



Where Is the North Pole? An Election-Year Survey on Global Change

Lawrence C. Hamilton

Summary

The north and south polar regions have been rapidly changing, affecting global weather and sea levels and sparking international concern about shipping and resources. While these global impacts occur, physical changes such as warming and less ice directly affect ecosystems and people living in polar regions. President Obama, visiting the northern Alaska town of Kotzebue in summer 2015, noted the impact of climate change on the American Arctic, where several towns may be abandoned due to rising flood risks in the next few decades, if not sooner.

Results from the survey highlight areas of knowledge, uncertainty, and division. Public views on almost everything related to climate change exhibit wide differences depending on political orientation.

To explore public knowledge and perceptions about climate change, University of New Hampshire researchers conducted the first Polar, Environment, and Science (POLES) survey in August 2016. A random sample of U.S. adults were asked for their views regarding science, climate change, sources of information, current problems, and possible solutions. In addition, the survey tested basic geographical knowledge related to polar regions, such as whether the United States has a significant population living in the Arctic, and what respondents know about the location of the North Pole.

Results from the survey highlight areas of knowledge, uncertainty, and division. Public views on almost everything related to climate change—acceptance of basic science observations, trusted

KEY FINDINGS



Fewer than one in five Americans knows that their country includes territory with thousands of people living in the Arctic.



Fewer than half understand the locations of the North or South Poles.



A majority recognizes that Arctic sea ice is declining and CO2 levels are rising, but knowledge of these scientific facts varies depending on political preference.



More than 60 percent agree that human activities are changing Earth's climate.



Public acceptance of the scientific consensus on climate change has been gradually rising in recent years.



Supporters of Donald Trump are less likely to trust scientists for information about climate change, to think that climate change is causing important problems, or to support actions to reduce its risks.

sources of information, the seriousness of current problems, or the need for any policy response—exhibit wide differences depending on political orientation. In this election year, such divisions appear as stark contrasts between supporters of Hillary Clinton and Donald Trump. Geographic questions that are not obviously tied to climate beliefs evoke less political division, but often reveal low levels of background knowledge.

Are Human Activities Changing Earth's Climate?

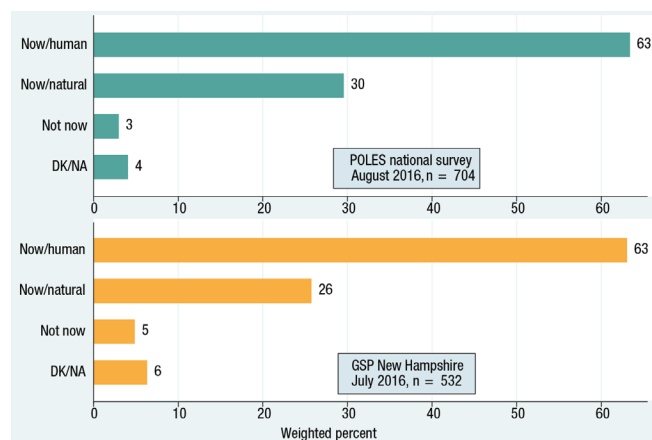
In more than 40 surveys and 30,000 interviews since 2010, Carsey School researchers have included this basic question about climate change.

Which of the following three statements do you think is more accurate?

- *Climate change is happening now, caused mainly by human activities.*
- *Climate change is happening now, but caused mainly by natural forces.*
- *Climate change is NOT happening now.*

Most scientists would choose the first statement—climate change is happening now, caused mainly by human activities.¹ Agreement on this conclusion among the public is lower than it is among scientists, but is gradually rising. Repeated surveys have tracked public acceptance drifting upward, from the low 50s to more than 60 percent over the past seven years.² **Figure 1** displays the most recent results from summer 2016 nationwide (POLES) and New Hampshire (GSP) surveys. Both find 63 percent agreement with the scientific consensus that human activities are changing the climate.³

FIGURE 1. WHICH STATEMENT ABOUT CLIMATE DO YOU THINK IS MORE ACCURATE?



Source: POLES National Survey, August 2016; GSP New Hampshire Survey, July 2016

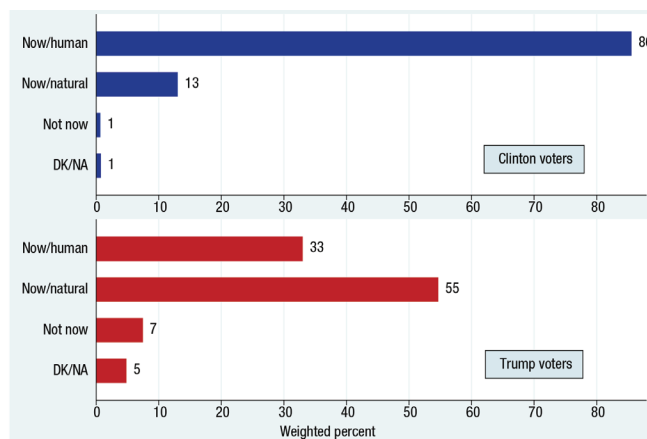
Many studies have documented wide divisions along ideological and party lines in opinions regarding whether humans are changing the Earth's climate.⁴ Indeed, climate change has become one of the most politically divisive questions asked on surveys.⁵ The August 2016 POLES survey, carried out during an election campaign, offers a fresh perspective on these well-known divisions.

The survey asked:

If the presidential election was being held today, would you vote for Republican Donald Trump... Democrat Hillary Clinton... some other candidate or would you skip this election?

