Rebuttal Comments to Boston Globe's Op/Ed Piece "Climate Changes are Proven Fact"

by ***Bill Gray***

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Comment by Bill Gray, Professor Emeritus, Colorado State University on Kerry Emanuel's Boston Globe (15 February 2010) Op/Ed piece titled "Climate Changes Are Proven Fact."

This piece has many inaccuracies, and in my view, is not a positive contribution to the global warming debate for the reasons I present in my rebuttal of various Emanuel statements.

Emanuel's Op/Ed piece is listed first, then a listing of some of Emanuel's specific comments are given in indented spacing followed by my responses.

Climate Changes Are Proven Fact

By Kerry Emanuel (MIT) | February 15, 2010
Boston Globe Op/Ed

OUTSIDE SCIENTIFIC forums, contemporary discussions of the phenomenon of global warming are now so heated that one wonders whether they are contributing to the phenomenon itself. With all the interest in alleged misdeeds of the Intergovernmental Panel on Climate Change and hacked email exchanges among climate scientists, it is easy to lose track of the compelling strands of scientific evidence that have led almost all climate scientists to conclude that mankind is altering climate in potentially dangerous ways. Recent suggestions by gubernatorial candidate Charles Baker that the scientific community is split on this issue have unfortunately added fuel to this largely manufactured debate.

A few essential points are undisputed among climate scientists. First, the surface temperature of the Earth is roughly 60 F higher than it would otherwise be thanks to a few greenhouse gasses that collectively make up only about 3 percent of the mass of our atmosphere.

Second, the concentrations of the two most important long-lived greenhouse gases, carbon dioxide and methane, have been increasing since the dawn of the industrial era; carbon dioxide alone has increased by about 40 percent. These increases have been brought about by fossil fuel combustion and changes in land use.

Third, in the absence of any feedbacks except for temperature itself, doubling carbon dioxide would increase the global average surface temperature by about 1.8 F. And fourth, global temperatures have been rising for roughly the past century and have so far increased by about 1.4 F. The rate of rise of surface temperature is consistent with predictions of human-caused global warming that date back to the 19th century and is larger than any natural change we have been able to discern for at least the past 1,000 years.

Disputes within climate science concern the nature and magnitude of feedback processes involving clouds and water vapor, uncertainties about the rate at which the oceans take up heat and carbon dioxide, the effects of air pollution, and the nature and importance of climate change effects such as rising sea level, increasing acidity of the ocean, and the incidence of weather hazards such as floods, droughts, storms, and heat waves. These uncertainties are reflected in divergent predictions of climate change made by computer models. For example, current models predict that a doubling of carbon dioxide should result in global mean temperature increases of anywhere from 2.5 to 7.5 F.

The uncertainties in the models, theory, and observations of climate change and associated risks and the sheer complexity of the problem provide many rounds of ammunition for the agenda-driven, be they apocalyptic or denialist. For the lawyerly, with the ability and will to cherry-pick the evidence, there is much ripe fruit to hurl in the increasingly heated climate wars of our generation. But when the dust settles, what we are left with is the evidence. And, in spite of all its complexity and uncertainties, we should not lose track of the simple fact that theory, actual observations of the planet, and complex models - however imperfect each is in isolation - all point to ongoing, potentially dangerous human alteration of climate.

It is easy to be critical of the models that are used to make such predictions - and we are - but they represent our best efforts to objectively predict climate; everything else is mere opinion and speculation. That they are uncertain cuts both ways; things might not turn out as badly as the models now suggest, but with equal probability, they could turn out worse. Science cannot now and probably never will be able to do better than to assign probabilities to various outcomes of the uncontrolled experiment we are now performing, and the time lag between emissions and the response of the climate to increasing greenhouse gas concentrations forces us to make decisions sooner than we would like. We do not have the luxury of waiting for scientific certainty, which will never come, nor does it do anyone any good to assassinate science, the messenger.

We have never before dealt with a problem that threatens not us, but our distant descendants. The philosophical, scientific, and political issues are unquestionably tough. We might begin by mustering the courage to confront the problem of climate change in an honest and open way.

Kerry Emanuel is director of the Program in Atmospheres, Oceans, and Climate at Massachusetts Institute of Technology.

REBUTTAL COMMENTS BY BILL GRAY

> *Emanuel "… compelling strands of scientific evidence that have led almost all climate scientists to conclude that mankind is altering climate in potentially dangerous ways."*

Gray – A high percentage of meteorologists and/or climate scientists do not agree that the climate changes we have seen are mostly man-made. Thousands of us think that the larger part of the climate changes we have observed over the last century are of natural origin. I believe that most of the changes that have been observed are due to multi-decadal and multi-century changes in deep global ocean currents. Such changes have yet to be properly incorporated into the global models or into most climate modeler's physical reasoning processes. Over 31 thousand American scientists have recently signed a petition advising the US not to sign any fossil fuel reduction treaty.

Many scientists believe that a slightly warmer CO_2 gas induced world, would be, in general, more beneficial for humanity. The small changes in climate we have seen so far and the changes we will likely see in the next number of decades are not potentially dangerous. It has been noted that vegetation growth is enhanced by higher CO_2 levels.

