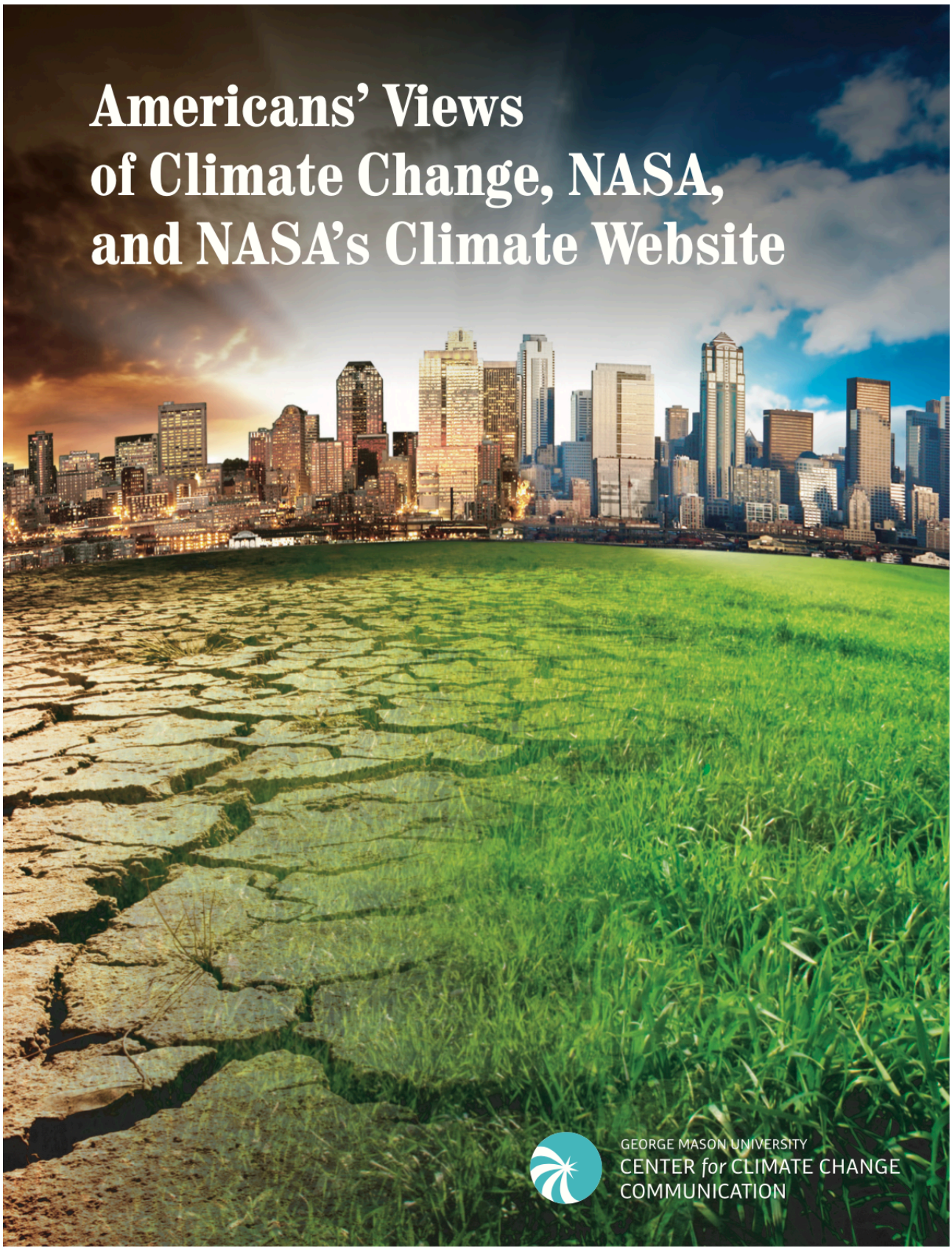
Americans' Views of Climate Change, NASA, and NASA's Climate Website



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Americans' Views of Climate Change, NASA, and NASA's Climate Website

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INTRODUCTION & MAIN POINTS

This report summarizes the results of a nationally representative survey of American adults conducted in 2018. The report's findings are intended to support NASA's efforts to inform and educate the American public on the issue of climate change. The results detail the information users are seeking on climate change, their evaluations of the clarity and usefulness of the website *climate.NASA.gov*, and the impacts the website has on visitors' climate change knowledge, attitudes and beliefs, and on their views of NASA and its earth science research.

The survey was conducted online with a nationally representative sample of 1,050 American adults in February, 2018. Respondents were sent to *climate.nasa.gov* and instructed to search for information on a question they have about climate change. The questionnaire contained several measures previously asked in 2012, allowing an examination of change over time in the website's effectiveness in providing information that site visitors are seeking.

The survey design included a split sample, in which half the respondents were asked questions about their views of NASA and their climate-related knowledge and attitudes *before* they visited the website, while the other half were asked these same questions *after* they visited the site. Comparisons of these pre- and post-website visit groups reveal the impacts of the site on visitors' knowledge and attitudes.

More details on the survey's methods are provided in the Methods section on p. 32.

The report is broken into three parts:

- What do Americans want to know about climate change?
- What do Americans think of NASA's climate website?
- How does visiting NASA's climate website affect Americans' views of NASA and climate change?

Below is an overview of the results from each section:

What do Americans want to know about climate change?

- Americans are most interested in hearing about solutions to climate change. A third of the survey's respondents had questions about solutions, including 13 percent who wonder whether there's still time to reduce climate change, or if it is too late.
- One in five Americans would like to understand how scientists know that climate change is human-caused, rather than the result of natural environmental changes.
- Americans' interest in learning about the impacts of climate change has decreased since 2012. At that time, a quarter of survey respondents had questions about impacts; by 2018, this proportion had shrunk by 12 percentage points to 13 percent.

What do Americans think of NASA's climate website?

- Visitors report finding both more – and more useful – information about their top questions, in comparison to 2012.
- Americans evaluate the website positively, with large majorities stating that it is simple to use, clear, engaging and trustworthy.

How does visiting NASA's climate website affect Americans' perceptions of NASA and climate change?

- Survey participants were more likely to have positive views of NASA's climate science research after visiting the website than before.
- Prior to visiting the website, majorities of respondents were already aware of five impacts of climate change: warmer oceans, increased ocean acidification, higher global temperatures, melting of glaciers, ice sheets and sea ice, and more extreme weather.
    - This result may help explain the decrease (described above) in the number of respondents asking questions about climate change impacts. The decrease may, in part, be the result of greater public familiarity with the impacts of climate change.
- Following the website visit, awareness of all five climate change impacts was significantly higher.
- Confusion remains, however, about the relationships among climate change, the hole in the ozone layer, acid rain, and volcanic activity. Majorities of respondents said the hole in the ozone layer, acid rain, and volcanic eruptions are impacts of climate change. This included both respondents who had and who had not visited the website
- Website visitors have a better understanding of the role of CO2 as a greenhouse gas that is warming Earth, as compared to people who have not visited the website. They're more likely to understand that the concentration of CO2 in the atmosphere is higher now than it has been in hundreds of thousands of years, and they are more likely to recognize that reducing greenhouse gas emissions will not restore the climate to its prior state.
- Website visitors are more likely to understand key climate change facts than those who have not visited the site; i.e., they're more certain that climate change is happening, human-caused and harmful. They're also more likely to feel worried about climate change, and to say it has higher personal importance, as compared to people who have not visited the website.

What Do Americans Want to Know About Climate Change?

AMERICANS ARE THE MOST INTERESTED IN HEARING ABOUT SOLUTIONS TO CLIMATE CHANGE

We asked respondents what they would most like to ask an expert about climate change, prior to sending them to the NASA climate change website (Table 1). The most frequently asked question topic[1] concerned solutions to climate change (34%), and within this topic, the most frequently asked question was whether there's still time to reduce climate change, or if it is too late (13%).

The second most-frequent question topic concerned the causes of climate change: a quarter of respondents asked about causation, with the majority of this group asking how scientists know that climate change is human-caused, rather than the result of natural environmental changes (20%).

Table 1. Top Questions for a Climate Change Expert

Solutions (32%)	Is there still time to reduce climate change, or is it too late?	13%
	What can the nations of the world do to reduce climate change?	6%
	What can the United States do to reduce climate change?	6%
	What can I do to reduce climate change?	6%
	How much would it cost the United States to reduce climate change?	3%
Causes (25%)	How do you know that climate change is caused mostly by human activities, not natural changes in the environment?	20%
	What causes climate change?	5%
Impacts (13%)	When will climate change begin to harm people?	4%
	What harm will climate change cause?	3%
	Will climate change harm people?	2%
	On the whole, will climate change be more harmful or beneficial?	2%
	What benefit will climate change cause?	2%
Reality (12%)	Is climate change really happening?	6%
	How do you know that climate change is happening?	6%
Other Questions (18%)	What kind of research are you conducting on climate change?	11%
	Other (Specify)	7%

Note: The fifteen questions in this table were identified in prior research, in which an open-ended question asked respondents what question they would most like to ask a climate expert. Their responses were coded into the fifteen questions listed above, and then grouped into the five topics shown in the left column.

[1] Topics have been grouped by four key perceptions about climate change – that it is real, human-caused, harmful and solvable – with an "other" category for questions that fall outside these topics. These perceptions are strongly predictive of support for mitigation policies and advocacy behaviors. See (a) van der Linden, S. L., Leiserowitz, A. A., Feinberg, G. D., & Maibach, E. W. (2015). The scientific consensus on climate change as a gateway belief: Experimental evidence. *PloS one*, *10*(2), e0118489; and (b) Roser-Renouf, C., Maibach, E. W., Leiserowitz, A., & Zhao, X. (2014). The genesis of climate change activism: From key beliefs to political action. *Climatic change*, *125*(2), 163-178.

AMERICANS' QUESTIONS ABOUT CLIMATE CHANGE HAVE CHANGED SINCE 2012

We previously asked for respondents' top questions in 2012.[2] Comparison of the 2012 and 2018 results shows that Americans have become less interested in hearing about the impacts of climate change (see Table 2): a quarter of respondents asked about climate change impacts in 2012, as compared to 13% in 2018, a decrease of 12 percentage points. Respondents were more likely in 2018 to ask questions about causes (+4%), solutions (+4%) and the research scientists are conducting on climate change (+3%).

The decrease in questions about impacts may indicate that Americans have greater awareness of the types of harm caused by climate change now than they did in 2012: results shown in Figure 9 on p. 22 show that prior to visiting the NASA website, a majority of respondents correctly identified each of the five climate change impacts in the survey. Interestingly, while the number of questions about impacts decreased, the proportion of Americans with questions about the reality of climate change has not changed over the intervening years.

Table 2. Change in Top Questions for a Climate Change Expert from 2012 to 2018

		2012	2018	Change
Solutions (+4%)	Is there still time to reduce climate change, or is it too late?	11%	13%	+2%
	What can the nations of the world do to reduce climate change?	5%	6%	+1%
	How much would it cost the United States to reduce climate change?	2%	3%	+1%
	What can the United States do to reduce climate change?	5%	6%	+1%
	What can I do to reduce climate change?	5%	6%	+1%
Causes (+4%)	What causes climate change?	3%	5%	+2%
	How do you know that climate change is caused mostly by human activities, not natural changes in the environment?	18%	20%	+2%
Impacts (-12%)	What harm will climate change cause?	7%	3%	-4%
	Will climate change harm people?	3%	2%	-1%
	On the whole, will climate change be more harmful or beneficial?	7%	2%	-5%
	What benefit will climate change cause?	2%	2%	0%
	When will climate change begin to harm people?	6%	4%	-2%
Reality (±0%)	Is climate change really happening?	8%	6%	-2%
	How do you know that climate change is happening?	4%	6%	+2%
Other Questions (+4%)	What kind of research are you conducting on climate change?	8%	11%	+3%
	Other (Specify)	6%	7%	+1%

Note: The percentage in the parentheses after each topic grouping represents the change in percentage between 2012 and 2018 for that topic

[2] Myers, T., Maibach, E., Roser-Renouf, C., Anderson, A., Stenhouse, N., & Leiserowitz, A. (2012). *Public Perceptions of Federal Agencies that Conduct Climate Change Research. George Mason University*, Fairfax, VA: Center for Climate Change Communication. Available at: https://www.climatechangecommunication.org/reports/public-perceptions-of-nasas-research-and-reactions-to-the-climate-nasa-gov-website/

