



Global Survey on Youth Perspectives on Climate Change and Global Warming

Atmospheric Science Class
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Abstract

Public opinion on societal issues is often influenced by media, religion, political affiliation, gender, and age. Significant variations in weather is often cited as a key influence on whether a person believed that global warming and climate change is a result of human activity, natural variations, or both. The *Global Survey on Youth Perspectives on Global Warming and Climate Change* polled students ages 13 to 18 worldwide to determine what factors influence their beliefs on global warming and climate. The survey found that approximately half of the students believe that global warming and climate change is a result of both human activity and natural variations. The results also showed that students base their beliefs on a combination of scientific research and data as well as information publicly available on the Internet.

Introduction

Weather plays a central role in life on Earth. From our planet's physical environment to the actions and feelings of human beings, weather is an important factor in all we do and experience. Weather and climate, though, are different: weather is the "state of the atmosphere at a place and time with regard to heat, dryness, sunshine, wind, rain, etc.," while climate is "the weather conditions prevailing in an area in general or over a long period of time." The weather may also play a key role in shaping our view of global warming and climate change, but what factors influence a teenager's perspective on this crucial environmental issue?

The students in the senior elective Atmospheric Science at Marymount School of New York sought to answer this question by conducting the *Global Survey on Youth Perspectives on Global Warming and Climate Change*. The goal of the survey was to determine if teenagers believe global warming is naturally induced, human induced, or

both, as well as to uncover what local and global evidence leads teenagers to make their conclusions about the cause of changes in the Earth's average temperature.

There have been a number of recent surveys on the connection between politics and global warming. For example, the Yale Program on Climate Change Communication, in the Politics and Global Warming Survey 2017, drew on a “nationally representative survey,” to determine “how American registered Republican, Democratic, and Independent voters view global warming, personal and collective actions, and climate policies.” (Link: <http://climatecommunication.yale.edu/publications/politics-global-warming-may-2017/2/>) In general, the survey found:

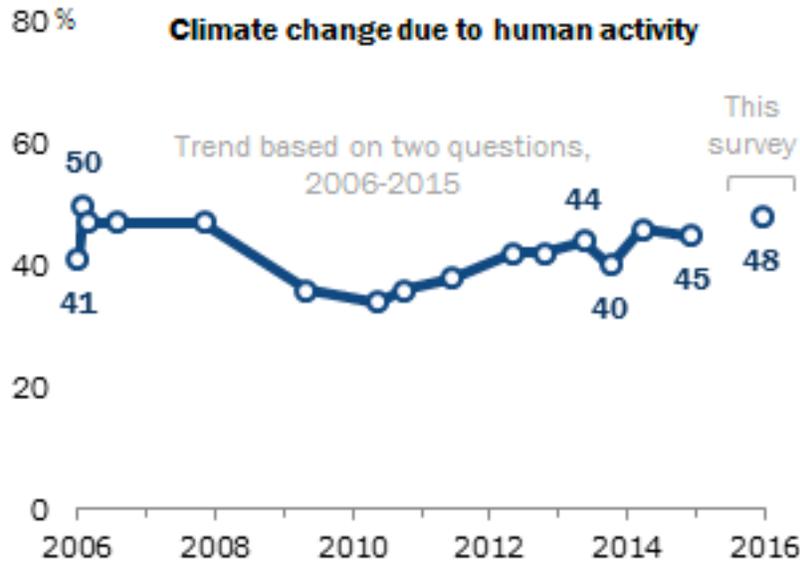
- Seven in ten registered voters (71%) think global warming is happening, including 97% of liberal Democrats, 85% of moderate/conservative Democrats, 65% of liberal/moderate Republicans, and 42% of conservative Republicans.
- A majority of registered voters (56%) think global warming is caused by mostly human activities, including 87% of liberal Democrats and 62% of moderate/conservative Democrats, but only 45% of liberal/moderate Republicans and 30% of conservative Republicans.
- A majority of registered voters (55%) are “very” or “somewhat” worried about global warming, including 86% of liberal Democrats and 72% of moderate/conservative Democrats, but only 43% of liberal/moderate Republicans and 23% of conservative Republicans.

