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# The Politics of Climate

*Polarized views about climate issues stretch from the causes and cures for climate change to trust in climate scientists and their research. But most Americans support a role for scientists in climate policy, and there is bipartisan support for expanding solar, wind energy*

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## The Politics of Climate

*Polarized views about climate issues stretch from the causes and cures for climate change to trust in climate scientists and their research. But most Americans support a role for scientists in climate policy, and there is bipartisan support for expanding solar, wind energy*

Political fissures on climate issues extend far beyond beliefs about whether climate change is occurring and whether humans are playing a role, according to a new, in-depth survey by Pew Research Center. These divisions reach across every dimension of the climate debate, down to people's basic trust in the motivations that drive climate scientists to conduct their research.

Specifically, the survey finds wide political divides in views of the potential for devastation to the Earth's ecosystems and what might be done to address any climate impacts. There are also major divides in the way partisans interpret the current scientific discussion over climate, with the political left and right having vastly divergent perceptions of modern scientific consensus, differing levels of trust in the information they get from professional researchers, and different views as to whether it is the quest for knowledge or the quest for professional advancement that drives climate scientists in their work.

At the same time, political differences are not the exclusive drivers of people's views about climate issues. People's level of concern about the issue also matters. The 36% of Americans who are more personally concerned about the issue of global climate change, whether they are Republican or Democrat, are much more likely to see climate science as settled, to believe that humans are playing a role in causing the Earth to warm, and to put great faith in climate scientists.

When it comes to party divides, the biggest gaps on climate policy and climate science are between those at the ends of the political spectrum. Across the board, from possible causes to who should be the one to sort this all out, liberal Democrats and conservative Republicans see climate-related matters through vastly different lenses. Liberal Democrats place more faith in the work of climate scientists (55% say climate research reflects the best available evidence most of the time) and their understanding of the phenomenon (68% say climate scientists understand very well whether or not climate change is occurring). Perhaps it follows, then, that liberal Democrats are much more inclined to believe a wide variety of environmental catastrophes are potentially headed our way, and that both policy and individual actions can be effective in heading some of these off. Even the Republicans who believe the Earth is warming are much less likely than Democrats to expect severe harms to the Earth's ecosystem and to believe that any of six individual and policy actions

asked about can make a big difference in addressing climate change. And, a majority of conservative Republicans believe that each of the six actions to address climate change can make no more than a small difference.

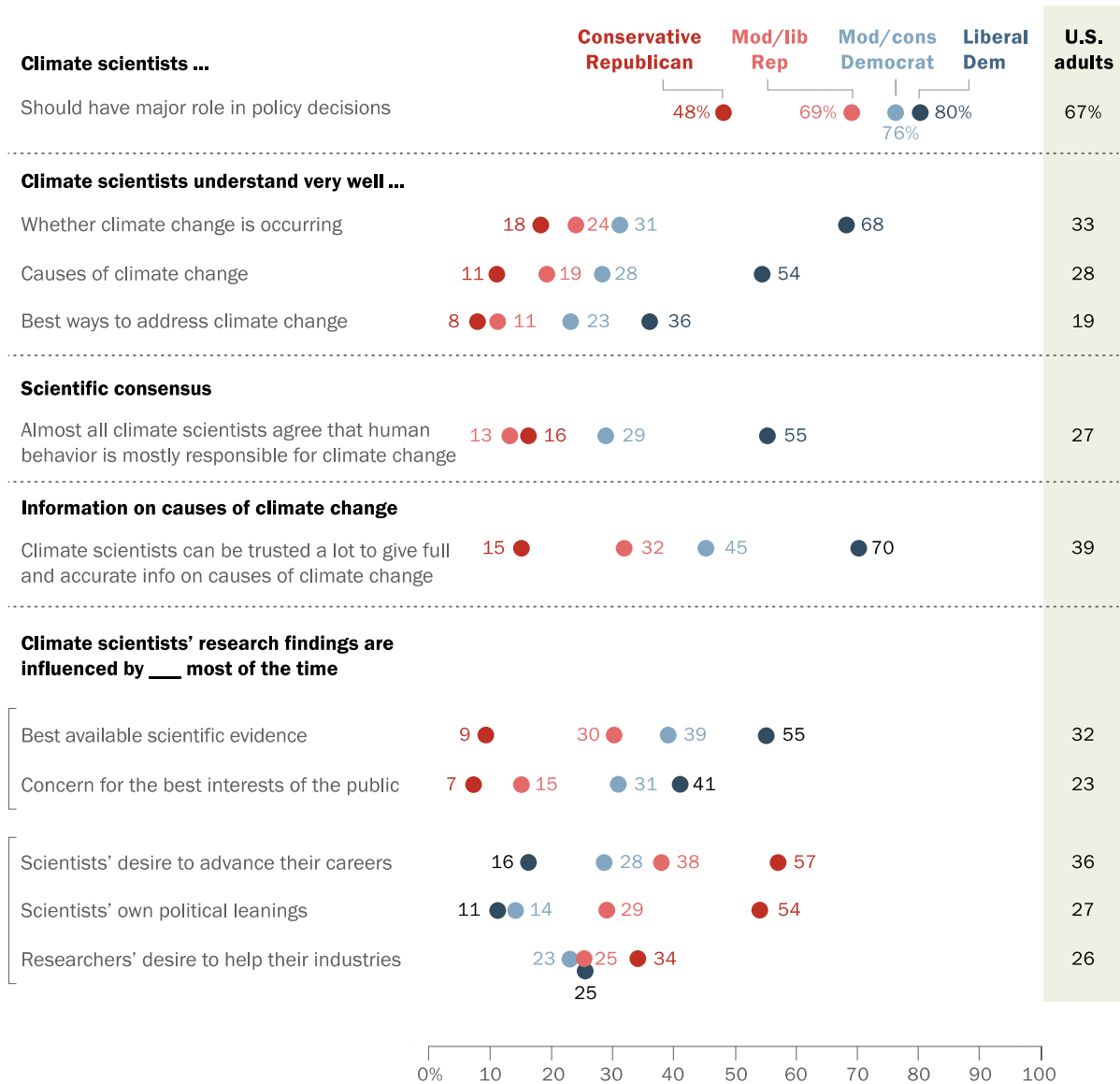
This survey extensively explores how peoples' divergent views over climate issues tie with people's views about climate scientists and their work. Democrats are especially likely to see scientists and their research in a positive light. Republicans are considerably more skeptical of climate scientists' information, understanding and research findings on climate matters. A few examples:

- Seven-in-ten liberal Democrats (70%) trust climate scientists' a lot to give full and accurate information about the causes of climate change, compared with just 15% of conservative Republicans.
- Some 54% of liberal Democrats say climate scientists' understand the causes of climate change very well. This compares with only 11% among conservative Republicans and 19% among moderate/liberal Republicans.
- Liberal Democrats, more than any other party/ideology group, perceive widespread consensus among climate scientists' about the causes of warming. Only 16% of conservative Republicans say almost all scientists agree on this, compared with 55% of liberal Democrats.
- The credibility of climate research is also closely tied with Americans' political views. Some 55% of liberal Democrats say climate research reflects the best available evidence most of the time, 39% say some of the time. By contrast, 9% of conservative Republicans say this occurs most of the time, 54% say it occurs some of the time.
- On the flip side, conservative Republicans are more inclined to say climate research findings are influenced by scientists' desire to advance their careers (57%) or their own political leanings (54%) most of the time. Small minorities of liberal Democrats say either influence occurs most of the time (16% and 11%, respectively).

While liberal Democrats give high marks to climate scientists' understanding of whether climate change is occurring, even among this group, fewer give strongly positive ratings when it comes to scientists' understanding about ways to address climate change. Minorities of all political groups say climate scientists' understand how to address climate change "very well."

## Trust in climate scientists is low among Republicans; considerably higher among liberal Democrats

% of U.S. adults in each group who say the following about climate scientists



Note: Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean toward a political party and other responses on each question are not shown.

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

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Despite some skepticism about climate scientists and their motives, majorities of Americans among all party/ideology groups say climate scientists should have at least a minor role in policy decisions about climate issues. More than three-quarters of Democrats and most Republicans (69% among moderate or liberal Republicans and 48% of conservative Republicans) say climate scientists should have a *major* role in policy decisions related to the climate. Few in either party say climate scientists should have no role in policy decisions.

To the extent there are political differences among Americans on these issues, those variances are largely concentrated when it comes to their views about climate scientists, per se, rather than scientists, generally. Majorities of all political groups report a fair amount of confidence in scientists, overall, to act in the public interest. And to the extent that Republicans are personally concerned about climate issues, they tend to hold more positive views about climate research.

Liberal Democrats are especially inclined to believe harms from climate change are likely and that both policy and individual actions can be effective in addressing climate change. Among the political divides over which actions could make a difference in addressing climate change:

- Power plant emission restrictions – 76% of liberal Democrats say this can make a big difference, while 29% of conservative Republicans say the same, a difference of 47-percentage points.
- An international agreement to limit carbon emissions – 71% of liberal Democrats and 27% of conservative Republicans say this can make a big difference, a gap of 44-percentage points.
- Tougher fuel efficiency standards for cars and trucks – 67% of liberal Democrats and 27% of conservative Republicans say this can make a big difference, a 40-percentage-point divide.
- Corporate tax incentives to encourage businesses to reduce the “carbon footprint” from their activities – 67% of liberal Democrats say this can make a big difference, while 23% of conservative Republicans agree for a difference of 44 percentage points.
- More people driving hybrid and electric vehicles – 56% of liberal Democrats say this can make a big difference, while 23% of conservative Republicans do, a difference of 33-percentage points.
- People’s individual efforts to reduce their “carbon footprints” as they go about daily life – 52% of liberal Democrats say this can make a big difference compared with 21% of conservative Republicans, a difference of 31 percentage points.

Across all of these possible actions to reduce climate change, moderate/liberal Republicans and moderate/conservative Democrats fall in the middle between those on the ideological ends of either party.

The stakes in climate debates seem particularly high to liberal Democrats because they are especially likely to believe that climate change will bring harms to the environment. Among this group, about six-in-ten say climate change will very likely bring more droughts, storms that are more severe, harm to animals and to plant life, and damage to shorelines from rising sea levels. By contrast, no more than about two-in-ten conservative Republicans consider any of these potential harms to be “very likely”; about half say each is either “not too” or “not at all” likely to occur.

One thing that doesn’t strongly influence opinion on climate issues, perhaps surprisingly, is one’s level of general scientific literacy. According to the survey, the effects of having higher, medium or lower scores on a nine-item index of science knowledge tend to be modest and are only sometimes related to people’s views about climate change and climate scientists, especially in comparison with party, ideology and concern about the issue. But, the role of science knowledge in people’s beliefs about climate matters is varied and where a relationship occurs, it is complex. To the extent that science knowledge influences people’s judgments related to climate change and trust in climate scientists, it does so among Democrats, but not Republicans. For example, Democrats with high science knowledge are especially likely to believe the Earth is warming due to human activity, to see scientists as having a firm understanding of climate change, and to trust climate scientists’ information about the causes of climate change. But Republicans with higher science knowledge are no more or less likely to hold these beliefs. Thus, people’s political orientations also tend to influence how knowledge about science affects their judgments and beliefs about climate matters and their trust in climate scientists.