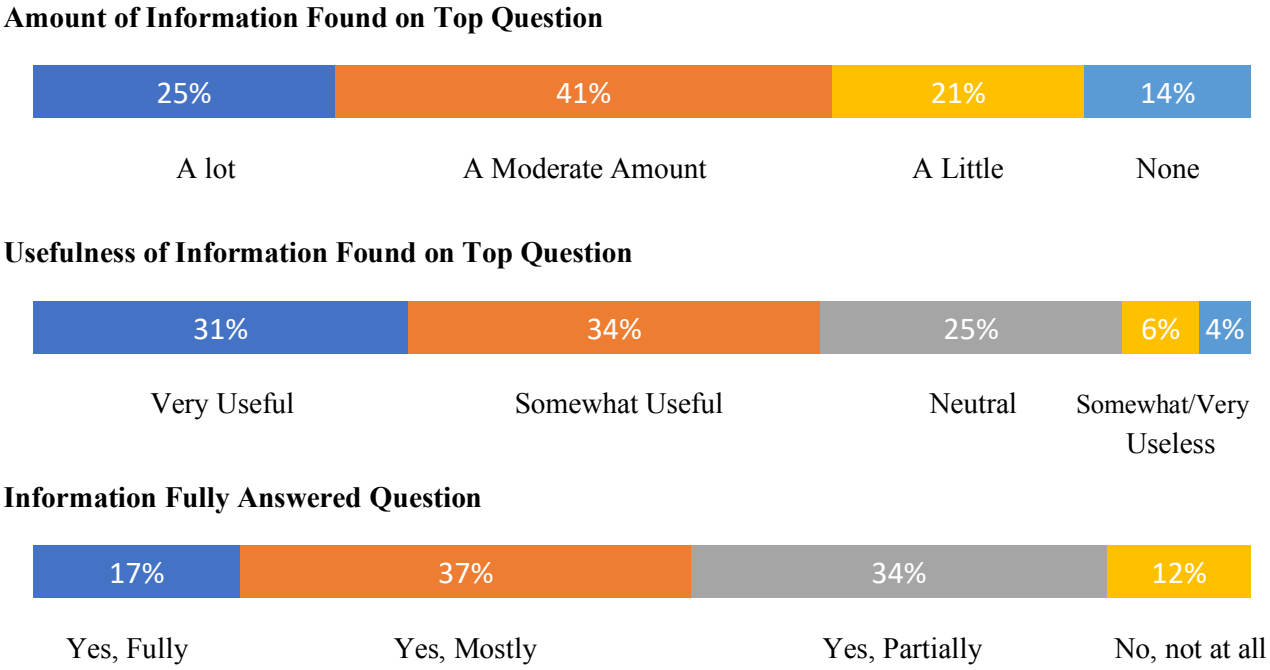
What Do Americans Think of NASA's Climate Website?

AMERICANS SAY NASA'S CLIMATE WEBSITE PROVIDES ANSWERS TO THEIR CLIMATE QUESTIONS

After asking respondents their top question for a climate change expert, we sent them to *climate.NASA.gov* to search for an answer to their question. When they returned to the survey, we asked them to evaluate the effectiveness of the website in answering their question (Figure 1).

Two-thirds of the website visitors found "a lot" or "a moderate amount" of information on their questions (66%), and said that the information was "very" or "somewhat" useful (65%). A large majority felt that their questions were at least partially answered (88%), with only 12 percent saying their search had not answered their question at all.

Figure 1. Information Search Success



Note: Usefulness of information and whether the information fully answered the question were only asked of those who indicated they found at least "a little" information on the website.

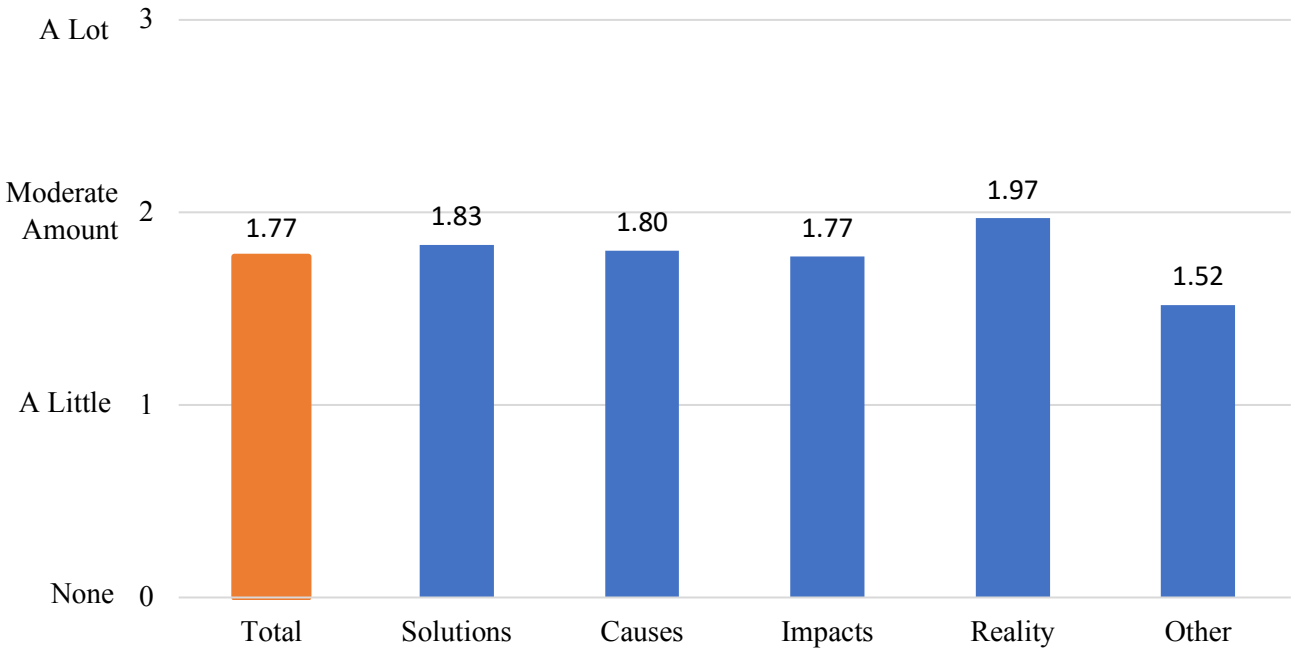
Question wording:

- *Amount of information found on top question: "How much information on NASA's website did you find about your question: [INSERT TOP QUESTION]"*
- *Usefulness of information found on top question: "How useful was the information on NASA's website that you found about your question: [INSERT TOP QUESTION]"*
- *Information fully answered question: "Did the information on NASA's website that you found fully answer your question: [INSERT TOP QUESTION]"*

While Information Searches on NASA's Climate Website Are Generally Successful, Results Vary by Topic and Question

Those who asked about the reality of climate change were most likely to say they found the information they were seeking (Figure 2). This group, while relatively small (12% of the respondents), knew the least about climate change, and hence had the most to learn. Note that the second highest mean for amount of information found was for the respondents who asked questions about solutions to climate change – a topic we know is of high interest to website visitors, but which falls outside NASA's organizational mandate. The results thus suggest that the NASA site is successfully helping visitors who are seeking information on climate solutions, while still respecting the agency's institutional constraints.

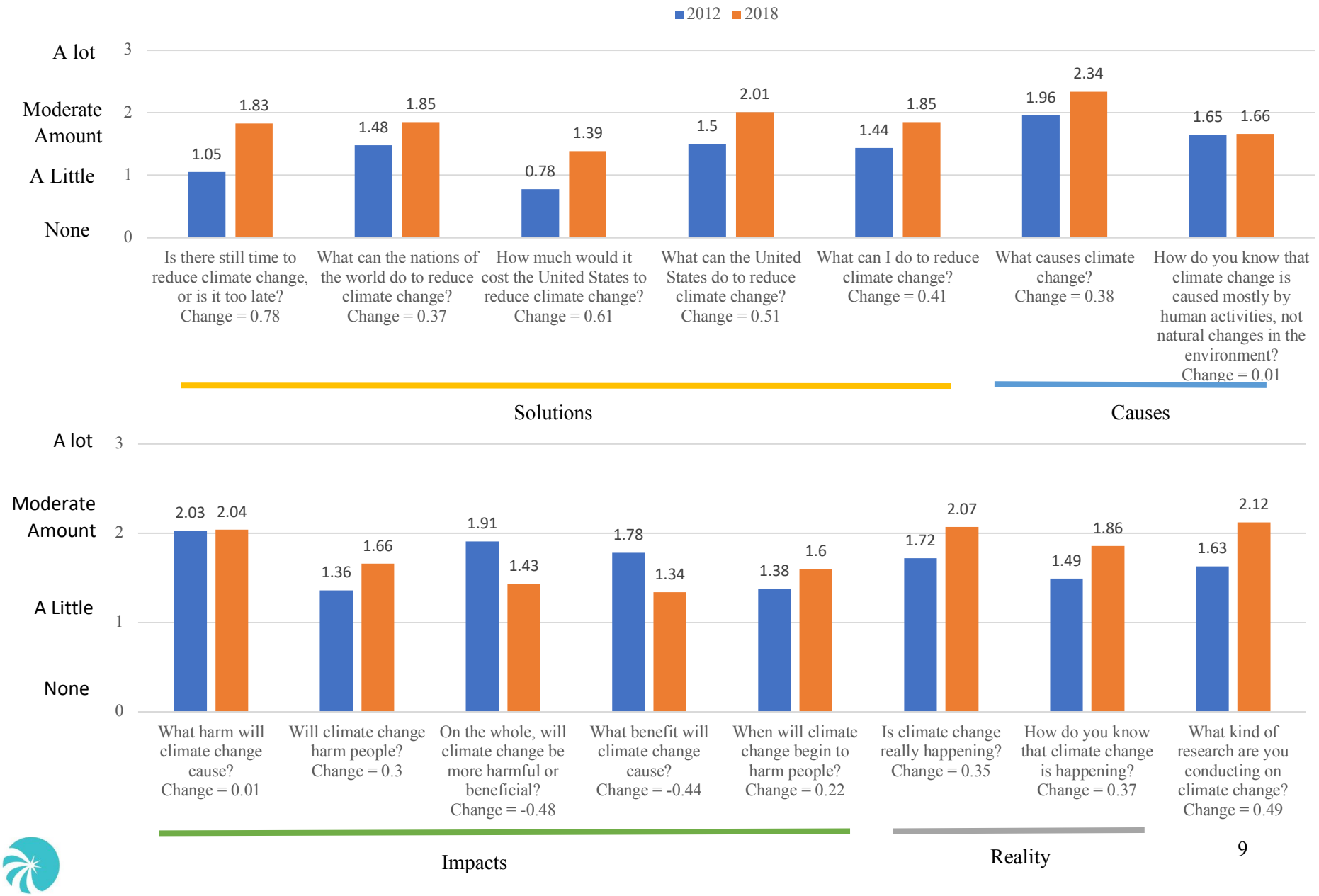
Figure 2. Amount of Information Found on Website, by Question Topic



Note: The amount of information found was significantly different across topics, p≤.001, ANOVA.

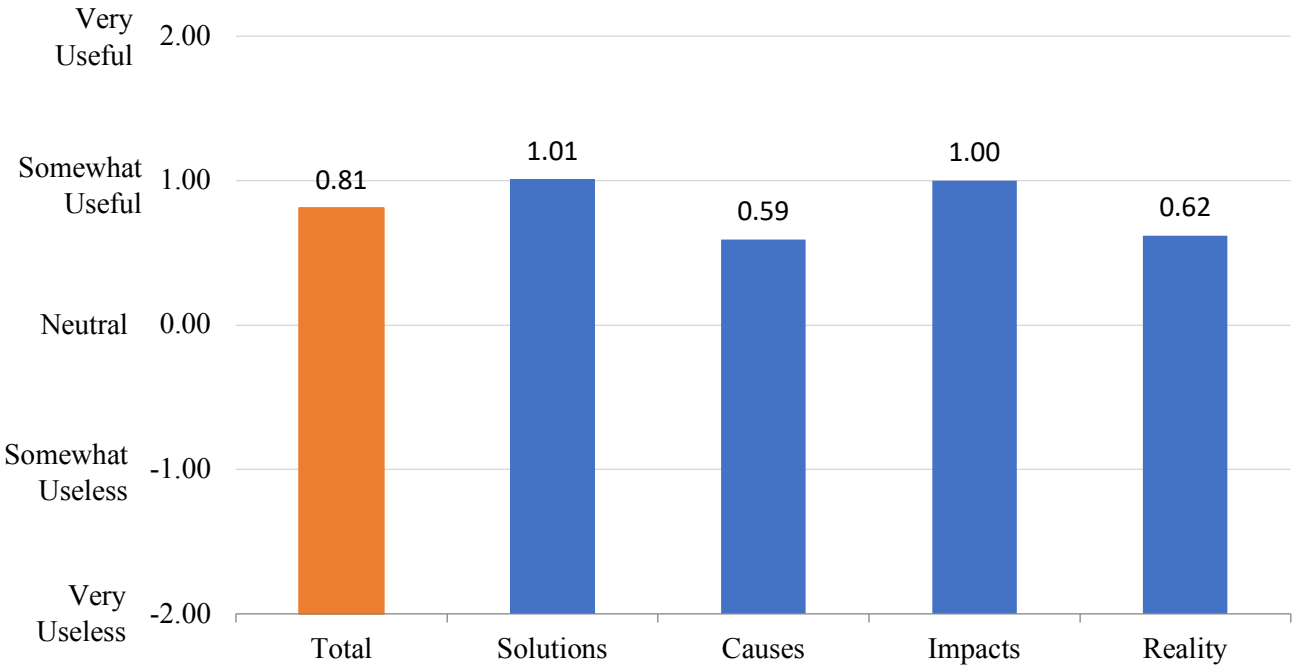
Furthermore, for the majority of questions, participants indicated that they found more information on the website in 2018 than they had in 2012 when we conducted a study with the same methodology (see Figure 3). The biggest change between 2012 and 2018 was for questions about solutions; participants in 2018 indicated they found more information about solutions than did participants in 2012.