Furthermore, in a 2016 Gallup Poll, a majority of Americans (63%) say, “the weather in their local area this winter was warmer than usual.” When asked what they think caused these abnormal temperatures, “most Americans say the shift was the result of human-induced climate change rather than normal variations.” Moreover, “just about 10% of Americans say it was a colder winter than usual and 26% say the weather was about the same.” (Source: <http://news.gallup.com/poll/189920/americans-attribute-warm-winter-weather-climate-change.aspx>)

In a 2015 Pew Research Center Poll, beliefs about global climate change remained fairly stable. “Roughly half of adults (48%) say climate change is mostly due to human activity; roughly three-in-ten say it is due to natural causes (31%) and another fifth say there is no solid evidence of warming (20%),” the survey notes. The poll results further suggest that, “the share saying human activity is the primary cause of climate change about the same as Pew Research Center surveys in 2014 (50%) and 2009 (49%).”

Modest fluctuations in public beliefs about climate change over time

% of U.S. adults who say the Earth is getting warmer mostly because of human activity



Note: Other responses and those saying "don't know" are not shown.

Source: Survey conducted May 10-June 6, 2016.

"The Politics of Climate"

PEW RESEARCH CENTER

<http://www.pewinternet.org/2016/10/04/public-views-on-climate-change-and-climate-scientists/>

The Pew Survey further concludes "politics is the central factor in shaping people's beliefs about the effects of climate change, ways to address warming, and trust in climate scientists." The survey notes:

- Most liberal Democrats think negative effects from global climate change are likely.
- Most conservative Republicans say each of the six actions to address climate change would have small or negligible effects; most liberal Democrats believe each can make a big difference.

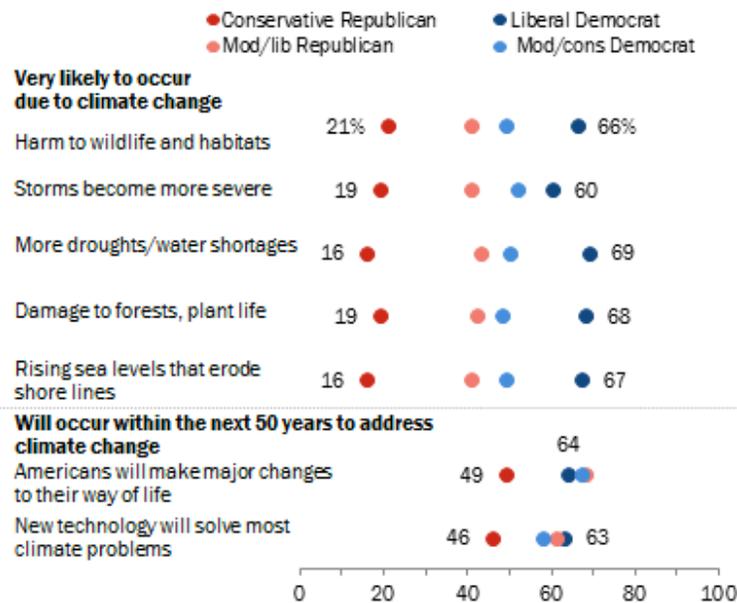
- Most support a role for climate scientists in climate policy decisions, though political groups differ in relative priorities for scientists and the public in policy matters.
- There are wide opinion differences over whether scientists understand climate change. Liberal Democrats are most likely to see widespread agreement among climate scientists.
- More than a third of Americans are deeply concerned about climate issues; their views about climate change and scientists differ starkly from the less concerned.
- In terms of the media, 42% of Americans say the media do not take the threat of global climate change seriously enough, while 40% of Americans say reporters give too little attention to skeptics of global climate change.

<http://www.pewinternet.org/2016/10/04/public-views-on-climate-change-and-climate-scientists/>

These conclusions are supported by the data summaries below:

Expectations of harm from climate change differ widely among political groups

% of U.S. adults in each group who say ...



Note: Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean toward a political party, those saying "don't know," and other responses are not shown.