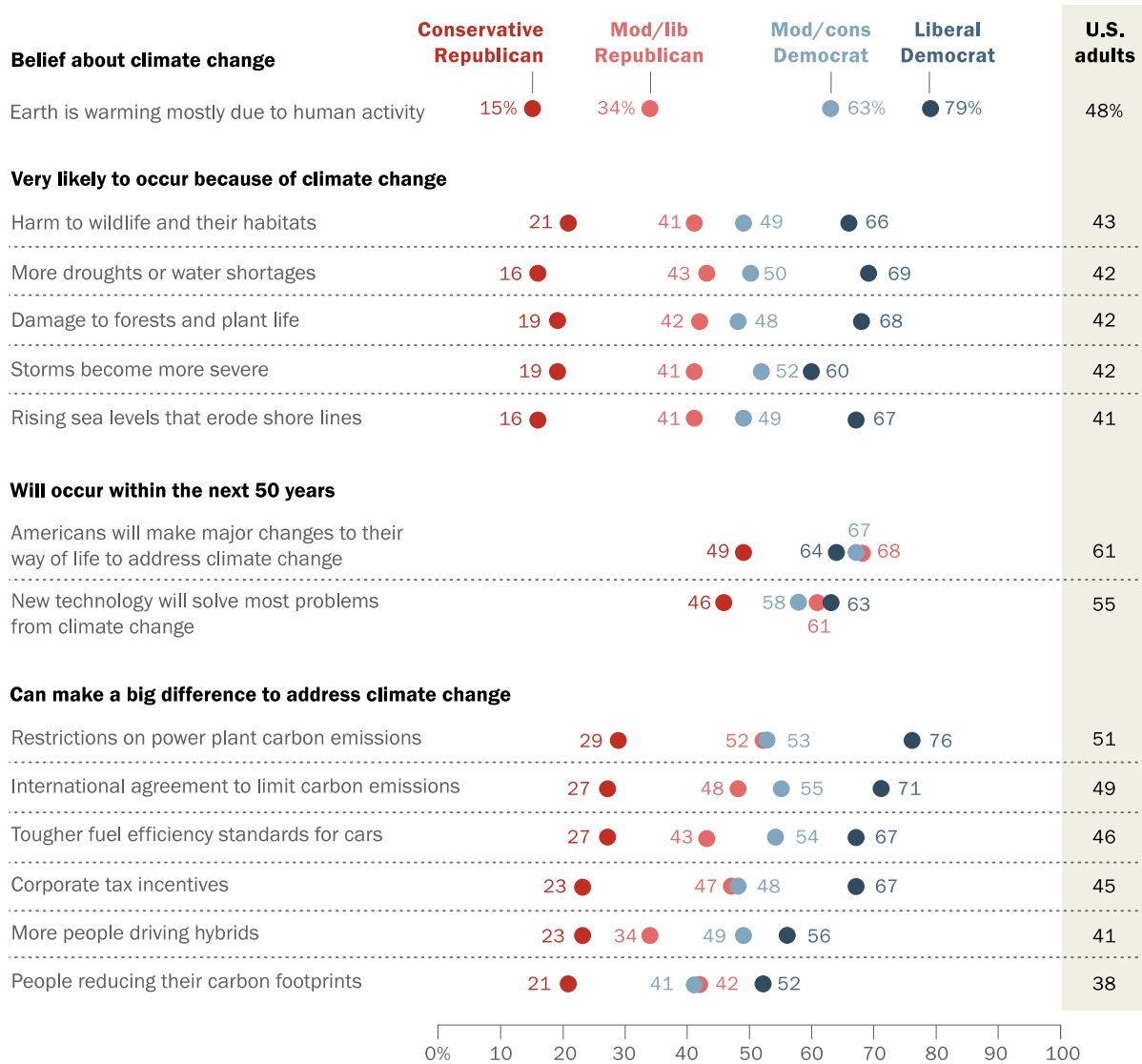
These are some of the principle findings from a new Pew Research Center survey. Most of the findings in this report are based on a nationally representative survey of 1,534 U.S. adults conducted May 10-June 6, 2016. The margin of sampling error for the full sample is plus or minus 4 percentage points.

Other key findings:



## Wide differences between conservative Republicans and liberal Democrats on likely effects of climate change and effectiveness of ways to address it

% of U.S. adults in each group who say the following about global 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 and other responses to each question are not shown. Beliefs about climate change include those who “lean” to each position.

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

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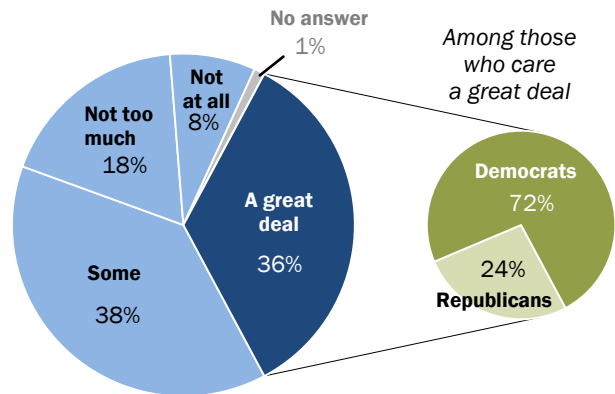
### *The climate-engaged public*

Some 36% of Americans are deeply concerned about climate issues, saying they personally care a great deal about the issue of global climate change. This group is composed primarily of Democrats (72%), but roughly a quarter (24%) is Republican. Some 55% are women, making this group slightly more female than the population as a whole. But, they come from a range of age and education groups and from all regions of the country.

There are wide differences in beliefs about climate issues and climate scientists between this more concerned public and other Americans, among both Democrats and Republicans alike. Indeed, people's expressions of care are strongly correlated with their views, separate and apart from their partisan and ideological affiliations.

