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The Climate of Belief: American Public Opinion on Climate Change

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Climate change has gained enormous visibility during the past year, reflected in a range of American policy initiatives leading up to the international deliberations in Copenhagen. The Environmental Protection Agency has designated carbon dioxide as an air pollutant and issued an endangerment



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finding that could generate federal regulation of emissions. Far-reaching climate legislation passed the House of Representatives in June 2009 and has since moved to the Senate for consideration. President Barack Obama has negotiated an intergovernmental agreement designed to reduce greenhouse gas emissions from the transportation sector. The president also pledged specific emission reduction targets as part of the American bargaining position at Copenhagen, though the recent summit produced very modest agreements. At the same time, a wide range of state and local government climate policies continue to be adopted and many are now being implemented.

But what does the American public think about the issue of climate change and possible policy responses? Have these views changed over time? We have



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tracked American public opinion on this issue for several years and are particularly attentive to any shifts between 2008 and 2009 in this year's National Survey of American Public Opinion on Climate Change. Known as the Muhlenberg-Michigan study, this opinion research reflects ongoing collaboration between the Muhlenberg College Institute of Public Opinion and the Gerald Ford School of Public Policy at the University of Michigan. This report will provide brief introduction to some of the key findings from our latest study, with a much longer analysis to be included in the forthcoming Brookings Institution Press book, *Greenhouse Governance: Addressing Climate Change in America*, edited by Barry Rabe.

The 2009 version of this survey drew from a telephone survey of 988 American adults who were interviewed between September 21 and November 20 of 2009. This followed a period of intense media coverage of climate change and various policy initiatives domestically and internationally. The latter stage of our survey period also coincided with the media frenzy surrounding the hacking and disclosure of e-mail communications between some prominent climate scientists that has raised questions about the rigor and transparency of climate research. This also overlapped a period in which a few other surveys reported some significant shifts in public attitudes from prior years, as well as competition for public attention with other issues such as the economic contraction, medical care reform, and foreign policy.

This report presents three sections on key findings from the 2009 survey. First, we examine whether Americans believe that global temperatures are increasing, and if so, what is causing this change. Second, we explore public views on a range of possible policy interventions and possible engagement by various levels of American government. Third, we consider a pair of policy options that have received considerable attention at the federal level in the past year, namely a carbon cap-and-trade program and taxation of the carbon content of fossil fuels.

Belief in the Existence of Climate Change

Our previous surveys have found that significant majorities of Americans believe that average global temperatures have been increasing in recent decades and that the significant majority of those who believe that this is occurring deem a combination of human and natural factors as causative. Some other national surveys (ABC News/Washington Post, Pew Research Center, Gallup), however, have indicated that there appeared to be a significant shift in these beliefs during 2009. Our findings also find some evidence of a single-year shift, with all tables in this section comparing our latest findings with those from a similar period one

year earlier.

From what you've read and heard, is there solid evidence that the average temperature on earth has been getting warmer over the past four decades?

	2008	2009
Yes	72%	66%
No	17%	20%
Not Sure	11%	14%

The results regarding individual belief in global warming also indicate that over the last year the most significant decline in acceptance of global warming occurred among Americans who identify themselves as politically independent. Between 2008 and 2009 the percentage of independents who believe average temperatures on the Earth are increasing fell from 74 percent to 61 percent. This 13 percent decline was larger than the 3 percent drop among Democrats and the 4 percent drop among Republicans. The substantial decline in belief among independent Americans has left this group's belief in global warming closer to Republicans rather than Democrats, marking a reversal from 2008.

	Democrats 2008	Democrats 2009	Republicans 2008	Republicans 2009	Independents 2008	Independents 2009
Yes	83%	80%	53%	49%	74%	61%
No	5%	6%	34%	36%	17%	25%
Not Sure	11%	14%	13%	15%	9%	14%

Among those individuals who said "yes" in response to the question on temperature, we also repeated a battery of questions from the previous year on respondents' confidence in their interpretation and in their understanding of the causes of temperature change. The 2009 findings among this group reflect some shift toward decline in confidence and whether human activities or natural patterns are significant factors in perceived change in temperature. Among Americans who believe that global warming is occurring there was an 18 percent decrease in respondents who said they were very confident that this phenomenon was taking place.

How confident are you that the average temperature on earth is increasing? Are you very confident, fairly confident, not too confident or not confident at all that the average temperature on earth is increasing?