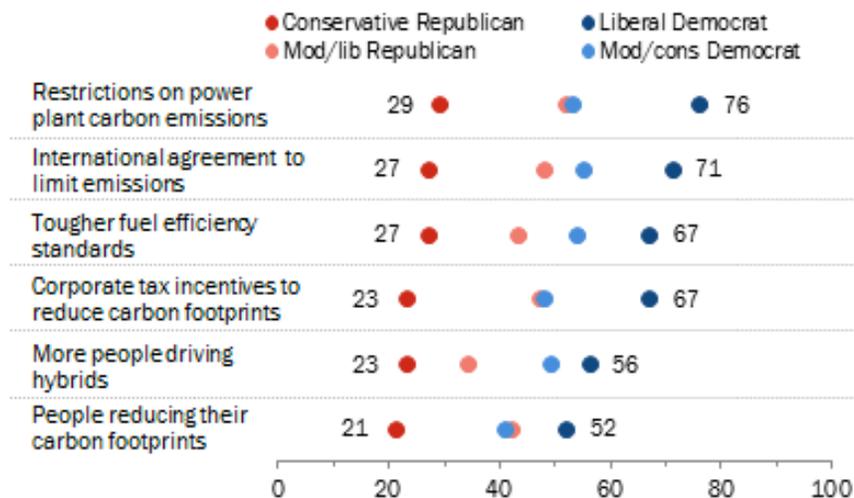
Source: Survey conducted May 10-June 6, 2016.

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Most liberal Democrats see wide range of actions as making a big difference to address climate issues

% of U.S. adults in each group who say ____ can make a big difference in addressing climate change



Note: Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean toward a political party, those saying "don't know," and other responses are not shown.

Source: Survey conducted May 10-June 6, 2016.

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Moreover, the Center for Local, State, and Urban Policy at the University of Michigan conducts the National Surveys of Energy and Environment (NSEE), an "on-going biannual national opinion survey on energy and climate policy." In the 2017 survey, researchers found the following:

- Seventy percent of respondents believe there is solid evidence that the average temperature on Earth has been increasing.
- Over ninety percent of respondents are fairly confident or very confident that the average temperature on Earth is increasing.
- Only thirty-four percent of respondents believe that increase in temperature is due to a combination of human activity and natural patterns.
- Twenty-one percent of respondents believe that human activity is the primary factor that causes them to believe that Earth's temperatures are increasing.
- Thirty-five percent of respondents stated that natural patterns are the primary factor that cause them to believe that Earth's temperatures are not increasing.

- Politics and religion have little impact on respondents' beliefs on global warming and climate change.

(Source: <http://closup.umich.edu/issues-in-energy-and-environmental-policy/2/nsee-findings-report-for-belief-related-questions/>)

Methodology

We began by reviewing current literature on global warming and climate change as well as researching existing surveys and studies on public opinion about both topics.

The survey we developed was open to all students, ages 13 to 18, worldwide. We used the following workflow.

1. Brainstormed a comprehensive list of possible survey questions by generating a Google Form. We used the questions from the NSEE as a basis for our questions, so that we could compare the responses by NSEE participants to the responses by participants in our survey.
2. Peer reviewed Google Forms and combined questions with common themes.
3. Created a final survey of sixteen questions in Typeform (link: <https://ericwalters.typeform.com/to/HBPQ8D>) that included demographics and public opinion.
4. The survey included the following questions, as shown in Table 1.

Table 1. Survey Questions
Demographic Questions
1. Name 2. Age 3. School 4. Location 5. Email
Opinion Questions
6. From what you have read and heard, is there solid evidence that the average temperature of the Earth has been getting warmer over the past century? 7. How confident are you that the average temperature on Earth is increasing? 8. Is the Earth getting warmer because of human activity such as burning fossil fuels or mostly because of natural variations in the Earth's climate? 9. What global evidence would lead you to conclude that the Earth's average temperature is increasing? 10. What evidence would lead you to believe that Earth's average temperature is increasing? 11. What evidence would lead you to believe Earth's average temperature is increasing? 12. Is there sufficient evidence to support the hypothesis that the Earth's average temperature is increasing? 13. Which of these factors have influenced your belief on global warming and climate change the most? 14. Whom do you believe is primarily responsible for addressing the potential effects of global warming and climate change? 15. Do you support a carbon tax? 16. Do you believe you are educated about global warming and climate change?

