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American Acceptance of Global Warming Retreats in Wake of Winter 2014

a report from the National Surveys on Energy and Environment

Introduction

The winter of 2014 took its toll on many aspects of life in the United States. From individual level costs such as increased heating expenses and disrupted work schedules to broad economic effects including strained public works budgets and slower than expected growth in gross domestic product, the generally cold and snowy winter left a substantial impact on the lives of many Americans. Along with the numerous economic and fiscal effects the last winter left behind has been an erosion in public acceptance of the existence of global warming. In the wake of winter 2014 Americans are less likely to say that there is solid evidence of global warming than at any point measured since the spring of 2011. These are among the key findings of the latest round of the National Surveys on Energy and Environment (NSEE) from the University of Michigan and Muhlenberg College.

Key Findings

1. The percentage of Americans who think there is solid evidence of global warming decreased by 6% between the Fall 2013 and the Spring 2014 surveys, with 55% of Americans now indicating that there is evidence of increasing temperatures on Earth over the last four decades.

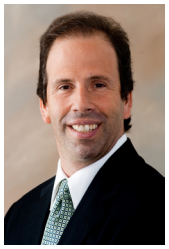
2. After the end of this past winter, one-third of Americans report that they do not think there is solid evidence of global warming, marking a four-year high in the percentage of Americans who maintain this view.

3. Among Americans who do not believe there is evidence of global warming, personal observations of weather have an increasingly large effect on this position, with 56% of these respondents stating that their observations of weather have a very large effect on their conclusions on this subject.

4. Fewer Americans than at any time in the history of the survey say that milder winters in their area have either a very large (15%) or somewhat large (24%) effect on their acceptance of solid evidence of global warming.

5. Near-record levels of Americans cite severe droughts in areas across the United States as having a very large effect on their position on the existence of global warming.

Authors



Christopher Borick
Professor of Political Science
Director, Muhlenberg Institute of Public Opinion
Muhlenberg College
cborick@muhlenberg.edu

Barry G. Rabe
J. Ira and Nicki Harris Professor of Public Policy
Director, Center for Local, State, and Urban Policy
Gerald R. Ford School of Public Policy
University of Michigan
Non-Resident Senior Fellow
Governance Studies Program
Brookings Institution
brabe@umich.edu

CLOSUP
Center for Local, State, and Urban Policy
Gerald R. Ford School of Public Policy

GERALD R. FORD SCHOOL OF PUBLIC POLICY
UNIVERSITY OF MICHIGAN

INSTITUTE OF PUBLIC OPINION
MUHLENBERG COLLEGE

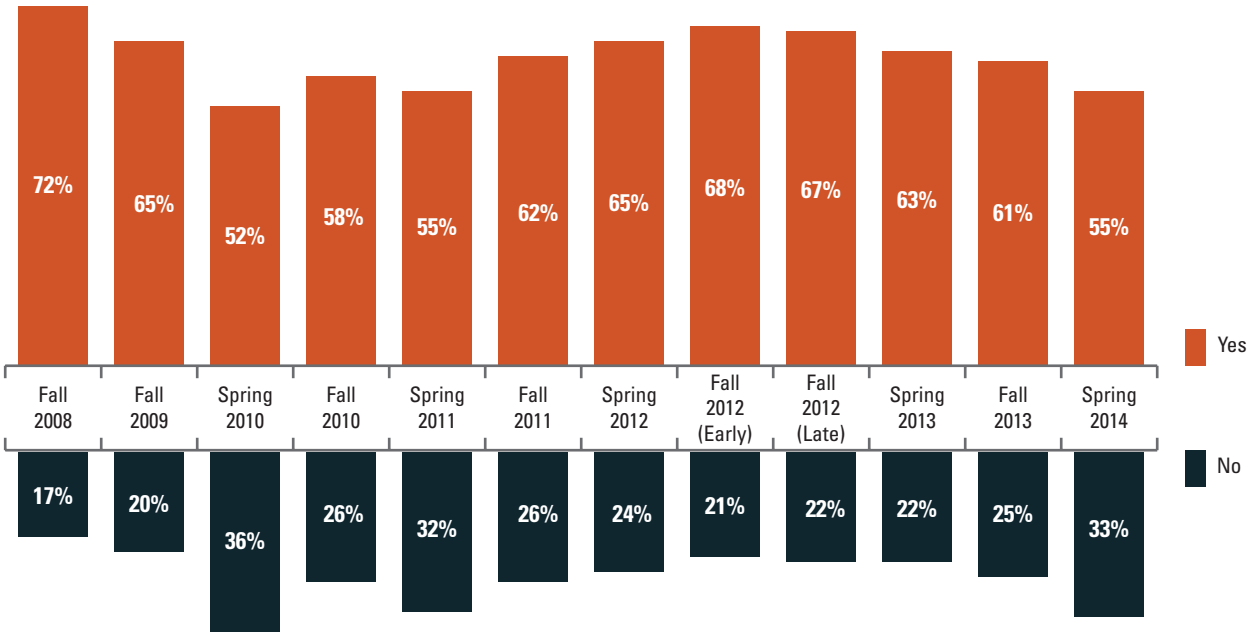
Scientific Evidence Meets a Less Accepting American Public