Figure 3. Amount of Information Found on NASA's Climate Website, Comparing 2012 to 2018, by Question



Respondents rated the website information on solutions as most useful, and the information on the causes of climate change least useful (see Figure 4). The lower perceived usefulness of information on causation is likely the result of the pre-existing beliefs of those who asked questions about the topic: two-thirds believed that either climate change is not happening, it's caused by natural changes, or it's caused equally by human activities and natural changes (66%). The results thus suggest there was a reactance effect: the group with questions about causes was most likely to be searching for information supporting their belief that climate change is not primarily human-caused, and the website does not provide any support for that misconception.

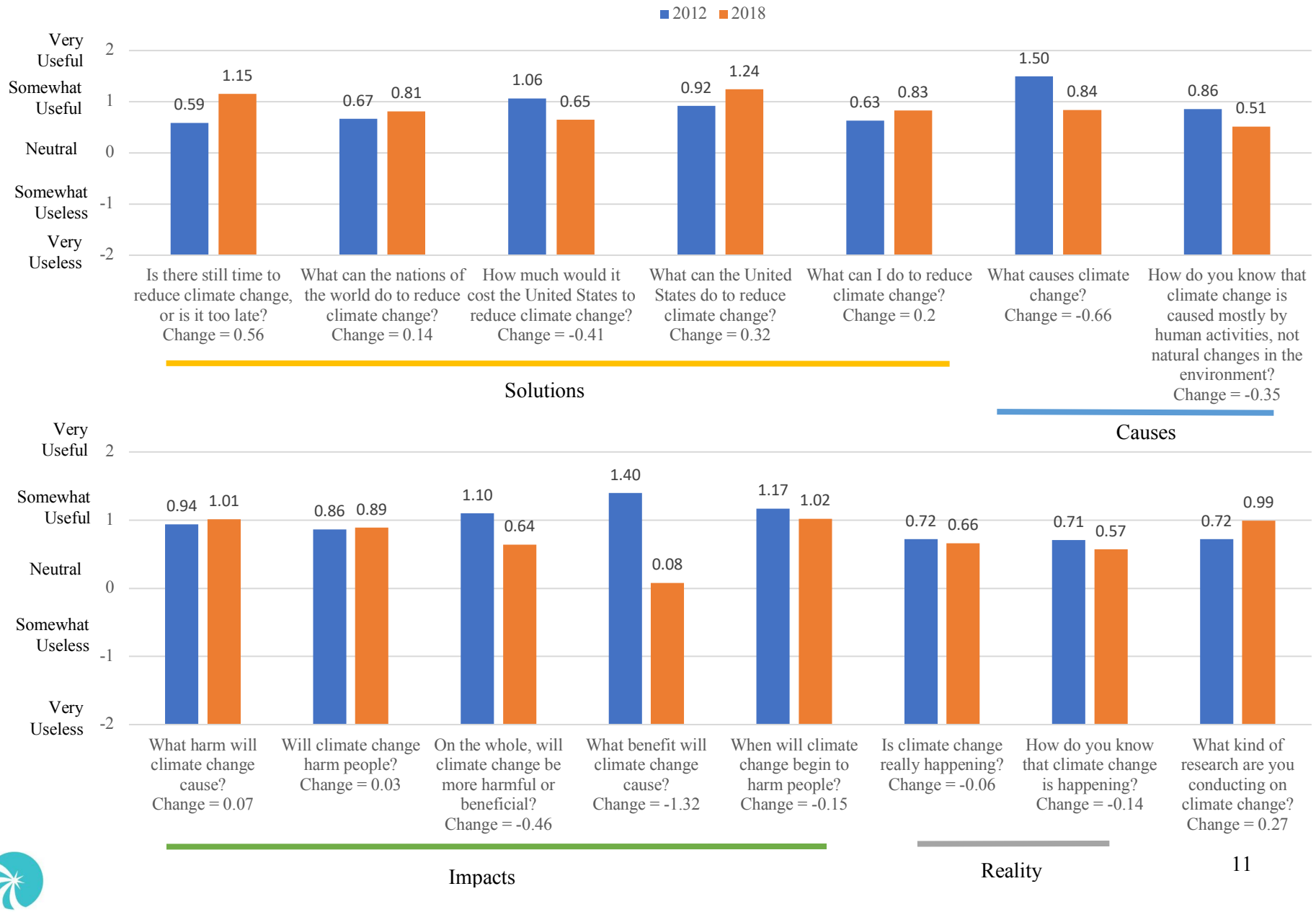
Figure 4. Usefulness of Information Found on Website, by Question Topic



Note: The usefulness of information found was significantly different across topics, p≤001, ANOVA.

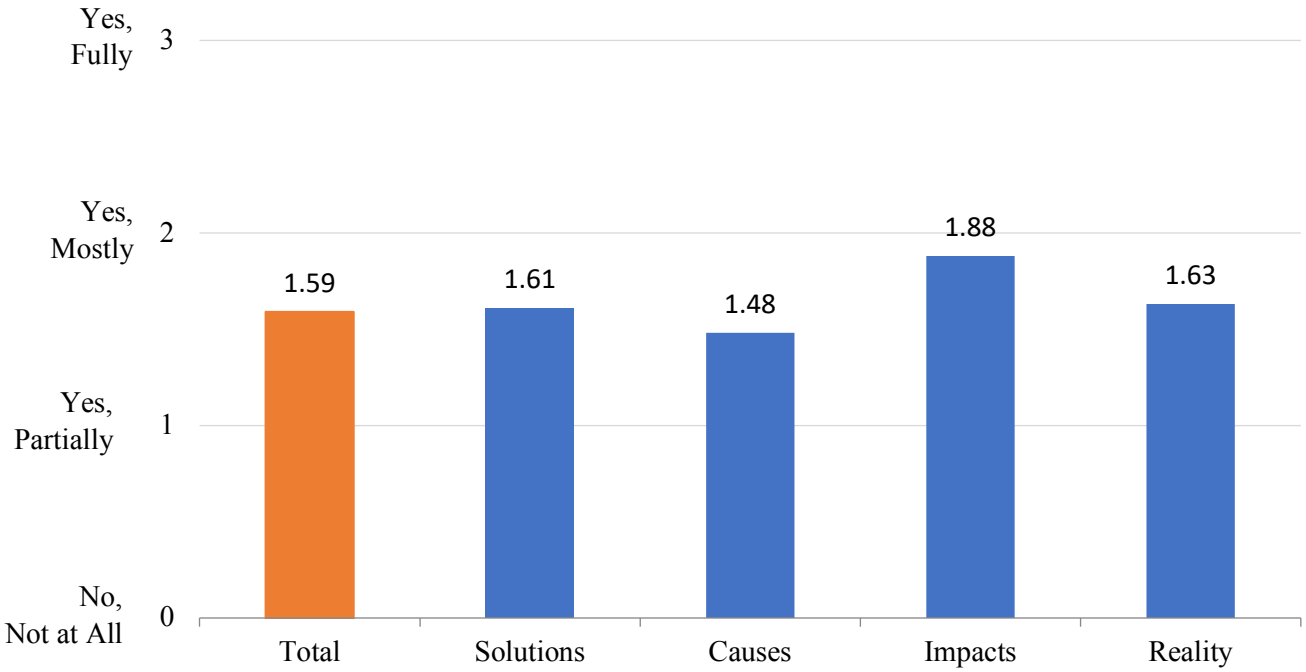
When comparing usefulness ratings by question between 2012 and 2018, the picture is somewhat mixed (see Figure 5), with some questions receiving lower ratings in 2018 than in 2012, while other received higher ratings. The question with the most positive change was whether there is still time to reduce climate change, while the question with the most negative change was what benefit climate change will cause.

Figure 5. Usefulness of Information Found on Website, Comparing 2012 to 2018, by Question



Finally, respondents seeking information on the impacts that climate change will cause were most likely to say their question was fully answered, reflecting, perhaps, the amount of information chronicling climate impacts on the website (see Figure 6). Respondents seeking information on causation were least likely to say the site fully answered their question. Once again, this is likely to be reactance arising from the lack of information on the website supporting the belief that climate change is not human-caused.

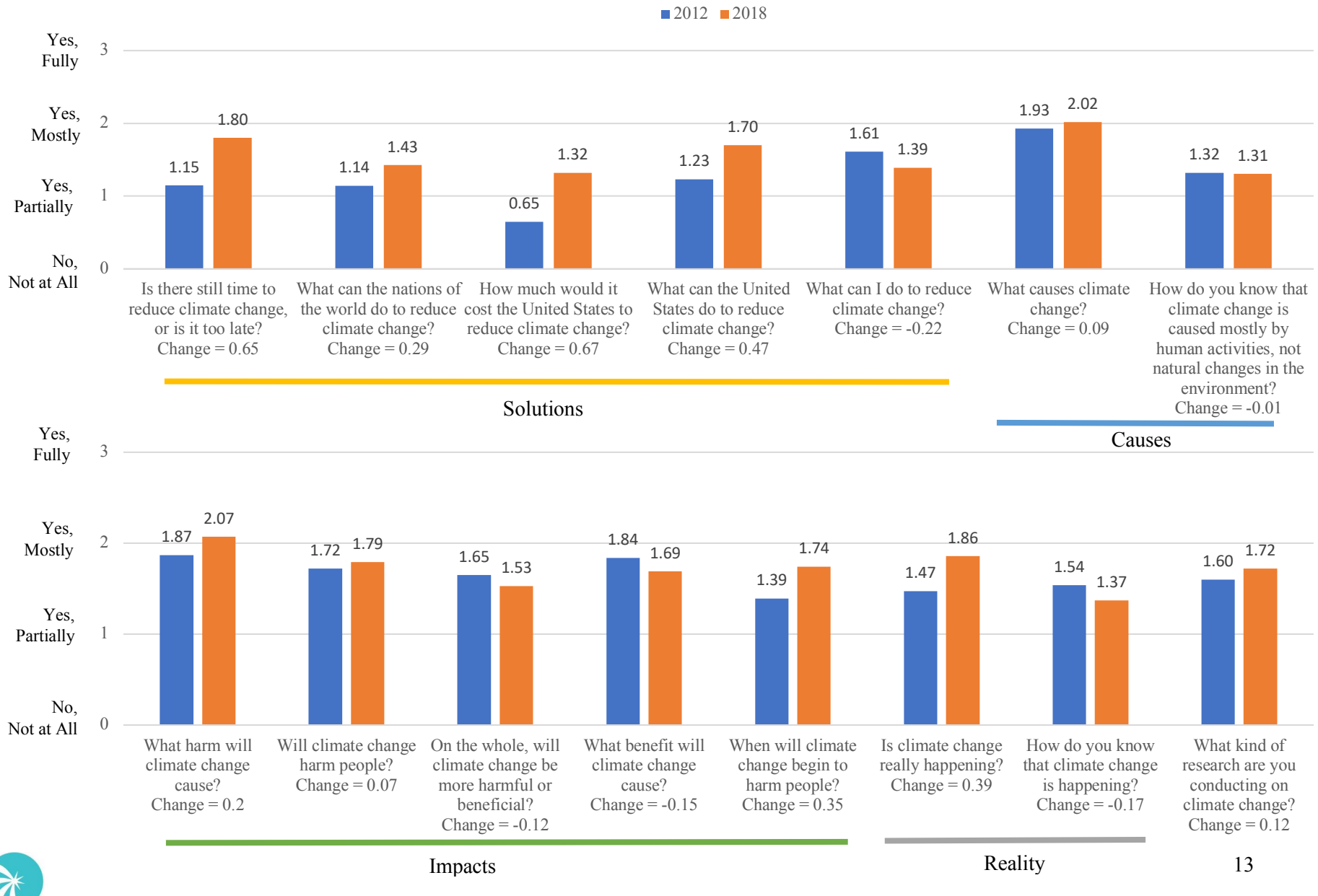
Figure 6. Information Fully Answered Question, by Question Topic



Note: Whether the information found fully answered the respondent's questions was significantly different across topics, p≤.001, ANOVA.

In comparison to 2012, participants in 2018 were more likely to say that information found on NASA's climate website answered their question (for 10 out of 15 questions; Figure 7). The questions with the largest positive change dealt with solutions, while those with negative change dealt with the reality, human causation, or impacts of climate change.