Twenty-six percent of POLES respondents said they would vote for Donald Trump, 35 percent said Hillary Clinton, 16 percent favored other candidates, 15 percent said they would skip this election, and 8 percent were still undecided. Focusing on the two main candidates (other groups being too small and mixed for meaningful analysis), **Figure 2** graphs the climate-change beliefs of 435 Clinton and Trump supporters. Differences between them are large and statistically significant: 86 percent of Clinton supporters but only 33 percent of Trump supporters agree with the scientific consensus on climate. A similar gap, 87 to 32 percent, appeared on the New Hampshire poll a month earlier (not shown).

FIGURE 2. WHICH STATEMENT ABOUT CLIMATE DO YOU THINK IS MORE ACCURATE?



Source: POLES National Survey, August 2016

Who Do You Trust for Information?

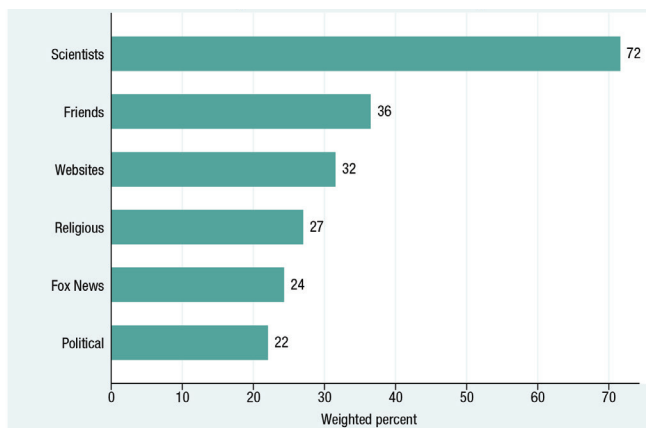
Climate change is a science-heavy topic that is challenging for non-scientists to follow. For insights on where people look for information, we asked:

As a source of information about climate change, would you say that you trust, don't trust, or are unsure about...

- Political leaders of your party?
- Religious leaders of your faith?
- Internet websites you follow?
- Fox TV news?
- Science agencies such as NASA that study the climate?
- Friends and family?

Figure 3 graphs the percentage who say they trust each source. Science agencies such as NASA are ranked highest, trusted by 72 percent. Friends and family come in a distant second, followed by internet websites and religious leaders. Respondents place the least trust in political leaders of their own party.

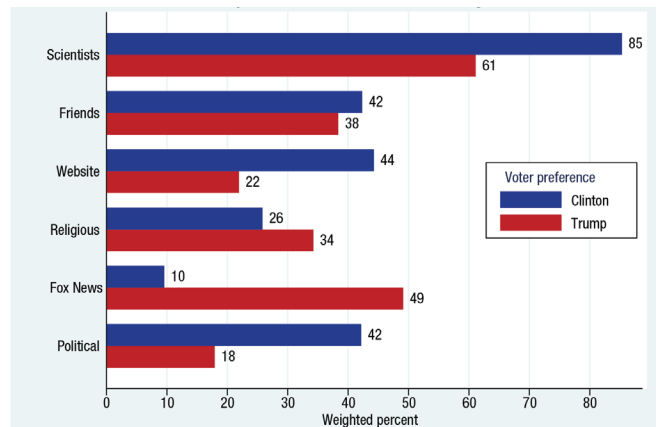
FIGURE 3. WHO DO YOU TRUST FOR INFORMATION ABOUT CLIMATE CHANGE?



Source: POLES National Survey, August 2016

Which sources are trusted depends on politics, however. **Figure 4** compares the responses of Clinton and Trump supporters. Eighty-five percent of Clinton supporters trust NASA scientists, about twice the proportion trusting friends and family, internet sources, or political leaders. Only 26 percent of Clinton supporters say they trust religious leaders, and 10 percent say Fox News. Trump supporters, on the other hand, place less trust in scientists than do Clinton supporters, and much more in Fox News. For them, Fox News is the second-most-trusted source for information about climate change.⁶

FIGURE 4. WHO DO YOU TRUST FOR INFORMATION ABOUT CLIMATE CHANGE?



Source: POLES National Survey, August 2016

Problems Caused by Climate Change

If humans are changing Earth's climate, does that matter right now or sometime in the future? Scientists have examined this question in detail with regard to various climate impacts,⁷ but our survey sought public perceptions.

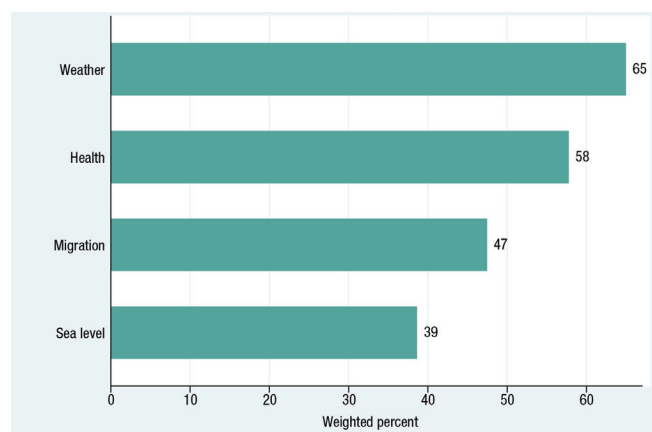
For each of the following, please tell me whether you think this is an important problem now, will be an important problem within the next 40 years, will be an important problem within the next few centuries, or will never be an important problem.