In May 2014 the American public received numerous pieces of evidence regarding the effects that global warming is having on both the United States and the overall climate of the planet. First, the White House released the National Climate Assessment that examined the impact of a changing climate on the United States, with the report demonstrating evidence of global warming, such as sea level increases, intensified droughts, and more intense heat waves. This report was followed quickly by a large report from NASA and the University of California that provides evidence of declining ice on the Western Antarctic Ice Sheet and projections of significantly rising sea levels.

While these warnings were widely covered in the American media, they were being heard by an American public that has become less likely to believe there is evidence of global warming than at any time during the past three years. As can be seen in *Figure 1*, 55% of Americans indicate that they think there is solid evidence that temperatures on Earth have gone up over the past four decades; while still a majority of the population, this marks the lowest level recorded in this series of surveys since Spring 2011, and the second-lowest mark in 12 iterations of the survey since Fall 2008. Conversely, the percentage of Americans who do not think there is solid evidence of global warming over the past forty years rose to its highest mark since Spring 2010, with one out of three (33%) US residents now maintaining a view that there is not solid evidence of global warming during this time frame.

Figure 1
American Views on the Existence of Evidence of Global Warming
2008-2014

"Next, I would like to ask you a few questions on the issue of global warming. 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?"



The most recent decline in public acceptance of evidence of global warming appears to be part of an emerging pattern in measurements of opinion after recent winter seasons. The NSEE has measured public opinion on global warming after each of the past five winters, with a decreasing percentage of Americans maintaining views that there is solid evidence of global warming after four of these five winters. In each of these four winter seasons, mean national temperatures between January and March were relatively normal. Conversely, after the one winter season (2012) that was ranked the warmest in the United States since records began to be collected back in 1895, the percentage of Americans who believed there was solid evidence of global warming rose from the previous fall (see *Table 1*).

Table 1
The Relationship between Winter Temperatures and American Views on Evidence of Global Warming
2010-2014

Year of NSEE Spring Survey	Rank Among Coldest January through March Periods (1895-2014)*	Percentage of Americans who Believe There is Evidence of Global Warming	Change From Previous Fall
2010	75 out of 116	52%	-13%
2011	67 out of 117	55%	-3%
2012	118 out of 118	65%	+3%
2013	51 out of 119	63%	-5%
2014	46 out of 120	55%	-6%

**Higher rank equates to colder weather*

The broad findings about the effect of winter weather on acceptance of global warming presented above corresponds with more detailed data reported later in this paper. It also corroborates key findings from a forthcoming article,"Weather or not? Examining the impact of meteorological conditions on public opinion regarding global warming," that will soon be published in *Weather, Climate, and Society*, a peer-reviewed journal published by the American Meteorological Society. In this forthcoming article authored by Borick and Rabe, the effects of snow and temperature departures from average are shown to be a significant predictor of an individual's position on the existence of global warming. Of particular note, after seasons wherein snowfall in a survey respondent's area of residence is greater than average, their likelihood of indicating there is solid evidence of global warming decreases.