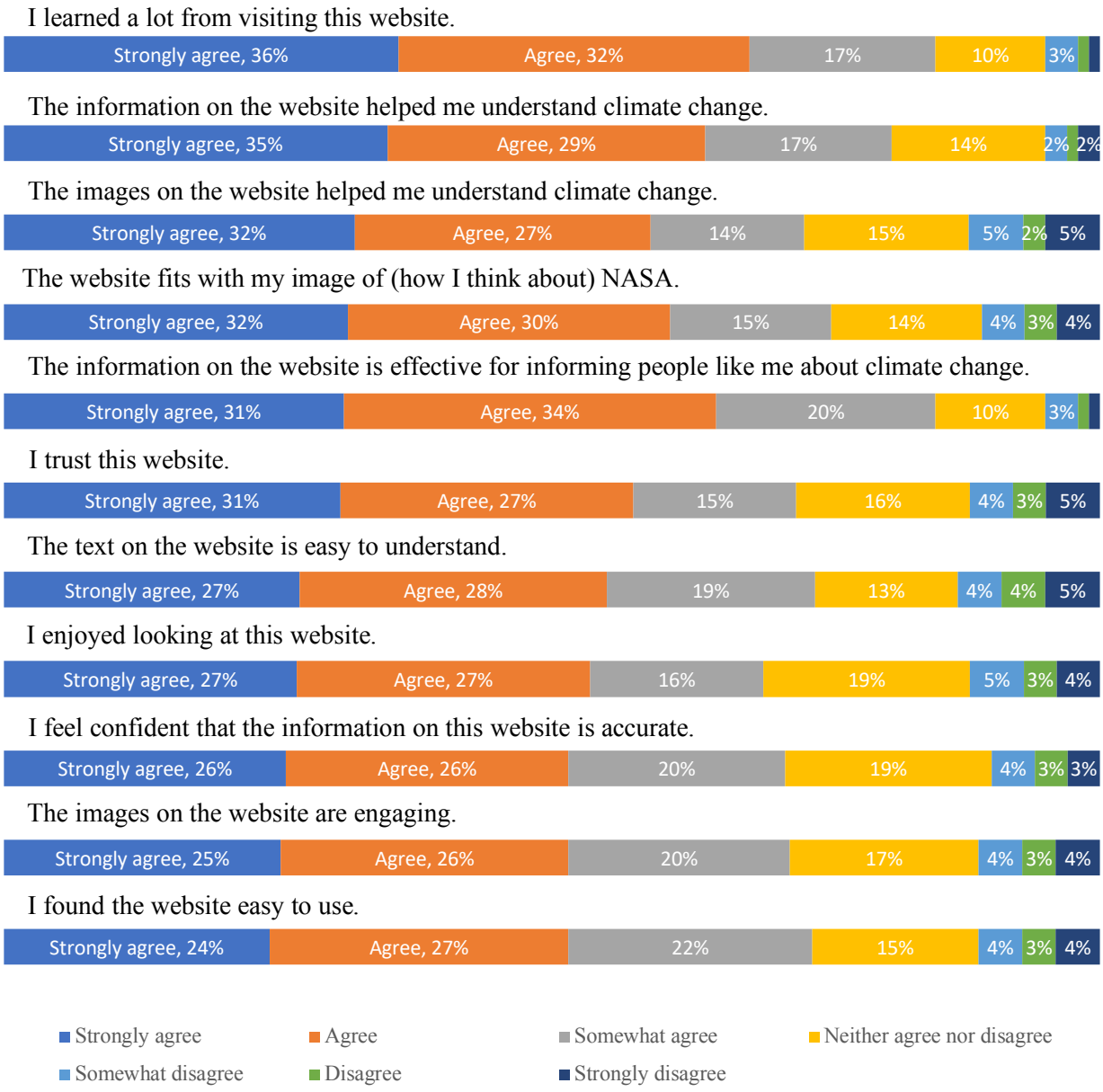
Figure 7. Information Fully Answered Question, Comparing 2012 to 2018, by Question



AMERICANS EVALUATE NASA'S CLIMATE WEBSITE POSITIVELY

Respondents were asked to evaluate the website by indicating their agreement or disagreement with eleven evaluative statements. Evaluations were overwhelmingly positive (Figure 8). Large majorities agreed with each statement: close to two-thirds agreed or strongly agreed that the site is easy to use (68%), the images are engaging (64%), and the text on the site is easy to understand (65%).

Figure 8. Evaluations of the Website.



Note: Question wording: "Thinking about the NASA global climate change website overall, how much do you agree or disagree with each of the following statements?" All percentages not shown (Somewhat disagree to Strongly disagree) were 1% or less, and are not shown due to space considerations.

HALF OF THE PARTICIPANTS WHO VISITED NASA'S CLIMATE WEBSITE PLAN TO RETURN

Half of the respondents (51%) said they are likely to return to the NASA website, and 44% said they're likely to also seek information on the issue from other sources (Table 3). Respondents were significantly more likely to say they would return to the NASA website in the future, rather than seeking information on climate change from other sources *($p \leq .001$, paired sample t-test).*

Table 3: Likelihood of Future Information Seeking on Climate Change

	Definitely Will	Probably Will	Not Sure	Probably Will Not	Definitely Will Not
Likelihood of visiting the website again	23%	28%	23%	16%	10%
Likelihood of seeking additional information on climate change from other sources	17%	27%	29%	19%	8%

Question wording:

- *Likelihood of visiting* climate.nasa.gov *again: "How likely are you to visit this website on your own time?*
- *Likelihood of seeking information from other sources: "How likely are you to seek additional information about climate change from any other source in the next few days or weeks?"*

INTEREST IN SUBSCRIBING TO NASA'S CLIMATE NEWSLETTER INCREASED SLIGHTLY FROM 2012

Sixteen percent of website visitors signed up for the NASA newsletter following their visit to the website, as compared to 13 percent in 2012. While the overall increase is small, an analysis of the change within Global Warming's Six Americas[3] shows that interest in receiving the newsletter has grown among the less engaged segments of the public, i.e., those who recognize that climate change is happening, but are only somewhat or not very concerned (Table 4). Subscriptions increased among the Concerned (+5 percentage points), the Cautious (+5 points), and the Disengaged (+2 points). While the proportion of Alarmed who subscribed did not change, over a quarter of this segment (28%) subscribed in 2012, evidence that this segment already had high interest in the newsletter.

Conversely, decreases in subscription rates occurred among the two segments that are skeptical about the reality and human-causation of climate change, the Doubtful (-12 percentage points) and Dismissive (-3 points). Overall, the changes in subscription rates suggest increased polarization in interest in learning about climate change.

Table 4. Newsletter Subscription Rates Among Global Warming's Six Americas

	2012	2018	Change
Alarmed	28%	28%	±0%
Concerned	15%	20%	+5%
Cautious	8%	13%	+5%
Disengaged	3%	5%	+2%
Doubtful	15%	3%	-12%
Dismissive	7%	4%	-3%
Total	13%	16%	+3%

Note: Question wording: "If you would like to sign up for NASA's Global Climate Change monthly newsletter, please visit the website below: http://climate.nasa.gov/ccNewsletter/." Date reported are based on the number of respondents who clicked on the link.

[3] Global Warming's Six Americas are six unique audience segments that perceive and respond to the issue of climate change in distinct ways. The Six Americas range across a spectrum of concern and issue engagement, with segments that accept and reject climate science at the ends of a continuum, and those that are less certain and less engaged in the middle. At one end of the spectrum are the Alarmed, who are very concerned about the issue and support aggressive action to reduce it, and at the other end are the Dismissive, who do not believe it is real or a problem. Between these two extremes are four groups – the Concerned Cautious, Disengaged and Doubtful – with lower certainty and issue engagement. The segments are strongly associated with a range of characteristics, including interest in learning about climate change, and ability to understand information on the topic. For more detail, see: Roser-Renouf, C., Stenhouse, N., Rolfe-Redding, J., Maibach, E. & Leiserowitz, A. (2015). Engaging diverse audiences with climate change: Message strategies for global warming's six Americas. In Hansen, A. & Cox, R. (Eds.), *Handbook of Environment and Communication* (pp. 368-386). New York: Routledge. Available at: https://www.climatechangecommunication.org/all/engaging-diverse-audiences-with-climate-change-message-strategies-for-global-warmings-six-americas-2/

How Does Visiting NASA's Climate Website Affect Americans' Perceptions of NASA and Climate Change?

AMERICANS VIEW NASA AND ITS CLIMATE RESEARCH EVEN MORE POSITIVELY AFTER VISITING NASA'S CLIMATE WEBSITE THAN BEFORE

To assess participants' views of NASA's science, we asked them to evaluate four aspects of NASA's climate science: the amount conducted, competency of the scientists, trust, and belief the agency will use the research to benefit the U.S. We asked half of the participants to assess these aspects *prior* to visiting the website to measure the current perceptions of the American public. The other half were asked these questions *after* visiting the website to assess the influence of visiting the website on users' views. Furthermore, to have a comparative baseline, we also asked participants to evaluate these aspects for three other agencies (NOAA, EPA, and DOD) prior to visiting the website.

Results indicate that visiting the website boosts evaluation of each of the four measured dimensions of NASA's climate science, primarily through informing the public (as can be seen by observing the shift in proportions from "I don't know" or "I have no opinion" to other responses in Tables 5 through 8).

Website Visitors Learn that NASA Conducts a Great Deal of Climate Change Research

Prior to visiting the website, Americans' thought that NOAA conducts much more climate change research than NASA does – 37 percent thought NOAA does "a lot" of climate research, compared to 24 percent for NASA. Perceptions of EPA's and NASA's climate research were very similar, while DOD was thought to conduct the least climate research (Table 5; note that both the EPA and DOD suffer from more partisan perceptions among the public[4]).

After visiting the website, twice as many respondents understood NASA does "a lot" of climate change research, and the proportion who said they didn't know was 22 percentage points lower. Of the four agencies, NASA became the agency thought to conduct the most climate research.

Table 5. Amount of Climate Change Research Conducted by Government Agencies

	NASA ***$p \leq .001$				
	Pre	**Post**	**NOAA**	**EPA**	**DOD**
A Lot	24%	49%	37%	24%	9%
A moderate amount	27%	31%	27%	25%	21%
A little	10%	5%	8%	15%	16%
None	1%	1%	2%	4%	9%
I don't know	37%	15%	26%	33%	44%

Note: Question wording: "How much scientific research on climate change does the [AGENCY NAME] conduct?"
****p≤.001 for the difference in distributions (ANOVA) between responses before or after visiting the website.*

[4] Myers, T., Maibach, E., Roser-Renouf, C, Anderson, A., & Stenhouse, N. (2012). *Public Perceptions of Federal Agencies that Conduct Climate Change Research.* George Mason University, Fairfax, VA: Center for Climate Change Communication. Available at: https://www.climatechangecommunication.org/wp-content/uploads/2016/03/2012-Public-Perceptions-of-Federal-Agencies-that-Conduct-Climate-Change-Research.pdf

Visiting the Website Increases Perceptions of the Competence of NASA's Scientists

Respondents who had not yet visited NASA's website viewed the scientists at NOAA as the most competent of the four agencies, with NASA a close second (Table 6). Following the visit, however, NASA scientists were viewed as the most competent, with over half the respondents saying they are "very competent." The proportion of respondents with no opinion on scientists' competence was 12 percentage points lower among the group that had visited the website, and the proportion that viewed NASA's scientists as very competent was 17 percentage points higher.

Note that the percentages who said that NASA scientists are incompetent – while very small – were equal in the before and after groups (5%) – evidence of the challenge of changing minds among those who do not trust climate science.

Table 6. Competency of Scientists at Government Agencies

	NASA ***$p \leq .001$				
	Pre	**Post**	**NOAA**	**EPA**	**DOD**
Very competent	36%	53%	40%	24%	13%
Somewhat competent	24%	21%	19%	21%	26%
Somewhat incompetent	7%	5%	6%	14%	6%
Very incompetent	5%	5%	4%	13%	6%
I have no opinion about this	28%	16%	31%	29%	49%

Note: Question wording was: "On average, how competent are the climate change research scientists at the [AGENCY NAME]?"
****p≤.001 for the difference in distributions (ANOVA) between respondents who were asked about NASA's scientists before or after visiting the website.*

Visiting the Website Increases Trust in NASA's Climate Change Research

As with scientists' competency, NOAA's climate change research is slightly more trusted than NASA's among those who have not yet visited the site (Table 7). The proportion who trust NASA's research is still high, however: prior to visiting the website over half (57%) of the respondents said they trust NASA's climate research, with the remaining 43 percent divided almost equally between those who don't trust the research (21%) and those who say they don't have an opinion (22%).

Among those who have visited the website, two-thirds trust NASA's research (67%). Moreover, the proportion who strongly trust NASA's research is 15 percentage points higher among those who have visited the website (26% vs. 41%). The "no opinion" group is 6 percentage points lower among website visitors, and the group that distrusts the research is 4 percentage points lower (21% vs. 17%).

Note also the low trust in the climate change research conducted by EPA and DOD; both NASA's and NOAA's climate research are much more trusted by the public than the research by either of these two agencies.

Table 7. Trust in Climate Change Research Conducted by Government Agencies

	NASA ***$p \leq .001$				
	Pre	**Post**	**NOAA**	**EPA**	**DOD**
Strongly trust	26%	41%	29%	16%	10%
Somewhat trust	31%	26%	29%	27%	21%
Somewhat distrust	15%	9%	12%	18%	21%
Strongly distrust	6%	8%	8%	17%	12%
I have no opinion about this	22%	16%	24%	22%	36%

Note: Question wording was: "How much do you trust the climate change scientific research conducted at the [AGENCY NAME]?"
****p≤.001 for the difference between respondents who were asked about NASA's research before or after visiting the website.*

A second measure of trust in NASA is the extent to which people believe it will use its climate change research to benefit the U.S. The pattern of results for this question mirror the first trust question: a quarter of the respondents think NOAA will definitely use its climate change research to benefit the U.S., compared to 19 percent who think NASA definitely will prior to visiting the website (Table 8). Both of these figures again compare favorably to the low trust in EPA and DOD – only one in ten respondents think these agencies will definitely use their climate research to benefit the U.S.

