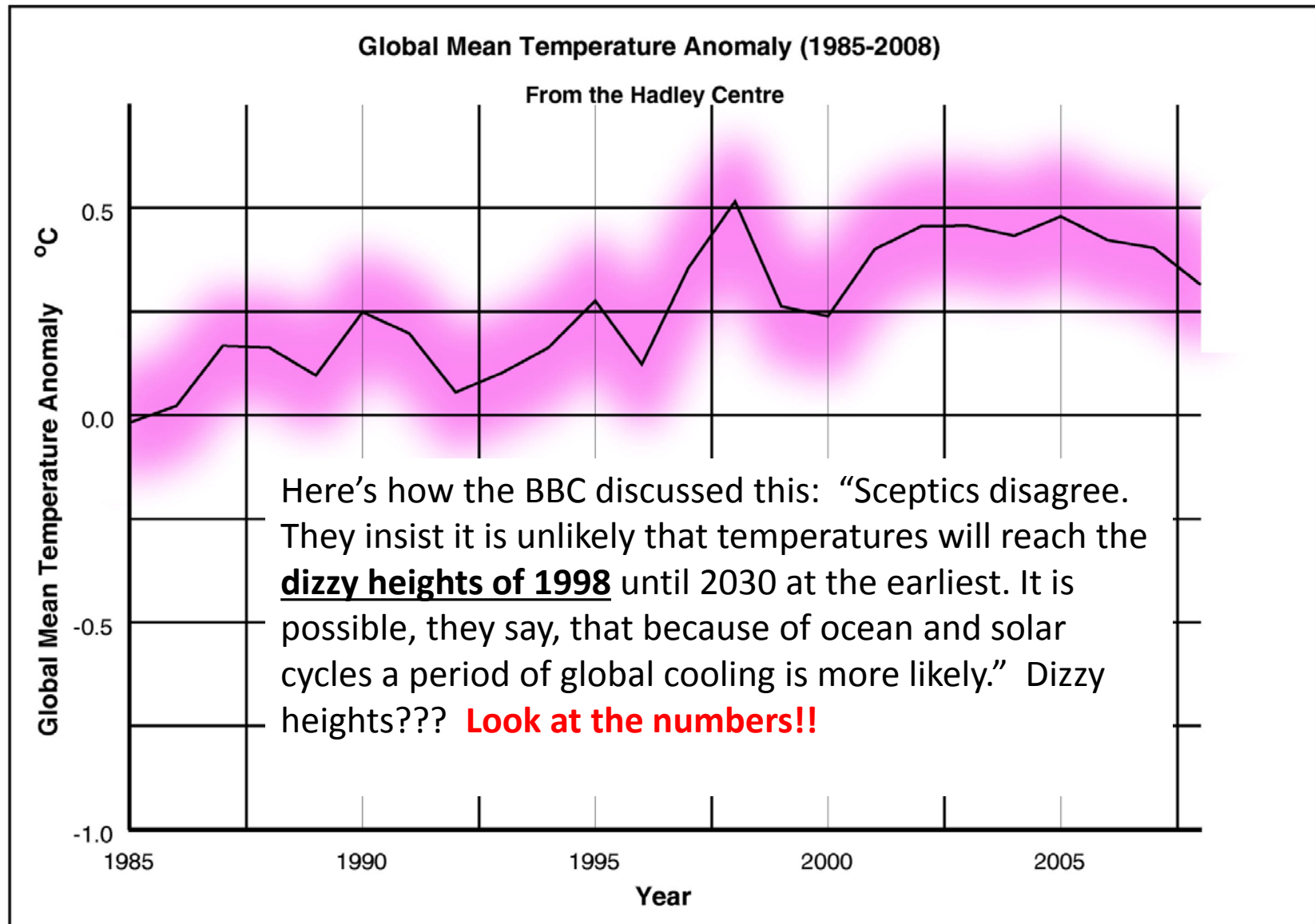


It goes without saying that since the 'pause' occurs after a warming episode, that the past 18 years will, indeed, be among the warmest years in the instrumental record. This hardly changes the fact that the warming has ceased.