In the case of the latest NSEE, the responses from Americans who do not think there is evidence of global warming demonstrate the role that personal experiences with winter weather have on their position on this issue. Thus, when asked to identify the primary factor that makes them believe that temperatures on Earth are not increasing after last winter, 38% of Americans who do not believe global warming is happening attributed this belief primarily to their personal observations of weather. Comparatively, after the record warmth of the winter of 2012, only 20% of those doubting the existence of global warming attributed their position to personal weather observations (see *Table 2*).

Table 2
The Primary Reason for Believing that Temperatures on Earth are Not Increasing
2008-2014

"What is the primary factor that makes you believe that temperatures on Earth are not increasing?"
(Open-ended responses coded into categories)

	Fall 2008	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012 (Early)	Fall 2012 (Late)	Spring 2013	Fall 2013	Spring 2014
Personal Observation	42%	N/A	43%	29%	40%	33%	20%	21%	18%	31%	31%	38%
Natural Patterns	19%	N/A	22%	32%	29%	22%	21%	24%	35%	21%	17%	20%
Lack of Evidence	11%	N/A	13%	7%	8%	14%	11%	12%	6%	7%	5%	8%
Media has Misled	3%	N/A	2%	3%	2%	2%	4%	3%	1%	4%	1%	<1%
Evidence Disproves	8%	N/A	9%	9%	5%	6%	10%	7%	11%	8%	20%	9%
Religious Factors	<1%	N/A	4%	3%	4%	8%	10%	11%	11%	16%	7%	6%
Politically Driven	2%	N/A	<1%	2%	1%	<1%	9%	12%	7%	4%	6%	4%
No Particular Reason	5%	N/A	4%	5%	3%	6%	6%	6%	4%	1%	2%	3%
Not Sure/Other	9%	N/A	3%	10%	10%	11%	10%	5%	8%	8%	11%	13%

Open-ended comments regarding the primary reason for indicating that global warming is not occurring further reflect the prominence of harsh winter weather observations during early 2014. A man from Ohio, for instance, attributed his view on global warming primarily to "the rough winter and polar vortex," with a West Virginian woman claiming "the extremely snowy and bitter cold winters lately" to be the main reason why she did not think global warming is happening. Likewise, when asked the primary reason for her view that temperatures on Earth are not rising, a woman from Indiana responded to this question by stating that "we just had the coldest winter in 30 years," while a woman from Texas responded "after this winter who would even ask that?"

These open-ended comments on the effects of weather on global warming skepticism are bolstered by individual responses to another NSEE question. Since the fall of 2011, NSEE respondents who have indicated that they did not think there is evidence of global warming have been asked about what effect their personal observations of weather in their area had on their position on this issue. The results of the latest survey show a record number (56%) of global warming skeptics indicating that their weather observations have a very large effect on their beliefs regarding this matter. In contrast, after Superstorm Sandy struck the east coast of the United States in the fall of 2012, only 20% of Americans who did not think there is evidence of global warming stated that their personal observations of weather had a very large effect on their position on this matter (see *Table 3*).

Table 3
The Effect of Personal Observations of Weather in a Respondent's Area on Their View that Global Warming is Not Occurring
2011-2014

"For each factor that I mention, please indicate if it has had a very large, somewhat large, not too large, or no effect on your view that global warming is not occurring. First, your personal observations of weather in your area."