Visiting the website again results in significantly more positive views of NASA: the proportions who say NASA will definitely use its climate research to benefit the U.S. is 14 percentage points higher in the group that has visited the website than among those who haven't.

Table 8. Government Agencies Will Use Climate Change Research to Benefit U.S.

	NASA ***$p \leq .001$				
	Pre	**Post**	**NOAA**	**EPA**	**DOD**
Definitely will	19%	33%	27%	11%	10%
Probably will	38%	34%	36%	30%	29%
Probably will not	15%	10%	11%	25%	23%
Definitely will not	4%	7%	4%	11%	5%
I have no opinion about this	24%	16%	22%	22%	33%

Note: Question wording: "To what degree do you believe the [AGENCY NAME] will use the findings from its climate change scientific research in ways that benefit America?"
****p≤.001 for the difference between respondents who were asked about NASA's research before or after visiting the website.*

AMERICANS PERCEIVE MORE ENVIRONMENTAL PROBLEMS AS EVIDENCE OF CLIMATE CHANGE AFTER VISITING NASA'S WEBSITE

To assess the effect of visiting the website on knowledge, attitudes and beliefs, we compared the answers of respondents who were asked the questions below *prior* to visiting the website to the answers of those who were asked *after* visiting the website. Differences in the two groups' responses represent the impacts of the website. Two types of knowledge were assessed: (1) awareness of the environmental impacts caused by climate change, and (2) understanding of basic climate change science, i.e., that the burning of fossil fuels by humans produces greenhouse gases that warm the planet, causing long-term changes to the climate.

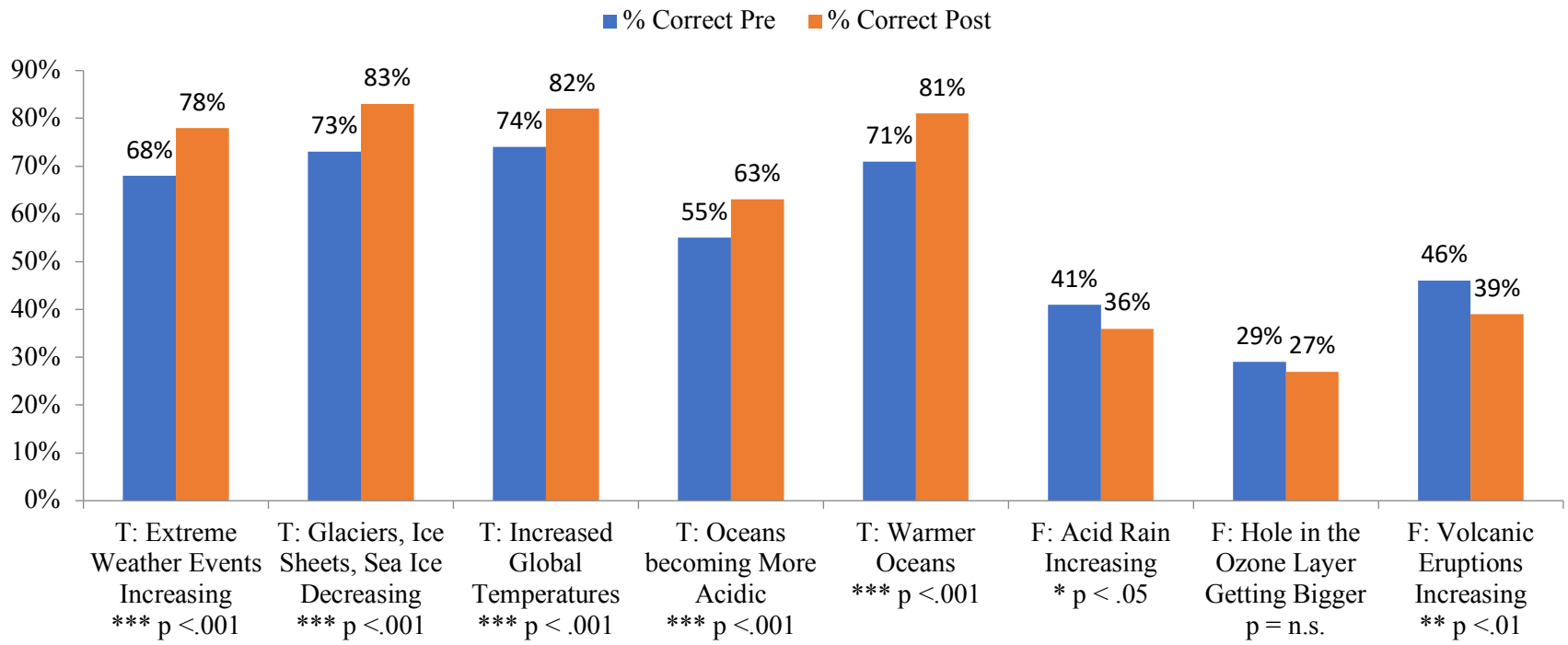
Results for items that asked about knowledge of climate change impacts show that prior to visiting the website, majorities of respondents were already aware of five impacts – warmer oceans, increased ocean acidification, higher global temperatures, melting of glaciers, ice sheets and sea ice, and more extreme weather. Majorities also believed (incorrectly) that climate change is causing three environmental issues that are not attributable to climate change – volcanic eruptions increasing, the ozone hole growing larger, and acid rain increasing (see Figure 9).

Comparison of the pre- and post-visit results show that visitors to the website come to believe climate change is evidenced by more types of impact – both accurate and inaccurate. Participants were more likely to recognize that as a result of climate change, the oceans are becoming warmer and more acidic, temperatures are rising, ice is melting, and extreme weather is increasing. These differences are relatively large – 8 to 10 percentage point differences between those who have visited the website and those who haven't.

However, participants who had been to the site were also somewhat more likely to overgeneralize what they had learned to other environmental issues, incorrectly stating that climate change is evidenced by an increase in volcanic eruptions and acid rain. The percentage holding the misperception that volcanic eruptions are increasing was 7 percentage points higher among website visitors (54% pre & 61% post), and the proportion who think that acid rain is increasing was five points higher (49% pre & 54% post).

These results suggest that longstanding misunderstandings about climate change are still widespread, particularly the belief that climate change is causing the hole in the ozone layer: 71 percent of respondents who had not yet visited the site said this is a climate change impact, as did 73 percent who had visited the site. Visiting the website did not reduce these misperceptions about the impacts of climate change among our respondents.

Figure 9. Knowledge about the Impacts of Climate Change Before and After Visiting the NASA Climate Change Website

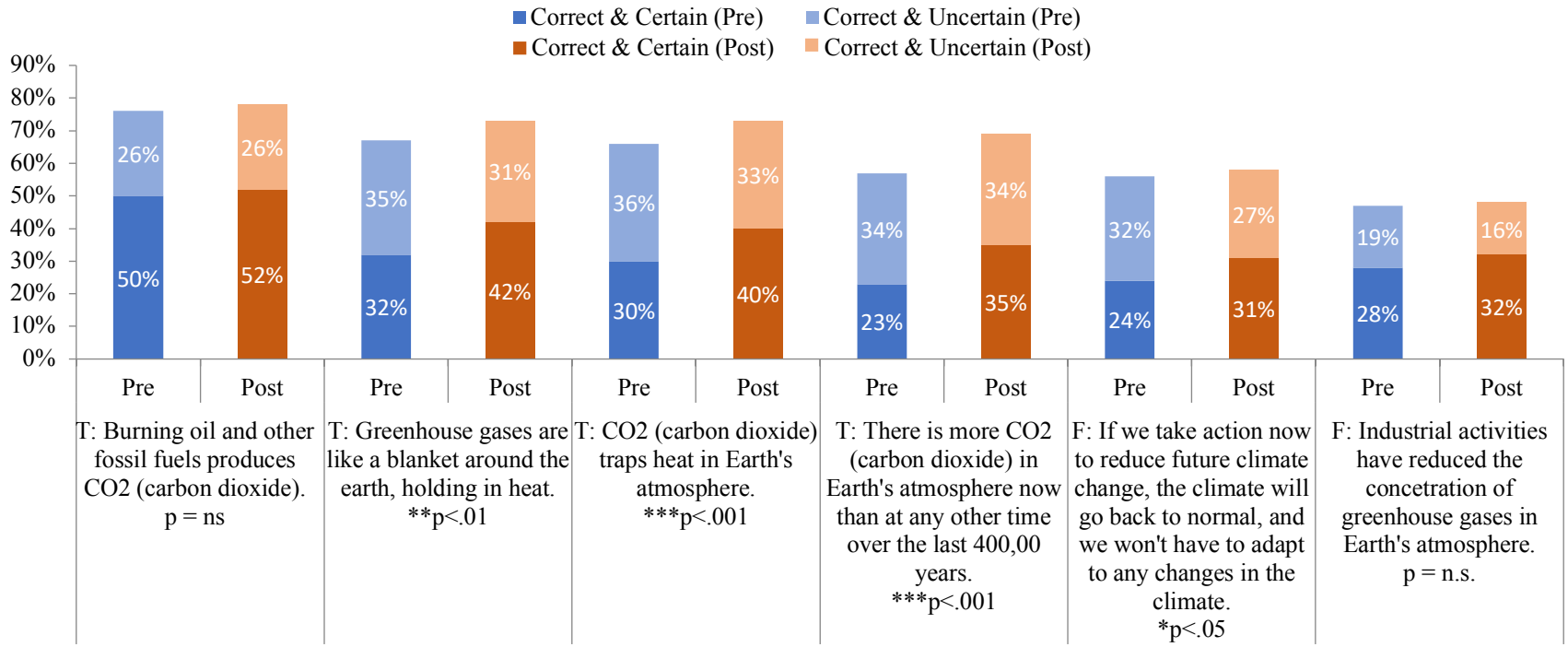


Note: "T" indicates this is a true effect of climate change, while "F" indicates the item is false - not an effect of climate change. Significance testing used chi-square tests, and represents the difference in the distributions, pre and post-test.
Question wording: "Which of the following is evidence that climate change is happening?"

AMERICANS ARE MORE KNOWLEDGEABLE ABOUT THE MECHANISMS CAUSING CLIMATE CHANGE AFTER VISITING NASA'S CLIMATE WEBSITE

Respondents were significantly more likely to correctly respond to four of six questions on climate science (Figure 10*)*. One exception was the item stating that CO2 is produced by burning fossil fuels, which was answered correctly by three-quarters of respondents who hadn't yet visited the website. Hence, the lack of a significant difference on this measure is likely a ceiling effect – the information is already quite well known. The largest difference in correct and certain responses was 12 percentage points in recognition that there is more CO2 in the atmosphere today than at any time over the last 400,000 years – a fact that was featured prominently on the website's Evidence page at the time of the survey.

Figure 10: Understanding of Climate Change Science Before and After Visiting the NASA Website



Note: "(T)" indicates the item is a true statement, while "F" indicates the item is false. The question asked: "To what extent do you think each of the following items is true or false?" Significance tests represent the differences in distributions between the pre- and post-tests, conducted with ANOVA.,

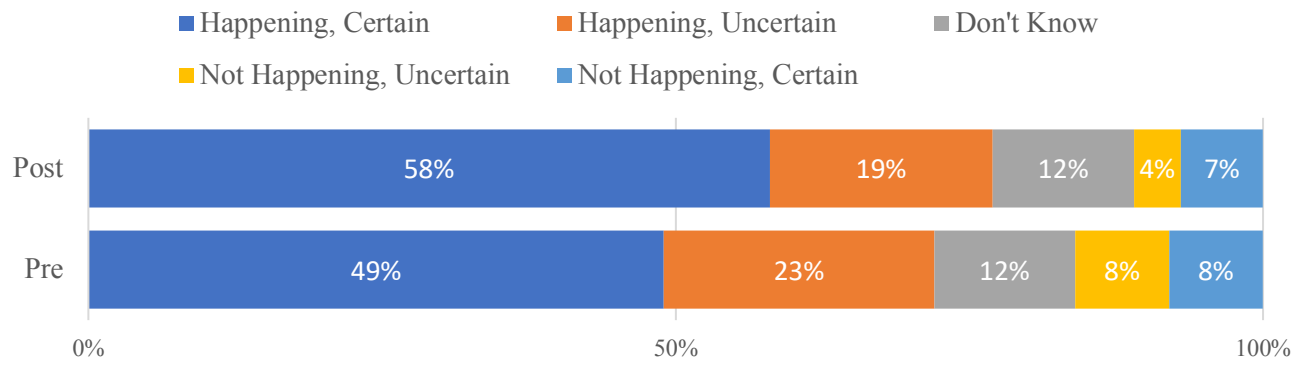
AMERICANS ARE MORE LIKELY TO UNDERSTAND FIVE KEY FACTS ABOUT CLIMATE CHANGE AFTER VISITING NASA'S CLIMATE WEBSITE

Recognition of five facts – that human-caused climate change is happening, harmful and solvable, and that there is a scientific consensus on the issue – is strongly predictive of support for climate change mitigation policies and advocacy behaviors.[5] In this section we compare the perceptions of respondents who were asked about these facts before and after visiting the website.