	2008	2009
Very Confident	58%	40%
Fairly Confident	38%	52%
Not Too Confident	4%	7%
Not Confident At All	0%	1%
Not Sure	1%	<1%

Within the cohort of Americans that believe in global warming there remains significant disagreement about the underlying cause of temperature increases on the planet. A slight majority of individuals that believe in global warming indicate that climate change has been caused by a combination of human activity and natural patterns, marking a 10 percent increase over the 2008 survey results. Slightly over a third of Americans whom believe in global warming think the temperature changes have been caused by human activity, a mark unchanged since 2008. The percentage of global warming believers in the United States who think the hotter temperatures have been caused completely by natural patterns declined in 2008, with only about 1 out of 10 believers falling into this category.

Is the earth getting warmer because of human activity such as burning fossil fuels, or mostly because of natural patterns in the earth's environment?

	2008	2009
Human Activities	36%	36%
Natural Patterns	18%	12%
A Combination	41%	51%
Not Sure	5%	1%

The decline in confidence that global warming is occurring has been accompanied by a drop in the percentage of believers in global warming that think this issue is a serious problem. In 2009, 51 percent of Americans who believe in global warming consider the change in temperature to be a very serious problem, compared to the 60 percent mark established in the 2008 survey. While most believers in global warming continue to see this issue as a serious problem, the intensity of those ratings has diminished in the last year.

In your view, is global warming a very serious problem, somewhat serious, not too serious, or not a problem?

	2008	2009
Very Serious	60%	51%
Somewhat Serious	32%	40%
Not Too Serious	5%	8%
Not A Problem At All	2%	<1%
Not Sure	<1%	<1%

A comparison of all survey results from 2008 and 2009 show Americans less likely to disagree with the statement that “there is not enough scientific evidence to support claims that the earth is getting warmer.”

We also explored public opinion on climate change through declarative statements with which all survey respondents could express their agreement or disagreement and the intensity of their reactions. The findings in each cell of the table reflect our 2009 findings, with the 2008 data included below in parentheses. In most cases, we note that respondents on both sides of both questions are less inclined to “strongly agree” or “strongly disagree” than was the case a year ago.

The results indicate a modest increase in skepticism regarding the role of evidence and scientists in global warming matters. A comparison of all survey results from 2008 and 2009 show Americans less likely to disagree with the statement that “there is not enough scientific evidence to support claims that the earth is getting warmer.” Similarly, Americans are less likely to disagree that “scientists are overstating evidence about global warming for their own interests” than they were in 2008. It is important to note that this increased skepticism was measured before the e-mail hacking incident became widely publicized.

Please identify your level of agreement with the following statements. For each statement, please indicate if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Not Sure
There is not enough scientific evidence to support claims that the earth is getting warmer.	19% (20%)	23% (18%)	24% (19%)	29% (39%)	6% (4%)
Scientists are overstating evidence about global warming for their own interests.	17% (19%)	25% (19%)	20% (20%)	29% (38%)	8% (5%)

(Cont'd)	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Not Sure
Any recent warming on earth is the result of natural trends and not the activities of man.	16% (21%)	27% (19%)	25% (22%)	26% (31%)	6% (8%)
The media is overstating the evidence about global warming	27% (24%)	22% (22%)	20% (20%)	27% (31%)	5% (4%)
Instead of trying to stop global warming from occurring we should focus on adapting to a warmer climate.*	10%	21%	25%	36%	9%

*not asked in the 2008 survey
2008 findings in parentheses

The strikingly diverse views of believers and non-believers regarding the evidence and presentation of information regarding climate change are presented in the following table. Large majorities of Americans who do not believe the planet is getting warmer express beliefs that scientists are overstating evidence about climate change for their own interests and that there is not enough scientific evidence to support claims that the Earth is getting warmer. In addition to doubts about the legitimacy of climate science, individuals who deny the existence of global warming overwhelmingly feel that the media has been overstating evidence about this matter. It is also notable that 1 out of 3 Americans that believe in global warming feel that the media is overstating evidence about climate change.