- Rising sea levels caused by climate change.
- Extreme weather events such as severe floods or droughts caused by climate change.
- Human health impacts caused by warmer conditions and insect-borne diseases connected with climate change.

— *Increasing migration, caused by climate change impacts such as crop failures, water scarcity, or rising sea levels.*

Figure 5 shows what proportion think each problem is important now. Sea-level rise has been a prominent concern among scientists who observe the melting of Greenland and Antarctic ice sheets, and among residents in coastal areas already seeing more floods.⁸ But many people live on higher ground, and for them threats of flooding seem less imminent. Moreover, although coastal flooding in some areas is increasing already, large rises in sea level are thought to be decades or centuries away. Only 39 percent in our survey consider sea-level rise an important problem now. On the other hand, extreme weather is visibly happening around the country, sometimes with disastrous effects. Weather disasters are nothing new, but their rising frequency in some places has been linked to climate change.⁹ Sixty-five percent of our survey respondents view extreme weather caused by climate change as an important problem now. The second-greatest public concern is health impacts caused by warmer conditions and insect-borne diseases connected with climate change (58 percent). An example in recent headlines, although not mentioned on the survey, is the northward spread of the mosquito (*Aedes aegypti*) that carries the Zika virus.¹⁰

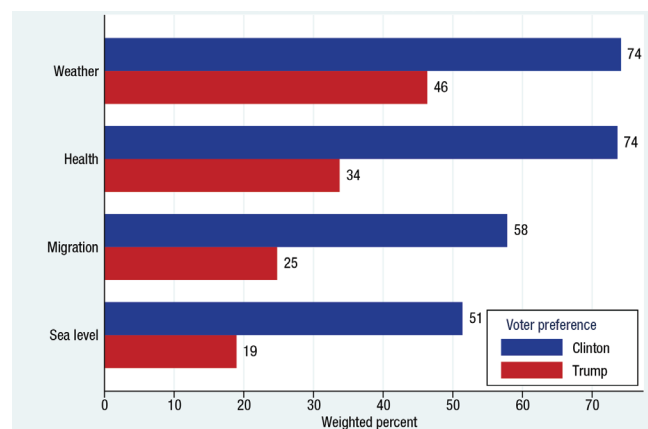
FIGURE 5. IMPORTANT PROBLEMS NOW, CAUSED BY CLIMATE CHANGE?



Source: POLES National Survey, August 2016

Clinton and Trump supporters give these four problems the same relative ranking, with weather highest and sea level lowest, but overall levels of concern on each item are much higher among Clinton supporters. Even so, almost half the Trump supporters consider extreme weather caused by climate change to be an important problem now, and a third consider health impacts from climate change important. More detailed analysis (not shown) suggests that many of the Trump supporters have climate change from natural causes in mind as a source of these problems, whereas Clinton supporters think of human-caused change.

FIGURE 6. IMPORTANT PROBLEMS NOW, CAUSED BY CLIMATE CHANGE?



Source: POLES National Survey, August 2016

What Should Be Done?

Policies intended to reduce risks from climate change broadly aim for either *adaptation* or *mitigation*. Adaptation accepts that climate is changing and seeks stopgap measures such as building sea walls or planting alternative crops that might postpone adverse effects, as well as strategic responses for continuing change. Mitigation aims to slow the pace of change itself, often by reducing emissions of greenhouse gases such as carbon dioxide (CO₂) that trap heat in the atmosphere. The POLES survey asked four questions regarding mitigation policies:

Some people have suggested that public investment in renewable energy such as wind and solar power could help to reduce risks of climate change. Do you think that renewable energy development should be a high priority, medium priority, low priority, or not a priority at all for the U.S.?

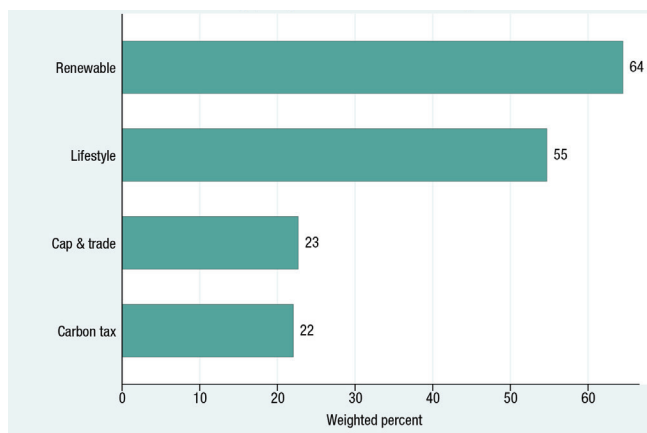
Others have suggested that changes in lifestyles and consumer behavior, to use less energy, could help to reduce risks of climate change. Do you think that reducing personal energy use should be a high priority, medium priority, low priority, or not a priority at all for the U.S.?

One policy step that has been proposed is a “carbon tax” on the production and use of fossil fuels, with revenue returned to consumers through “carbon dividend” tax reductions. Do you think that a carbon tax of this type should be a high priority, medium priority, low priority, or not a priority at all for the U.S.?

Another policy step that has been proposed is a “cap-and-trade” system, which sets a limit on carbon emissions but allows for trading between companies. Do you think that a cap-and-trade system should be a high priority, medium priority, low priority, or not a priority at all for the U.S.?

Percentages answering “high priority” on each of these four questions are graphed in **Figure 7**. Renewable energy development proves most popular, prioritized by almost two-thirds of the respondents. Changes in lifestyle and consumer behavior also have majority support. However, government incentives to reduce greenhouse emissions, which many economists believe will be necessary, receive much less support. Less than one-fourth of survey respondents think that either a cap-and-trade system or a revenue-neutral carbon tax (in which revenue is returned to consumers) should be high priorities.