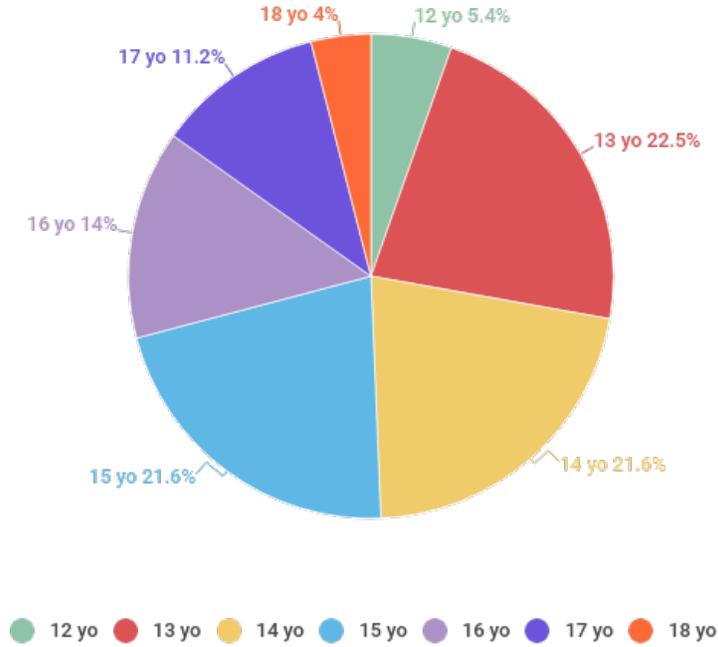
Question responses are embedded in the **Results** section.

5. We tested the survey for functionality.
6. We generated a master email list, that included schools worldwide with students that met our age parameters.
7. We drafted an email template announcing the survey; that email was sent to all schools on a master email list that included schools on every continent.
8. The survey description and link was posted on the following listservs: Independent School Educators' List; K-12 Fab Labs and Makerspaces Google Group; STEMTeachersNYC Google Group; and the MLI @ MMT monthly email.
9. The survey was announced on the NCGS Coalition Connection.

The survey was open for the period of January 15 through March 2, 2018.

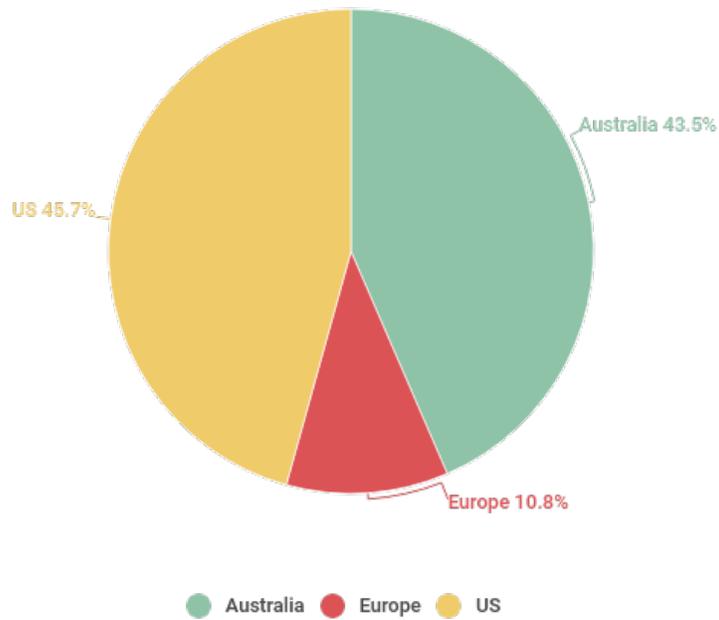
Results

A total of 675 people responded to the survey. A demographic breakdown of respondents is shown in the demographic tables below:



Demographic Table 1. Ages of Respondents



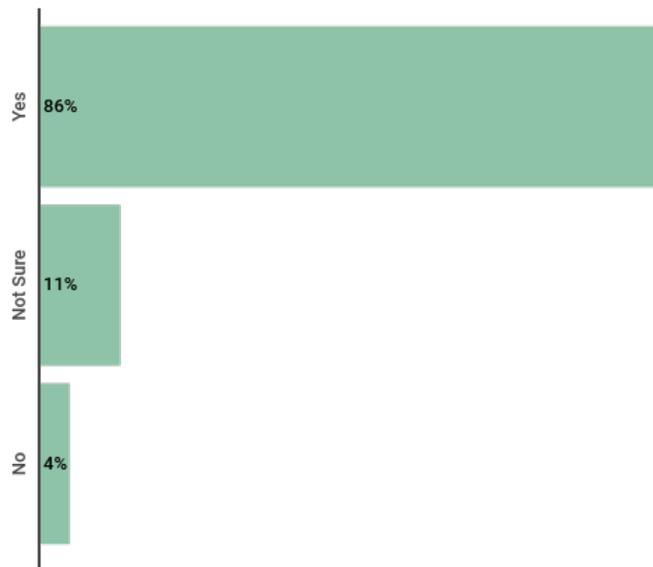


Demographic Table 2. Locations of Respondents

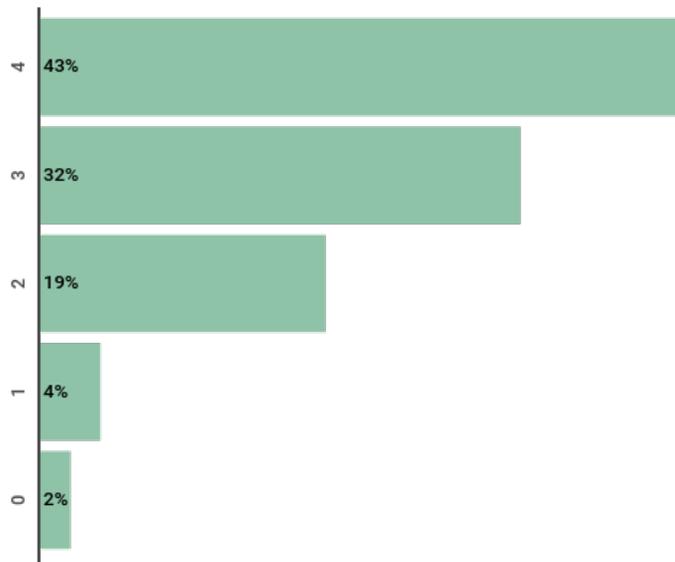
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Each survey response was reviewed for completeness and adherence to survey guidelines. Responses that were incomplete or did not meet survey requirements were deleted.

Results for each question are shown in the data tables below:

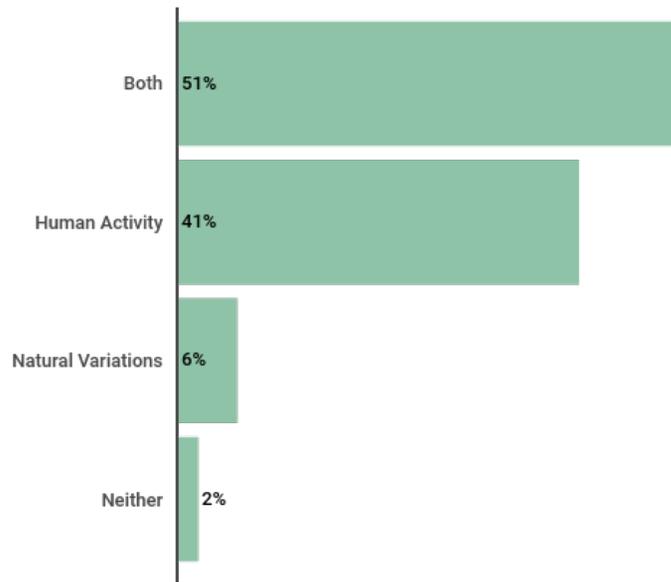


Data Table 1. From what you have read and heard, is there solid evidence that the average temperature on Earth has been getting warmer over the past century?



