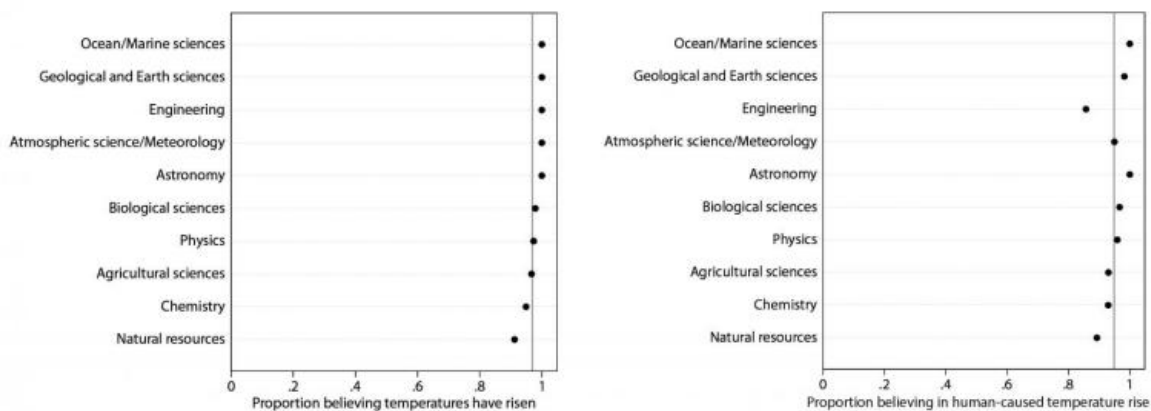


# Climate change consensus extends beyond climate scientists

September 24 2015

Climate change beliefs by academic discipline



This figure shows the proportion of Big Ten university scientists, sorted by academic discipline, who said they believe average global temperatures have risen from pre-1800s levels (left) and that human activity has significantly contributed to the rise (right). The vertical line represents the average. Credit: *Environmental Research Letters* image/J. Stuart Carlton

A Purdue University-led survey of nearly 700 scientists from non-climate disciplines shows that more than 90 percent believe that average global temperatures are higher than pre-1800s levels and that human activity has significantly contributed to the rise.

The study is the first to show that consensus on human-caused climate change extends beyond climate scientists to the broader scientific community, said Linda Prokopy, a professor of natural resource social science.

"Our survey indicates that an overwhelming majority of scientists across disciplines believe in [anthropogenic climate change](#), are highly certain of these beliefs and find climate science to be credible," Prokopy said.

"Our results also suggest that scientists who are climate change skeptics are well in the minority."

Previous studies have shown that about 97 percent of actively publishing climate scientists believe in human-caused climate change, and a review of scientific literature on the existence of climate change indicated that about 97 percent of studies affirm climate change is happening.

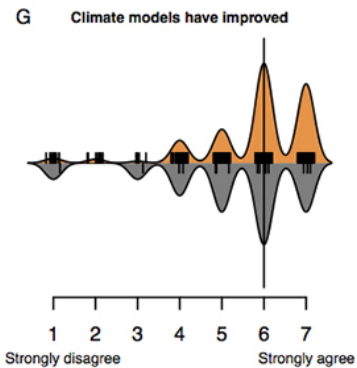
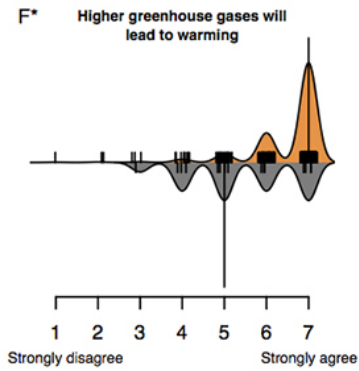
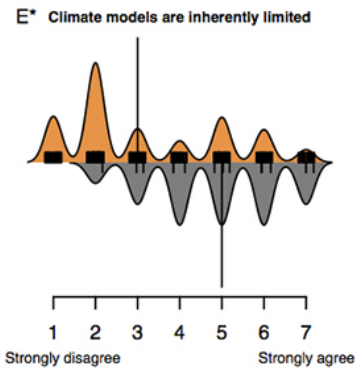
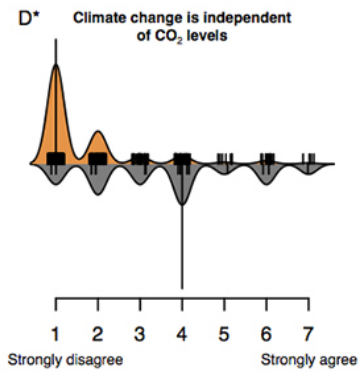
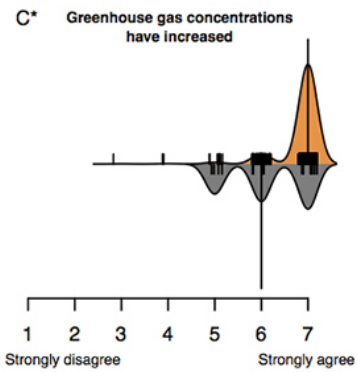
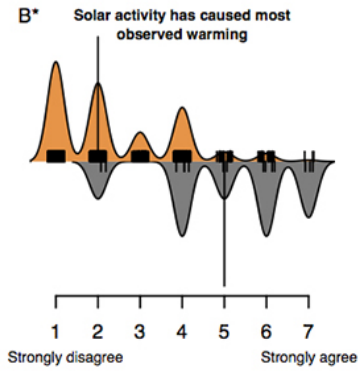
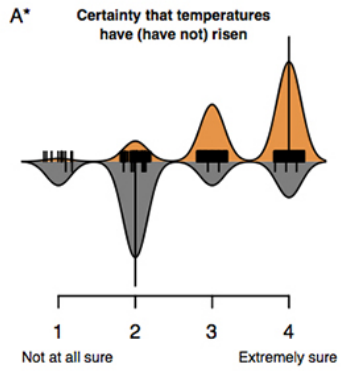
However, no direct surveys had assessed whether the general agreement on the impact of human activities on the Earth's climate extended to scientists in other disciplines.

