Comment by:

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on the

Scope of Considerations for the Notice of Intent To Prepare an Environmental Impact Statement for Model year 2022-2025 Corporate Average Fuel Economy Standards

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Docket ID: NHTSA-2017-0069

Agency: National Highway Traffic Safety Administration

Parent Agency: Department of Transportation

Due Date: September 25, 2017

Comment:

The National Highway Traffic Safety Administration (NHTSA) has asked for public comments on "determining the scope of considerations to be addressed in the EIS [environmental impact statement] and for identifying any significant environmental matters related to the proposed action".

On March 22, 2017, EPA Administrator Scott Pruitt and Secretary of Transportation Elaine Chao announced that they would reconsider EPA's Mid-Term Evaluation for 2022-2025 greenhouse gas emissions standards in order to allow additional consultation with NHTSA.

Accordingly, Docket NHTSA-2017-0069 states:

> ..NHTSA is obligated to conduct a *de novo* rulemaking, with fresh inputs and a fresh consideration and balancing of all relevant factors, to establish final CAFÉ standards…

And later that

> Similar to past EIS practice NHTSA plans to analyze environmental impacts related to fuel and energy use, emissions and their effects on climate change and the environment

and that the

> scoping process initiated by this notice seeks public comment on the range of alternatives under consideration, on the impacts to be considered, and on the most important matters for in-depth analysis in the EIS.

There is a paradigm-shift occurring in global warming that is highly relevant to the scope of the NHTSA EIS. It began with the revelation of remarkable and increasing discrepancies between the climate models (often referred to as CMIP5 models) in the most recent report of the U.N.'s Intergovernmental Panel on Climate Change (IPCC) and observations in the bulk atmosphere over vast swaths of the planet. Figure 1 is a stark representation of this in University of Alabama-Huntsville's John Christy's 2017 congressional testimony. A table of the related data subsequently appeared in the peer-reviewed literature in the Bulletin of the American Meteorological Society.