When People Visit the Website, Certainty That Climate Change Is Happening Increases

People who had visited the website were more likely to indicate both that climate change is happening, and that they were certain about this, as compared to those who had not yet visited the site (Figure 11). The proportion who were certain that climate change is happening was 9 percentage points higher among site visitors, while the proportion who said it's not happening or that they don't know if it's happening was 5 percentage points lower.

Figure 11. Certainty that Climate Change Is Happening



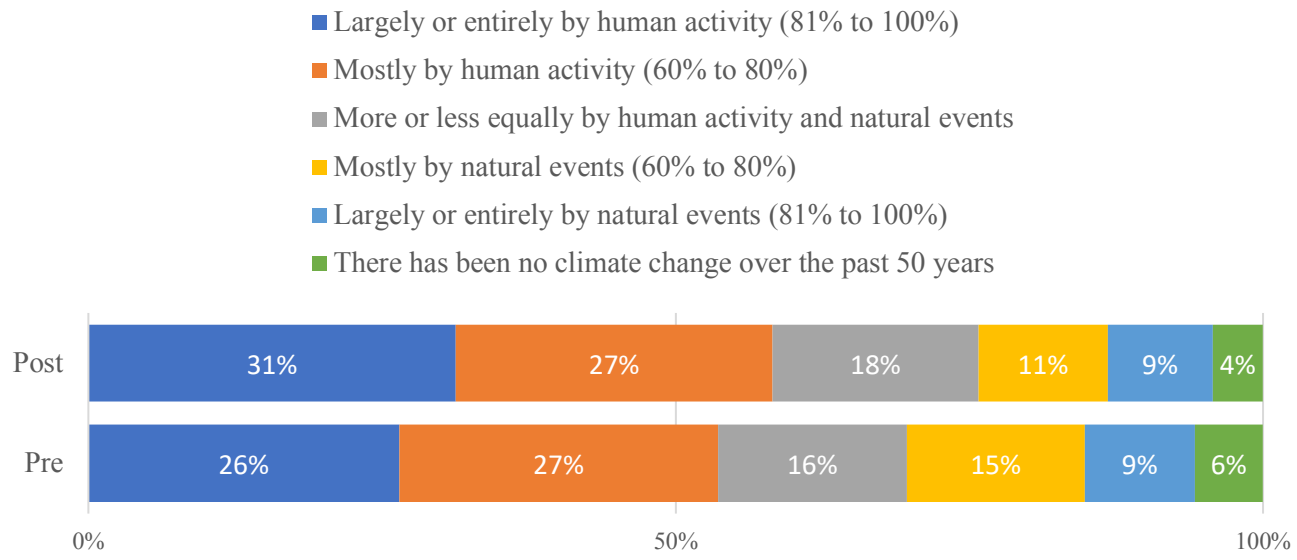
Note: The mean difference between the pre and post conditions was significant when tested with an ANOVA, $p \leq .001$. *Question Wording: Responses to two questions were combined: (1) Climate change refers to the idea that the world's average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world's climate may change as a result. What do you think: Do you think that climate change is happening? [Yes; No; Don't know], and (2) How sure are you that climate change is/is not happening? Scale: Happening, certain=5; Happening, uncertain=4; Don't know=3; Not happening, uncertain=2; Not happening, certain=1.*

[5] (a) van der Linden, S. L., Leiserowitz, A. A., Feinberg, G. D., & Maibach, E. W. (2015). The scientific consensus on climate change as a gateway belief: Experimental evidence. *PloS one*, *10*(2), e0118489; and (b) Roser-Renouf, C., Maibach, E. W., Leiserowitz, A., & Zhao, X. (2014). The genesis of climate change activism: From key beliefs to political action. *Climatic Change*, *125*(2), 163-178.

When People Visit the Website, Recognition that Climate Change Is Being Caused by Human Activities Increases

Respondents who were asked about the causes of climate change after visiting the website were more likely to say that climate change is caused by human activity than were respondents who had yet to visit the site (Figure 12). The proportion who said climate change is caused largely or entirely by human activity was 5 percentage points higher among those who had visited the website. Although this is a significant increase, it remains true that a large proportion continue to believe that natural events account for half or more of climate change, or that climate change is not happening (42%).

Figure 12. Recognition of Human Causation of Climate Change



Note: The mean difference between the pre and post conditions was significant when tested with an ANOVA, $p \leq .01$.
Question wording: "Do you think that the climate change that has occurred over the past 50 years has been caused…?" Six-point response scale: (1) There has been no climate change; (2) Largely or entirely by natural events (80%-100%); (3) Mostly by natural events (60%-80%); (4) More or less equally by human and natural events; (5) Mostly by human activity (60-80%); (6) Largely or entirely by human activity (80%-100%).

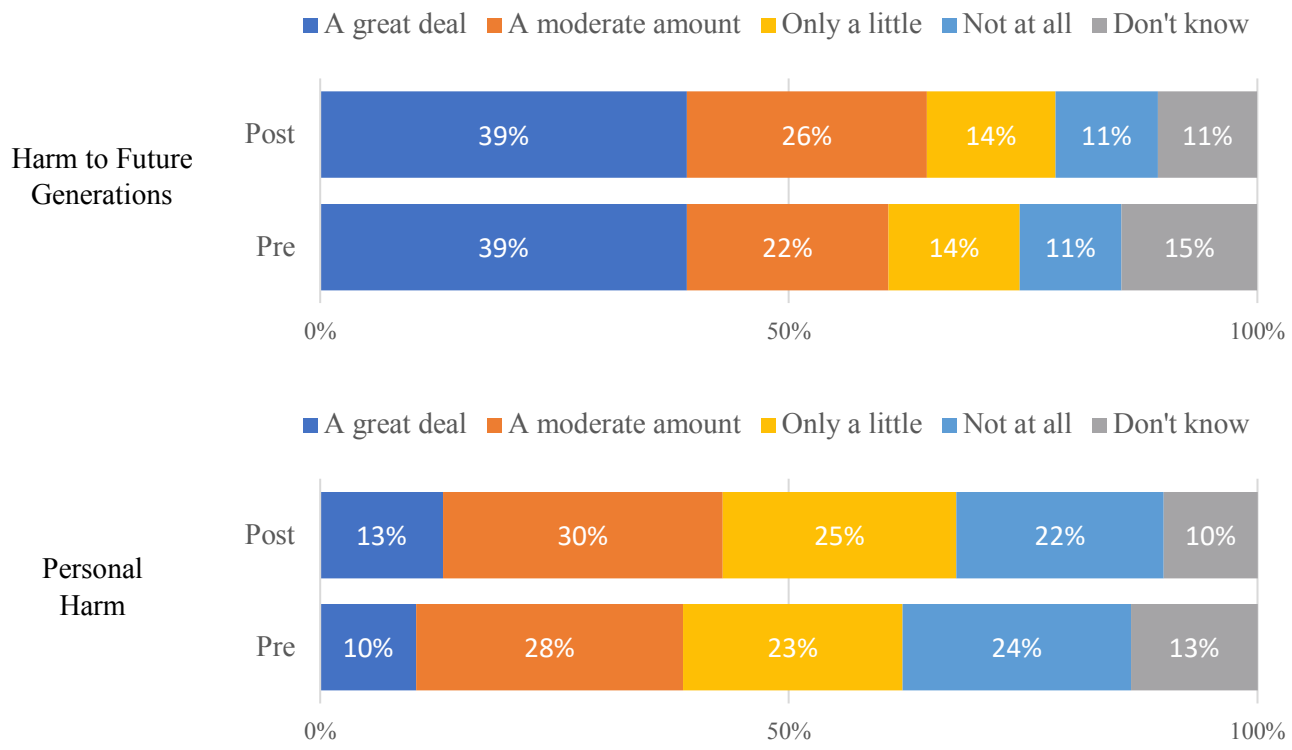
Recognition that Climate Change Is Harmful Increases When People Visit the Website[6]

Visitors to the website are more certain that climate change will be harmful to future generations, and to them personally, as compared to those who have not yet visited the site.

Visitors to the website are no more likely that people who have not visited the site to say that future generations of people will be harmed "a great deal" by climate change, but they are somewhat more likely to say they will be harmed "a moderate amount" – a difference of four percentage points; the proportion who said they don't know how much future generations will be harmed is also lower by four percentage points.

Visitors to the website are slightly more likely to say they would experience "a great deal" or "a moderate amount" of personal harm – a difference from those who have not visited the website of 5 percentage points. The differences in responses for both of these measures pre- and post-viewing the website were statistically significant.

Figure 13. Expected Harm from Climate Change



Note: The differences in the distributions between the pre and post conditions for harm to future generations and for personal harm, when tested with chi-square tests were significant, $p \leq 001$.
Question wording: "How much will climate change harm (1) future generations; (2) you personally?"

[6] See note on sample and methods used for this measure on the methods page.

When People Visit the Website, Recognition that Climate Scientists Agree that Human-Caused Climate Change Is Happening Increases[7]

Visitors to the website make significantly higher estimates of the proportion of climate scientists who think human-caused climate change is happening (Table 9). The difference between respondents who were asked to make an estimate of the proportion *after* they visited the website was three percentage points higher than the estimates of those who were asked this question *before* they visited the site.

A third group of respondents were asked to make estimates both before and after their website visit; among this group, post-website visit estimates were, on average, six percentage points higher than pre-site estimates.

Table 9. Perceptions of the Scientific Consensus on Climate Change

	Asked *Once* Either Before *or* After Website Visit *$p \leq .05$		**Asked *Twice* Both Before *and* After Website Visit** ***$p \leq .001$	
	Pre	**Post**	**Pre**	**Post**
Mean	75.52	79.03	75.07	81.09

Note: Both the mean difference between the pre and post conditions amongst those who were asked only once and those who were asked twice were statistically significant (among those asked once, $p \leq 01$; among those asked twice, $p \leq .001$).

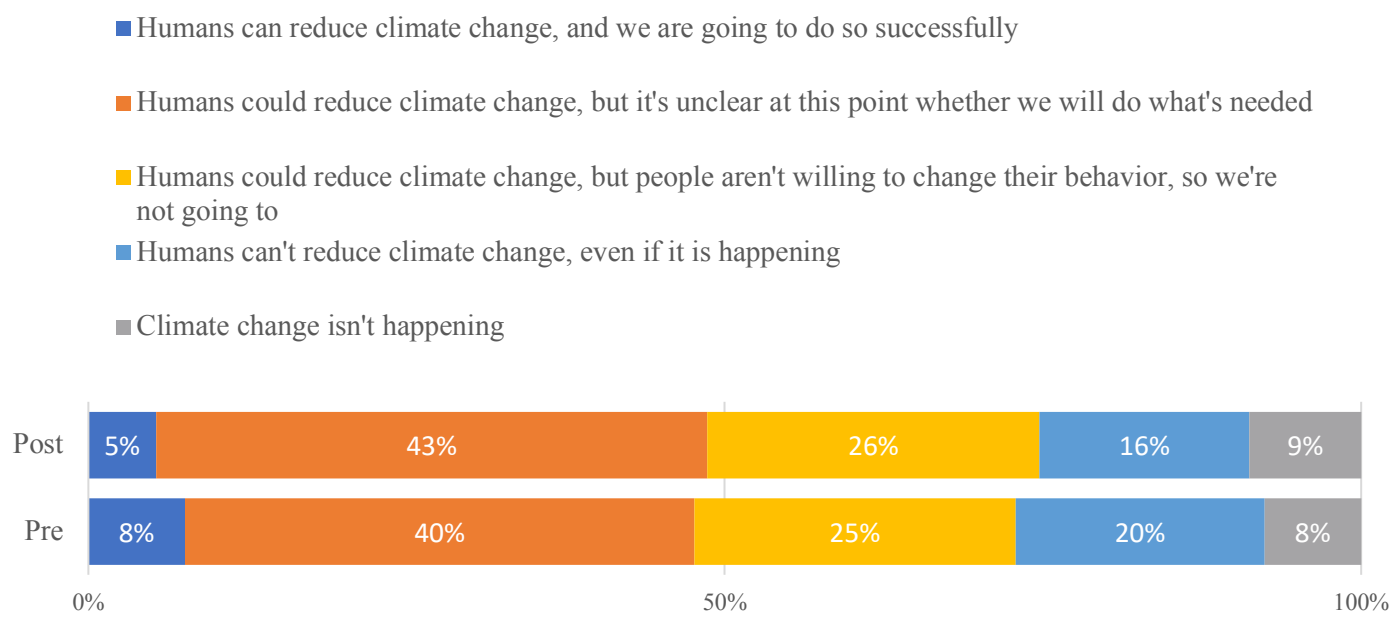
Question wording: "To the best of your knowledge, what percentage of climate scientists think that human-caused global warming is happening?" A slider bar allowed respondents to enter any percentage from 0% to 100%.

