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# The Chilling Effect of Winter 2013 on American Acceptance of Global Warming

a report from the National Surveys on Energy and Environment

## Introduction

After a period of growing public acceptance in the United States that global warming is occurring, the latest version of the National Surveys on Energy and Environment (NSEE) provides evidence of a modest decline in the number of Americans who believe there is evidence that temperatures on Earth are rising. This small decline in acceptance of global warming among residents of the United States appears to be related to their perceptions and experiences with a winter and spring that included below-average temperatures in many parts of the country. These are among the latest findings from the Spring 2013 NSEE from The Center for Local, State, and Urban Policy at the University of Michigan and The Muhlenberg College Institute of Public Opinion.

## Key Findings

1. The percentage of Americans who think there is solid evidence of global warming modestly declined during early 2013. During this period, 63% of NSEE respondents state that they believe global warming is occurring, compared to 67% of respondents in the late Fall 2012.

2. Among those Americans who think there is evidence of global warming, there was a slight decline in the confidence that they have in this position. In Spring 2013, 54% of NSEE respondents state that they are very confident that temperatures on the planet are rising, compared with 61% maintaining this position late last fall.

3. As compared to late 2012, fewer Americans in Spring 2013 cited their experiences with warmer-than-normal temperatures as a primary reason for their belief that global warming is occurring.

4. Of the 22% of Americans who think there is not evidence of global warming, a growing number cite their personal observations of cold and snowy winter conditions as the primary factor influencing this belief during Spring 2013 (31% versus 18% in late Fall 2012).

5. Among Americans who express doubt about the existence of global warming, a growing percentage cite religious factors as the main reason for their skepticism. In Spring 2013, a record level of 16% of such respondents cited religious factors as the primary reason for their skepticism, compared to less than 1% of such respondents in Fall 2008 when the NSEE began.

6. The NSEE findings from Spring 2013 provide continuing evidence from past findings that while weather conditions may play a role in shifting individual positions on the existence of global warming, more often they tend to confirm Americans' existing beliefs on the presence or absence of global warming.

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## Overall Views on the Existence of Global Warming

Since its inception in 2008, the NSEE has tracked Americans' perceptions of the presence of evidence of global warming. After a significant decline in climate change belief between Fall 2008 and Spring 2010 (see *Table 1*), over the past few decades, there has been a general trend of increasing belief of solid evidence of global warming. As shown in *Table 1*, in two Fall 2012 surveys, more Americans than at any time since 2008 indicated that they thought global warming was occurring. However, in Spring 2013, the number of Americans maintaining this view declined by 5% from the post-2008 record of 68% set during early Fall 2012. Notably, the modest decline in the percentage of Americans who believe there is evidence of global warming did not translate into an increased number of Americans who do not think it is occurring, but instead corresponded with elevated levels of uncertainty regarding this matter. In particular, the percentage of Americans who are not sure if there is solid evidence of global warming increased to its highest level (15%) since Fall 2010.

**Table 1**

"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?"

| | Fall 2008 | Fall 2009 | Spring 2010 | Fall 2010 | Spring 2011 | Fall 2011 | Spring 2012 | Fall 2012 (Early) | Fall 2012 (Late) | Spring 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| Yes | 72% | 65% | 52% | 58% | 55% | 62% | 65% | 68% | 67% | 63% |
| No | 17% | 20% | 36% | 26% | 32% | 26% | 24% | 21% | 22% | 22% |
| Not Sure | 11% | 15% | 13% | 16% | 12% | 12% | 11% | 11% | 11% | 15% |

Along with the slight decline in the number of Americans who think that global warming is happening, there also appears to be a modest decline in the level of confidence that individuals maintain regarding the existence of increasing temperatures on Earth. As shown in *Table 2*, in the three NSEE surveys conducted during 2012, over 60% of respondents indicated that they were very confident of their appraisal that global warming was occurring; however, in Spring 2013, this figure declined to 54%.

**Table 2**

"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?"

| | Fall 2008 | Fall 2009 | Spring 2010 | Fall 2010 | Spring 2011 | Fall 2011 | Spring 2012 | Fall 2012 (Early) | Fall 2012 (Late) | Spring 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| Very Confident | 58% | 40% | 53% | 55% | 50% | 49% | 63% | 63% | 61% | 54% |
| Fairly Confident | 38% | 52% | 39% | 37% | 43% | 44% | 32% | 31% | 35% | 43% |
| Not Too Confident | 3% | 7% | 6% | 6% | 5% | 5% | 4% | 4% | 4% | 3% |
| Not Confident At All | 0% | 1% | 1% | 1% | 2% | 2% | 1% | 1% | <1% | <1% |
| Not Sure | 1% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |

NOTE: Asked only of respondents who indicated there is solid evidence of global warming.

## Explaining the Decline

The drop in the number of Americans who think global warming is occurring and their decreased confidence in their position on this matter suggests that the solid rebound in acceptance of global warming among the American public observed in recent surveys has at least temporarily ended. At this point we turn to an examination of the factors that may have led to the slight downturn in public acceptance of global warming.