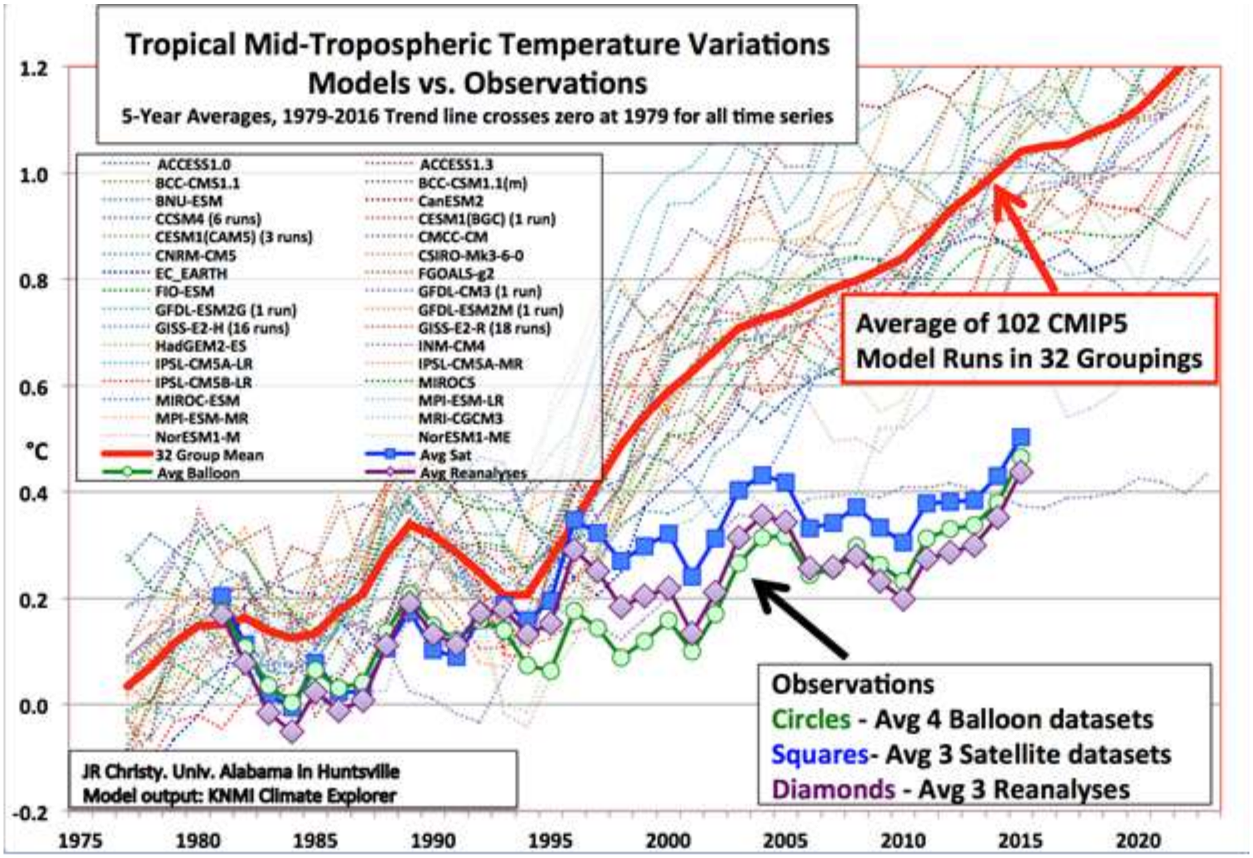

Figure 1. Average of the IPCC computer model projections for the tropical mid-troposphere versus three standard sets of observations. The disparity is large and growing. Source: March 29, 2017 Testimony of John Christy, hyperlinked above. This region covers over 37% of the planet.

Another Christy illustration (Figure 2) from the same testimony is truly discouraging with regard to the climate models:

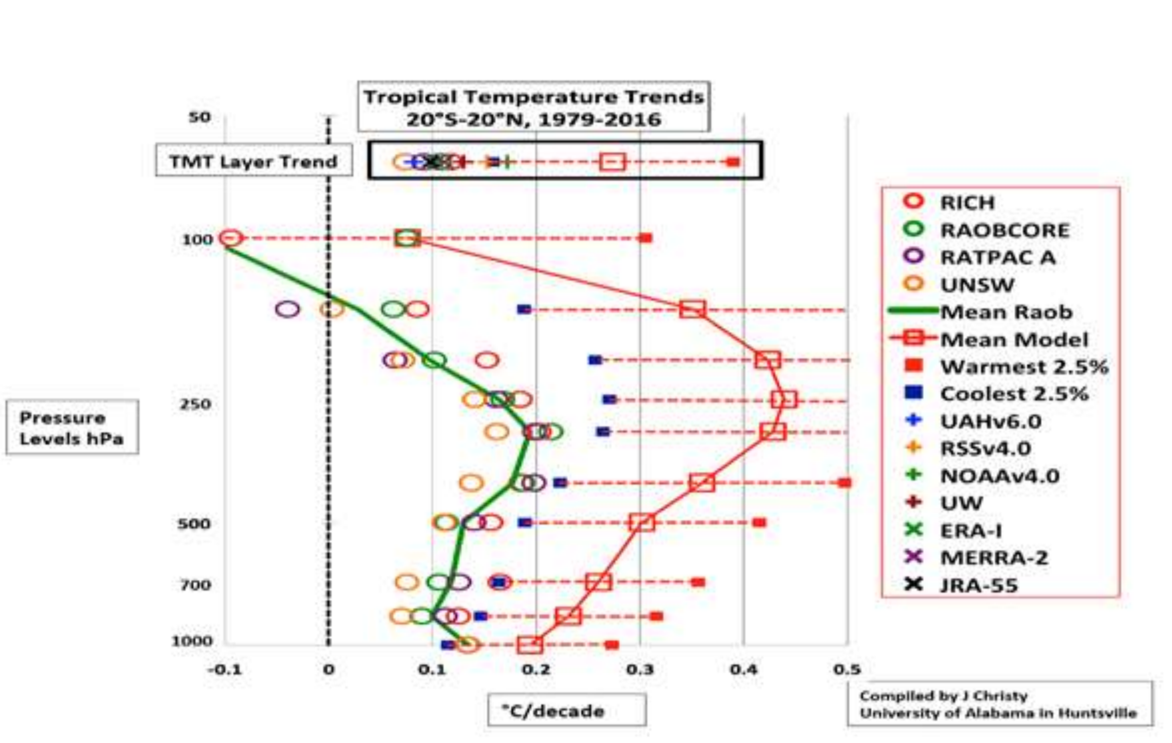

Figure 2. Observed (green) and predicted (red) rates of temperature change with height in the tropics. Figure S2 10 in the Bulletin of the American Meteorological Society report, State of the Climate in 2016.