[7] See note on sample and methods used for this measure on the methods page.

Visiting the Website Does Not Increase Visitors' Confidence that Climate Change Can Successfully Be Reduced

Visitors to the website are no more likely to say that humans will successfully reduce climate change (Figure 14). This finding is interesting in light of results on page 8 regarding the success of respondents' information searches at the NASA website: respondents searching for information on solutions said, on average, that they found a moderate amount of information on the topic, and that it mostly answered their questions. Of the four question topics, the information on solutions was rated as the most useful. Thus, while the website largely satisfies visitors seeking information on solutions, it does not increase their confidence that we will successfully reduce climate change.

Figure 14. Solvability



Note: The mean difference between the pre and post condition was not significant, when tested with an ANOVA.
Question wording: Which of the following statements comes closest to your view?

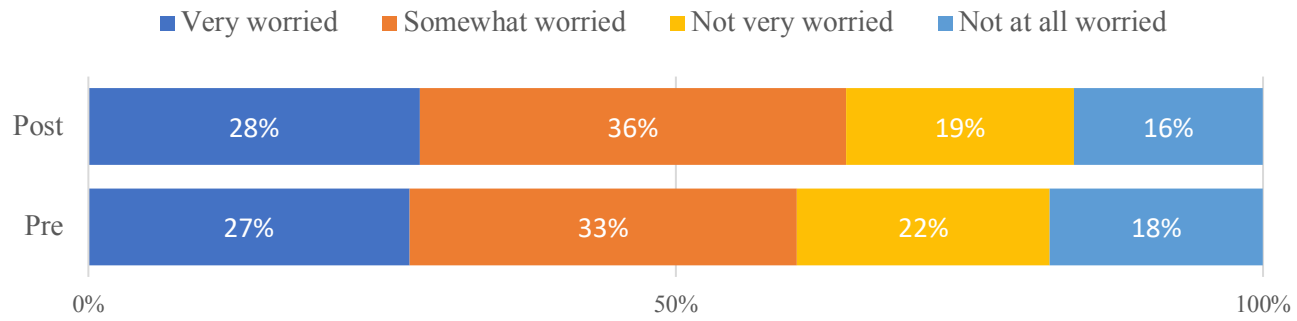
AMERICANS ARE MORE ENGAGED WITH CLIMATE CHANGE AFTER VISITING THE WEBSITE

Engagement with climate change is an important indicator of people's willingness to pay attention to information about the issue, and to think about and retain the information they encounter.[8] Engagement is typically measured by the degree to which people are worried about the issue, how personally important they believe the issue to be, and whether they need further information on the issue before they form an opinion about climate change.

When People Visit the Website, They Become More Worried about Climate Change

Prior to visiting the website, 60 percent of the respondents were already worried about climate change – a relatively high proportion (Figure 15). However, among those who had visited the site, worry was even higher – 64 percent – while the proportion who said they were not at all or not very worried was 5 percentage points lower.

Figure 15. Worry about Climate Change[9]



Note: The mean difference between the pre and post condition was significant when tested with a paired samples t-test, $p \leq .001$.

Question wording: "How worried are you about climate change?"

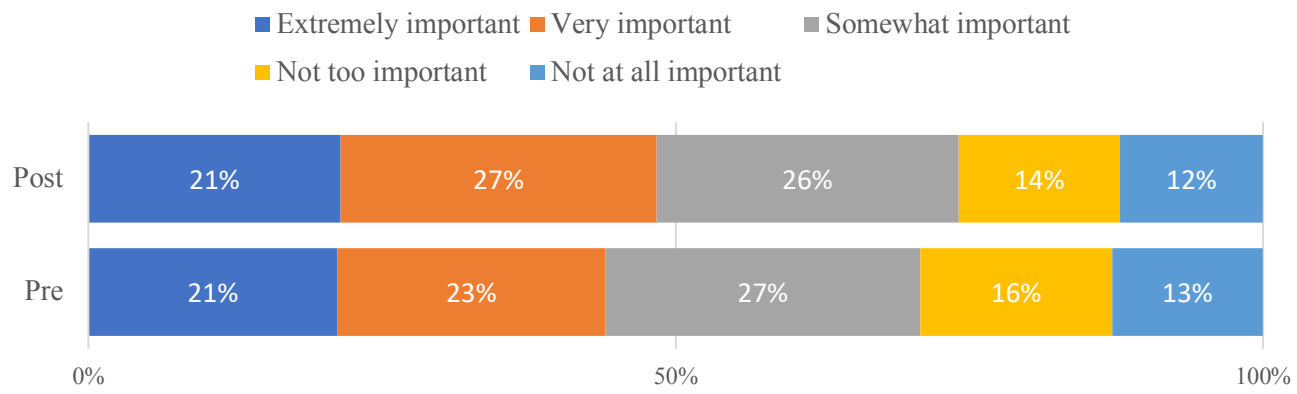
[8] Roser-Renouf, C., Stenhouse, N., Rolfe-Redding, J., Maibach, E. & Leiserowitz, A. (2015). Engaging diverse audiences with climate change: Message strategies for global warming's six Americas. In Hansen, A. & Cox, R. (Eds.), *Handbook of Environment and Communication* (pp. 368-386). New York: Routledge.

[9] See note on sample and methods used for this measure on the methods page.

After People Visit the Website, They Say Climate Change Is More Personally Important

Among participants who had visited the website, 48 percent said the issue was "extremely" or "very" important to them personally, as compared to 44 percent of those who had not yet visited the website. This increase occurred exclusively in the "very important" category,

Figure 16. Personal Importance of Climate Change[10]



Note: The mean difference between the pre and post condition was significant when tested with a paired samples t-test, p≤.001.

Question wording: How important is the issue of climate change to you personally?

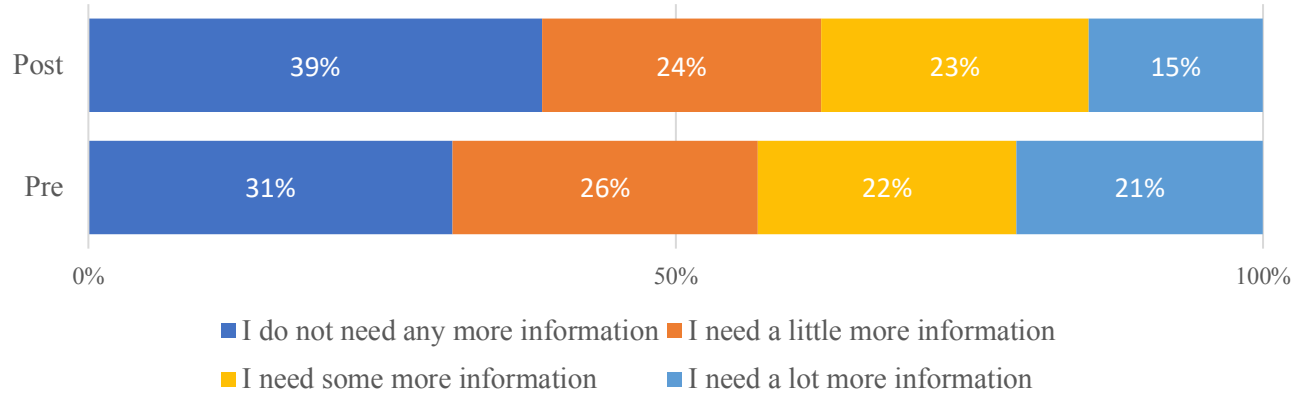
[10] See note on sample and methods used for this measure on the methods page.

After People Visit the Website, They Have Less Need for Information to Form an Opinion on the Issue.

Need for information is an indicator of attitudinal certainty: People who have firmly made up their minds about an issue respond to questions about attitudinal certainty by saying they don't need any more information to make up their minds. This does not imply that they aren't interested in learning more about the issue – it simply means that more information is unlikely to change their opinions.

As shown in Figure 17, visiting the website greatly reduces visitors' need for information to make up their minds about climate change: the proportion saying they do not need any more information is 8 percentage points higher among those who have visited the site, while the proportion saying they need "a lot" more information is 6 percentage points lower.

Figure 17. Need for Information



Note: The mean difference between the pre and post condition was significant when tested with an ANOVA, $p \leq .001$.

Question wording: "On some issues, people feel that they have all the information they need in order to form a firm opinion, while on other issues they would like more information before making up their mind. For climate change, where would you place yourself?"

METHODS

In February of 2018, we employed YouGov, a sample provider, to survey a nationally representative[11] cohort sample of adult Americans. The survey was fielded from February 5th to February 28th; 1,150 adults, aged 18 and older, responded, for a completion rate of 68.4 percent, and a margin of sampling error of 2.5% with 95% confidence. The average age of participants was 47 years old.

All respondents were asked to assess NASA, as NASA was the sponsor of this research. For comparison purposes, three other agencies that are part of the U.S. Global Change Research Program were also assessed for some questions. Each respondent was asked to assess two agencies – NASA and one other randomly assigned agency. As all respondents were asked to assess NASA, while only subsets were asked about the other agencies, the number of respondents assessing NASA is substantially larger than for all other agencies.

For most of the pre and post comparisons described in this report, half of the participants were asked the questions prior to visiting the website and half after. However, for the two measures of harm on page 26, as well as the measures of worry and personal importance on pages 29 and 30, all of the respondents were asked these questions both before and after the website visit. Hence, while most comparisons are between two independent groups of respondents with half the respondents in each group, these four measures have responses from all 1,150 respondents both before and after the website. Perceptions of the scientific consensus shown on p. 27 were assessed with a third method: one-third of the respondents estimated the consensus before visiting the website, one-third estimated after visiting the site, and the final third made two estimates – one before and one after.

To test whether differences between the pre and post groups were possibly due to differential drop-out rates, we conducted a chi-square test comparing the drop-out rate of each condition. Results showed no difference in the percentage of participants who dropped out between conditions (29% of those in the pre and 30% of those in the post condition, $X^2(1) = 0.34$, $p = 0.561$). We also tested whether there were demographic differences between the two conditions; there were no differences between the pre and post conditions on gender, ethnicity, race (white or not), party ID, political ideology, education, or family income. Therefore, differences between the pre and post conditions on knowledge and beliefs appear to be due to the random assignment of participants to either view or not view the NASA website rather than to drop-outs or demographic differences between the conditions.

[11] YouGov interviewed 1313 respondents who were then matched down to a sample of 1150 to produce the final dataset. The respondents were matched to a sampling frame on gender, age, race, and education. The frame was constructed by stratified sampling from the full 2016 American Community Survey (ACS) 1-year sample with selection within strata by weighted sampling with replacements (using the person weights on the public use file).

The matched cases were weighted to the sampling frame using propensity scores. The matched cases and the frame were combined and a logistic regression was estimated for inclusion in the frame. The propensity score function included age, gender, race/ethnicity, years of education, and region. The propensity scores were grouped into deciles of the estimated propensity score in the frame and post-stratified according to these deciles. The weights were then post-stratified on 2016 Presidential vote choice, and a four-way stratification on gender, age, race, and education, to produce the final weights.

We utilized SPSS' complex sampling module to weight the analyses reported in this report.

QUESTIONNAIRE

You are being invited to participate in a survey being conducted by George Mason University. Please take a moment to read through the following information and to decide whether you want to participate in our survey. Clicking on the button at the bottom of the page will take you to the start of the survey.

RESEARCH PROCEDURES
We are interested in learning how Americans think about science and scientists. If you agree to help with this research, you will be asked to complete a survey that will take you 20 minutes, and will include visiting a website and reporting back your impressions of the website. We will be able to identify which parts of that website you visit.

RISKS
There are no foreseeable risks for taking part in this study.

BENEFITS
There are no direct benefits to you as a participant.

CONFIDENTIALITY
The data in this study will be confidential. Each participant will be given a study number so that his or her name will not be included in the data set, or summary reports.

PARTICIPATION
To encourage you to participate, YouGov will provide you points for your participation. Your participation is voluntary, you need not answer any question that you prefer not to answer, and you may withdraw from the study at any time and for any reason. If you decide not to participate or to withdraw from the study, however, you will not receive compensation.

CONTACT
Professor Teresa Myers at George Mason University is conducting this research. She can be reached at tmyers6@gmu.edu if you have questions or wish to report a research-related problem. You may also contact the George Mason University Office of Research Integrity and Assurance at irb@gmu.edu if you have questions or comments regarding your rights as a participant in the research.

This research has been reviewed according to George Mason University procedures governing your participation in this research.

CONSENT
By selecting "Yes" below, you are indicating that you have read this form and agree to participate in this study.

- Yes/No

2. Thinking about science news – how often do you read, watch or listen to news about science?
    - Nearly every day; A few times a week; A few times a month; Less often

3. Which statement best describes how you get science news?
    - I mostly get science news because I'm looking for it
    - I mostly get science news because I happen to come across it

4. Now we would like to ask you about some reasons for why scientists might choose to communicate with the public.

How **important** do you think each of the following reasons is **to scientists** when they choose to communicate with the public? **[PROGRAMMING NOTE: Response Options: 7 radio buttons, with labels at the first (Not at all important), fourth (Moderately important); and seventh (Very Important); ALSO, PLEASE RANDOMIZE THE STATEMENTS]**

- To ensure that people are informed about scientific issues.
- To correct scientific misinformation.
- To defend science from those who spread falsehoods.
- To draw attention to their own research.
- To advance their career.
- To get more funding for their research.