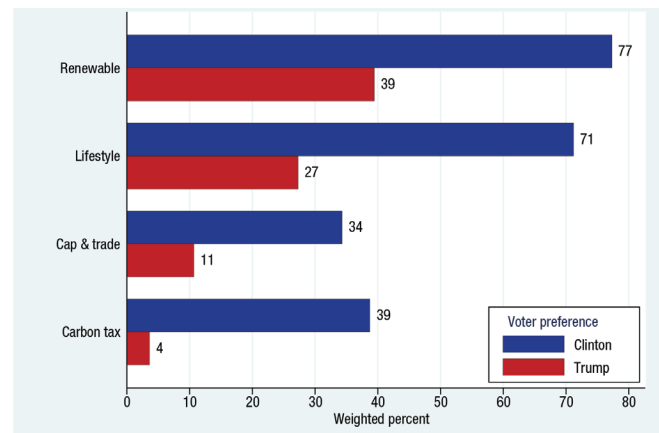
FIGURE 7. HIGH PRIORITY TO REDUCE RISKS OF CLIMATE CHANGE?



Source: POLES National Survey, August 2016

Figures 2 and 6 highlighted political divisions on the reality and seriousness of climate change; **Figure 8** depicts divisions on mitigation policy. Most Clinton supporters give high priority to renewable energy investments and consumer or lifestyle changes. Lower but still noteworthy numbers of Trump supporters also place high priority on action to reduce climate risks: 39 percent prioritize renewable energy investments and 27 percent consumer or lifestyle changes. Cap-and-trade policies or a revenue-neutral carbon tax are less popular with both groups, but especially disfavored by Trump supporters.

FIGURE 8. HIGH PRIORITY TO REDUCE RISKS OF CLIMATE CHANGE?



Source: POLES National Survey, August 2016

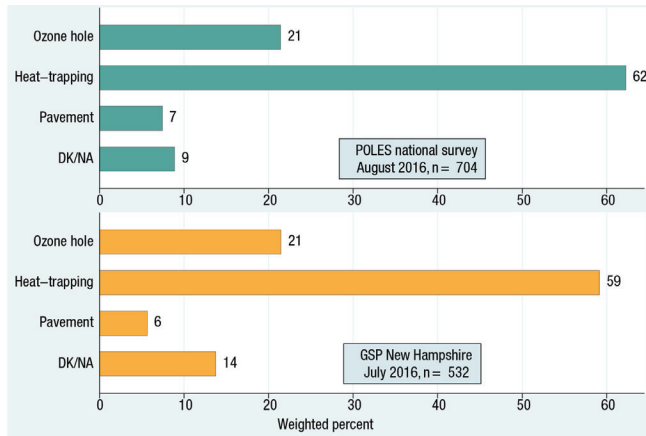
The consistency of positions rejecting climate science, climate impacts, and mitigation or adaptation policies suggests a cultural dimension. Conceptually distinct elements (such as beliefs about scientific evidence, and preferences regarding policy) have become bundled together into worldviews and social identity.¹¹

Testing Knowledge

Might the divergence between scientific and public views on climate change reflect a lack of knowledge, or shortcomings in education and science communication? Many people express self-confidence about their knowledge: 24 percent of survey respondents say they understand “a great deal” about climate change, and 57 percent say “a moderate amount.” Relatively few state that they know only a little (17 percent) or nothing at all (3 percent). Objective tests suggest, however, that such confidence often derives from political convictions rather than knowledge of science or the physical world.¹²

Answering some questions appears straightforward. For example, a majority correctly say that by “greenhouse effect” scientists refer to the heat-trapping properties of certain gases, such as carbon dioxide. **Figure 9** charts responses to this question on both national and New Hampshire surveys.

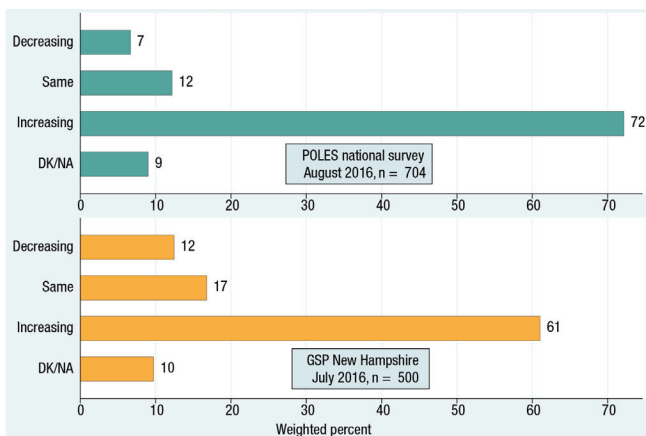
FIGURE 9. MEANING OF ‘GREENHOUSE EFFECT’?



Source: POLES National Survey, August 2016; GSP New Hampshire Survey, July 2016

The greenhouse effect is a well-known principle in physics. What sparked the modern concern about climate change is the observation that atmospheric concentrations of CO₂ and other greenhouse gases are dramatically rising, largely from fossil fuel consumption and other human activities. CO₂ concentrations are likely to reach more than twice their pre-industrial levels within a few decades.¹³ **Figure 10** shows that a majority of respondents recognize that CO₂ levels are rising.