The implications of this error are enormous. It means that vertical motion in the tropical troposphere is substantially and systematically underestimated in most of the climate models, which means in reality there is a stronger Hadley circulation, a stronger subtropical subsidence, and stronger trade winds. It is important to understand that the weather regime implications of these errors, which are large, have not been quantified. In general, it is the vertical stratification of temperature that determines tropical precipitation and cloudiness. The models must be systematically predicting a less cloudy and precipitating atmosphere than is being observed, an enormously important error, and vital to calculating any water vapor feedback, which is the major reason that these models can produce more than the approximately 1°C of warming resulting directly from doubling atmospheric carbon dioxide.

A vast amount of atmospheric water vapor originates in the tropics and is transported vertically through the low-level tropical inversion, ultimately entering the planet's general circulation. The amount of moisture flux is determined by the vertical temperature contrast. This single but widespread error therefore results in unreliable precipitation forecasts worldwide, which in turn effects how the sun's radiation is partitioned in the earth-atmosphere system. The error means that the CMIP5 general circulation models, which are the ones used by the IPCC, cannot be a basis for the scope of the NHTSA environmental impact statement.

The mean sensitivity of these models[1], which is 3.2^{o}C, therefore should not be considered as the mean of the scope of the EIS. The growing discrepancy between predicted and observed bulk temperatures is reason enough to eliminate these models.

There is an alternative that is much more logically defensible. Given bad forecasts, why not use what is being observed? Beginning in 2011, a substantial number sensitivity estimates have been calculated using real-world observations. A partial list is in Figure 3 and in the References to this Comment.

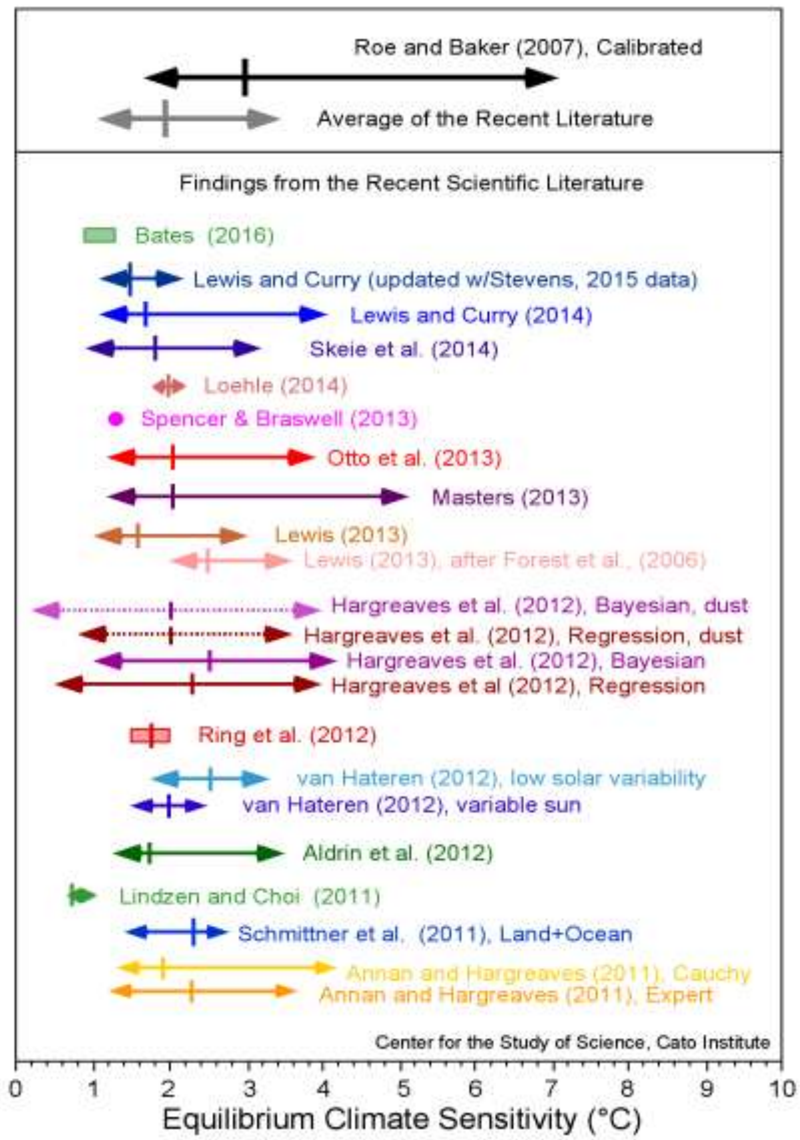

Figure 3. Observation-based calculations of climate sensitivity beginning in 2011 produce about 60% of the warming of the CMIP5 models. From Michaels and Knappenberger, 2016, with citations also at the end of this Comment.