Indeed, all IPCC models overestimate observed warming (which is insignificantly different from zero). This essentially invalidates the argument for attribution.



The media respond by assuming that the audience cannot deal with numbers.



Temperatures where the pink fuzz overlaps are not statistically significantly different.

What about the future?

Only models with high sensitivity lead to potential alarm, and high sensitivity appears grossly unlikely.

Where do prominent scientific supporters of climate action actually stand?

What's happening to the climate is unprecedented

Print

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From Prof Martin Rees and Dr Ralph J. Cicerone.

Sir, We were stimulated by your editorial "[Cooler on warming](#)" (April 5). There has undoubtedly been a shift in public and media perceptions of climate change – a consequence of, at least in part, leaked e-mails from some climate scientists and the publication of errors in the fourth Intergovernmental Panel on Climate Change report.

However, as your editorial acknowledges, neither recent controversies, nor the recent cold weather, negate the consensus among scientists: something unprecedented is now happening. The concentration of carbon dioxide in the atmosphere is rising and climate change is occurring, both due to human actions.

If we continue to depend heavily on fossil fuels, by mid-century CO₂ concentrations will reach double pre-industrial levels. Straightforward physics tells us that this rise is warming the planet. Calculations demonstrate that this effect is very likely responsible for the gradual warming observed over the past 30 years and that global temperatures will continue to rise – superimposing a warming on all the other effects that make climate fluctuate. Uncertainties in the future rate of this rise, stemming largely from the "feedback" effects on water vapour and clouds, are topics of current research.

It is the responsibility of scientific organisations like ours to present the public and politicians with a balanced assessment of the evidence – and, importantly, to indicate the level of confidence and the range of uncertainties attached to them.

Our two science academies have long contributed critical, objective and open reports on climate change. We intend to draw upon the efforts of leading scientists everywhere to make our future reports more accessible and valuable and, by fostering scientific research, we hope to do a better job of reducing inherent uncertainties. We must also promote best scientific practice, especially with regard to the sharing of data. But policymakers and the public must realise that, even if scientific uncertainties could be reduced

to zero, formulating effective political responses would still be controversial and challenging. Our academies will provide the scientific backdrop for the political and business leaders who must create effective policies to steer the world toward a low-carbon economy.

Martin Rees,
President of the Royal Society

Ralph J Cicerone,
President of the US National Academy of Sciences

Here is a letter signed by the presidents of both the Royal Society and the National Academy of Science, both of which have endorsed immediate action to curb warming.

It tells us a great deal about the current state of science, and the exploitation of authority.

BBC 4 interview of Ralph Cicerone on 13/07/2012. John Humphrys is the interviewer.

John Humphrys: *You don't sound if I can use this word apocalyptic. I mean, you're not saying "If we don't do these things, we're going to go to hell in a handbasket, we're going to fry, in a few years".*

Ralph Cicerone: *Well, there are people who are saying those things John*

Humphrys: *But not you.*

Ralph Cicerone: *No. I don't think it's useful, I don't think it gets us anywhere, and **we don't have that kind of evidence.***

The situation may have been best summarized by Mike Hulme, director of the Tyndall Centre at the University of East Anglia (a center of concern for global warming):

“To state that climate change will be ‘catastrophic’ hides a cascade of value-laden assumptions which do not emerge from empirical or theoretical science.”

Even Gavin Schmidt, Jim Hansen’s successor as head of NASA’s Goddard Institute of Space Studies, whose website, Realclimate.org, is a major defender of global warming, does not agree with claims of extremes:

“General statements about extremes are almost nowhere to be found in the literature but seem to abound in the popular media. . . .It's this popular perception that global warming means all extremes have to increase all the time, even though if anyone thinks about that for 10 seconds they realize that's nonsense.”

One should note that extremes depend significantly on the temperature difference between the tropics and the poles – something that is expected to diminish in a warmer world.