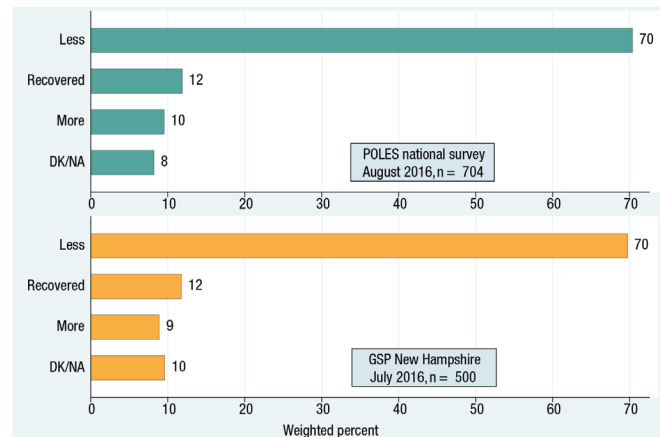
FIGURE 10. IS CO2 IN ATMOSPHERE DECREASING OR INCREASING IN RECENT DECADES?



Source: POLES National Survey, August 2016; GSP New Hampshire Survey, July 2016

The decreasing extent of Arctic sea ice, along with land ice in Greenland, Antarctica, and many of the world’s glaciers, has been among the most visible signs of global warming. Most people are aware that Arctic sea ice covers less area than it did 30 years ago (**Figure 11**). Relatively few believe that Arctic ice has recovered, a false claim advanced by some political commentators.¹⁴

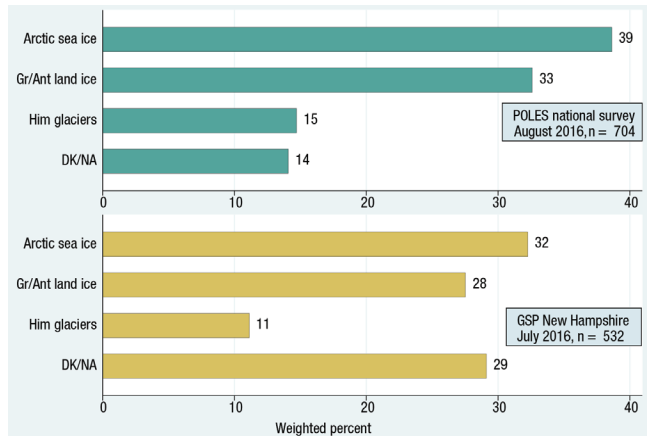
FIGURE 11. IS LATE-SUMMER ARCTIC SEA ICE AREA LESS THAN 30 YEARS AGO?



Source: POLES National Survey, August 2016; GSP New Hampshire Survey, July 2016

Arctic sea ice decline concerns scientists for many reasons, including its impact on ecosystems, weather, ocean circulation, and the heat balance of the planet. However, melting all of the Arctic sea ice would have only minor effects on global sea levels, because the sea ice is already floating. Concerns about sea-level rise focus instead on the melting of land ice, and particularly the great ice sheets of Greenland and Antarctica—which would flood coastal cities if they melted. Greenland alone holds potential for more than 20 feet of sea-level rise, and Antarctica more than 200. Among the general public, however, many people mistakenly think that sea ice rather than land ice holds the greatest potential for sea-level rise (**Figure 12**). As survey questions go, this is clearly difficult, and public confusion is not surprising. The confusion does contrast, however, with the high percentages expressing confidence in their understanding about climate change.

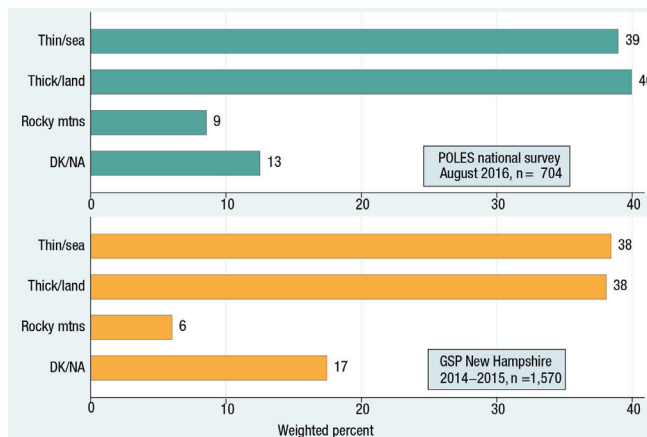
FIGURE 12. WHICH COULD DO MOST TO RAISE SEA LEVEL, IF MELTED?



Source: POLES National Survey, August 2016; GSP New Hampshire Survey, July 2016

Our survey included two questions testing the most basic polar knowledge: where *are* the North and South Poles? Glancing at a globe will show the North Pole located in the middle of the Arctic Ocean, and the South Pole on the continent of Antarctica. Among survey respondents, however, less than 40 percent correctly place the North Pole on ice a few feet or yards thick, floating over a deep ocean. Similar proportions think the pole is on ice more than a mile thick, over land, while others imagine a rocky, mountainous landscape (Figure 13). Answers regarding the South Pole are not much better; less than half correctly place it on thick ice over land (not shown).

FIGURE 13. WHICH BEST DESCRIBES THE NORTH POLE?