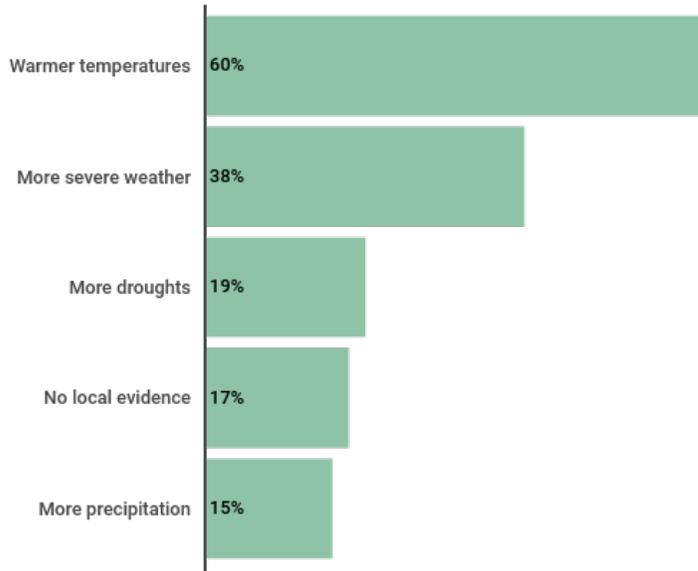
Data Table 2. How confident are you that the average temperature on Earth is increasing? (0 = not very confident, 4 = very confident)





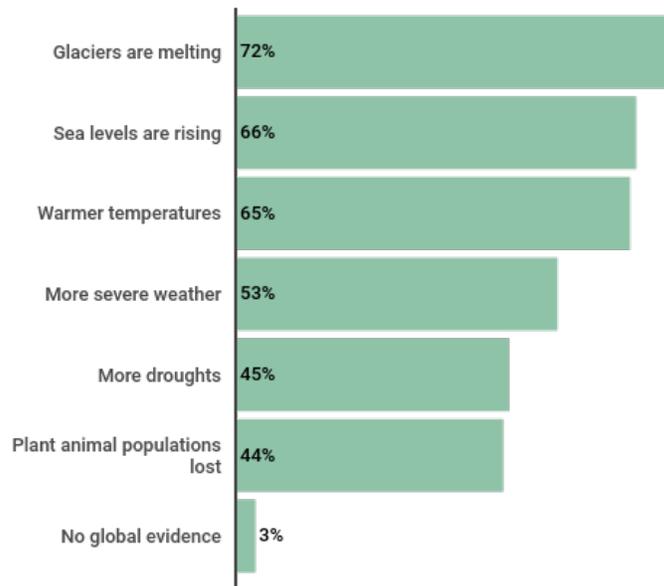
Data Table 3. Is the Earth getting climate because of human activity such as burning fossil fuels or mostly because of natural variations in the Earth's climate?

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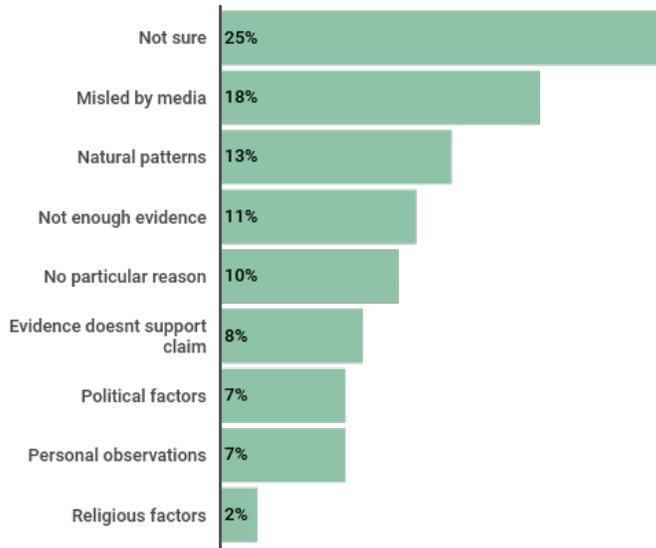
Data Table 4. What local evidence would lead you to conclude that the Earth's average temperature is increasing? (You may select more than one answer.)