Emanuel "…, the surface temperature of the Earth is roughly 60 F higher than it would otherwise be thanks to a few greenhouse gasses that collectively make up only about 3 percent of the mass of our atmosphere."

Gray – The globe's greenhouse gas induced higher temperatures are due almost exclusively to water vapor (the overwelling greenhouse gas) not much at all due to CO_2 and methane. It is the variation of atmospheric water vapor (particularly in the upper troposphere) that is of dominant importance to the greenhouse gas warming question. It is likely that increases in CO_2 and other minor greenhouse gases will lead to small reductions in upper tropospheric water vapor which will bring about greater loss of infrared radiation energy flux to space. Increases in CO_2 and lesser greenhouse gases should (due to their influence on upper level water vapor) lead to little global temperature increase. Such conditions appear to be presently occurring. During the last decade and a half when CO_2 amounts have risen there has been an increased (not decreased) infrared radiation flux to space. Little or no global warming has occurred in the last decade.

Emanuel "…, in the absence of any feedbacks except for temperature itself, doubling carbon dioxide would increase the global average surface temperature by about 1.8 F."

Gray – You can't at the outset eliminate water vapor and cloud feedback and consider only temperature feedback and expect to have a realistic explanation of CO_2's future influence on global temperature. Water vapor and cloud feedback changes can negate most or all the lesser greenhouse gas influences on global temperature.

Emanuel "The rate of rise of surface temperature is consistent with predictions of human-caused global warming that date back to the 19th century and is larger than any natural change we have been able to discern for at least the past 1,000 years."

Gray – this is pure 'off-the-wall' assertion that the global warmers want to believe in because they do not want to consider other causes of climate change which would negate their human-induced warming hypothesis. The global warming community has yet to come to grips with the powerful potential climate altering influences of multi-decadal and multi-century changes in the globe's deep ocean circulations. The Medieval warm period and the early Holocene warm period are believed to have been warmer than today's temperatures. Some natural processes brought about these changes. Why could these same natural processes not be acting today?

Emanuel "… current models predict that a doubling of carbon dioxide should result in global mean temperature increases of anywhere from 2.5 to 7.5 F."

Gray – All the global General Circulation Models (GCMs) which predict future global temperature change for a doubling of CO_2 are badly flawed. They do not realistically handle the changes in upper tropospheric water vapor and cloudiness. They give unrealistically high upper-tropospheric moisture and temperature condition for CO_2 doubling. Model global warming estimates for a doubling of CO_2 are thought by thousands of us to be many times larger than what will likely occur. The GCMs are not yet simulating the fundamental influence of the multi-decadal and multi-century scale variations of the ocean's deep circulation patterns.

It should be noted that the GCMs have failed to account for the weak global cooling over the last decade. It is also important to note that the GCM groups do not make official shorter range global temperature forecasts of 1 to10 years which could accurately be verified. If they won't do this why

should we believe their forecasts at 50-100 years? Any experienced meteorologist or climate scientist who would actually believe a long range climate model should really have their head examined. They are living in a dream world.

> *Emanuel "… models… represent our best efforts to objectively predict climate; everything else is mere opinion and speculation."*

Gray – As discussed above, the global GCM climate models are likely our worst (not best) guide to the future. The physics and numerical coding within the global climate models will never be able to replicate the overly complex global atmosphere-ocean environment and its continuing changes. Especially so with the need for integrations over hundreds of thousands of time steps. Increases in future measurement detail accuracy and future increases in computer power will likely never be sufficient to make skillful long range climate modeling a possibility. Climate prediction skill should be considered and will likely continue to be about as reliable as long range stock prediction.

Our only guide to the future climate rests with the study of past observations of the globe together with judicious physical reasoning of the primary process which in the past have influenced climate change.

> *Emanuel "That they are uncertain cuts both ways; things might not turn out as badly as the models now suggest, but with equal probability, they could turn out worse."*

Gray – Ridiculous. The global models have grossly errored on the side of too much global warming though their assumptions of unrealistic positive water vapor feed-back loop and lack of consideration of deep ocean currents. There is absolutely no way the models could have underplayed the role of human-induced CO_2 increases on global warming.

> *Emanuel "We do not have the luxury of waiting for scientific certainty, which will never come, nor does it do anyone any good to assassinate science, the messenger."*

Gray – Living in an academic 'ivory tower' relieves Emanuel of having to face up to the hard economic and social realities of reducing fossil fuel usage. Following Emanuel's logic we should move to implement the Cap-and-Trade bill presently before Congress, agree to international standards to implement fossil fuel restrictions and follow UN-global government dictates. I wonder if Emanuel has factored in the ensuing much higher costs of renewable energy and the resulting significant lowering of the global population's standard of living, which large fossil fuel reductions would bring. I wonder if Emanuel realizes the effects these changes would have on the increased poverty and starvation within 3rd world countries. And has he considered how little the environment would really improve if such human sacrifices for nature were made?

We should all feel an obligation to assassinate 'faulty' science wherever we see it, including the blind belief (without evidence except the faulty models) that humans are largely responsible for climate change.

> *Emanuel "We might begin by mustering the courage to confront the problem of climate change in an honest and open way."*

Gray – Emanuel needs to make a better effort to follow his own advice. His Op/Ed piece is one-sided and is less than an honest and fair representation of the global warming controversy.

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