In the past, shifts in public views on the existence of global warming have corresponded with individual perceptions of weather. Likewise, in the most current iteration of the NSEE, the findings regarding diminished acceptance of global warming appear to correspond with changes in the American public's observations and experiences with weather during the winter and spring of 2013. In each version of the NSEE, respondents are asked to identify the primary factor that leads them to believe that temperatures on Earth are rising. As the percentage of Americans who believed global warming was happening increased in the later stages of 2011 and for most of 2012, the most commonly-cited primary reason for an individual's view on this matter was their experiences or observations of warmer temperatures. However, after the winter and early spring of 2013, the percentage of NSEE respondents citing warmer temperatures as the primary factor influencing their acceptance of global warming dropped to its lowest level since Spring 2010 (see *Table 3*).

**Table 3**

"What is the primary factor that has caused you to believe that temperatures on Earth are increasing?" (Open-ended format)

| | Fall 2008 | Fall 2009 | Spring 2010 | Fall 2010 | Spring 2011 | Fall 2011 | Spring 2012 | Fall 2012 (Early) | Fall 2012 (Late) | Spring 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 Glaciers Melting | 19% | N/A | 22% | 17% | 21% | 14% | 15% | 13% | 11% | 15% |
| 2 Warmer Temperatures | 19% | N/A | 15% | 22% | 17% | 24% | 21% | 20% | 24% | 16% |
| 3 Weather Change | 18% | N/A | 15% | 17% | 17% | 24% | 20% | 19% | 20% | 21% |
| 4 Scientific Research | 9% | N/A | 14% | 10% | 9% | 8% | 11% | 12% | 12% | 8% |
| 5 Gore Documentary | 2% | N/A | <1% | <1% | <1% | <1% | <1% | <1% | 0% | 1% |
| 6 Media Coverage | 15% | N/A | 16% | 14% | 14% | 12% | 9% | 8% | 9% | 7% |
| 7 Declining Species | <1% | N/A | N/A | 1% | 2% | 2% | 1% | <1% | <1% | <1% |
| 8 Human Activity | 4% | N/A | 5% | 9% | 7% | 9% | 10% | 12% | 11% | 13% |
| 9 Natural Patterns | <1% | N/A | 3% | 2% | 3% | 4% | 4% | 3% | 4% | 4% |
| 10 Not Sure/Other | 12% | N/A | 10% | 10% | 11% | 5% | 10% | 13% | 9% | 15% |

NOTE: Asked only of respondents who indicated there is solid evidence of global warming.

Another indicator of the impact of the winter of 2013 on Americans' perceptions of climate change can be found in an NSEE question that examines the relative effect of milder winter conditions on views regarding evidence of global warming. Since its beginning in 2008, NSEE respondents have been asked to rate the impact that milder winter conditions have had on their view that temperatures on Earth are rising. During Spring 2013, the percentage of Americans (21%) who indicated that milder winters in their area had a very large effect on their view that there is evidence of global warming dropped by 13% from the 2012 average and reached its lowest point since Spring 2011 (see *Table 4*).

**Table 4**

"Have milder winters in your area had a very large, somewhat large, not too large, or no effect on your view that the Earth is getting warmer?"

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

NOTE: Asked only of respondents who indicated there is solid evidence of global warming.

Notably, during the past four NSEE surveys conducted after winter seasons, there has been significant variation in the public's connection between winter weather in their area and their position on the existence of global warming. In this vein, *Table 5* presents the relationship between actual weather conditions during the last four winter seasons and individual evaluations of the impact of winter conditions on their views regarding global warming. During the 2012 winter season, which was the warmest on record, 35% of Americans who believed there is evidence of global warming also stated that milder winter conditions in their area had a very large effect on their position that global warming is happening. Conversely, in the winters of 2010, 2011 and 2013, in which temperatures were more normal, an average of only 21% of Americans who thought global warming was occurring also stated that milder winters in their areas had a very large effect on their view that global warming was occurring. It should also be noted that the number of Americans who believe there is evidence of global warming only increased from the fall of the previous years after the exceptionally warm winter of 2012 (see *Table 5*).

**Table 5**

The Relationship Between Actual Winter Temperatures and Public Perception of Global Warming

| Season | Rank among coldest January to March periods* | Percent of those who think there is evidence of global warming who also stated that milder winters in their area had a very large effect on their position that global warming is occurring | Change in the percentage points of the number of Americans who think there is evidence of global warming |
|---|---|---|---|
| Winter 2013 | 74 out of 119 | 21% | -4% |
| Winter 2012 | 118 out of 118 | 35% | +3% |
| Winter 2011 | 58 out of 117 | 17% | -3% |
| Winter 2010 | 60 out of 116 | 19% | -13% |

*Rankings provided by the National Climatic Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA). Lower numbers indicate colder winter temperatures. Winters measured as January 1 to March 31.