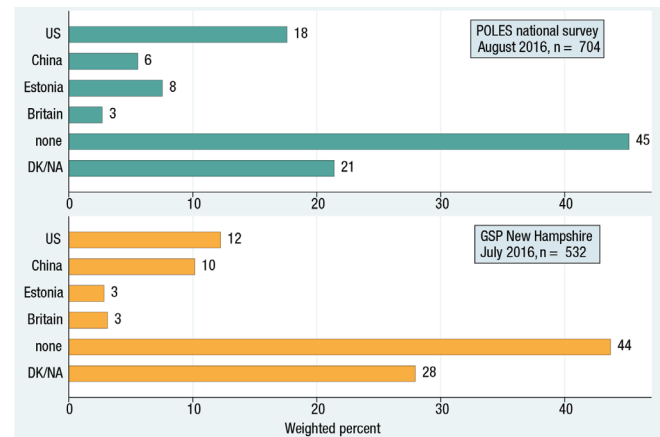
Source: POLES National Survey, August 2016; GSP New Hampshire Survey, July 2016

A final polar question explored whether Americans realize that their country is an Arctic nation. More than 3 million square miles of Alaska lie north of the Arctic circle, including North Slope oilfields along with the predominantly Inuit towns of Barrow (population 4,500), Kotzebue (3,200), and many smaller communities such as the coastal village of Kivalina (400), which faces imminent danger from flooding due to climate-linked erosion.¹⁵ In summer 2015 President Obama became the first acting U.S. president to visit America’s Arctic when he traveled to Kotzebue, and he spoke there to highlight the impacts of climate change, which are unmistakable to Arctic residents. The survey question listed five nations including the United States, and asked:

Which of the following countries has territory with thousands of people living north of the Arctic Circle?

Fewer than 20 percent correctly chose the United States. Forty-five percent answered “none of these,” while others guessed China, Estonia, or Great Britain. Both nationwide and New Hampshire surveys indicate that most Americans are unaware their nation has territory with thousands of people living in the Arctic (Figure 14).

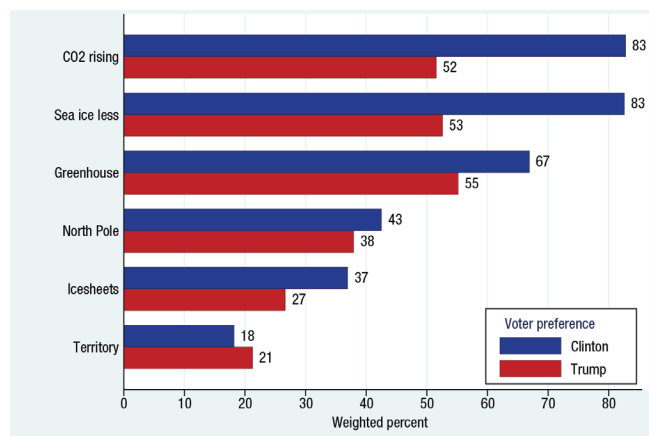
FIGURE 14 WHICH COUNTRY HAS TERRITORY WITH 1000S OF PEOPLE LIVING NORTH OF ARCTIC CIRCLE



Source: POLES National Survey, August 2016; GSP New Hampshire Survey, July 2016

Earlier surveys testing public knowledge about climate change, or polar change in particular, noticed “two kinds” of facts: those that do or do not link in obvious ways to beliefs about the reality of climate change.¹⁶ Rising CO₂ levels or declining Arctic sea ice are examples of directly linked questions. **Figure 15** depicts 30-point political gaps between Clinton and Trump supporters in POLES survey responses on these two facts. Trump supporters are much less likely to accept or know the scientific observations that CO₂ has increased and Arctic sea ice declined.

FIGURE 15. ACCURATE RESPONSES ON SIX KNOWLEDGE QUESTIONS



Source: POLES National Survey, August 2016

Other factual questions in Figure 15 link less obviously to what people believe about climate change. Consequently, they exhibit narrower political differences—12 points or less, which are not statistically significant in these data. The “two kinds of facts” seen in Figure 15 confirm findings of earlier research.

Discussion

These results highlight Americans’ limited knowledge about polar regions, including the locations of the North and South Poles and the fact that a large part of Alaska, with towns and industry, lies north of the Arctic Circle. The importance of melting land ice, rather than sea ice, for sea level rise also confuses most people, although the connection between Greenland or Antarctic land ice and global sea level features prominently in media reports.

Public uncertainty on such facts points toward areas where better education and science communication could help advance understanding.

Equally basic scientific facts that have more obvious implications about climate change, such as rising CO₂ levels or declining Arctic sea ice, face a different kind of response. While location of the North Pole is answered incorrectly by people of all persuasions, trends in CO₂ levels or sea ice are more often missed by Trump supporters, in keeping with their more frequent rejection of human-caused climate change.¹⁷ Science education or more targeted communication efforts could be effective among those less committed to the rejection of anthropogenic climate change but have little impact on culturally motivated disbelief. More nuanced, culturally tailored communication strategies might help in communicating science, or the need for adaptation and mitigation, across this divide.¹⁸

Logically, we could separate the scientific observation that climate change is occurring from the political question of what should be done. In public opinion, however, the science and political issues prove not very distinct. The gaps between Trump and Clinton supporters are wide on scientific and policy questions alike, including whether scientists can be trusted for information, and whether climate change, from any source, is causing problems now. Other studies have found political divisions affecting perceptions about local temperature trends,¹⁹ flooding,²⁰ and whether the past winter was warmer or colder than average.²¹ This consistency across domains suggests a broad ideological or cultural position dismissing the scale and risks of anthropogenic climate change.

The two candidates take opposing positions on the reality of human-caused climate change. Majorities of each candidate’s supporters also take opposing positions, but within each group there are different views. For instance, one-third of Trump supporters accept that human activities are changing the climate, and almost 40 percent think that renewable energy should be a high priority. They count among the 63 or 64 percent overall holding these views. Thus, despite sharp political divisions, there is broad and rising public recognition of climate-change problems and of the need to shift our energy use in response.