### **36% of Americans are personally concerned about climate issues**

*% of U.S. adults who say they care \_\_\_ about the issue of global 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 are not shown.

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

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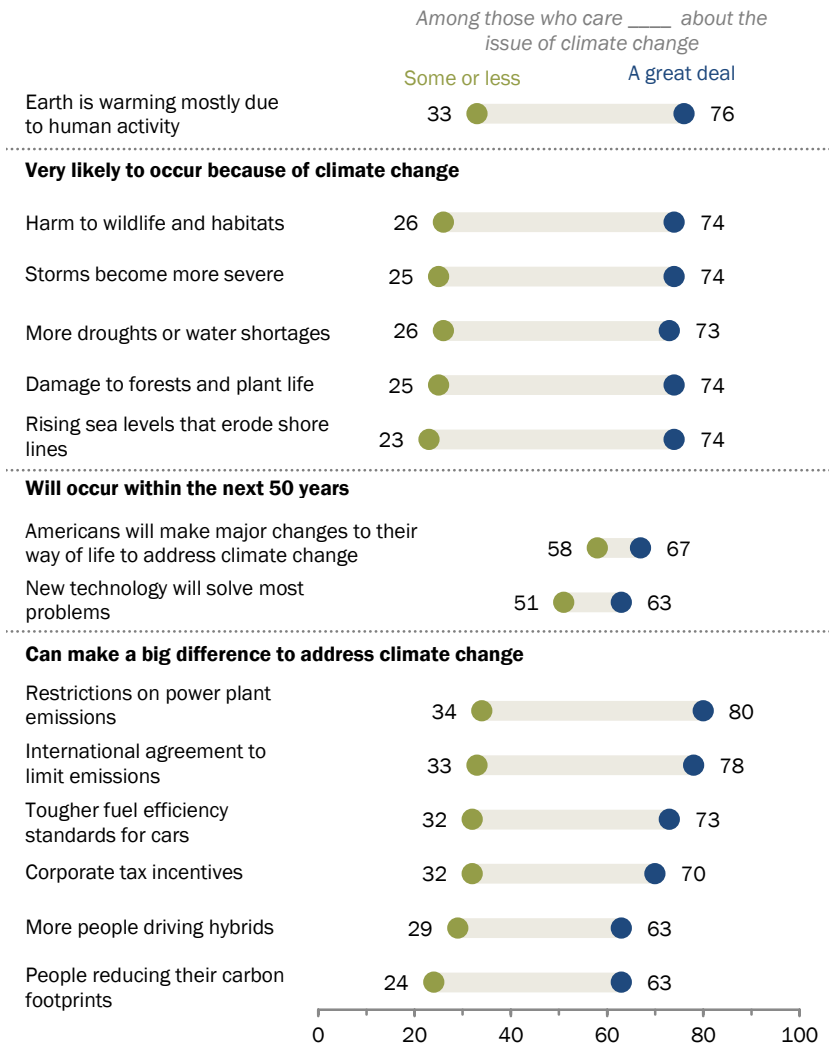
Most, but not all, among those with more personal concern about climate issues say the Earth’s warming is due to human activity. They are largely pessimistic about climate change, saying it will bring a range of harms to the Earth’s ecosystems. At the same time, this more concerned public is quite optimistic about efforts to address climate change. Majorities among this group say that each of six different personal and policy actions asked about can be effective in addressing climate change.

Further, those with deep concerns about climate issues are much more inclined to hold climate scientists and their work in positive regard. This group is more likely than others to see scientists as understanding climate issues. Two-thirds (67%) of this more climate-engaged public trusts climate scientists a lot to provide full and accurate information about the causes of climate change; this

compares with 33% of those who care some and 9% of those with little concern about the issue of climate change. About half of those with deep personal concerns about this issue (51%) say climate researchers’ findings are influenced by the best available evidence “most of the time.” By the same

### More climate-engaged Americans say negative effects are likely and policy actions can make a big difference

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



Note: Respondents who gave other responses or did not answer are not shown.  
 Source: Survey conducted May 10-June 6, 2016.  
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token, those deeply concerned about climate issues are less inclined to think climate research is often influenced by considerations other than the evidence, such as scientists' career interests or political leanings.

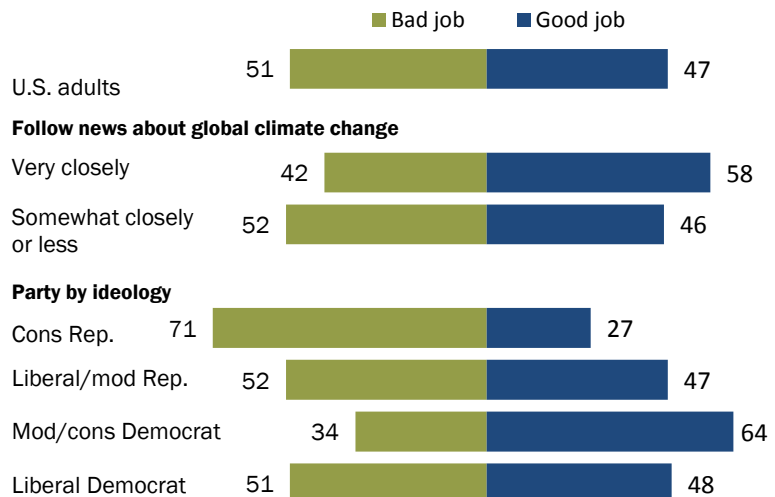
People's views about climate scientists, as well as their beliefs about the likely effects of climate change and effective ways to address it, are explained especially by their political orientation and their personal concerns with the issue of climate change. There are no consistent differences or only modest differences in people's views about these issues by other factors including gender, age, education and people's general knowledge of science topics.

