

Global Warming is not a Hoax

by Bill Menke, June 2, 2017, in response to a request by Mongabay¹

Back in 1897, the Indiana State Legislature was on the verge of declaring that, contrary to mathematical proof, the circle really could be squared (and, incidentally, that the value of pi really was exactly 3.2), when solid arguments by a Purdue mathematics professor caused legislators to reconsider. The physics of global warming is as scientifically irrefutable as the mathematical properties of the number pi. The world MUST warm as the burning of fossil fuels causes atmospheric CO₂ levels to rise. Warming will only cease when people take action to reduce CO₂; no legislation, no executive policy and no political theory that does not lead to CO₂ reductions can be effectual, for the laws of physics cannot be gainsaid. Scientists throughout the US must repeat this message in every conceivable forum: Climate change is not a hoax and those who believe it to be one need to reconsider, for inaction today endangers the next generation, both in America and around the world.

¹"Mongabay is preparing an article for release when/if the Trump administration makes its final decision withdrawing from the Paris Climate Agreement this week. The article will include comments from scientists from around the world. We're hoping that you can be part of this effort ...", Glenn Scherer, Mongabay Contributing Editor, glenn@mongabay.com.

Addendum (June 6, 2017): The New York Times² quotes Gwen Beatty, a Junior at a Wellston Ohio high school, as saying in connection to Climate Change, "Scientists are wrong all the time". I do not agree with Ms. Beatty's "all the time" portraiture, yet certainly scientists have been wrong on occasion; furthermore, climate change is a high-stakes issue in which erroneous advice is guaranteed to cause hardship to many people around the world. Two factors convince me that scientists are right about climate change. First, the underlying physics of heat transfer, which is really what global warming is all about, is very well understood and applicable to not only to the Earth's atmosphere, but to Venus' (where it does an excellent job in predicting the hellishly hot surface temperature of that planet³) and to many industrial processes, where it has proven to work. Second,

the question that we human beings are implicitly posing - whether anthropogenic CO₂ release can continue *indefinitely* without the world warming - is an extremely straightforward one to which the answer is simply, *no*. The key prediction being made by climate scientists is the sensitivity of the Earth's surface temperature to increased levels of atmospheric CO₂ and this number⁴ has a statistical uncertainty. This level of uncertainty would be relevant if we human beings were planning to double atmospheric CO₂ from pre-industrial levels (which will happen around the year 2100) and then stop, for we would like to be able to access whether we had stopped *in time*. It is irrelevant in a world in which we intend to reach this level - and keep going. In that scenario, the world *must* warm, and even given the uncertainties, scientists can confidently predict that the warming will be problematic.

²Harmon, A., Climate Science Meets a Stubborn Obstacle: Students, A., New York Times, June 4, 2017.

³Pollack, J.B. O.B.Toon and R. Boese, Greenhouse models of Venus' high surface temperature, as constrained by Pioneer Venus measurements, J. Geophys. Res. 85, 8223-8231, 1980.

⁴A consensus figure is 2.6–4.1 °C for a doubling of atmospheric levels of CO₂.