

## Open Letter to Tony Evers and Lowell Holtz

**As a candidate for the office of State Superintendent of Public Instruction we call on you to support basic climate literacy as a goal for every Wisconsin high school graduate, including an understanding of the scientific consensus on the nature, extent, causes and major impacts of global warming.**

Modern science has been a collective enterprise since the first National Academies of Science in Italy, Britain and France in the 1600s.<sup>1</sup> Scientific ideas need evidence. And, until both the idea and the evidence have been judged by a jury of scientific peers—it's just a claim. Peer review is critical to separate scientific facts from claims.

Today, the gold standard for science is a paper published in a peer-reviewed journal. There are over 120,000 peer-reviewed climate papers.<sup>2</sup> In the early 1990's, the total was less than 1,000. Now there are over 1,000 a month. As a result, we know so much more now than we did in 1990...and, we know it with so much more confidence.

You can summarize those 120,000 papers on global warming in a few words.

1. It's real.
2. It's humans.
3. It's dangerous.
4. Climate scientists overwhelmingly agree on those first three points.
5. We've got solutions that are technically feasible, economically advantageous, and effectively protect public health and welfare.

However, scientific knowledge never gives us absolute certainty or proof. Modern science is just a consensus of experts.<sup>3</sup> And, unlike 20 or 25 years ago, today, the scientific consensus on climate change is overwhelming.

From 2004 to 2015, there were 7 major surveys of climate scientists<sup>4</sup> —particularly, those who publish in peer-reviewed journals. Five of the seven surveys found a 97% to 100% consensus that it's real...it's us...it's dangerous. Even when survey questions were phrased to test how sure or confident they were in that opinion, more than 9 out of 10 climate scientists agreed with the scientific consensus. The American Association for the Advancement of Science called this level of consensus among climate scientists as strong as the consensus among doctors that cigarettes cause strokes and heart disease.<sup>5</sup>

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<sup>1</sup> "Modern science." Oreskes, Naomi; Conway, Erik M. [Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming](#). Bloomsbury Press (2010). The authors are historians of science at Harvard (Oreskes) and NASA's Jet Propulsion Laboratory (Conway).

<sup>2</sup> <http://www.carbonbrief.org/analysis-the-most-cited-climate-change-papers> Almost 120,000 research articles with "climate change" or "global warming" in the key words or abstract up to 2014. Data from *Scopus*. Credit: Rosamund Pearce, Carbon Brief, July 2015.

<sup>3</sup> "Modern science." Oreskes, Naomi; Conway, Erik M. [Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming](#). Bloomsbury Press (2010).

<sup>4</sup> The authors of 7 major surveys of climate scientists from 2004 to 2015 published a joint paper on the consensus in 2016. Cook et al. (2016). Intermediate-level explanation: <https://skepticalscience.com/global-warming-scientific-consensus.htm> Advanced explanation: <https://skepticalscience.com/global-warming-scientific-consensus.htm>

<sup>5</sup> [http://whatweknow.aaas.org/wp-content/uploads/2014/07/whatweknow\\_website.pdf](http://whatweknow.aaas.org/wp-content/uploads/2014/07/whatweknow_website.pdf) "The science linking human activities to climate change is analogous to the science linking smoking to lung and cardiovascular diseases." What We Know: The Reality, Risk and Response to Climate Change, American Association for the Advancement of Science, 2014, p. 1.

And, it's not just climate scientists. 80 National Academies of Science—representing the best minds from other scientific disciplines across the world—agree.<sup>6</sup> Global warming is real, primarily caused by human activity, and dangerous. None of them disagree.

Finally, we would like to point out three things that make climate change a **uniquely** dangerous problem—unlike any other social problem we've ever seen. No other social problem has all three.

1. **Time limit.** Climate change comes with a time limit—in this case, for safely burning fossil fuels. What's the time limit on human activity continuing to emit 40 billion metric tons of CO<sub>2</sub> a year? At that rate, to stay below the 2C threshold for “dangerous” warming we've got about 20 to 25 years,<sup>7</sup> or about one generation. But, after that, human CO<sub>2</sub> emissions would need to be zero.
2. **No reverse gear.** What happens if we actually get to zero CO<sub>2</sub> emissions? Unfortunately, that's the second problem. Climate change has no reverse gear—at least not on any human time scale. A 2009 study led by (then) NOAA climate scientist, Susan Solomon, found that once we stop **ALL** CO<sub>2</sub> emissions, “temperatures do not drop significantly for at least 1,000 years.”<sup>8</sup> That's 40 or 50 human generations. Climate change is not like education reform or health care where a few years of sustained attention can reverse decades of neglect.
3. **“Doing nothing” risks civilization as we know it.**<sup>9</sup> Today's youngest students face that possibility within their lifetimes. With most social problems, “doing nothing” maintains the status quo. Things don't get better...they don't get worse. Since we can all agree that risking civilization is not an option, doing nothing about climate change is not an option.

In order to ensure a stable climate for our children and the generations that will follow them, here and around the world, we urge you to make climate literacy for every Wisconsin high school graduate an important priority if you are elected Wisconsin's next Superintendent of Public Instruction.

Sincerely,

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<sup>6</sup> Global map listing 80 National Academies of Science from <https://www.skepticalscience.com/global-warming-scientific-consensus-intermediate.htm>

<sup>7</sup> May 2016 Carbon Brief: <https://www.carbonbrief.org/analysis-only-five-years-left-before-one-point-five-c-budget-is-blown>.

<sup>8</sup> *Irreversible climate change due to carbon dioxide emissions*, PNAS (2009) Susan Solomon, Gian-Kasper Plattner, Reto Knutti, and Pierre Friedlingstein <http://www.pnas.org/content/106/6/1704.full.pdf>

<sup>9</sup> “Why then are climatologists speaking out about the dangers of global warming? The answer is that virtually all of us are now convinced that **global warming poses a clear and present danger to civilization.**” **Dr. Lonnie G. Thompson**, Distinguished University Professor in the School of Earth Science at Ohio State University, winner of the National Medal of Science, member of the U.S. National Academy of Sciences, arguably the most distinguished glaciologist/paleoclimatologist in the world, “[Climate Change: The Evidence and Our Options](#)”, Byrd Polar Research Center Publication 1402, Fall 2010.

**Dick Smith**  
**Citizens' Climate Lobby**  
**Wisconsin**

**Keith Reopelle**  
**Senior Policy Director**  
**Clean Wisconsin**

**Ashwat Narayanan**  
**Director of Transportation Policy**  
**1000 Friends of Wisconsin**

**Peter Bakken**  
**Coordinator – Public Policy**  
**Wisconsin Council of Churches**

**Terry Wiggins**  
**Interfaith Earth Network**  
**of Southeastern Wisconsin**

**Maha Ezalarab**  
**Executive Director**  
**Physicians for Social Responsibility--Wisconsin**

**Reverend Cindy Crane**  
**Director**  
**Lutheran Office for Public Policy in Wisconsin**

**Alexandra Bryant**  
**Steering Committee**  
**Wisconsin Health Education Network**

**John Helt**  
**Board President**  
**Wisconsin Interfaith Power & Light**

**Paul Geenen**  
**WI State Lead**  
**Organizing for Action**

**Mark Gill**  
**Organizer**  
**Climate Action Round Table**

**Jeremy Gragert**  
**Progressive Students and Alumni**  
**Eau Claire**

**Mitch Brey**  
**Campaign Director**  
**RePower Madison**

**Huda Alkaff**  
**Founder and Director**  
**Wisconsin Green Muslims**

**Don Ferber**  
**John Muir Chapter**  
**Sierra Club**