Agreement with Statements Regarding Global Warming Among Believers (B) and Non-Believers (NB)

	Strongly Agree		Somewhat Agree		Somewhat Disagree		Strongly Disagree		Not Sure	
	B	NB	B	NB	B	NB	B	NB	B	NB
There is not enough scientific evidence to support claims that the earth is getting warmer.	9%	58%	14%	34%	32%	5%	42%	2%	3%	>1%
Scientists are overstating evidence about global warming for their own interests.	9%	49%	17%	34%	25%	9%	41%	2%	7%	6%

(Cont'd)	Strongly Agree		Somewhat Agree		Somewhat Disagree		Strongly Disagree		Not Sure	
	B	NB	B	NB	B	NB	B	NB	B	NB
Any recent warming on earth is the result of natural trends and not the activities of man.	8%	44%	19%	40%	31%	9%	36%	4%	6%	3%
The media is overstating the evidence about global warming	13%	74%	19%	20%	25%	5%	39%	1%	4%	>1%
Instead of trying to stop global warming from occurring we should focus on adapting to a warmer climate.	7%	15%	17%	30%	24%	32%	46%	13%	6%	10%

Our study also identified an important decline in the number of Americans who said that global warming is already affecting their state. The survey results show a 12 percent decline in the percentage of Americans who strongly agree that global warming is already affecting their home state. In our 2008 study, we found that personal experiences with hotter temperatures in a respondent's home state were among the most important factors in determining belief in global warming. Thus the decline in the percentage of Americans that strongly believe their state has already experienced effects from global warming may be contributing to the lower levels of belief that the planet is warming.

Levels of Agreement with the statement "My state has already felt negative effects from global warming."

	2008	2009
Strongly Agree	28%	16%
Somewhat Agree	27%	30%
Somewhat Disagree	12%	19%
Strongly Disagree	17%	15%
Not Sure	16%	19%

Views on Intergovernmental Roles

The shift in some measures of belief on the existence or severity of climate change does not extend to reduced support for governmental assumption of responsibility for taking actions to reduce global warming. In recent years, state

governments have been particularly active in devising policies to reduce greenhouse gas emissions. For example, 29 have adopted renewable electricity mandates known as portfolio standards and 23 are in various stages of implementing their own carbon cap-and-trade programs. Local governments such as municipalities and counties have increasingly devised their own policies and, as noted above, federal exploration of policy engagement has increased in the last year. Consequently, the area of climate policy has increasingly taken on a multi-level quality in the American intergovernmental system, which has led us to examine not only receptivity to various policy options but also to public views on the respective roles of various levels of American government.

Our 2009 survey findings include a shift toward greater support for federal government assumption of “a great deal of responsibility,” increasing by seven points to 55 percent from the previous year. There is a slightly greater increase in support for taking such responsibility at the local level, with somewhat less of a jump at the state level. Only one in 10 respondents said that federal and state governments had “no responsibility” in this area, reflecting declines of five and seven percent from 2008.

For each level of government that I mention please tell me if it has a great deal of responsibility, some responsibility or no responsibility for taking actions to reduce global warming:

	A Great Deal of Responsibility	Some Responsibility	No Responsibility	Not Sure
Federal Government	55% (48%)	31% (33%)	10% (15%)	4% (5%)
State Governments	37% (34%)	49% (46%)	10% (17%)	4% (4%)
Local Governments	34% (26%)	47% (47%)	14% (22%)	6% (5%)

2008 findings in parentheses

We also explored a related set of questions that considered relationships across levels of government. This issue has arisen repeatedly this year in both federal consideration of possible policies that might influence states and among evolving state policies that could influence (or be influenced by) their neighbors. In general, we find considerable support for allowing individual states to adopt standards on greenhouse gas emissions that are stricter than any established by the federal government. There is also continuing support for unilateral state efforts in the absence of comparable action by neighboring states or the federal government, though there are some shifts in the intensity with which those views are held from a year ago. Moreover, most Americans continue to believe

that their state economies will be bolstered by an expanded use of renewable energy sources, but there has been a twenty percent decline from 2008 in the number of Americans who strongly agree with this proposition. Americans have also become more divided on the economic effect of renewable energy requirements in states where neighboring states lack similar requirements.

Please identify your level of agreement with the following statements. For each statement please indicate if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Not Sure
The federal government should allow state governments to adopt stricter standards for the emission of greenhouse gases than any federal standards.*	35%	40%	11%	8%	6%
My state should not adopt anti-global warming policies unless its neighboring states also adopt similar policies.	11% (19%)	21% (15%)	27% (22%)	33% (40%)	8% (5%)
If the federal government fails to address the issue of global warming it is my state's responsibility to address the problem.	26% (41%)	40% (29%)	16% (9%)	11% (17%)	7% (5%)
State governments will boost their economies by requiring greater use of renewable energy.	27% (47%)	43% (30%)	12% (6%)	8% (8%)	10% (9%)
My state's economy will be damaged if it requires greater use of renewable energy while neighboring states don't have such requirements.	16% (13%)	25% (24%)	25% (20%)	16% (31%)	18% (13%)

*Question not asked in 2008 survey
2008 findings in parentheses

Public Opinions on Climate Policy Options

The 111th Congress has explored a wide range of policy tools that are intended, at least in part, to reduce greenhouse gas emissions. In many instances, some versions of these tools are already in operation in respective state and local governments, raising questions of continued operation in the event of new

federal policy. These policies cut across various sectors that generate greenhouse gases, including electricity generation, transportation, industry, and agriculture. We examined public support for these policy tool options, not only in general terms, but also through offering options that enabled respondents to determine whether they supported no policy adoption at any government level, either federal or state adoption, or both federal and state adoption.