### *Media coverage on climate*

Americans are closely divided in their view of the news media's coverage of climate change. Some 47% of U.S. adults say the media does a good job covering global climate change, while 51% say they do a bad job. A 58% majority of people following climate news very closely say the media do a good job, however. Conservative Republicans stand out as more negative in their overall views about climate change news coverage.

### **U.S. public is closely divided in ratings of news media's coverage of climate issues**

*% of U.S. adults who say the news media do a \_\_\_\_\_ in covering issues about global climate change*



Note: Very good/bad and somewhat good/bad responses are combined. Respondents who did not answer are not shown. Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean toward a political party are not shown.

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

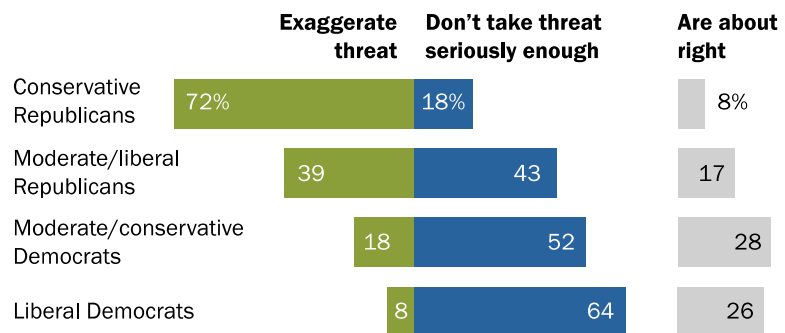
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Public ratings of the media may be linked to views about the mix of news coverage. In all, 35% of Americans say the media exaggerates the threat from climate change, a roughly similar share (42%) says the media does not take the threat seriously enough; two-in-ten (20%) say the media are about right in their reporting. People's views on this are strongly linked with political divides; 72% of conservative Republicans say the media exaggerates the threat of climate change, while 64% of liberal Democrats say the media does not take the threat of climate change seriously enough.

### Strong party-ideological divides over balance of news media coverage on climate issues

*% of U.S. adults who say the news media generally \_\_\_\_\_ in their reporting on 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 and respondents who did not answer are not shown.

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

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## Confidence in scientists and other groups to act in public interest

Though the survey finds that climate scientists are viewed with skepticism by relatively large shares of Americans, scientists overall – and in particular, medical scientists – are viewed as relatively trustworthy by the general public. Asked about a wide range of leaders and institutions, the military, medical scientists, and scientists in general received the most votes of confidence when it comes to acting in the best interests of the public.

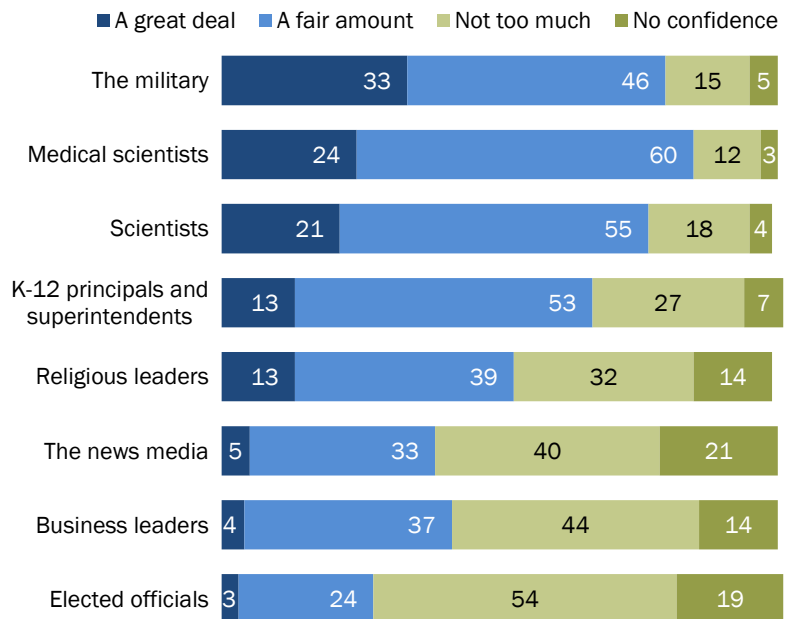
On the flip side, majorities of the public have little confidence in the news media, business leaders and elected officials. Public confidence in K-12 school leaders and religious leaders to act in the public’s best interest falls in the middle.

Fully 79% of Americans express a great deal (33%) or a fair amount (46%) of confidence in the military to act in the best interests of the public. The relatively high regard for the military compared with other institutions is consistent with a [2013 Pew Research Center survey](#), which found 78% of the public saying the military contributes “a lot” to “society’s well-being.”

Most Americans also have at least a fair amount of confidence in medical scientists and scientists to act in the best interest of the public. Some 84% of U.S. adults express confidence in medical scientists; 24% say they have a great deal of confidence and six-in-ten (60%) have a fair amount of

### Americans’ trust in military, scientists relatively high; media, business leaders, elected officials low

*% of U.S. adults who say they have \_\_\_ of confidence in each of the following groups to act in the best interests of the public*



Note: One third of respondents randomly assigned to rate “medical scientists”; two-thirds randomly assigned to rate “scientists.” Other questions asked of all, N = 4,563.

Respondents who did not give an answer are not shown.