Prokopy and fellow researchers conducted a 2014 survey of scientists from more than 10 non-climate disciplines at Big Ten universities to determine the relative prevalence of belief in, and skepticism of, climate change in the scientific community.

Of 698 respondents, about 94 percent said they believe average [global temperatures](#) have "generally risen" compared with pre-1800 levels, and 92 percent said they believe "[human activity](#) is a significant contributing factor in changing mean global temperatures."

Nearly 79 percent said they "strongly agree" and about 15 percent "moderately agree" that climate science is credible. About 64 percent said climate science is a mature science compared with their own field,

and about 63 percent rated climate science as "about equally trustworthy" compared to their discipline.



Temperatures have risen since the 1800s  
 Temperatures have not risen since the 1800s  
 | Group median  
 | Individual datapoint  
 \* Statistically significant difference

These beanplots show climate change beliefs among nonclimate scientists who do or do not believe that average global temperatures have risen since the 1850s. The width and shape of the beanplots represent kernel density estimates for the distribution of responses. The thin, vertical black lines represent individual responses, which were jittered to improve clarity. The vertical lines represent the medians. Credit: *Environmental Research Letters* image/J. Stuart Carlton

Disagreement about climate change is rarely a simple dispute about facts, Prokopy said. People's interpretation of information can also be influenced by their cultural and political values, worldview, and personal identity. Prokopy's research team found that division over climate change was linked to disagreement over science - such as the potential effects of carbon dioxide on the Earth's climate - but also differing cultural and political values, which the survey gauged in a section of questions on respondents' general worldviews.

While cultural values did not appear to influence scientists as much as previous studies have shown they influence the general public on a variety of issues, including climate change, the survey indicated that "when it comes to climate change, scientists are people, too," said lead author Stuart Carlton, a former postdoctoral research assistant in Prokopy's lab.

"While our study shows that a large majority of scientists believe in human-caused climate change, it also shows that their beliefs are influenced by the same types of things that influence the beliefs of regular people: cultural values, political ideologies and personal identity," he said.

Prokopy said she was "quite surprised to find cultural values influencing scientists as much as they are. This shows how strong these values are and how hard they are to change."

Respondents' certainty in their beliefs on climate change appeared to be linked to the source of their climate information. Certainty was correlated to how much of respondents' climate information came from scientific literature or mainstream media, Prokopy said. The more respondents relied on scientific studies for information on climate change, the greater their certainty that human activity is causing the Earth's temperatures to rise.

"Climate literature is very compelling and convincing," she said. "Scientists are not fabricating their data."

Nearly 60 percent of those who believe in climate change said they were "extremely sure" and about 31 percent said they were "very sure" average global temperatures have risen. Respondents who said they believe global temperatures have fallen or remained constant were "significantly less certain" in their beliefs, Prokopy said.

Carlton said the tendency of some media to portray climate change as more controversial among scientists than it actually is could decrease people's certainty in whether climate change is occurring and its potential causes.

"The media probably do this for good reasons: They want to give each side of a story to try to be balanced," said Carlton, now the healthy coastal ecosystems and social science specialist at Texas Sea Grant. "However, our study shows that there is very little disagreement among climate scientists or other scientists about the existence of climate change or the quality of climate science as a discipline. There are important questions about what we should do about climate change, but

those are policy controversies, not science controversies."

The survey results did not reveal many strikingly different responses by discipline, Prokopy said, though among the fields of study represented, natural resource [scientists](#) showed the highest amount of skepticism that global temperatures have risen.

Respondents across disciplines nearly unanimously agreed that climate science is credible, but views on its maturity and trustworthiness compared with their own discipline varied. Physicists and chemists, for example, rated climate science as a highly credible discipline but gave it lower marks in trustworthiness and overall maturity compared with their own fields. Prokopy said this was "not surprising given that physics and chemistry are some of the oldest, most established scientific disciplines."

While previous studies showed that many prominent [climate science](#) skeptics were physicists, Carlton said this survey did not show similar evidence.

"The proportion of physicists and chemists who believed in [climate change](#) was right around average."

**More information:** The paper was published Thursday (Sept. 24) in *Environmental Research Letters* and is available at [iopscience.iop.org/1748-9326/10/9/094025](http://iopscience.iop.org/1748-9326/10/9/094025)

Provided by Purdue University

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