[1] "sensitivity" is the net surface warming resulting from a doubling of atmospheric carbon dioxide.

These generally yield a lower sensitivity, with a mean value of around 2.0^{o}C and a 90 percent confidence interval from 1.5 to 3.5^{o}C. This is given on the top of Figure 3, along with the highly inflated distribution used by the Obama Administrations, given as Roe and Baker, 2007. This is based upon models displaying the errors show in Figures 1 and 2, and should clearly not be included in the scope of the NHTSA EIS.

It is important to note that the baseline "business as usual" (BAU) emissions scenario used for the Paris accord is in error. It has an increase in net radiative forcing by 2100 of 8.5 watts/m^2, and the structural assumptions are a large increase in the use of coal for electrical generation and no change in the use of more cost-competitive natural gas. The experience of the world's second-largest emitter, the United States, shows this to be wrong. Gas is rapidly replacing coal; the implications are noted below.

Two very recent publications (one of which is currently in press) underscore the need to use a lower, reality-based sensitivity. Millar et al. (2017) found that the overprediction of warming since 2000 has serious consequences for future warming, and they argued that, because of it, meeting the Paris aspirational goal of 1.5^{o}C of warming by 2100 could happen if emissions were reduced by 70% of the BAU emissions that were used to calculate the effects of Paris.

There is a fundamental error in this approach, noted by Michaels (2017, in press). It assumes that the warming of the early 20th century (1910-45), which is statistically similar to the warming that began in the late 1970s and continued until "the pause" in 1997 (warming resumed in 2015) was anthropogenerated. If, as Stevens (2015) has shown, the cooling effects of anthropogenerated sulfate aerosols has been greatly overestimated, it then follows that assuming the early-century warming is caused by increasing carbon dioxide would mean that the subsequent warming would have to be enormous, which it clearly is not. In fact, tinkering with forcings in many aspects of the climate models is ubiquitous, and, as shown by Voosen (2016), they are all "tuned" to mimic both periods of warming, a logical impossibility unless the sulfate cooling in recent decades is assumed to be enormous. Stevens (2015) has shown that there is no support for this.

Consequently, Millar et al., have made the same fundamental error in attributing the early 20th century warming to human activity. Discounting this warming, emissions reductions would have to be only 50% to hold anthropogenerated warming to 2100 to 1.5^{o}C, and a quite achievable 25% reduction to limit it to the top number in the Paris accord, which is 2.0^{o}C. Global substitution of natural gas for coal in new electrical generation facilities would go a long way towards meeting this goal, as argued in Michaels (2017 in press).

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The importance of this to the NHTSA EIS can't be overstated. To summarize: it is now accepted that the average sensitivity in the CMIP5 models must be discounted, and that the baseline BAU emissions scenario for Paris is too high. Michaels (2017 in press) argues that, making these adjustments results in the world successfully meeting the high end warming allowed by Paris. Therefore, the scope of the NHTSA EIS must include a scenario where 2022-2025 CAFÉ standards are unchanged from the 2021 standard.

Summary

This document is in response to NHTSA's solicitation of public comments on the scope of their Environmental Impact Statement on 2022-2025 CAFÉ standards.

It is shown here that the CMIP5 suite of climate models, used by the IPCC and governments worldwide to craft global warming policy, including the Paris accord, have made a fundamental error in predicting too much warming in the early 21st century. Recent research, prominently published in *Nature Geosciences*, demonstrates that subsequent predicted warming must be reduced, and that a 1.5^{o}C warming by 2100 could be achieved by reducing emissions eventually by 70%.

Additionally, as shown above, the CMIP5 models have made an enormous error in horizontal and vertical temperature predictions for the bulk tropical troposphere, which covers 37% of the earth and is the source for much of the world's rainfall. The propagation of forecast errors for sensible weather regimes through the CMIP5 models as a result of this has not been quantified, but it must be enormous, another reason to substitute real-world based sensitivity calculations, which are, on average, 40% lower than the CMIP5 sensitivity. NHTSA would be better serve by using a mean equilibrium climate sensitivity of 2.0^{o}C, and a 90% probability range of 1.5-3.5^{o}C.

The aforementioned publication has a fundamental error in that it assumes that the warming of the early 20th century was anthropogenerated. Adjusting for this, as was done in Michaels (2017 in press), along with an assumption that favorable economics will hasten a transition from coal to natural gas for electrical generation means that the reductions necessary to meet the Paris accord are only 30%, which will be feasible.

The lower end of the 2022-25 CAFÉ standards considered by NHTSA in its EIS must therefore be the 2021 standard.

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