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

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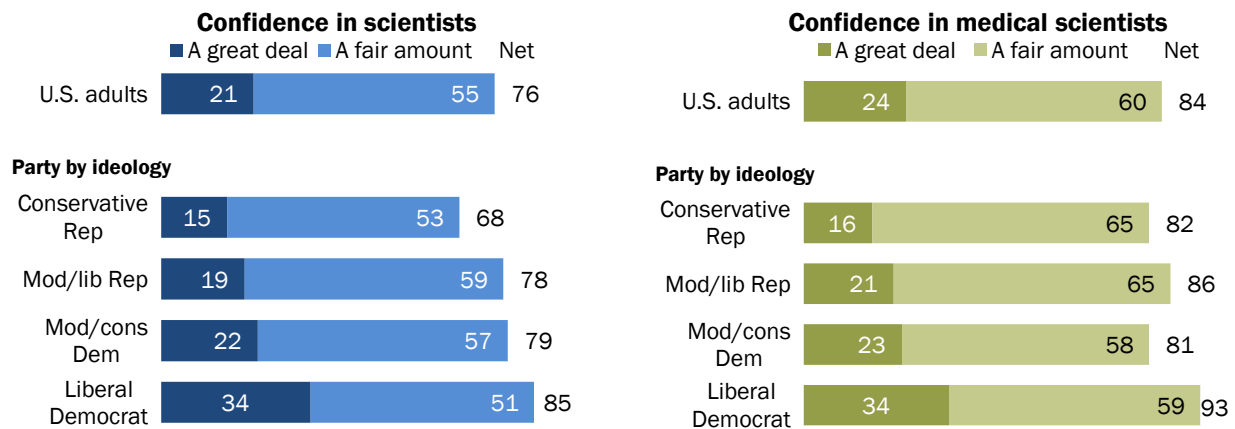
confidence in medical scientists to act in the public’s best interests. Three-quarters of Americans (76%) have either a great deal (21%) or a fair amount of confidence (55%) in scientists, generally, to act in the public interest. Confidence in either group is about the same or only modestly different across party and ideological groups.

Confidence in the news media, business leaders and elected officials is considerably lower; public views about school and religious leaders fall in the middle.

People in both political parties express deep distrust of elected officials, in keeping with [previous Pew Research Center](#) studies showing near record low trust in government. Just 3% of Americans say they have a “great deal” of trust in elected officials to act in the best interests of the public; lower than any of the seven groups rated. Some 72% of Americans report not too much or no confidence in elected officials to act in the public interest.

### Broad confidence in scientists to act in the public interest among all political groups

% of U.S. adults who say they have \_\_\_\_ of confidence in scientists/medical scientists to act in best interests of public



Note: Views of “scientists” asked of random two-thirds of sample, N= 3,014; views of “medical scientists” asked of random one-third of sample, N=1,549. Republicans and Democrats include independents and other non-partisans who “lean” toward the parties. Respondents who do not lean toward a political party are not shown. Those saying not too much, no confidence at all, or no answer are not shown.

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

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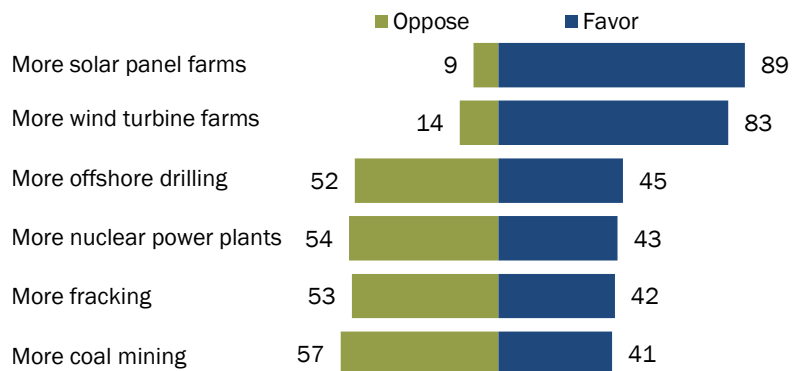
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## Strong bipartisan support for expanding solar, wind energy production

One spot of unity in an otherwise divided environmental policy landscape is that the vast majority of Americans support the concept of expanding both solar and wind power. The public is more closely divided when it comes to expanding fossil fuel energies such as coal mining, offshore oil and gas drilling, and hydraulic fracturing for oil and natural gas. While there are substantial party and ideological divides over increasing fossil fuel and nuclear energy sources, strong majorities of all political groups support more solar and wind production.

### Strong public support for expanding wind, solar power

% of U.S. adults who say they favor or oppose ...



Note: Respondents who did not answer are not shown.

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

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These patterns are broadly consistent with [past Center findings](#) that climate change and fossil fuel energy issues are strongly linked with party and ideology, but political divisions have a much more modest or no relationship with public attitudes on a host of other science-related topics.

### *Boom for home solar ahead?*

Some 41% of Americans say they have given serious consideration to installing solar panels at home (including 4% who report they have already done so). Their reasons include both cost savings and help for the environment. A similar share of homeowners (44%) have either installed solar panels (4%) or given serious thought to doing so (40%). Western residents and younger adults (ages 18 to 49) are especially likely to say they have considered, or already installed, solar panels at home. Two-thirds of homeowners in the West have considered or installed solar panels, compared with 35% of homeowners in the South, 40% in the Midwest and 38% in the Northeast.



## One-in-five Americans aim for everyday environmentalism; their political and climate change beliefs mirror the U.S. population

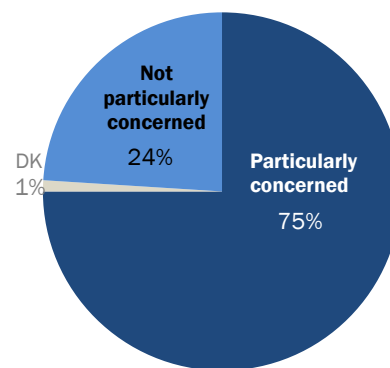
While most Americans espouse some concern for the environment, a much smaller share says they always try to live in ways that help the environment. Three-quarters of Americans (75%) say they are “particularly concerned about helping the environment” as they go about daily living. But just two-in-ten (20%) describe themselves as someone who makes an effort to live in ways that protect the environment “all the time.” A majority (63%) say they sometimes do and just 17% do not do at all or not too often.