	Fall 2011	Spring 2012	Fall 2012 (Early)	Fall 2012 (Late)	Spring 2013	Fall 2013	Spring 2014
Very Large	40%	23%	31%	20%	40%	44%	56%
Somewhat Large	28%	18%	28%	31%	36%	31%	25%
Not Too Large	16%	31%	18%	18%	10%	13%	10%
No Effect	14%	28%	21%	30%	14%	12%	10%
Not Sure	1%	2%	2%	1%	<1%	<1%	<1%

At the same time, the majority of Americans who think there is solid evidence of global warming are *less* likely now than at any time in the history of the NSEE to cite their personal experiences with milder winters as having a substantial effect on their view that global warming is happening. As can be seen in *Table 4*, currently only 15% of Americans who think there is evidence of global warming indicate that milder winters in their area have a very large effect on their view of this matter, while a further 24% say milder winters have a somewhat large effect. Both indicate record lows of Americans who cite milder winters as having an effect on their belief in global warming. For comparison, after the record warm winter of 2012, the NSEE found that 35% of Americans who acknowledged evidence of global warming stated that milder winters in their area had a large effect on their conclusion that global warming was happening.

Table 4
The Effect of Milder Winters in a Respondent's Area on Their View That the Earth is Getting Warmer
2008-2014

"For each factor that I mention, please indicate if it has had a very large, somewhat large, not too large, or no effect on your view that the Earth is getting warmer: Milder winters in your area."

	Fall 2008	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012 (Early)	Fall 2012 (Late)	Spring 2013	Fall 2013	Spring 2014
Very Large	36%	N/A	19%	32%	17%	24%	35%	34%	34%	21%	23%	15%
Somewhat Large	31%	N/A	38%	28%	25%	33%	33%	33%	36%	38%	40%	24%
Not Too Large	13%	N/A	15%	17%	19%	25%	18%	17%	17%	28%	25%	41%
No Effect	18%	N/A	26%	22%	37%	17%	14%	14%	12%	12%	11%	20%
Not Sure	3%	N/A	2%	<1%	1%	2%	1%	2%	1%	1%	1%	1%

Among the factors that have risen in importance as a cause of American acceptance of evidence of global warming in this version of the NSEE is the existence of severe droughts across areas of the United States during 2013-14. The current survey results indicate that 45% of the Americans who think there is evidence of global warming said that severe droughts in the US have had a very large effect on their position on this matter, representing the largest percentage since Fall 2008. Notably, after previous winters, only 28% or 29% of Americans who thought there is strong evidence of global warming indicated that severe droughts had a very large effect on their view (see *Table 5*).

Table 5
The Effects of Severe Droughts in the United States on Respondent's View That the Earth is Getting Warmer
2008-2014

"For each factor that I mention, please indicate if it has had a very large, somewhat large, not too large, or no effect on your view that the Earth is getting warmer: Severe droughts in areas across the United States."

	Fall 2008	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012 (Early)	Fall 2012 (Late)	Spring 2013	Fall 2013	Spring 2014
Very Large	47%	N/A	29%	41%	29%	35%	29%	39%	43%	28%	37%	45%
Somewhat Large	32%	N/A	38%	35%	39%	55%	41%	44%	39%	54%	49%	40%
Not Too Large	8%	N/A	14%	13%	17%	6%	18%	8%	11%	11%	9%	8%
No Effect	9%	N/A	14%	10%	14%	3%	9%	6%	5%	5%	5%	5%
Not Sure	3%	N/A	5%	2%	1%	2%	3%	3%	1%	3%	1%	2%

As might be expected, the effect of severe droughts on an individual's belief that there is solid evidence of global warming are related to the individual's area of residency. With severe droughts affecting large areas of the western and south central United States in this case, we find residents of those areas who express belief that global warming is happening to be more likely to attribute their acceptance of global warming to a very large degree to those drought conditions. As can be seen in *Table 6*, a majority (53%) of residents of the West who think there is evidence of global warming indicate that severe droughts have a very large effect on their appraisal of this matter. Conversely, residents of other regions—including the Northeast, Midwest, and South—are comparatively less likely (40% to 44%) to state that severe drought has a very large effect on their acceptance of evidence of global warming. Finally, among participants who accept global warming and who live in drought-stricken states, the effect of droughts on their acceptance of this phenomenon appears particularly strong, with 59% of those accepting global warming in those states indicating that severe droughts have a very large effect on their belief in global warming.

Table 6
The Effects of Severe Droughts in the United States on Respondent's View that the Earth is Getting Warmer by Region

"For each factor that I mention, please indicate if it has had a very large, somewhat large, not too large, or no effect on your view that the Earth is getting warmer: Severe droughts in areas across the United States."

