

New research shows scientific agreement on anthropogenic nature of climate change strengthened since 2009

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Scientific support for the link between human activity and climate change has strengthened to the extent that there is now near universal agreement. Whereas in 1996, reports hedged statements with phrases such as "the balance of evidence suggests..." (Houston et al 1996), this evolved to "it is extremely likely that human influence has been the

dominant cause of the observed warming since the mid-20th century" (Qin et al., 2014) and the more recent observation that "human influence on the climate system is now an established fact" (2021 IPCC Technical Summary).

A new paper from an international team of researchers published today in *Environmental Research Letters* looks at how [scientific consensus](#) on anthropogenic global warming (AGW) has evolved over the last 10 years. The research study led by Krista Myers and Peter Doran from Louisiana State University, with John Cook from Monash University and John Kotcher and Teresa A. Myers from George Mason University is based on the results of a survey of Earth Scientists conducted in September 2019. It follows the trail of a similar study carried out by Doran and Kendall Zimmermann in 2009.

"Although there have been many studies finding a [consensus](#) amongst [climate scientists](#), there's little research into exactly how agreement has evolved over time and how different definitions of climate expertise shape that view," explains John Cook. "This is the first time the methodology of the 2009 study has been replicated to measure how climate consensus has strengthened over time."

Of the 10,929 earth scientists invited to take the survey, 2,780 responded. Across all definitions of climate expertise, the survey responses indicated that there is strong and robust consensus among geoscientists that the Earth's temperature is getting warmer mostly because of [human activity](#).

Out of all survey respondents who answered the primary question about the cause of global warming (n = 2,548), 91.1 percent responded that the Earth is getting warmer mostly because of human activity. This is roughly 11 percentage points higher than the 80 percent agreement found by the 2009 study when asking a similar question about AGW. In

addition, the authors found that 100 percent of the most actively publishing climate experts—those who had published 20 or more climate papers each between 2015 and 2019—accept that global warming is human-caused.

"The findings show that consensus has increased across the board. The findings also reaffirm that consensus increases with the level of expertise—the more you know about climate science, the more likely you are to understand that humans are responsible for [climate change](#). Near 100 percent of scientists in our most expert group who identify as climatologists and actively publish in the peer-reviewed literature are in complete agreement that climate change is real and caused by humans," says Peter Doran.

When analyzing the responses by subdiscipline, the authors found that those who self-identified as Economic Geologists had the lowest level of consensus with 84.1 percent agreeing with AGW. The 2009 Doran and Kendal Zimmerman study also found economic geologists to be the most skeptical, but with a much lower 47 percent agreement with AGW which indicates a significant increase in consensus amongst this subgroup over the last 10 years. The authors also found a large increase in the level of agreement on AGW among those self-identifying as meteorologists—from 64 percent in the 2009 study to 91 percent in the 2019 study.

The authors conclude that "given the persistent gap between expert consensus on anthropogenic global warming and public understanding, it is imperative to strengthen efforts to engage and educate people about the scientific consensus on climate change. Such efforts are essential to helping our society make more informed decisions about how to stabilize our [climate](#)."

More information: Consensus revisited: quantifying scientific

agreement on climate change and climate expertise among Earth scientists 10 years later, *Environmental Research Letters* (2021). DOI: [10.1088/1748-9326/ac2774](https://doi.org/10.1088/1748-9326/ac2774)

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