Though more among this group of “everyday environmentalists” have a deep concern about climate issues, their beliefs about the causes of climate change closely match those of the public as a whole. Further, this group of environmentally conscious Americans is comprised of both Republicans (41%) and Democrats (53%) in close proportion to that found in the population as a whole.

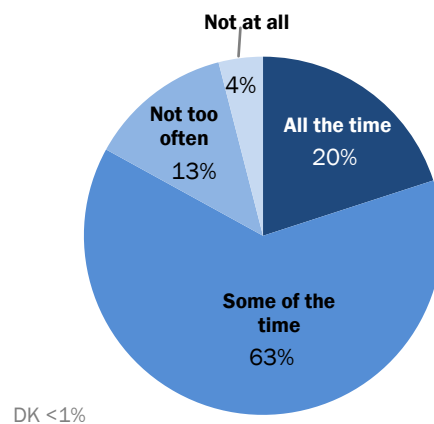
How different are the actual behaviors of Americans who live out their concerns for the environment all the time from the rest of the public? When it comes to the list of potential activities covered in the Pew Research Center questionnaire, the answer is “not very.” Yes, those who describe themselves as always trying to protect the environment are a bit more likely to do things such as bring their own re-usable shopping bags to the grocery store in order to help the environment, but most do so only sometimes, at best. They are more likely

### Most Americans report concern for the environment; one-in-five try to act on that concern all the time

*% of U.S. adults who say that they are \_\_\_ about helping the environment as they go about their daily lives*



*% of U.S. adults who say they make an effort \_\_\_ to live in ways that help protect the environment*



Source: Survey conducted May 10-June 6, 2016.  
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to buy a cleaning product because its' ingredients would be better for the environment, but again, most do so no more than sometimes. They are a bit more likely to have worked at a park cleanup day (23% vs. 11% of other adults) but no more likely to have cared for plantings in a public space. And they are no more likely than other Americans to reduce and reuse at home by composting, having a rain barrel or growing their own vegetables. Nor are environmentally conscious Americans more likely than other people to have spent hobby and leisure time hiking, camping, hunting or fishing in the past year.

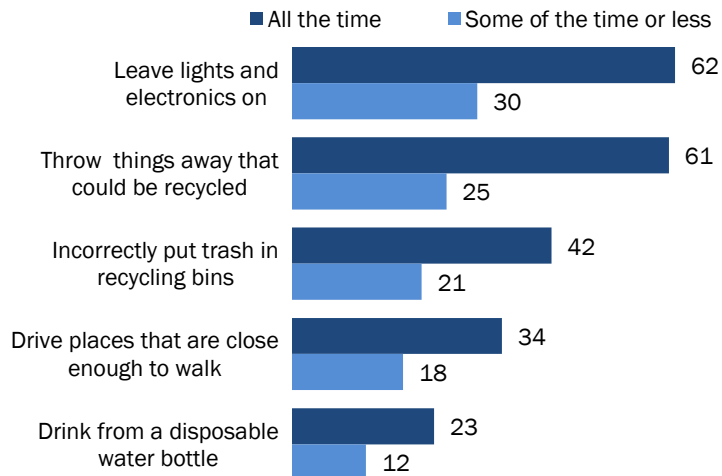
There is one way in which environmentally conscious Americans stand out attitudinally, however. They are much more likely to be bothered when *other people* waste energy by leaving lights on or not recycling properly.

A majority of Americans who are focused on living in ways that protect the environment say it bothers them “a lot” when they see other people leave lights and electronic devices on (62%), or throw away things that could be recycled (61%). And, sizeable minorities of environmentally conscious Americans are bothered a lot by people incorrectly putting trash in recycling bins (42%) or people driving places that are close enough to walk (34%). The least irksome behavior is drinking from a disposable water bottle; 23% of environmentally conscious Americans say this bothers them a lot, compared with 12% among those who are less focused on everyday environmentalism.

### Environmentally concerned Americans are bothered when they see others waste

*% of U.S. adults in each group who say it bothers them ‘a lot’ when they see people ...*

*Among those who try to live in ways that help the environment all the time or some of the time or less*



Note: Respondents who gave other responses or who did not give an answer are not shown.

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

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# 1. Public views on climate change and climate scientists

There is a host of ways Americans' opinions about climate issues divide. The divisions start with views about the causes of global climate change. Nearly half of U.S. adults say climate change is due to human activity and a similar share says either that the Earth's warming stems from natural causes or that there is no evidence of warming. The disputes extend to differing views about the likely impact of climate change and the possible remedies, both at the policy level and the level of personal behavior.

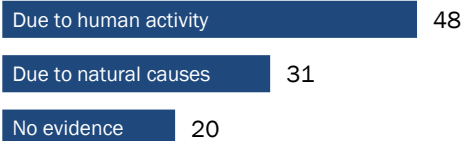
Roughly four-in-ten Americans expect harmful effects from climate change on wildlife, shorelines and weather patterns. At the same time, many are optimistic that both policy and individual efforts to address climate change can have an impact. A narrow majority of Americans anticipate new technological solutions to problems connected with climate change, and some 61% believe people will make major changes to their way of life within the next half century.

On all of these matters there are wide differences along political lines with conservative Republicans much less inclined to anticipate negative effects from climate change or to judge proposed solutions as making much difference in mitigating any effects. Half or more liberal Democrats, by contrast, see negative effects from climate change as very likely and believe an array of policy solutions can make a big difference.