Data and Methodology: The POLES Survey

The POLES survey conducted telephone interviews with 704 U.S. residents in August 2016. Random-digit dialing sampled both landline and cellular telephone users. Trained personnel at the University of New Hampshire Survey Center and the University of Northern Florida Public Opinion Research Laboratory carried out interviews, which included a deliberate oversample of 203 Alaska residents along with 501 residents from the lower 48 states. Response rates to the August survey were 15 percent for nationwide sampling and 30 percent for the Alaska subsample, by AAPOR definition 4.²² Probability weights, widely used in survey research to account for known sampling biases, were calculated for these POLES data to keep overall results representative for the U.S. adult population. Weighting took into account the number of adults and telephone lines within households to equalize the chances that any one adult would be selected for inclusion. In addition, the Alaska oversample has been weighted in proportion to 2015 U.S. and Alaska populations. Lastly, analyses also are weighted for representativeness in terms of sex, race, age, and census division. The weights have been applied to all the analyses in this brief. Wording of all the POLES environment and science questions, with weighted response percentages, are available from the Carsey School website.²³

A number of the POLES questions were pre-tested in July 2016 on New Hampshire's Granite State Poll (GSP), a quarterly survey of state residents. Previous studies have found that on environment and science-related topics, the GSP serves as a reasonable proxy for broader U.S. opinions.²⁴ The POLES and GSP surveys obtained strikingly similar results on most items. This replication across two independent surveys supports the robustness of our conclusions, and confirms earlier indications that the GSP provides a reasonable proxy for national views on science and environmental topics.²⁵

The August 2016 POLES interviews make up the first stage of this research. More detailed analysis will follow, and also a second stage with additional interviews after the fall election.

End notes

1. J. Cook et al., "Consensus on Consensus: A Synthesis of Consensus Estimates on Human-Caused Global Warming," *Environmental Research Letters* 11, no. 4 (2016), doi:10.1088/1748-9326/11/4/048002.
2. L.C. Hamilton et al., "Tracking Public Beliefs About Anthropogenic Climate Change," *PLOS ONE* 10, no. 9 (2015):e0138208. doi: 10.1371/journal.pone.0138208.
3. The level of public acceptance for human-caused climate change is roughly comparable to that for human evolution; see D. Masci, "On Darwin Day, 5 Facts About the Evolution Debate" (2016), <http://www.pewresearch.org/fact-tank/2016/02/12/darwin-day/>. There is substantial overlap among the groups holding, or opposing, these views.
4. R.E. Dunlap, A.M. McCright, and J.H. Yarosh, "The Political Divide on Climate Change: Partisan Polarization Widens in the U.S.," *Environment* 58, no. 5 (2016):4–23, doi: 10.1080/00139157.2016.1208995; L.C. Hamilton, "Education, Politics and Opinions About Climate Change: Evidence for Interaction Effects," *Climatic Change* 104 (2011):231–42, doi: 10.1007/s10584-010-9957-8; L.C. Hamilton and K. Saito, "A Four-Party View of U.S. Environmental Concern," *Environmental Politics* 24, no. 2 (2015):212–27, doi: 10.1080/09644016.2014.976485; A.M. McCright and R.E. Dunlap, "The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001–2010," *Sociological Quarterly* 52 (2011):155–94 ; C. Funk and B. Kennedy, "The politics of climate," Pew Research Center (2016), <http://www.pewinternet.org/2016/10/04/the-politics-of-climate/>.
5. L.C. Hamilton, "Do You Trust Scientists About the Environment? News Media Sources and Politics Affect New Hampshire Resident Views" (Durham, NH: Carsey School of Public Policy, University of New Hampshire, 2014), <http://scholars.unh.edu/carsey/213/>.
6. Differences between Trump and Clinton supporters in Figure 4 are statistically significant regarding scientists, websites, Fox news, and political leaders (all $p < 0.01$, based on weighted logit regressions).
7. Many of these studies are reviewed in reports by the Intergovernmental Panel on Climate Change (IPCC): IPCC, *Climate Change 2013: The Physical Science Basis* (Cambridge, UK: Cambridge University Press, 2013); IPCC, *Climate Change 2014: Impacts, Adaptation, and Vulnerability* (Cambridge, UK: Cambridge University Press, 2014).