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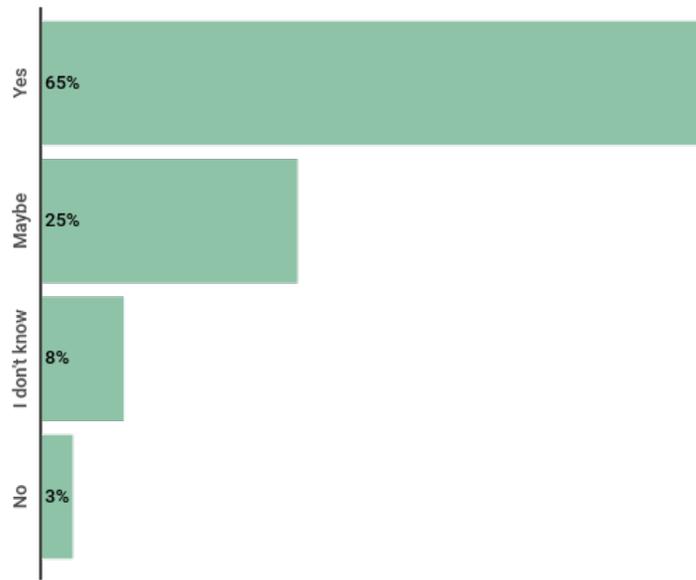
Data Table 5. What global evidence would lead you to conclude that the Earth's average temperature is increasing? (You may select more than one)

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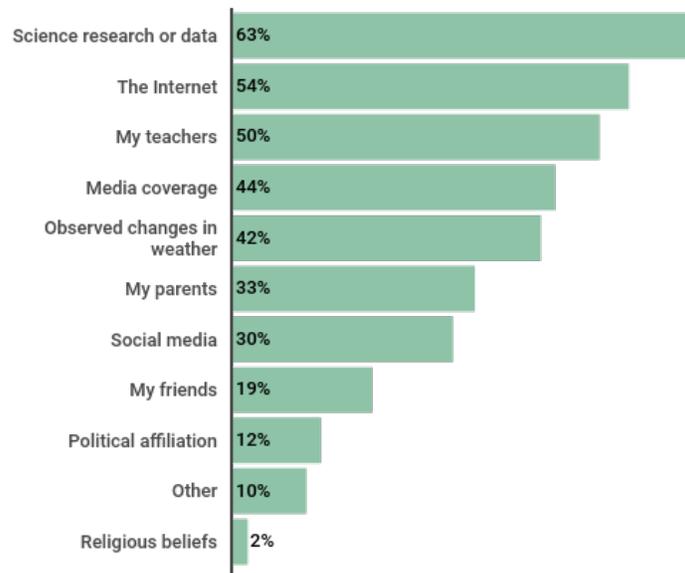


Data Table 6. What evidence would lead you to believe that temperatures on Earth are not increasing? (You may select more than one answer.)

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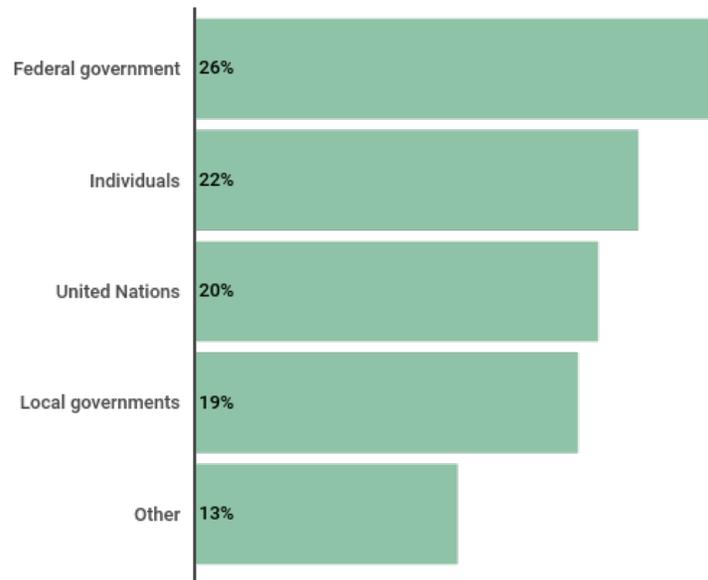


Data Table 7. Is there sufficient evidence to support the hypothesis that the Earth's average temperature is increasing?