Region	Very Large	Somewhat Large	Not Too Large	No Effect	Not Sure
Northeast	41%	45%	6%	8%	1%
Midwest	40%	41%	13%	3%	3%
South	44%	42%	8%	4%	3%
West	53%	31%	8%	6%	2%
Drought-Stricken States	59%	28%	7%	4%	2%

Note: Drought-Stricken States are identified as having a majority of the state in drought conditions as measured by the National Drought Mitigation Center in April of 2014 and include: CA, OR, UT, NV, NM, AZ, TX, OK, KS, NE

Conclusions

While a majority of Americans continue to believe that there is solid evidence of global warming, the cold and snowy winter of 2014 appears to have moderately eroded the overall level of acceptance of the existence of the phenomenon among American residents. This decline in expressed belief about the arrival of global warming comes as an increasing body of scientific evidence detailing the effects of climate change has been released to the American public. Against this apparent disconnect between scientific evidence and public opinion, the Obama Administration continues to advance its climate change policies through executive actions, including the recently released regulations on coal-burning power plants. The more divided public opinion regarding global warming may further reduce any likelihood of significant congressional action on climate change in the foreseeable future. However, additional results from the Spring 2014 NSEE provide evidence that the American public's preferences regarding climate policy include fairly widespread support for certain policy options that have seen limited use within the United States. These findings, which include an extensive examination of alternative versions of a carbon tax, will be covered in a follow-up report to be released shortly.

Methodology for the National Surveys on Energy and Environment (NSEE)

The National Surveys on Energy and Environment (NSEE) are designed, conducted, and financed by the University of Michigan and Muhlenberg College. This research initiative began in the fall of 2008 and was formerly known as the National Survey of American Public Opinion on Climate Change (NSAPOCC). This key findings report summarizes data collected in telephone surveys of residents of the United States conducted during the spring of 2014. The survey included interviews with 798 adult residents of the United States between March 24 and April 9, 2014. There were 425 interviews conducted by land line and 373 by cell phone. The survey had a margin of error of +/- 3.5% at a 95% level of confidence and an AAPOR RR2 response rate of 12%. Percentages throughout the survey have been rounded upward at the 0.5 mark; thus, many totals in the results will not equal 100%. Interviews are conducted by personnel under the supervision of the Muhlenberg College Institute of Public Opinion in Allentown, Pennsylvania. The data has been weighted by the following categories: age, gender, educational attainment, race, and region. The instrument was designed by Christopher Borick of Muhlenberg College and Barry Rabe of the University of Michigan, with valuable input from Erick Lachapelle at the University of Montreal and the late David Amdur at Muhlenberg College.

Survey Iteration	Fielding Dates	Sample Size	Margin of Error
Fall 2008	September 8 - September 24, 2008	603	+/-4%
Fall 2009	September 21 - October 20, 2009	988	+/-3%
Spring 2010	March 22 - April 9, 2010	726	+/-4%
Fall 2010	November 15 - December 9, 2010	916	+/-3.5%
Spring 2011	March 18 - April 5, 2011	712	+/-4%
Fall 2011	December 4 - December 21, 2011	887	+/-3.5%
Spring 2012	March 27 - April 14, 2012	729	+/- 4%
Fall 2012 (Early)	September 26 - October 11, 2012	917	+/-3.5%
Fall 2012 (Late)	November 26 - December 5, 2012	998	+/-3.5%
Spring 2013	April 1 - April 14, 2013	853	+/-3.5%
Fall 2013	October 3 - October 14, 2013	948	+/-3.5%
Spring 2014	March 24 - April 9, 2014	798	+/-3.5%

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University of Michigan
Center for Local, State, and Urban Policy
Gerald R. Ford School of Public Policy
Joan and Sanford Weill Hall
735 S. State Street, Suite 5310
Ann Arbor, MI 48109-3091

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web: www.closup.umich.edu
email: closup@umich.edu
twitter: @closup
phone: 734-647-4091