We had not previously asked this exact question before, but we found a generally consistent pattern from prior surveys in that regulatory tools that mandate increased levels of renewable energy, increase vehicular fuel efficiency, and increase the use of nuclear energy have the greatest overall support for adoption at one or both levels. Each policy option had more support overall at one or both levels than opposition to adoption by any level, with the exception of increased gasoline taxes. Only on the issue of establishing fuel efficiency standards for automobiles did we find a clear preference for action by a specific level of government, with respondents much more likely to prefer the federal government over state governments when it comes to automobile regulation. We explore the cap-and-trade and carbon tax options in greater detail in the following section.

Next I'm going to provide you with a list of policies that can be used to limit the emission of greenhouse gases. For each option that I mention please tell me if the policy should be adopted only by the federal government, only by your state government, by both the federal and state governments or should not be adopted by any government.

	Federal	State	Both	Neither	Not Sure
Allow businesses to buy and sell permits to release green house gases if it results in an overall decrease in emissions	11%	7%	41%	22%	18%
Increasing taxes on all fossil fuels to reduce consumption and greenhouse gas emissions	10%	6%	31%	42%	11%
Increased use of nuclear power to reduce greenhouse gas emissions	12%	6%	52%	17%	12%
Increasing taxes on gasoline to reduce consumption and greenhouse gas emissions	8%	8%	25%	49%	10%

(Cont'd)	Federal	State	Both	Neither	Not Sure
Require a set portion of all electricity to come from renewable energy sources such as wind and solar power in order to reduce greenhouse gas emissions.	9%	9%	56%	16%	9%
Require a set portion of all transportation fuels to come from renewable energy sources such as ethanol and other biofuels in order to reduce greenhouse gas emissions.	10%	8%	52%	17%	12%
Require auto makers to increase the fuel efficiency of their vehicles to reduce greenhouse gas emissions even if it increases the cost of the vehicle	23%	5%	44%	19%	9%

Market Based Policy Options: Public Attitudes Toward Cap-and-Trade v. Carbon Taxes

Considerable debate in the current Congress has focused on devising a cap-and-trade system to reduce greenhouse gas emissions, allowing regulated parties considerable flexibility in determining how to achieve their reduction targets. This would build on prior experience with these policy tools for some air pollutants and some state experimentation for carbon emissions. One version of the cap-and-trade approach was included in the American Clean Energy and Security Act (ACES) passed by the House in June 2009 and is now under consideration in various forms in the Senate. In contrast, a number of policy analysts and a set of Republican and Democratic legislators in both chambers of Congress have endorsed a more direct market tool, namely direct taxation of the carbon content of fossil fuels with the intent of reducing consumption. While our previous question provides one glimpse into public support for these respective approaches, we decided to examine these options more fully, including questions linked to increased energy costs.

In these portions of the survey, we find that initial support for cap-and-trade exceeds that of a carbon tax. Indeed, a slight majority of respondents are either strongly or somewhat supportive of cap-and-trade (53 percent), whereas only a minority (36 percent) has similar views about a carbon tax. However, these

Differences between cap-and-trade and carbon taxes “largely disappear when similar projected costs are attached to the proposed policy.”

differences largely disappear when similar projected costs are attached to the proposed policy. We use measures of \$15 and \$50 per month increases in energy costs attached to each proposal, with the \$15 measure a rough proxy of what some prominent analysts estimate to be the added costs that would be imposed through enactment of the cap-and-trade provisions in the ACES proposal.

In neither case did we give any indication as to how revenue from these respective policies might be used by governments. We believe that this question is an important one for future research, reflected in the current debate over possible options that might return revenues to the citizenry via commensurate tax reductions, or so-called dividend checks, as opposed to other purposes such as deficit reduction or subsidizing alternative energy development. Other recent surveys suggest that including revenue return for one tool but not another can generate substantial swings in public reaction. But our intent was to attempt to place these policy options on a parallel track with one another, and we do note substantial convergence of public response when a comparable cost estimate is added.

