Understanding climate change in America: Skepticism, dogmatism and personal experience

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Published: December 18, 2025 8:36am EDT

Warmer temperatures can supercharge storms.

Joe Raedle/Getty Images

Scientists are trained to be professional skeptics: to always judge the validity of a claim or finding on the basis of objective, empirical evidence. They are not cynics; they just ask themselves and each other a lot of questions.

If they see a claim that a finding is true, they will ask: “Why?” They may hypothesize that if that finding is true, then some related findings must also be true. If it’s unclear whether one or more of those other findings is true, they will do more work to find out.

It is no wonder that science moves so slowly, especially on really important topics such as climate change.

Dogmatism is the opposite of skepticism. It is the proclivity to assert opinions as unequivocally true without taking account of contrary evidence or the contradictory findings. It is why public debate over scientific findings never seems to go away.

An example of the difference is the reaction to the Intergovernmental Panel on Climate Change's finding in 1995 that "evidence suggests a discernible human influence on global climate." The IPCC's assessment reports involve hundreds of researchers from around the world who reviewed the global scientific understanding of the planet's changing climate.

It's an instructive case in the differences between skepticism and dogmatism, and it's something to think about as you hear people talk about climate change.

Origins of a dogmatic response

Shortly after the IPCC released that finding in 1995, persistent and well-organized attacks on the science began. Many came from groups supported by the owners of Koch Industries, a conglomerate involved in oil refining and chemicals.

Their strategies mimicked earlier assaults on science and scientists who had warned the public that smoking posed a serious threat to their health. This time it was a warning about fossil fuels' impact on the climate.

The similarity should not be a surprise. Science historians Naomi Oreskes and Erik Conway, in their 2011 book "Merchants of Doubt," and American historian Nancy MacLean, in her 2010 book "Democracy in Chains," have explained how the strategy was written by some of the same people who had tried to stop efforts to tighten tobacco regulations a decade or so earlier.

The dogma presented to the public for fighting regulation held that personal freedoms are paramount and that they are not to be diminished by any efforts designed explicitly to improve the general welfare.

What a skeptical response looks like

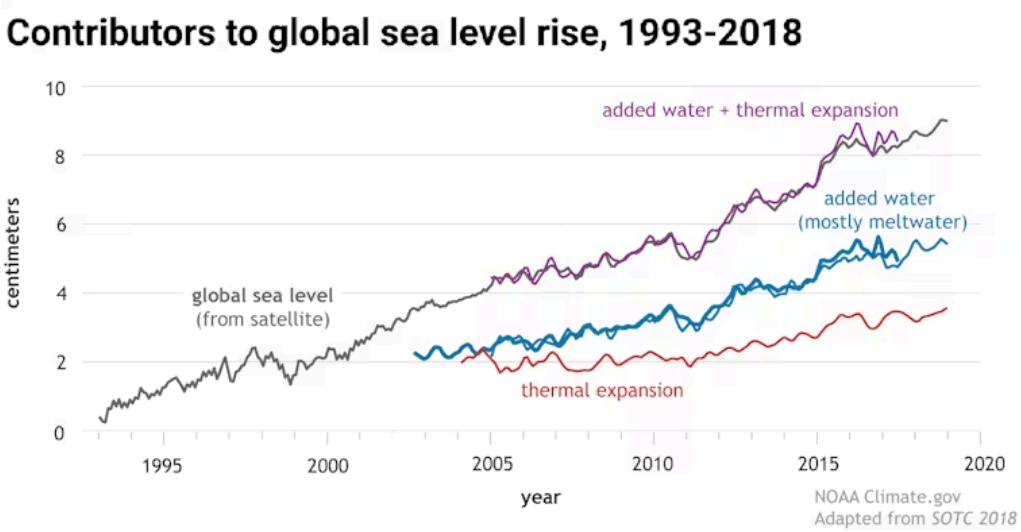
Climate scientists understood in 1995 that they must provide more than laboratory results, which go back to Svante Arrhenius' work in 1895 demonstrating a causal correlation between increasing carbon dioxide concentrations and rising temperatures.

They also accepted the challenge of exploring collections of associated effects that should also be true if human activity was changing the climate.

Scientists have since examined dozens of different independently monitored aspects of climate change and confirmed the expected fingerprints of climate change all around the world.

Since the upper layers of the oceans absorb 90% of the atmosphere’s excess heat, they should be persistently warming as global temperatures rise. Has that happened? Yes, it has.