8. J. Gillis, "Flooding of Coast, Caused by Global Warming, Has Already Begun," *New York Times*, September 3, 2016, <http://www.nytimes.com/2016/09/04/science/flooding-of-coast-caused-by-global-warming-has-already-begun.html>.
9. K.E. Trenberth, J.T. Fasullo, and T.G. Shepherd, "Attribution of Climate Extreme Events," *Nature Climate Change* 5 (2015):725–30, doi:10.1038/nclimate2657; P.A. Stott, N. Christidis, F.E.L. Otto, et al., "Attribution of Extreme Weather and Climate-Related Events," *WIREs Climate Change* 7, no. 1 (2016):23–41, doi: 10.1002/wcc.380.
10. G. Mercer, "The Link Between Zika and Climate Change," *The Atlantic*, February 24, 2016, <http://www.theatlantic.com/health/archive/2016/02/zika-and-climate-change/470643/>.
11. D.M. Kahan, H. Jenkins-Smith, and D. Braman, "Cultural Cognition of Scientific Consensus," *Journal of Risk Research* 14, no. 2 (2011):147–74. L. Mason, "'I Disrespectfully agree': The differential effects of partisan sorting on social and issue position," *American Journal of Politics* 59, no. 1 (2015):128–145, doi: 10.1111/ajps.12089.
12. L.C. Hamilton, "Polar Facts in the Age of Polarization," *Polar Geography* 38, no. 2 (2015):89–106, doi: 10.1080/1088937X.2015.1051158.
13. IPCC 2013; for a historical perspective, see S.R. Weart, *The Discovery of Global Warming*, revised edition (Cambridge, MA: Harvard University Press, 2008).
14. L.C. Hamilton, "Did the Arctic Ice Recover? Demographics of True and False Climate Facts," *Weather, Climate, and Society* 4, no. 4 (2012):236–49, doi: 10.1175/WCAS-D-12-00008.1.
15. L.C. Hamilton et al., "Climigration? Population and Climate Change in Arctic Alaska," *Population and Environment* (2016), doi: 10.1007/s11111-016-0259-6.
16. Hamilton 2012; Hamilton 2015.
17. Although this election-year analysis compares Clinton and Trump supporters, other studies have found parallel divisions along the lines of political party, or self-described liberal/conservative ideology.
18. D.M. Kahan, "Climate Science Communication and the Measurement Problem," *Advances in Political Psychology* 36, no. 1 (2015):1–43, doi: 10.1111/pops.12244.
19. L.C. Hamilton et al., "Wildfire, Climate, and Perceptions in Northeast Oregon," *Regional Environmental Change* 16 (2016):1819–32, doi: 10.1007/s10113-015-0914-y.
20. L.C. Hamilton et al., "Flood Realities, Perceptions, and the Depth of Divisions on Climate," *Sociology* 50 (2016):913–933, doi: 10.1177/0038038516648547.
21. L.C. Hamilton and M. Lemcke-Stampone, "Was December Warm? Family, Politics, and Recollections of Weather" (Durham, NH: Carsey School of Public Policy, University of New Hampshire, 2016), <http://scholars.unh.edu/carsey/276/>.
22. See American Association for Public Opinion Research (AAPOR), *Standard Definitions: Final Disposition of Case Codes and Outcome Rates for Surveys*, 4th ed. (Lenexa, KS: American Association for Public Opinion Research, 2006).
23. Several earlier surveys, asking different questions, also explored U.S. public perceptions about polar regions; see L.C. Hamilton, "Who Cares About Polar Regions? Results From a Survey of U.S. Public Opinion," *Arctic, Antarctic, and Alpine Research* 40, no. 4 (2008):671–78; L.C. Hamilton, M.J. Cutler, and A. Schaefer, "Public Knowledge and Concern About Polar-Region Warming," *Polar Geography* 35, no. 2 (2012):155–68, doi: 10.1080/1088937X.2012.684155; L.C. Hamilton, M.J. Cutler, and A. Schaefer, "Public Knowledge About Polar Regions Increases While Concerns Remain Unchanged" (Durham, NH: Carsey Institute, University of New Hampshire, 2012), <http://scholars.unh.edu/carsey/157/>; L.C. Hamilton, and M. Lemcke-Stampone, "Arctic Warming and Your Weather: Public Belief in the Connection," *International Journal of Climatology* 34 (2014):1723–28, doi: 10.1002/joc.3796.
24. For examples comparing GSP and nationwide surveys, see Hamilton et al. 2015.
25. Hamilton 2012.

About the Authors

Lawrence C. Hamilton is professor of sociology and a senior fellow at the Carsey School of Public Policy at the University of New Hampshire (<https://carsey.unh.edu/person/lawrence-hamilton>).

Acknowledgments

Support for the POLES survey was provided by the PoLAR Partnership grant from the National Science Foundation (DUE-1239783), with additional help from the New Hampshire EPSCoR Safe Beaches and Shellfish project (IIA-1330641). Science and polar questions on New Hampshire's Granite State Poll have been supported by the Sea Ice Prediction Network (NSF PLR-1303938), the Sustainable Futures North project (NSF PLR-1263650), the New Hampshire EPSCoR Ecosystems and Society project (NSF EPS-1101245), and the Carsey School of Public Policy and the Sustainability Institute at the University of New Hampshire. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

The authors thank Michael Ettlinger, Curt Grimm, Amy Sterndale, Michele Dillon, Laurel Lloyd, and Bianca Nicolosi at the Carsey School of Public Policy and Patrick Watson for editorial contributions.



Creating innovative approaches to climate change education and engagement.

The PoLAR Climate Change Education Partnership seeks to inform public understanding of and response to climate change through the development and use of novel educational tools that utilize fascination with shifting polar environments and are geared towards lifelong learners.

Columbia Climate Center at the Earth Institute
ATTN: Jessica Brunacini
475 Riverside Drive, Suite 253
New York, NY 10115
(212) 853 0405

www.thepolarhub.org

The PoLAR Partnership is supported by a grant from the National Science Foundation (DUE-1239783). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



University of New Hampshire
Carsey School of Public Policy

The Carsey School of Public Policy at the University of New Hampshire is nationally recognized for its research, policy education, and engagement. The school takes on the pressing issues of the twenty-first century, striving for innovative, responsive, and equitable solutions. With an expanding range of degree and non-degree programs, the Carsey School offers a growing number of opportunities for those interested in beginning, or advancing, careers in public policy.

Huddleston Hall
73 Main Street
Durham, NH 03824
(603) 862-2821
TTY USERS: DIAL 7-1-1
OR 1-800-735-2964 (RELAY N.H.)

carsey.unh.edu