

## Climate Change

### Partisanship, Understanding, and Public Opinion

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#### Three Questions, Ten Surveys

In 2010, Carsey Institute researchers began including three new questions about climate change on a series of regional surveys. We asked how much people understand about the issue of global warming or climate change; whether they think that most scientists agree that climate change is happening now as a result of human activities; and what they believe personally about the topic. The questions are neutrally worded, concern beliefs about present facts rather than possible future events, and address the main point of statements made by scientists.

An earlier Carsey brief presented results from our first survey using these questions, a statewide New Hampshire poll of about 500 people conducted in April 2010.<sup>1</sup> Further New Hampshire polls took place in July and September 2010, and in February 2011.<sup>2</sup> We also included the same climate questions on six other surveys conducted in rural areas around the country, under the Carsey Institute's Community and Environment in Rural America (CERA) initiative.<sup>3</sup> Together, the four New Hampshire and six CERA surveys involved 9,489 interviews in seven different regions of the United States. They provide a wealth of information on people's views concerning topics from politics to environment, community and family. In this brief, we focus on what the surveys uncovered about climate-change beliefs, and their relationship with self-assessed understanding.

#### How Much Do You Understand?

Our first climate-change question asks whether people believe they understand a great deal, a moderate amount, only a little, or nothing at all about the issue of global warming or climate change. Figure 1 illustrates responses from the three 2010 New Hampshire polls, combined into one chart here because they are not significantly different. More than one-half of the respondents say they understand "a moderate amount,"

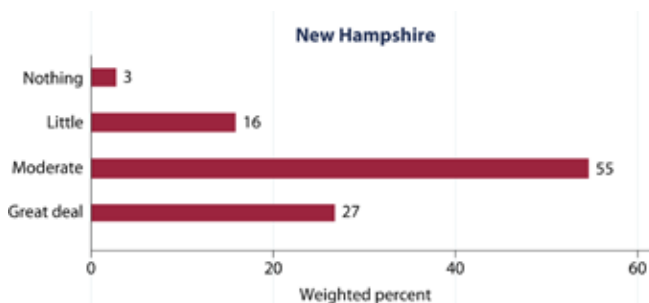
#### Key Findings

A series of regional surveys conducted by Carsey Institute researchers in 2010 and early 2011 asked nearly 9,500 individuals about climate change. Key findings include:

- Most people say that they understand either a moderate amount or a great deal about the issue of global warming or climate change.
- Large majorities agree that climate change is happening now, although they split on whether this is attributed mainly to human or natural causes.
- The level of understanding and specific beliefs about climate change vary from region to region.
- Beliefs about climate change are strongly related to political party. Republicans most often believe either that climate is not changing now or that it is changing but from mainly natural causes. Democrats most often believe that the climate is changing now due mainly to human activities.
- Political polarization is greatest among the Republicans and Democrats who are most confident that they understand this issue. Republicans and Democrats less sure about their understanding also tend to be less far apart in their beliefs.
- People who express lower confidence also might be more likely to change their views in response to weather.

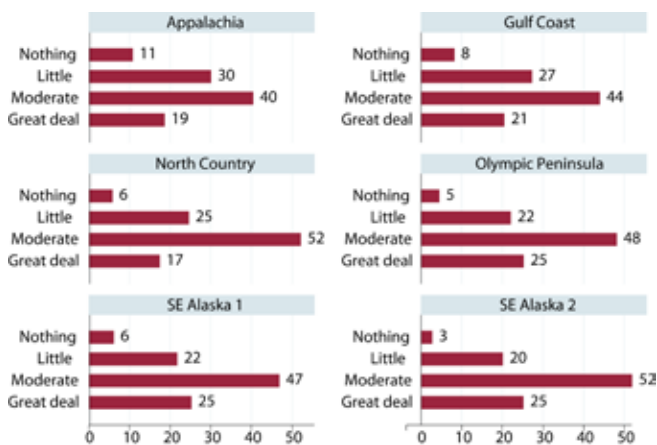
and more than one-fourth say "a great deal." These are self-assessments, not tested by a follow-up quiz to see whether people can explain, for example, what the term "greenhouse effect" actually means. The survey answers thus reflect self-confidence, which has an untested relation to knowledge. For simplicity, however, we use the term "understanding" in referring to this question.