How about politicians?

The turning point on global warming

By John McCain and Joe Lieberman | February 13, 2007 (*Boston Globe*)

THERE IS NOW a broad consensus in this country, and indeed in the world, that global warming is happening, that it is a serious problem, and that humans are causing it. **The recent report by the Intergovernmental Panel on Climate Change concluded there is a greater than 90 percent chance that greenhouse gases released by human activities like burning oil in cars and coal in power plants are causing most of the observed global warming. This report puts the final nail in denial's coffin about the problem of global warming.**

In addition, the US Fish and Wildlife Service has identified a warming climate, and the resulting melting of sea ice, as the reason polar bears may now be threatened as a species. The US Center for Disease Control's National Center for Environmental Health has cited global warming as the largest looming public health challenge we face. And President Bush has himself called global warming a serious challenge that we need to confront.

Indeed, if we fail to start substantially reducing greenhouse gas emissions in the next couple of years, we risk bequeathing a diminished world to our grandchildren. Insect-borne diseases such as malaria will spike as tropical ecosystems expand; hotter air will exacerbate the pollution that sends children to the hospital with asthma attacks; food insecurity from shifting agricultural zones will spark border wars; and storms and coastal flooding from sea-level rise will cause mortality and dislocation.

To confront this challenge, we have reintroduced the Climate Stewardship and Innovation Act.

But the McCain-Lieberman comments are nothing compared to Secretary of State, John Kerry's truly remarkable speech in Indonesia last February. As was once said of a writer, Lillian Hellman: Every word she said including 'the' and 'a' was untrue.

The full text runs to over 5 pages and is available on the web:

<http://www.state.gov/secretary/remarks/2014/02/221704.htm#.UwEe-hfRKHU.twitter>

I have included much of his text for the convenience of those who want a pdf copy of this lecture.

When I think about the array of global climate – of global threats – think about this: terrorism, epidemics, poverty, the proliferation of weapons of mass destruction – all challenges that know no borders – the reality is that climate change ranks right up there with every single one of them. And it is a challenge that I address in nearly every single country that I visit as Secretary of State, because President Obama and I believe it is urgent that we do so.

And the reason is simple: The science of climate change is leaping out at us like a scene from a 3D movie. It's warning us; it's compelling us to act. And let there be no doubt in anybody's mind that **the science is absolutely certain**. It's something that we understand with absolute assurance of the veracity of that science. No one disputes some of the facts about it. Let me give you an example. When an apple separates from a tree, it falls to the ground. We know that because of the basic laws of physics. No one disputes that today. It's a fact. It's a scientific fact. Science also tells us that when water hits a low enough temperature, it's going to turn into ice; when it reaches a high enough temperature, it's going to boil. No one disputes that. Science and common sense tell us if you reach out and put your hand on a hot cook stove, you're going to get burned. I can't imagine anybody who would dispute that either.


So when thousands of the world's leading scientists and five reports over a long period of time with thousands of scientists contributing to those reports – when they tell us over and over again that our climate is changing, **that it is happening faster than they ever predicted, ever in recorded history, and when they tell us that we humans are the significant cause, let me tell you something: We need to listen.**


 Not even IPCC claimed this.

When 97 percent of scientists agree on anything, we need to listen, and we need to respond. **Well, 97 percent of climate scientists have confirmed that climate change is happening and that human activity is responsible.** These scientists agree on the **causes** of these changes and they agree on the **potential** effects. They agree that the emission of greenhouse gases like carbon dioxide contributes heavily to climate change. They agree that the energy sources that we've relied on for decades to fuel our cars and to heat our homes or to air condition our homes, to – all the things that provide us electricity like oil and coal – that these are largely responsible for sending those greenhouse gases up into the atmosphere. And the scientists agree that emissions coming from deforestation and from agriculture can also send enormous quantities of carbon pollution into our atmosphere.

 IPCC iconic statement

And they agree that, if we continue to go down the same path that we are going down today, the world as we know it will change – and it will change dramatically for the worse.