5. If you could ask an expert on climate change one question, which question would you ask?
[PROGRAMMING NOTE: RANDOMIZE RESPONSE OPTIONS, EXCEPT FOR OTHER]
    - Is climate change really happening?
    - How do you know that climate change is happening?
    - What causes climate change?
    - How do you know that climate change is caused mostly by human activities, not natural changes in the environment?
    - What harm will climate change cause?
    - What benefit will climate change cause?
    - On the whole, will climate change be more harmful or beneficial?
    - Will climate change harm people?
    - When will climate change begin to harm people?
    - What can I do to reduce climate change?
    - What can the United States do to reduce climate change?
    - How much would it cost the United States to reduce climate change?
    - What can the nations of the world do to reduce climate change?
    - Is there still time to reduce climate change, or is it too late?
    - What kind of research are you conducting on climate change?
    - Other _____[SMALL TEXT BOX]_____

[PROGRAMMING NOTE: HALF OF PARTICIPANTS SHOULD VIEW Q6-14 AND 19-24 PRIOR TO VISITING THE WEBSITE; HALF SHOULD SEE QUESTIONS 6-14 AND 19-24 AFTER Q35; THIS VIEWING ORDER NEEDS TO BE RECORDED, AS WELL]

6. Which of the following is evidence that climate change is happening? **[YES/NO FOR EACH STATEMENT IN A GRID; RANDOMIZE THE STATEMENTS WITH EXCEPTION OF LAST ONE – PUT THE LAST ITEM AS A CHECKBOX SEPARATE FROM THE GRID AND IF SELECTED, THEN BLANK OUT RESPONSES TO OTHER STATEMENTS]**
   - Increased global temperatures
   - Warmer oceans
   - Oceans becoming more acidic
   - Glaciers, ice sheets, and sea ice decreasing
   - Extreme weather events increasing
   - Volcanic eruptions increasing
   - Acid rain increasing
   - Hole in the ozone layer getting bigger
   - None of the above because climate change is not happening

7. To what extent do you think each of the following statements is true or false? **[SCALE POINTS: Definite true; Probably true; Probably false; Definitely false; Don't know; RANDOMIZE THE STATEMENTS]**
   - Burning oil and other fossil fuels produces CO_2 (carbon dioxide)
   - Industrial activities have reduced the concentration of greenhouse gases in Earth's atmosphere
   - Greenhouse gases are like a blanket around the earth, holding in heat
   - If we take action now to reduce future climate change, the climate will go back to normal, and we won't have to adapt to any changes in the climate
   - CO_2 (carbon dioxide) traps heat in Earth's atmosphere
   - There is more CO_2 (carbon dioxide) in Earth's atmosphere now than at any other time over the last 400,000 years

[PROGRAMMING NOTE: OF THE HALF THAT ARE SEEING THESE QUESTIONS BEFORE VISITING THE WEBSITE, ONE-THIRD OF THOSE SHOULD *ALSO* SEE Q8 REPEATED AFTER VISITING THE WEBSITE (JUST BEFORE Q35); ALSO, OF THE HALF THAT ARE SEEING THESE QUESITONS AFTER VISITING THE WEBSITE, ONE-THIRD SHOULD *ALSO* SEE Q8 BEFORE VISITING THE WEBSITE (AFTER Q5) – THIS WORKS OUT TO ONE-THIRD SEEING Q8 PRIOR TO THE WEBSITE ONLY; ONE THIRD AFTER THE WEBSITE ONLY, AND ONE-THIRD BOTH BEFORE AND AFTER]

8. To the best of your knowledge, what percentage of climate scientists think that human-caused global warming is happening?

   Please click on the slider bar below to indicate your answer. You can slide the indicator on the bar anywhere from 0% (no climate scientists think it's happening) to 100% (all climate scientists think it's happening).

   [SLIDER BAR WITH LABELS FOR EACH TO%, WITH WORD LABELS OVER O, 50, AND 100: 0% (None), 50% (Half), and 100% (All)**]**

   [CHECK BOX FOR] Don't know

9. Climate change refers to the idea that the world's average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world's climate may change as a result.

   What do you think: Do you think that climate change is happening?
   [PROGRAMMING NOTE: PLEASE RANDOMIZE THESE RESPONSE OPTIONS]
   - Yes; No; Don't know

10. How sure are you that climate change is happening? **[PROGRAMMING NOTE: ONLY SHOW THIS QUESTION IF THE RESPONSE TO Q9 WAS YES]**
    - Not at all sure; Somewhat sure; Very sure; Extremely sure

11. How sure are you that climate change is not happening? **[PROGRAMMING NOTE: ONLY SHOW THIS QUESTION IF THE RESPONSE TO Q9 WAS NO]**
    - Not at all sure; Somewhat sure; Very sure; Extremely sure

12. Do you think that the climate change that has occurred over the past 50 years has been caused:
    - Largely or entirely by human activity (81% to 100%)
    - Mostly by human activity (60% to 80%)
    - More or less equally by human activity and natural events
    - Mostly by natural events (60% to 80%)
    - Largely or entirely by natural events (81% to 100%)
    - There has been no climate change over the past 50 years

13. Which of the following statements comes closest to your view?
    - Climate change isn't happening
    - Humans can't reduce climate change, even if it is happening
    - Humans could reduce climate change, but people aren't willing to change their behavior, so we're not going to
    - Humans could reduce climate change, but it's unclear at this point whether we will do what's needed
    - Humans can reduce climate change, and we are going to do so successfully

14. On some issues, people feel that they have all the information they need in order to form a firm opinion, while on other issues they would like more information before making up their mind. For climate change, where would you place yourself?
    - I do not need any more information
    - I need a little more information
    - I need some more information
    - I need a lot more information

[PROGRAMMING NOTE: ALL PARTICIPANTS SHOULD SEE QUESTIONS 15-18 PRIOR TO VISITING THE WEBSITE. THEY ARE REPEATED IN Q36-39].

15. How much do you think climate change will harm future generations of people?
    - Don't know; Not at all; Only a little; A moderate amount; A great deal

16. How important is the issue of climate change to you personally?
    - Not at all important; Not too important; Somewhat important; Very important; Extremely important

17. How worried are you about climate change?
    - Not at all worried; Not very worried; Somewhat worried; Very worried

18. How much do you think climate change will harm you personally?
    - Don't know; Not at all; Only a little; A moderate amount; A great deal

19. We would like to get your impression of the scientific research on climate change conducted at various federal government agencies. For each agency, we will ask you the following questions:

    - How much scientific research on climate change does the agency conduct?
    - On average, how competent are the climate change research scientists at the agency?
    - How much do you trust the climate change science research conducted at the agency?
    - To what degree to you believe the agency will use the findings of its climate change science research in ways that benefit Americas?

[PRESENT QUESTIONS 21-24 TWO TIMES; ONCE FOR NASA [National Aeronautics & Space Administration] AND THEN RANDOMLY SELECT ONE OF THE FOLLOWING THREE AGENCIES: NOAA [National Oceanic & Atmospheric Administration, which includes the National Weather Service], EPA [Environmental Protection Agency], DOD [Department of Defense]]

20. How much scientific research on climate change does the [AGENCY NAME] conduct?
    - None; A Little; A Moderate Amount; A Lot; I Don't Know

21. On average, how competent are the climate change research scientists at the [AGENCY NAME]?
    - Very Incompetent; Somewhat Incompetent; Somewhat Competent; Very Competent; I Have No Opinion About This

22. How much do you trust the climate change scientific research conducted at the [AGENCY NAME]?
    - Strongly Trust; Somewhat Trust; Somewhat Distrust; Strongly Distrust; I Have No Opinion About This

23. To what degree do you believe the [AGENCY NAME] will use the findings from its climate change scientific research in ways that benefit America?
    - Definitely Will Not; Probably Will Not; Probably Will; Definitely Will; I Have No Opinion About This

24. Next we'd like to show you a website designed by NASA to provide members of the public with information about climate change. Please spend up to ten minutes browsing this website.

Specifically, we'd like you to attempt to find information that answers your question: "[ANSWER TO TOP QUESTION]".

[PROGRAMMING NOTE: NEED TO GENERATE AND SEND OVER A PARTICIPANT ID TO NASA – MUST USE THE pid TAG]

http://climate.nasa.gov/?pid=

If you see a message like "The page you are on is trying to open a site in a new window," please click "Accept".

Please come back to the survey after you have browsed the website. You can leave this survey window open while you look around the website-we'll alert you after ten minutes have passed.

When you are done browsing the website and are ready to answer a few questions, please come back to this window and click the "Next" button that will appear shortly.

[PROGRAMMING INSTRUCTIONS: HIDE "NEXT" BUTTON FOR 1 MINUTE. TIME HOW LONG UNTIL THE RESPONDENT HITS THE NEXT BOTTON; IF RESPONDENT HAS NOT CLICKED "NEXT" AFTER 10 MINUTES, POP-UP A REMINDER WINDOW WITH THE FOLLOWING TEXT]

25. **[PROGRAMMING NOTE: SKIP IF THEY DON'T NEED THE REMINDER]** Just as a reminder, please return to the survey when you are done browsing the website. We have just a few more questions for you!

26. Thank you. Now we'd like to ask a few questions about your experience on this website.

27. How interesting did you find the information on the website?
    - Extremely interesting; Very interesting; Slightly interesting; Not interesting at all

28. How clear did you find the information on the website?
    - Extremely clear; Very clear; Moderately clear; Slightly clear; Not clear at all

29. How much information on NASA's website did you find about your question: "[INSERT TOP QUESTION]"
    - None; Little; A Moderate Amount; A Lot

[IF Q29 NE 1 "NONE" (BUT DO SHOW TO THOSE WHO SKIPPED Q29]

30. How useful was the information on NASA's website that you found about your question: **"[INSERT TOP QUESTION FROM Q5]"**
    - Very Useless; Somewhat Useless; Neutral; Somewhat Useful; Very Useful

[IF Q29 NE 1 "NONE" (BUT DO SHOW TO THOSE WHO SKIPPED Q29]

Did the information on NASA's website that you found fully answer your question: **[INSERT TOP QUESTION FROM Q5]**"

- No, Not at All; Yes, Partially; Yes, Mostly; Yes, fully

31. Now, thinking about the NASA global climate change website overall, how much do you agree or disagree with each of the following statements?

[PROGRAMMING NOTE: RESPONSE OPTIONS: Strongly disagree; Disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Agree; Strongly agree; ALSO, PLEASE RANDOMIZE STATEMENTS]

- The information on the website helped me understand climate change
- The information on the website is effective for informing people like me about climate change
- I enjoyed looking at this website
- The website fits with my image of (how I think about) NASA
- The text on the website is easy to understand
- The images on the website helped me understand climate change
- The images on the website are engaging
- I found the website easy to use
- I feel confident that the information on this website is accurate
- I trust this website
- I learned a lot from visiting this website

32. How likely are you to visit this website on your own time?

Definitely will; Probably will; Not sure; Probably will not; Definitely will not

34. How likely are you to seek additional information about climate change from any other source in the next few days or weeks?
    - Definitely will; Probably will; Not sure; Probably will not; Definitely will not

35. Now we have just a few additional questions about climate change. You may have seen some of these before, but please simply respond with what you think now.

36. How much do you think climate change will harm future generations of people?
    - Don't know; Not at all; Only a little; A moderate amount; A great deal; Refused

37. How important is the issue of climate change to you personally?
    - Not at all important; Not too important; Somewhat important; Very important; Extremely important; Refused

38. How worried are you about climate change?
    - Not at all worried; Not very worried; Somewhat worried; Very worried; Refused

39. How much do you think climate change will harm you personally?
    - Don't know; Not at all; Only a little; A moderate amount; A great deal

40. Now we have a few questions about you.

41. What is your age? (in years)

42. What is your gender?

- Female; Male; Non-binary/third gender; Prefer to self-describe [text entry]; Prefer not to say

43. Please specify your ethnicity:
    - Hispanic or Latino; Not Hispanic or Latino; Prefer not to answer

44. Please specify your race (check all that apply):
    - American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Pacific Islander; White; Other [text entry]; Prefer not to answer

45. What is your highest level of education?
    - No formal education credentials; High school diploma or equivalent; Some college, no degree; Associate's degree; Bachelor's degree; Master's degree; Doctoral or professional degree

46. In general, do you think of yourself as…
    - Very liberal; Somewhat liberal; Moderate, middle of the road; Somewhat conservative; Very conservative

47. Generally speaking, do you think of yourself as…
    - Strong Republican; Moderate Republican; Independent, but Lean Republican; Independent, no Lean; Independent, but Lean Democrat; Moderate Democrat; Strong Democrat; Other (please specify) [text entry]; No party/not interested in politics

[PROGRAMMING NOTE: PLEASE RECORD IF PARTICIPANTS FOLLOW THE LINK]

48. If you would like to sign up for NASA's Global Climate Change monthly newsletter, please visit the website below:

http://climate.nasa.gov/ccNewsletter/

Thank you for your participation!