**FIGURE 1: HOW MUCH DO YOU UNDERSTAND ABOUT GLOBAL WARMING OR CLIMATE CHANGE ISSUES? COMBINED RESULTS FROM THREE STATEWIDE NEW HAMPSHIRE SURVEYS IN 2010 (1,531 INTERVIEWS)**



The New Hampshire responses in Figure 1, where 82 percent claim a moderate amount or a great deal of understanding, present an upper extreme in confidence compared with our CERA surveys. Across the six predominantly rural CERA regions, however, self-confidence on this topic is still surprisingly high (Figure 2). Large majorities ranging from 59 percent (Appalachia) to 77 percent (Southeast Alaska 2) say that they understand at least a moderate amount about climate change. One-quarter of the Olympic Peninsula and Southeast Alaska respondents say they understand a great deal. In the next sections, we look at what their understanding leads people to believe.

**FIGURE 2: HOW MUCH DO YOU UNDERSTAND ABOUT GLOBAL WARMING OR CLIMATE CHANGE ISSUES? RESULTS FROM SIX REGIONAL CERA SURVEYS IN 2010 (7,438 INTERVIEWS)**



### Three Questions About Climate Change

Three questions about climate change have been included on a series of surveys by Carsey Institute researchers. The questions are neutrally worded, with the order of questions and of their responses rotated to avoid possible bias.

*“Next, I would like to ask you some questions about the issue of global warming or climate change. How much do you feel you understand about this issue—would you say a great deal, a moderate amount, only a little, or nothing at all?”*

- 4 A great deal
- 3 A moderate amount
- 2 Only a little
- 1 DK/Nothing at all”

*“Which of the following two statements do you think is more accurate?”*

- 3 Most scientists agree that climate change is happening now, caused mainly by human activities.
- 2 There is little agreement among scientists whether climate change is happening now, caused mainly by human activities.”
- 1 (unsure—volunteered)

*“Which of the following three statements do you personally believe?”*

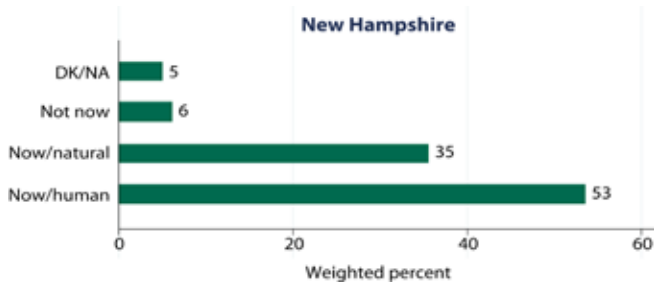
- 4 Climate change is happening now, caused mainly by human activities.
- 3 Climate change is happening now, but caused mainly by natural forces.
- 2 Climate change is not happening now.”
- 1 (unsure—volunteered)

### What Do You Personally Believe?

The high levels of understanding reported by New Hampshire residents in Figure 1 translate into general agreement that climate is changing now (88 percent), but disagreement remains about its main cause (Figure 3). A slight majority attribute current climate change to human activities, but more than one-third believe instead that it has mainly natural causes. Only a small fraction of the New Hampshire respondents believe that climate is not changing now.