There is a proposed system called cap and trade where the government would issue permits limiting the amount of greenhouse gases companies can put out. Companies that did not use all their permits could sell them to other companies. The idea is that many companies would find ways to put out less greenhouse gases because that would be cheaper than buying permits. Would you strongly support, somewhat support, somewhat oppose or strongly oppose this type of system?

Strongly Support	17%
Somewhat Support	36%
Somewhat Oppose	14%
Strongly Oppose	20%
Not Sure	12%

What if the cap and trade program significantly lowered greenhouse gases but increased your monthly energy costs by \$15 a month? Would you strongly support, somewhat support, somewhat oppose or strongly oppose this type of system?

Strongly Support	14%
Somewhat Support	28%
Somewhat Oppose	22%
Strongly Oppose	29%
Not Sure	8%

What if the cap and trade program significantly lowered greenhouse gases but increased your energy costs by \$50 a month? Would you strongly support, somewhat support, somewhat oppose or strongly oppose this type of system?

Strongly Support	7%
Somewhat Support	15%
Somewhat Oppose	18%
Strongly Oppose	54%
Not Sure	6%

Another way to lower greenhouse gas emissions would be to increase taxes on carbon based fuels such as coal, oil, gasoline and natural gas. Would you strongly support, somewhat support, somewhat oppose or strongly oppose this type of system?

Strongly Support	11%
Somewhat Support	25%
Somewhat Oppose	20%
Strongly Oppose	35%
Not Sure	9%

What if the carbon fuels taxes significantly lowered greenhouse gases but increased your energy costs by \$15 a month? Would you strongly support, somewhat support, somewhat oppose or strongly oppose this type of system?

Strongly Support	14%
Somewhat Support	30%
Somewhat Oppose	20%
Strongly Oppose	30%
Not Sure	6%

What if the carbon fuels taxes significantly lowered greenhouse gases but increased your energy costs by \$50 a month in added expenses? Would you strongly support, somewhat support, somewhat oppose or strongly oppose this type of system?

Strongly Support	7%
Somewhat Support	13%
Somewhat Oppose	19%
Strongly Oppose	56%
Not Sure	5%

Finally, the survey results indicate a significant decline in willingness to pay for increased production of renewable energy. The percentage of Americans unwilling to pay anything for more renewable energy increased from 22 percent to 33 percent over the last year. Among those willing to pay some amount of money to get more renewable energy there was a notable decline in the percentages of those willing to pay \$250 or more per year for this cause. In 2008, 17 percent of Americans said they would be willing to pay at least \$250 each year to increase renewable energy production, but in 2009, only 5 percent held this position. While many factors may have contributed to this outcome, the struggling national economy is a likely determinant of the softened support levels.

If it required you to pay extra money each year in order for more renewable energy to be produced, how much would you be willing to pay? Would you be willing to pay:

	2008	2009
Nothing additional each year	22%	33%
1-49 dollars a year	16%	31%
50-99 dollars a year	17%	13%
100-249 dollars a year	13%	11%
250-499 dollars a year	10%	3%
500 dollars or more a year	7%	2%
Not Sure	15%	6%

Looking Ahead

Our findings confirm some shift in public belief that global warming is occurring but that there is considerable support for policy development across governmental levels. In subsequent rounds of survey analysis, we will be attentive to possible shifts in public views on this issue in the aftermath of the Copenhagen climate summit, the controversy surrounding the release of e-mail exchanges among some prominent climate scientists, and pending Senate consideration of climate legislation. We will also be examining public response to alternative ways that climate policy might allocate revenues derived from cap-and-trade or carbon tax policies.

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Methodology Statement

The findings from this survey were drawn from a telephone survey of Americans between September 21 and November 20, 2009. The survey results are based on a random sample of adults age 18 and older who reside in the United States. Interviewing and sampling was conducted by the Muhlenberg College Institute of Public Opinion. The final number of completed surveys in the national sample was 988 with a resulting margin of error of +/- 3% at the 95% confidence interval. However, the margin of errors for sub groups (i.e. Republicans, non-believers) is larger due to smaller sample sizes. Percentages throughout the survey have been rounded upward at the .5 mark, thus many totals in the results will not equal 100%. The response rate (AAPOR RR1 Standard Definition) for the survey was 31%. Ten callbacks were employed in the fielding process. The survey questionnaire in some instances linked directly with prior national survey questions to allow for comparison across various audiences and was designed by Dr. Barry Rabe of the Gerald Ford School of Public Policy at the University of Michigan and Dr. Christopher Borick of the Muhlenberg College Institute of Public Opinion.

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