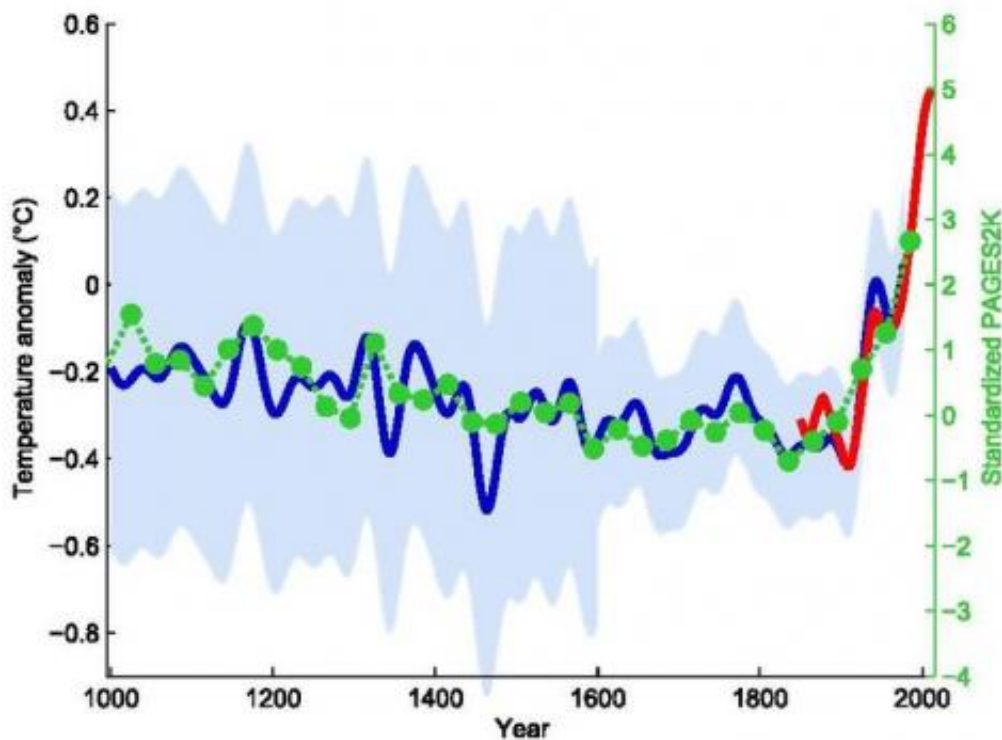


Iconic graph at center of climate debate

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The original northern hemisphere hockey stick graph of Mann, Bradley & Hughes 1999, smoothed curve shown in blue with its uncertainty range in light blue, overlaid with green dots showing the 30-year global average of the PAGES 2k Consortium 2013 reconstruction. The red curve shows measured global mean temperature, according to HadCRUT4 data from 1850 to 2013. Credit: Klaus Bittermann/Wikipedia

The "Hockey Stick" graph, a simple plot representing temperature over time, led to the center of the larger debate on climate change, and

skewed the trajectory of at least one researcher, according to Michael Mann, Distinguished Professor of Meteorology, Penn State.

"The ["Hockey Stick" graph](#) became a central icon in the climate wars," Mann told attendees today (Feb. 11) at the annual meeting of the American Association for the Advancement of Science. "The graph took on a life of its own."

Mann and his coauthors, Raymond S. Bradley and Malcolm K Hughes, created the graph for a paper, "Northern hemisphere temperatures during the past millennium: Inferences, uncertainties, and limitations" which appeared in *Geophysical Research Letters* in 1999. In 2001, the Intergovernmental Panel on Climate Change published a version of the graph in its report, pushing the hockey stick depiction of temperature trends to the forefront of the climate change discussion.

"There have been dozens of other climate reconstructions, all very similar to ours," said Mann. "They are based on different data and different approaches, and of course everyone thinks their approach is best, but they all imply that the modern warming spike is unique. And still the Hockey Stick remains the iconic graph."

The original paper and the IPCC report demonstrated that temperature had risen with the increase in industrialization and use of fossil fuels. The researchers' conclusion was that worldwide human activity since the industrial age had raised carbon dioxide levels, trapping greenhouse gases in the atmosphere and warming the planet.

But the iconic graph engendered attacks, including calls for into the validity and veracity of the research. Subsequent investigations by the National Academy of Sciences, The National Science Foundation and Penn State all found the research both honest and solid.

Mann is quick to point out that there are two entirely distinct debates taking place when it comes to climate change research. One is the legitimate scientific challenging of research results that is part of the give and take of the scientific method all done in good faith to help advance the forefront of our knowledge. The other consists of bad faith attacks on scientists and the science, intended to advance some agenda—political, religious or economic.

Mann was thrust into a larger-than-life role in the climate debate because of the notoriety of the Hockey Stick Graph. As a scientist he was dragged along with his research to a place most scientists do not go and generally do not want to go.

"I was forced to take on a role very different than the one that I had envisioned," said Mann.

In 2012, Mann published "The Hockey Stick and the Climate Wars: Dispatches from the Front Lines," (Columbia University Press) describing his experiences as a reluctant figure in the [climate change](#) debate.

"This was not what I envisioned I would be doing when I chose to be a scientist, but over time I have grown to embrace this role," said Mann. "I feel privileged to be in a position to inform the larger public discourse over what may be the greatest challenge civilization has faced."

Provided by Pennsylvania State University

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