Figure 4 shows results on this same question from the six CERA surveys. Across all of the surveys, only 4 percent to 11 percent believed that climate is not changing. Majorities of the North Country and Southeast Alaska 2 respondents believe that current changes result from human activities. North Country residents, like those of New Hampshire, probably have been influenced by New England’s recent trend toward warmer winters.<sup>4</sup> The Southeast Alaska 2 survey includes coverage of Juneau, the state capital, where

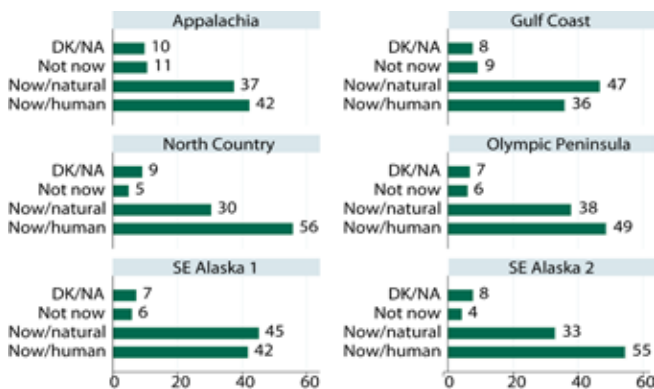
**FIGURE 3: WHAT DO YOU PERSONALLY BELIEVE ABOUT CLIMATE CHANGE? RESULTS FROM THREE 2010 NEW HAMPSHIRE SURVEYS**



people often hear about the climate-related changes in sea ice, permafrost, erosion, and ecosystems taking place farther north in Alaska. Lower percentages on the Gulf Coast, Appalachia, or the Southeast Alaska 1 (Ketchikan area) surveys believe in human-caused change.

Figures 3 and 4 offer some support for the idea that human-caused climate change tends to have more acceptance in snow-country areas, where winter change has been most visible.<sup>5</sup> Together with Figures 1 and 2, they also show a correlation between regional levels of self-assessed understanding and belief in human-caused change. Places where higher proportions say they understand the issue also tend to have higher proportions who believe that climate is changing as a result of humans. The relationship between understanding and belief turns out to be more complicated than a simple correlation, however.

**FIGURE 4: WHAT DO YOU PERSONALLY BELIEVE ABOUT CLIMATE CHANGE? RESULTS FROM SIX 2010 CERA SURVEYS**



**Ten Surveys in Seven Regions**

In 2010 and early 2011, Carsey Institute researchers included the three climate-related questions on ten surveys which mainly asked about other topics. The surveys involved a total of 9,489 interviews, all conducted by the Survey Center at the University of New Hampshire. Trained interviewers used computer-assisted telephone interviewing techniques, speaking with randomly-selected individuals (the adult with most recent birthday) at randomly-selected phone numbers. Probability weights have been applied to make minor adjustments for more representative results.

*New Hampshire (n = 2,051; April, July and September 2010; February 2011)*

The Granite State Poll (GSP) is a regular statewide opinion survey, focused mainly on voting and political topics. The GSP interviews new samples of about 500 people four times each year. Beginning in April 2010, the GSP included our climate change questions. Because differences among the three 2010 polls were not statistically significant, they are combined for Figures 1 and 3. Figure 7 shows signs of change in the February 2011 poll.

*Appalachia (n = 1,020; late November 2010 through early January 2011)*

Following up on a Community and Environment in Rural America (CERA) survey conducted in 2007, we interviewed new samples of residents in Harlan and Letcher Counties in the Appalachian region of Kentucky.

*Gulf Coast (n = 2,023; late July through September 2010)*

Shortly after the Gulf of Mexico oil spill, we carried out a CERA survey of coastal residents in Bay, Franklin and Gulf Counties, Florida; and in Plaquemines and Terrebonne Parishes, Louisiana.

*North Country (n = 1,852; June 2010)*

Another CERA survey focused on residents of northern New England: in Oxford County, Maine; Coos County, New Hampshire; and Essex County, Vermont.

*Olympic Peninsula (n = 1,013; October and November 2010)*

On Washington state's Olympic Peninsula, this CERA survey interviewed residents of Clallam and Grays Harbor Counties.

*Southeast Alaska 1 (n = 509; August 2010)*

As a pilot study for work in rural Alaska, this smaller-scale CERA survey contacted people in the Ketchikan Gateway Borough and Prince of Wales Census Area.