 This is not the implication of the iconic statement.

So we know this is happening, and we know it with virtually the same certainty that we understand that if we reach out and touch that hot stove, we're going to get burned. In fact, this is not really a complicated equation. **I know sometimes I can remember from when I was in high school and college, some aspects of science or physics can be tough – chemistry. But this is not tough. This is simple. Kids at the earliest age can understand this.**  Really?

Try and picture a very thin layer of gases – a quarter-inch, half an inch, somewhere in that vicinity – that's how thick it is. It's in our atmosphere. **It's way up there at the edge of the atmosphere.** And for millions of years – literally millions of years – we know that layer has acted like a thermal blanket for the planet – trapping the sun's heat and warming the surface of the Earth to the ideal, life-sustaining temperature. Average temperature of the Earth has been about 57 degrees Fahrenheit, which keeps life going. Life itself on Earth exists because of the so-called greenhouse effect. But in modern times, as human beings have emitted gases into the air that come from all the things we do, that blanket has grown thicker and it traps more and more heat beneath it, raising the temperature of the planet. **It's called the greenhouse effect because it works exactly like a greenhouse in which you grow a lot of the fruit that you eat here.**



Kerry proceeds to get both descriptions and physics wrong!

This is what's causing climate change. It's a huge irony that the very same layer of gases that has made life possible on Earth from the beginning now makes possible the greatest threat that the planet has ever seen. And the results of our human activity are clear. **If you ranked all the years in recorded history by average temperature, you'd see that 8 of the 10 hottest years have all happened within the last 10 years. Think about it this way: all 10 of the hottest years on record have actually happened since Google went online in 1998. Now, that's how fast this change is happening. And because the earth is getting hotter at such an alarming speed, glaciers in places like the Arctic are melting into the sea faster than we expected. And the sea is rising – slowly, but rising – and will rise to dangerous levels. Scientists now predict that by the end of the century, the sea could rise by a full meter. Now, I know that to some people a meter may not sound like a lot, but I'll tell you this: it's enough to put half of Jakarta underwater. Just one meter would displace hundreds of millions of people worldwide and threaten billions of dollars in economic activity. It would put countries into jeopardy. It would put countless – I mean, come to the local level – it would put countless homes and schools and parks, entire cities at risk.**

Kerry confuses temperature with trend and concludes that 20cm is a meter. 

Now, climate change also tragically means the end of some species. The changing sea temperature and the increasing amount of acidity – the acidity comes from coal-fired power plants and from the pollution, and when the rain falls the rain spills the acidity into the ocean. And it means that certain species of fish like cod or sardines can no longer live where they once lived. This is devastating for the world's fisheries. And scientists predict that fisheries will be among the hardest hit. Just think about the fishermen who sell their fish catches at Pasar Ikan. Think about it. There are some studies that say that Indonesia's fisheries could actually lose up to 40 percent of what they currently bring in – so a fisherman who usually has about a hundred fish to sell one day would suddenly only have 60 or so for sale. The impact is obvious.

Climate change also means water shortages. And if you have these enormous water shortages, then you have a change in the weather – because of the weather patterns, you’re going to wind up with droughts, the lack of water. And the droughts can become longer and more intense. In fact, this isn’t something around the corner – this is happening now. We are seeing record droughts right now, and they’re already putting a strain on water resources around the world. We’ve already seen in various parts of the world – in Africa, for instance – people fighting each other over water, and we’ve seen more conflicts shaping up now over the limits of water. Back in the United States, President Obama just the other day visited California, where millions of people are now experiencing the 13th month of the worst drought the state has seen in 500 years. And no relief is in sight. What used to be a 100-year or a 500-year event is now repeating itself within 10 years.

Furthermore, climate change means fundamental transformations in agriculture worldwide. Scientists predict that, in some places, heat waves and water shortages will make it much more difficult for farmers to be able to grow the regular things we grow, like wheat or corn or rice. And obviously, it’s not only farmers who will suffer here – it’s the millions of people who depend on those crops that the farmers grow. For example, the British government research showed that climate change may have contributed to the famine that killed as many as 100,000 people in Somalia just back in 2010 and 2011.