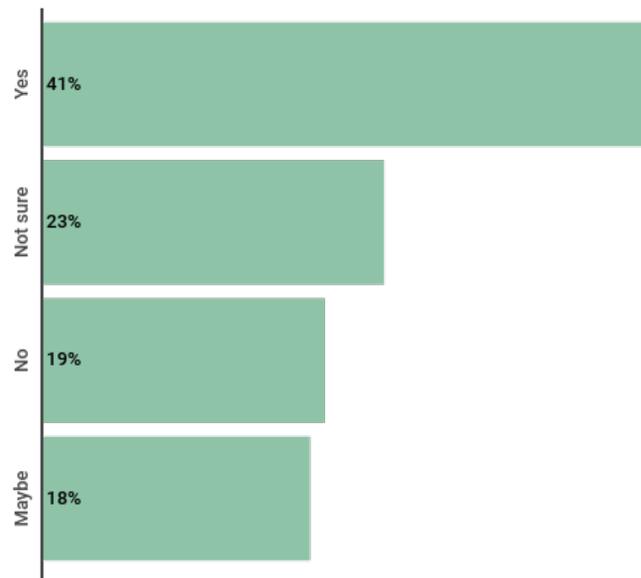


Data Table 8. Which of these factors have influenced your belief on global warming and climate change the most? (You may select more than one answer.)



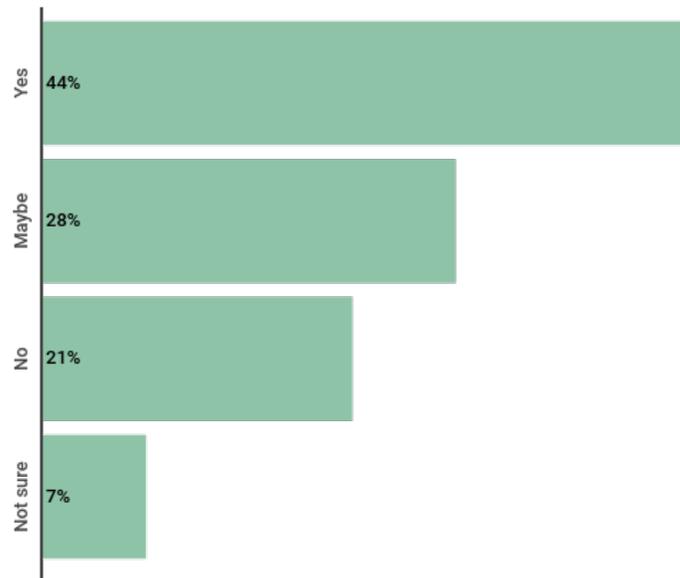


Data Table 9. Whom do you believe is primarily responsible for addressing the potential effects of global warming and climate change?



Data Table 10. Do you support a carbon tax?





Data Table 11. Do you believe you are educated about global warming and climate change?

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Conclusions

In general, the following conclusions were reached about student perspectives on global warming and climate change:

- Most respondents believe there is solid evidence that the average temperature on Earth has been increasing over the past century.
- Most respondents are confident or very confident that the average temperatures on Earth are increasing.
- Approximately one-half of the respondents believe that the increase in the Earth's temperature is due to both human activity and natural variations.
- Most respondents believe that warmer temperatures in their area are the best evidence that the Earth's average temperature is increasing.
- Globally, melting glaciers, rising sea levels, and warmer temperatures offer the best evidence that the Earth's average temperature is increasing.
- As most respondents believe that the Earth's average temperature is increasing, approximately one-fourth of the respondents are not sure what

evidence would suggest that that the Earth's average temperature is not increasing.

- Most respondents believe there is sufficient evidence to support the hypothesis that the Earth's average temperature is increasing.
- Most respondents state that scientific research or data, the Internet, and teachers influence personal beliefs on global warming and climate change.
- There is general consensus that the all parties are responsible for addressing the potential effects of global warming and climate change.
- Approximately four out of ten respondents support a carbon tax while one in five respondents do not support a carbon tax.
- Approximately forty-five percent of respondents believe they are educated about global warming and climate change.

Results with data broken down by age and location are posted on our website: weather.marymountnyc.org

In general, the results from this survey were pretty much parallel to the results from the NSEE survey. Of interest:

- A greater percentage of respondents ages 13 to 18 believe there is solid evidence that the Earth's average temperature is increasing than respondents in the NSEE survey.
- A greater percentage of respondents ages 13 to 18 believe that this increase in temperature is due to both human activity and natural variations.
- Both groups' beliefs are solidly shaped by scientific research or data, while neither group is greatly influenced by politics or religion.

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Authors

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