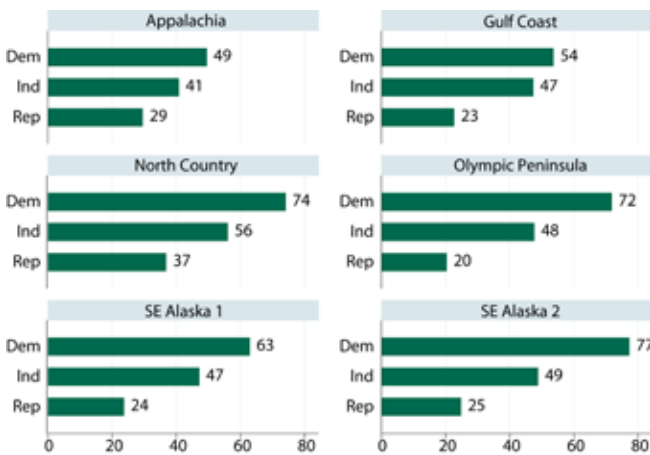
*Southeast Alaska 2 (n = 1,021; November and December 2010)*

This USDA-supported CERA survey interviewed residents of Haines, Juneau, Sitka, Wrangell and Yakutat Boroughs, and of the Hoonah-Angoon and Petersburg Census Areas.

## Partisanship, Understanding, and Belief

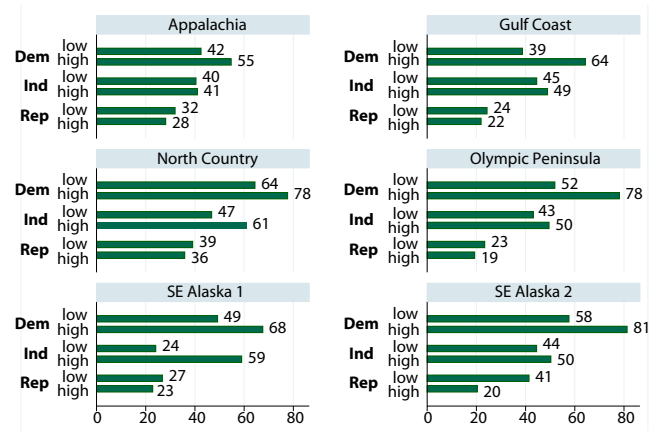
In recent years, the idea that human activities such as deforestation and fossil fuel burning are measurably changing the composition of Earth’s atmosphere, with corresponding effects on climate, has expanded from a scientific research topic to become a political wedge issue.<sup>6</sup> Partisan divisions regarding this issue now appear as deep as those for hot-button “social” issues. Our New Hampshire polls find roughly a 50 point gap between the percentage of Republicans and Democrats who believe that climate is changing because of human acts.<sup>7</sup> Partisan divisions stand out on the CERA surveys as well, where they range from 20 points in Appalachia or 31 on the Gulf Coast to 52 points in Southeast Alaska 2 and the Olympic Peninsula. Independents always hold a middle position between the partisan extremes (Figure 5).

**FIGURE 5: PERCENT WHO BELIEVE THAT CLIMATE IS CHANGING NOW, CAUSED MAINLY BY HUMAN ACTIVITIES—BY POLITICAL PARTY, ON SIX 2010 CERA SURVEYS**



Partisanship interacts with self-assessed understanding in a complicated but strikingly consistent way, as seen across all six of the CERA surveys in Figure 6. For this graphic, the Democrats, Independents, and Republicans are subdivided according to whether they say they understand climate change moderately or a great deal (labeled “high” in the figure), or say they have little or no understanding (“low” in the figure). Within each small chart, the Democrat/high-understanding subgroup has the highest proportion who personally believe climate is changing now due to human activities. The Republican/high-understanding subgroup has the lowest. In other words, across all of these surveys, Democrats and Republicans with high confidence in their understanding also stand the farthest apart. For example, looking at Olympic Peninsula respondents

**FIGURE 6: PERCENT WHO BELIEVE THAT CLIMATE IS CHANGING NOW, CAUSED MAINLY BY HUMAN ACTIVITIES—BY POLITICAL PARTY AND BY LOW OR HIGH UNDERSTANDING, ON SIX 2010 CERA SURVEYS**