And scientists further predict that climate change also means longer, more unpredictable monsoon seasons and more extreme weather events. Now, I'll tell you, I can't tell you – no weatherman on TV or anybody is going to be able to look at you and tell you – that one particular storm was absolutely the result of climate change. But scientists do predict that many more of these disastrous storms will occur if we continue down the current path. Ladies and gentlemen, I saw with my own eyes what the Philippines experienced in the wake of Typhoon Haiyan and I will tell you it would be absolutely devastating if that kind of storm were to become the normal thing that happens every single year in many places. On top of the unspeakable humanitarian toll, the economic cost that follows a storm like that is absolutely massive. I don't mean just the billions that it costs to rebuild. We've seen here in Asia how extreme weather events can disrupt world trade. For example, after serious flooding in 2011, global prices for external computer hard drives rose by more than 10 percent. Why? Because electronic manufacturing zones around Bangkok were out of commission, wiped out by the weather. So it's not just about agriculture – it's also about technology. It's about our global economy. It's about potentially catastrophic effects on the global supply chain.

Now, despite all of these realities – despite these facts – much of the world still doesn't see or want to see the need to pursue a significant response to this threat. As recently as 2011, a survey of city officials here in Asia found that more than 80 percent of the population said they did not anticipate climate change hurting their cities' economies.

And despite more than 25 years of scientific warning after scientific warning after scientific warning – despite all that, the call to arms that we heard back in Rio back in 1992 – despite that, we still haven't globally summoned the urgency necessary to get the job done. And as a result of this complacency, last year the amount of carbon dioxide in our atmosphere reached the highest point in human history – despite all the warnings. Now, I know that these are some dramatic scientific facts – statistics. **But think of it this way: If the worst-case scenario about climate change, all the worst predictions, if they never materialize, what will be the harm that is done from having made the decision to respond to it? We would actually leave our air cleaner. We would leave our water cleaner. We would actually make our food supply more secure. Our populations would be healthier because of fewer particulates of pollution in the air – less cost to health care. Those are the things that would happen if we happen to be wrong and we responded. But imagine if the 97 percent of those scientists are correct and the people who say no are wrong. Then the people who say no will have presented us with one of the most catastrophic, grave threats in the history of human life. That's the choice here.**

Kerry confuses pollution with CO2; CO2 is essential to life and there are clear benefits to more CO2.

Notwithstanding the stark choices that we face, here's the good thing: there is still time. The window of time is still open for us to be able to manage this threat. But the window is closing. And so I wanted to come to Jakarta to talk to you because we need people all over the world to raise their voices and to be heard. There is still time for us to significantly cut greenhouse emissions and prevent the very worst consequences of climate change from ever happening at all. **But we need to move on this, and we need to move together now. We just don't have time to let a few loud interests groups hijack the climate conversation. And when I say that, you know what I'm talking about? I'm talking about big companies that like it the way it is that don't want to change, and spend a lot of money to keep you and me and everybody from doing what we know we need to do.**

At least in the US, I know of no industry that does this; most go along with political correctness.

First and foremost, we should not allow a tiny minority of shoddy scientists and science and extreme ideologues to compete with scientific fact. Nor should we allow any room for those who think that the costs associated with doing the right thing outweigh the benefits. There are people who say, “Oh, it’s too expensive, we can’t do this.” No. No, folks. We certainly should not allow more time to be wasted by those who want to sit around debating whose responsibility it is to deal with this threat, while we come closer and closer to the point of no return.

So much for scientific inquiry or even the IPCC Scientific Working Group.

I have to tell you, this is really not a normal kind of difference of opinion between people. Sometimes you can have a reasonable argument and a reasonable disagreement over an opinion you may have. **This is not opinion. This is about facts. This is about science. The science is unequivocal. And those who refuse to believe it are simply burying their heads in the sand.** Not only doesn’t Kerry understand climate, he also doesn’t know what science is.