## Weather and Doubts About Climate Change

While the percentage of Americans who indicate that they don't believe there is evidence of global warming was unchanged between Fall 2012 and Spring 2013, skeptics were much more likely to identify their personal experiences with weather as a key reason for their position on the matter during the latter period. In Spring 2013, almost one out of three (31%) Americans who did not think there was evidence of global warming cited their personal observations of weather as the primary reason for their doubts regarding its existence. This finding demonstrates that a larger percentage of Americans who do not think global warming is occurring connected that position to their experiences with weather in early 2013 than in the past year. During 2012, only about 20% of Americans who did not believe there was evidence of global warming attributed this position primarily to their experiences with weather, compared to the 31% found in the most recent NSEE survey (see *Table 6*).

**Table 6**

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

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

NOTE: Asked only of respondents who indicated there is not solid evidence of global warming.

The verbatim responses provided by individuals in the Spring 2013 NSEE help to demonstrate the connection made by those doubting global warming between last winter's weather and the existence of climate change. A middle-aged woman from Connecticut, for instance, stated that the "worst winter in years" served as the primary reason why she did not think global warming was occurring, while a young woman from Illinois said that the "colder, longer winter" served as the primary factor behind her doubts. A Massachusetts man in his early thirties reported that the primary reason for his belief that global warming was not happening was that "it's just as cold here as it always was," while an elderly Massachusetts resident stated that the main factors behind his lack of belief in the phenomenon were that "winters are darn cold and long." Finally, a young woman from Virginia stated that her view that global warming is not occurring was primarily caused by the fact that "it's April and it's 41 degrees. It should be warmer by now," while an elderly man in Ohio stated that he didn't think there was evidence of global warming primarily because "he was still digging out from snow this past year."

## The Rise of Religious Factors and Doubts About Global Warming

One of the most notable trends among individuals doubting the existence of global warming is the increased prominence of religious factors behind their positions on this matter. Over the course of the NSEE, a growing percentage of those who do not think global warming is occurring attribute this view primarily to religious factors. In Fall 2008, less than one percent of those who thought that global warming was not occurring attributed this position primarily to religious factors, yet by Spring 2013, this figure had risen to a record level of 16%.

The verbatim responses from the latest NSEE help to demonstrate the links that many Americans are making between their religious beliefs and their views on climate change. An elderly man from Alabama indicated that the primary factor behind his position that global warming is not happening is that "the Lord controls everything," while a middle-aged woman from Arkansas similarly explains her skepticism regarding global warming by stating that "the good Lord makes the weather."

## Conclusion: Change versus Confirmation

The results of the latest version of the NSEE appear to provide increasing evidence that Americans are using their experiences with weather more as a confirmation of their views on the existence of global warming rather than as a cause of change in positions on this matter. While there has been some fluctuation in views on the existence of climate change in recent years, with increasing levels of acceptance in 2012 and some increased uncertainty in Spring 2013, there has been more volatility in the identification of the reasons that people attribute to their views about global warming. More specifically, as weather and temperatures (e.g. record heat, strong hurricanes) that support the existence of global warming were commonplace during 2012, the percentage of Americans citing those factors as the primary reason behind their acceptance of global warming grew substantially. However, during the fairly cold and snowy winter of 2013, those who think climate change is happening were less likely to turn to their experiences with weather as a pivotal factor behind their positions on this matter. Conversely, in 2012, Americans who did not think there is evidence of global warming shied away from citing weather-related factors as the key to their skepticism. But then, after the winter of 2013 with its more traditional cold temperatures and snowy conditions, these individuals once again returned to these factors as key reasons for their doubts that there is evidence of global warming.

While the presence of fairly cold and snowy winter weather in 2013 most likely had a greater effect on confirming climate change skepticism among the nearly 1 in 5 Americans who do not think there is evidence of global warming than it did to lead individuals to change their positions on this matter, it appears that the winter of 2013 ended a period of increasing public acceptance of global warming. Unlike after the winter of 2012, during which time there was an increase in acceptance of global warming among Americans in comparison with the previous fall, this winter has appeared to slightly erode some of the growing acceptance and confidence regarding the existence of global warming while modestly increasing uncertainty about this phenomenon. To be sure, a solid majority of Americans continue to believe that there is evidence of global warming. Nevertheless, the most recent period appears to have ended the rebound in acceptance that had been evolving over the past two years.

# 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 2013. The survey included interviews with 852 adult residents of the United States between April 1st and 14th, 2013. There were 552 interviews conducted by land line and 300 by cell phone. The survey had a margin of error of +/- 3.5% at a 95% level of confidence and an AAPOR RR3 response rate of 13%. Percentages throughout the survey have been rounded upward at the .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.

| Survey Iteration | Fielding Dates | Sample Size | Margin of Error |
|---|---|---|---|
| Fall 2008 | September 8 - 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 - 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 | 996 | +/-3.5% |
| Spring 2013 | April 1 - April 14, 2013 | 852 | +/-3.5% |

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