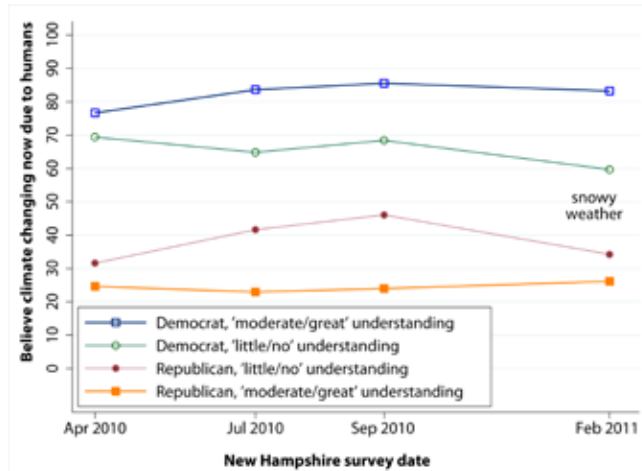


who say they have moderate or great understanding, we see a 59 point gap (19 versus 78 percent) between Republicans and Democrats. Among those who say they have little or no understanding, the gap narrows to “only” 29 points (23 versus 52 percent). The other surveys show similar patterns.

Figure 7 offers a different way to visualize the relationship. This graphic displays results from four successive New Hampshire polls, including the April, July, and September 2010 polls graphed earlier, along with a more recent poll done in February 2011. Lines track the percent who believe that climate change is happening now because of human activities. The top line shows this percentage among Democrats with moderate or great understanding. The bottom line shows the percentage among Republicans with moderate or great understanding. Two lines in between these extremes show Democrats and Republicans who have little or no understanding.

Belief in human-caused climate change remains high, between 77 and 86 percent, among Democrats with moderate or great understanding. Belief remains consistently low, between 23 and 26 percent, among Republicans with moderate or great understanding. Among both Democrats and Republicans with little or no understanding, however, belief in climate change dropped on the February poll. Interviews for this poll were conducted during a 10-day period of cold and snowy weather, which perhaps disproportionately affected the views of people with low understanding. Conversely, those who feel better informed might hold less changeable views. We will continue to follow these four groups on future polls.

**FIGURE 7: PERCENT WHO BELIEVE THAT CLIMATE IS CHANGING NOW, CAUSED MAINLY BY HUMAN ACTIVITIES, ON FOUR NEW HAMPSHIRE SURVEYS (2,051 INTERVIEWS TOTAL)**



## Observations

Most people gather information about climate change not directly from scientists but indirectly, for example through news media, political activists, acquaintances, and other non-science sources. Their understanding reflects not simply scientific knowledge, but rather the adoption of views promoted by political or opinion leaders they follow. People increasingly choose news sources that match their own views.<sup>8</sup> Moreover, they tend to selectively absorb information even from this biased flow, fitting it into their pre-existing beliefs. This “biased assimilation” has been demonstrated in experiments that find people reject information about the existence of a problem if they object to its possible solutions.<sup>9</sup> Unlike those experimental studies, however, our surveys said nothing about possible solutions or policies related to climate change. The deeply partisan responses nevertheless suggest that many people made this association themselves, basing their beliefs about science and physical reality on what they thought would be the political implications if human-caused climate change were true.

Our question’s two elements (climate changing now, owing mainly to humans) match the central point of statements and reports from science organizations, national academies, reviews of research results, and surveys of scientists.<sup>10</sup> For example, an open letter to Congress from the presidents or directors of eighteen scientific organizations (including the American Association for the Advancement of Science, the American Geophysical Union, the American Meteorological Society, and the American Statistical Association) noted that “Observations throughout the world make it clear that climate change is occurring, and rigorous scientific research

demonstrates that the greenhouse gases emitted by human activities are the primary driver.”<sup>11</sup> Many science organizations have made similar statements, expressing the same elements as our survey question. Although there remains active discussion among scientists on many details about the pace and effects of climate change, no leading science organization disagrees that human activities are now changing the Earth’s climate.<sup>12</sup> The strong scientific agreement on this point contrasts with the partisan disagreement seen on all of our surveys.