Now, President Obama and I believe very deeply that we do not have time for a meeting anywhere of the Flat Earth Society. One of the arguments that we do hear is that it’s going to be too expensive to be able to address climate change. I have to tell you, that assertion could not be less grounded in fact. In fact, it’s exactly the opposite. Serious analysts understand that the costs of doing nothing far outweigh the costs of investing in solutions now. You do not need a degree in economics or a graduate degree in business in order to understand that the cost of flooding, the cost of drought, the cost of famine, the cost of health care, the cost of addressing this challenge is simply far less – the costs of addressing this challenge are far less than the costs of doing nothing. Just look at the most recent analysis done by the World Bank, which estimates that by 2050, losses – excuse me one second – losses from flood damage in Asian ports – fishing ports, shipping ports – the losses in those ports alone could exceed \$1 trillion annually unless we make big changes to the infrastructure of those ports.

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Of course, some political figures skip any pretenses concerning science and move directly to their agenda.

Christiana Figueres, executive secretary of U.N.'s Framework Convention on Climate Change

"This is the first time in the history of mankind that we are setting ourselves the task of intentionally, within a defined period of time, to change the economic development model that has been reigning for at least 150 years, since the Industrial Revolution."

Ms. Figueres is not alone in taking this approach. Pope Francis' closest adviser castigated conservative climate change skeptics in the United States, blaming capitalism for their views. Speaking with journalists, Cardinal Oscar Rodríguez Maradiaga criticized certain "movements" in the United States that have preemptively come out in opposition to Francis's planned encyclical on climate change. "The ideology surrounding environmental issues is too tied to a capitalism that doesn't want to stop ruining the environment because they don't want to give up their profits."

It is difficult to know whether the statements of prominent political figures represents dishonesty, ignorance or both.

Ms. Figueres may be the most honest. No proposed measures will have any discernible impact on climate (regardless of one's view of the physics) unless one rolls back the industrial revolution everywhere and permanently. Of course, no country outside the western world would even consider this though they are perfectly happy to endorse the efforts of the West to do so.

As we have seen, advocates of alarm generally defend their position by appeal to consensus. However, as the late novelist Michael Crichton eloquently noted in a lecture at Cal Tech:

“In science consensus is irrelevant. What is relevant is reproducible results. The greatest scientists in history are great precisely because they broke with the consensus. There is no such thing as consensus science. If it’s consensus, it isn’t science. If it’s science, it isn’t consensus. Period.”

Ignoring the fact that consensus is peculiar to political rather than scientific discourse, it is still worth noting what any consensus as might exist actually consists in.

- Climate change exists.
- There has been warming since the Little Ice Age ended.
- Man’s emissions can contribute something to climate change.
- Levels of CO₂ in the atmosphere have been increasing.

There is, in fact, widespread agreement on the above. None of this implies alarm or catastrophe – except in the imagination of politicians, green campaigners, or the media.

However, given the iron triangle, it is unlikely that many scientists will complain about the misrepresentation of the consensus.

In view of the very serious implications of proposed policies alleged to deal with global warming such as the restriction of access to electricity for the 1.3 billion human beings currently without such access, and the increased poverty for billions more with its obvious implications for health and longevity, etc., not to mention foregoing the well-established benefits of added CO₂. It is clear that we really do have a potential planetary emergency. However, as is so often the case, the emergency does not arise from science and technology, but rather from politics. It is worth examining whether science can play a role in the mitigation of this emergency. It is doubtful whether the answer will consist in research grants. However, science has much at stake. Its hard earned *raison d'être* as our most effective tool for objective assessment is being squandered, and with it, the basis for public trust and support.

Thank you for your attention.

I hope that all of you will sleep better knowing that we only have to deal with the normal run of catastrophes provided by both nature and our political leaders, and that man-made climate change is unlikely to compete with these traditional sources.