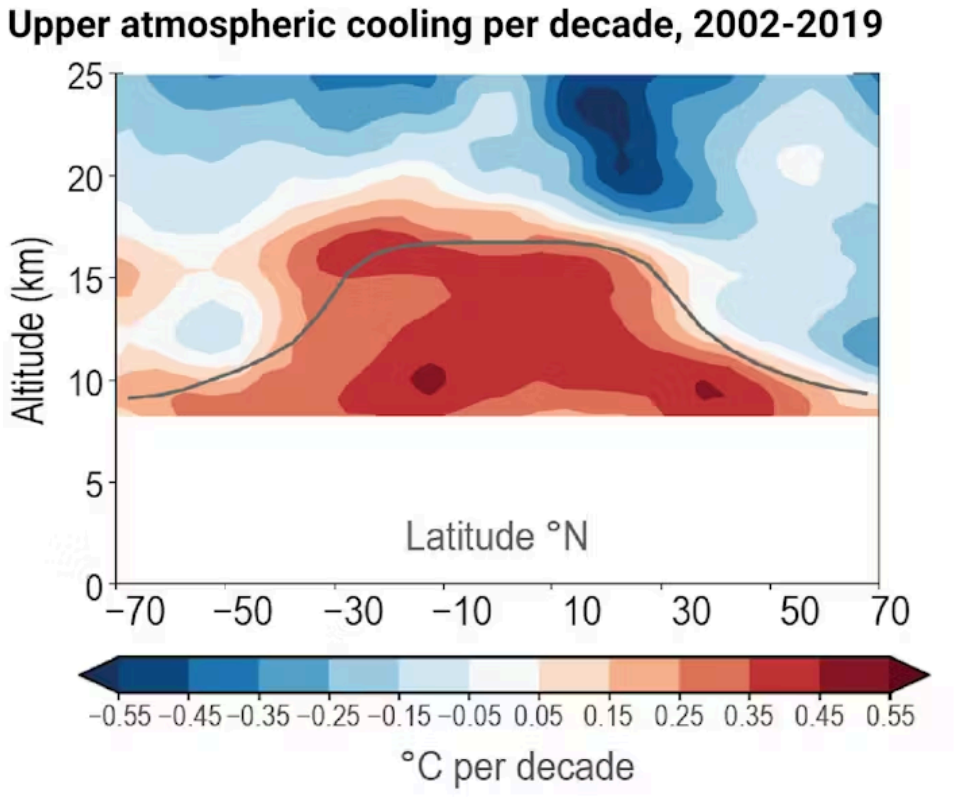
Since land-based ice melts when temperatures get too warm, global sea level should rise. And it should rise by more than would happen with thermal expansion of warming ocean water alone. Is it? Data shows that it is.



The major contributors to sea level rise.

NOAA Climate.gov

Syukuro Manabe and Richard Wetherald argued in 1967 that the upper atmosphere should cool while surface temperatures rise in response to higher carbon dioxide concentrations. Has it cooled over the past 50 years? Yes, it has, just as Manabe predicted.



The upper atmosphere has been cooling while the lower atosphere, close to Earth's surface, has warmed over the past two decades. The gray line marks the tropopause, between the lower troposphere and higher stratosphere.

IPCC 6th Assessment Report

By 2021, as the evidence piled up, the IPCC's Sixth Assessment stated: "It is unequivocal that human influence has warmed the global climate system since pre-industrial times. Combining the evidence from across the climate system increases the level of confidence in the attribution of observed climate change to human influence and reduces the uncertainties associated with assessments based on single variables. Large-scale indicators of climate change in the atmosphere, ocean, cryosphere and at the land surface show clear responses to human influence consistent with those expected based on model simulations and physical understanding."

Convincing the public

But has the public been convinced? The data on this is mixed.

Annual surveys conducted by the Yale Program on Climate Change Communication have found that the percentage of Americans “alarmed” about climate change rose over the past 11 years – from 15% in 2014 to 26% in 2024. And they show that much of that increase came from an increase in concern among Americans who earlier considered themselves “concerned” or “cautious.”

Over the same time period, though, the proportion of citizens in the survey who considered themselves “disengaged,” “doubtful” or “dismissive” shrank only modestly, from 29% to 27%.

Other surveys suggest that personal experience likely plays a significant role in how people understand climate change.

Many local and national news stations have mentioned climate change as a contributing factor in their extensive coverage of destructive wildfires in Los Angeles and Hawaii, flash floods in North Carolina and Texas, persistent drought across the Southwest, extreme heat waves and destructive hurricanes.

Some of their viewers could certainly be coming around to believing what evidence shows: that climate-related disasters have become more frequent and more intense.

Americans are also directly experiencing other effects of climate change on their homes, health and wallets. For example:

- Doctors in the North are seeing increasing cases of Lyme disease. Those in the South have been witnessing a rising number of cases of dengue fever. Both are spread by insects whose ranges are expanding as temperatures rise.
- Lobster populations have collapsed in Long Island Sound and flourished farther north in Canada's Bay of Fundy.
- Residents in southern New England now enjoy feeding bluebirds in winter.
- Homeowners across the U.S. are seeing their property insurance premiums quickly rise as disaster risks increase. Many others can't get coverage from insurance companies at all because of their area's disaster risks.

Stories like these do not make the national news very often, but they do show up in conversations around the kitchen table.

Reaching those with dismissive views

So, how can those Americans who are dismissive of climate change be reached? Some dogmatically believe claims that "climate change is a hoax" despite ever-growing evidence to the contrary.

Talking about personal experiences with extreme weather events, wildfires or droughts and their connections to rising global temperatures can help.

It might also help to remind them of failed dogma from the past that was disproved by science, yet people continued for years to believe them. For example, we know today that the Earth is not flat, the Sun does not circle the Earth, and living organisms cannot materialize spontaneously from nonliving matter.

The shift in public perceptions of climate risks leaves me hopeful that more people are acknowledging the scientific understanding of climate change and catching up with the climate scientists who have produced, questioned, reexamined and reaffirmed their findings through rigorous application of the scientific method.

Gary W. Yohe does not work for, consult, own shares in or receive funding from any company or organization that would benefit from this article, and has disclosed no relevant affiliations beyond their academic appointment.