If the scientists are right, evidence of climate change will become more visible and dramatic in the decades ahead. Arctic sea ice, for example, provides one closely-watched harbinger of planetary change. In its 2007 report the IPCC projected that late-summer Arctic sea ice could disappear before the end of the 21st century. Since that report was written, steeper-than-expected declines have led to suggestions that summer sea ice might be largely gone by 2030, and some think much sooner. We will find out in time—either the ice will melt, or it won’t. The Arctic Ocean, along with other aspects of the ocean-atmosphere system, presents an undeniable physical reality that could become more central to the public debate. In the meantime, however, public beliefs about physical reality remain strikingly politicized.

## ENDNOTES

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2. The UNH Survey Center conducted all telephone interviews.
3. For an introduction to the CERA initiative, see L. C. Hamilton et al., “Place Matters. Challenges and Opportunities in Four Rural America,” *Reports on Rural America*, vol. 1, no. 4 (Durham, NH: Carsey Institute, 2008), available at [http://carseyinstitute.unh.edu/publications/Report\\_PlaceMatters.pdf](http://carseyinstitute.unh.edu/publications/Report_PlaceMatters.pdf).
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6. R. E. Dunlap and A. M. McCright, “A Widening Gap: Republican and Democratic Views on Climate Change,” *Environment* (September/October, 2008).

7. Hamilton, “Do Scientists Agree About Climate Change?”
8. M. A. Baum and T. Groeling “New Media and the Polarization of American Political Discourse,” *Political Communication* 25 (2008): 345–65.
9. D. M. Kahan et al. “The Second National Risk and Culture Study: Making Sense of—and Making Progress in—the American Culture War of Fact.” Research Paper no. 370 (George Washington University, 2007).
10. For statements from science organizations see N. Oreskes, “The Scientific Consensus on Climate Change,” *Science*, vol. 306, no. 5702 (2004):1686. For national academies of science, see G8+5, “G8+5 National Academies’ Joint Statement: Climate Change and the Transformation of Energy Technologies to a Low Carbon Future” (National Academies of Brazil, Canada, China, France, Germany, India, Italy, Japan, Mexico, Russia, South Africa, UK and USA, 2009), available at [www.nationalacademies.org/includes/G8+5energy-climate09.pdf](http://www.nationalacademies.org/includes/G8+5energy-climate09.pdf); and NRC, *Advancing the Science of Climate Change* (Washington, DC: National Research Council of the National Academies, 2010). For overviews of research see IPCC, *Climate Change 2007—The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2009); and K. Richardson, et al. *Synthesis Report from Climate Change: Global Risks, Challenges and Decisions* (Denmark: University of Copenhagen, 2009), available at [www.pik-potsdam.de/news/press-releases/files/synthesis-report-web.pdf](http://www.pik-potsdam.de/news/press-releases/files/synthesis-report-web.pdf). For surveys of scientists, see P.T. Doran and M.K. Zimmerman, “Direct Examination of the Scientific Consensus on Climate Change,” *EOS*, vol. 90, no. 3 (2009): 22–23.
11. A. I. Leshner et al. “Open Letter to Congress on the Consensus Scientific View of Climate Change.” Press release (Washington, DC: American Association for the Advancement of Science, 2009), available at [www.aaas.org/news/releases/2009/media/1021climate\\_letter.pdf](http://www.aaas.org/news/releases/2009/media/1021climate_letter.pdf).
12. Wikipedia provides a central source with references to many synthesis reports, statements by scientific organizations, surveys of scientists, and reviews of the science literature: [http://en.wikipedia.org/wiki/Scientific\\_opinion\\_on\\_climate\\_change](http://en.wikipedia.org/wiki/Scientific_opinion_on_climate_change).

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