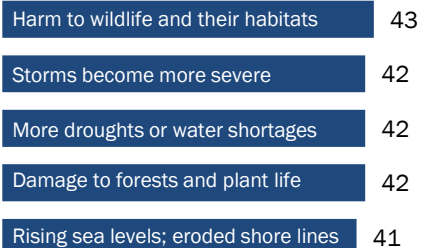
## Many in U.S. expect negative effects and life changes due to climate change

*% of U.S. adults who say the following about global climate change*

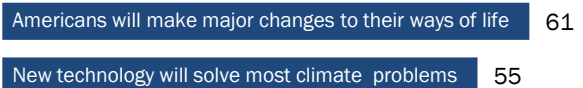
### Beliefs about global climate change



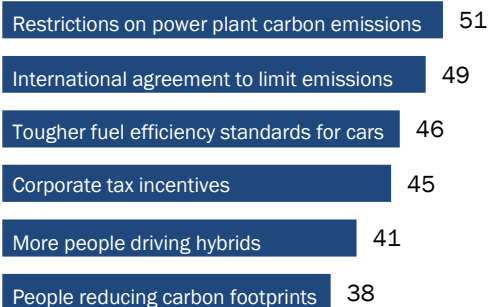
### Very likely to occur because of climate change



### Will occur within next 50 years to address climate change



### Can make a big difference to address climate change



Note: Beliefs about climate change includes those who "lean" toward each position. Other responses on each question are not shown.

Source: Survey conducted May 10-June 6, 2016. "The Politics of Climate"

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Americans who are more deeply concerned about climate issues, regardless of their partisan orientation, are particularly likely to see negative effects ahead from climate change, and strong majorities among this group think policy solutions can be effective at addressing climate change.

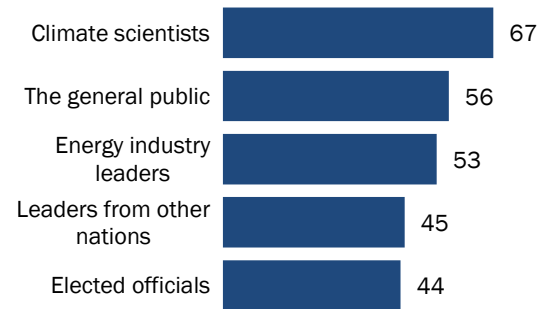
Roughly two-thirds of Americans say climate scientists should have a major role in policy decisions about climate matters, more than say that the public, energy industry leaders, or national and international political leaders should be so involved.

But, overall, majorities of Americans appear skeptical of climate scientists. No more than a third of the public gives climate scientists' high marks for their understanding of climate change; even fewer say climate scientists understand the best ways to address climate change. And, while Americans trust information from climate scientists more than they trust that from other groups, fewer than half of Americans have "a lot" of trust in information from climate scientists (39%).

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## Most U.S. adults support a major role for climate scientists in policy decisions

*% of U.S. adults who say each of these groups should have a major role in making decisions about policy issues related to global climate change*



Note: Respondents who gave other responses or who did not give an answer are not shown.

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

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A minority of Americans perceive that the best available scientific evidence is driving climate research findings most of the time. And a roughly equal share says other, more negative, factors influence climate research.

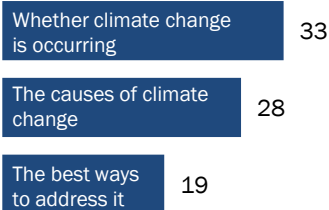
People's trust and confidence in climate scientists varies widely depending on their political orientation. Liberal Democrats are much more trusting of climate scientists' understanding of the issue and disclosure of full and accurate information about it. Republicans, particularly conservatives, are highly critical of climate scientists and more likely to ascribe negative rather than positive motives to the influences shaping scientists' research.

This chapter provides an overview of Americans' attitudes about climate change and climate scientists. It then details the divides in these views among political groups and among those who are more or less concerned about climate issues. Americans who care more about the issue of climate change, regardless of political orientation, are more trusting of climate scientists, more likely to expect negative effects to occur because of climate change, and more likely to believe that both individual efforts and policy actions can be effective in addressing climate change.

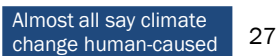
## Minority of U.S. adults see climate scientists' research and understanding in a positive light

*% of U.S. adults who say the following about global climate change*

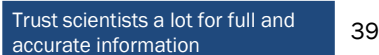
### Climate scientists understand very well ...



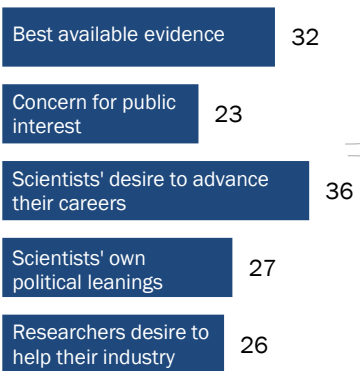
### Perception of scientific consensus



### Information on causes of climate change



### Research findings influenced by \_\_\_ most of the time



Note: Beliefs about climate change includes those who "lean" toward each position. Other responses on each question are not shown.

Source: Survey conducted May 10-June 6, 2016. "The Politics of Climate"

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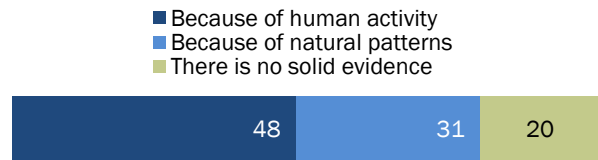
### Beliefs about global climate change remain fairly stable

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 share saying human activity is the primary cause of climate change is about the same as [Pew Research Center surveys](#) in 2014 (50%) and 2009 (49%). Center surveys from 2006 to 2015 using somewhat different question wording found a similar share expressing this view (45% in the most recent, [2015 survey](#)).

### About half of Americans say Earth is warming due to human activity

*% of U.S. adults saying climate change is mostly due to human activity/mostly due to natural patterns/there is no solid evidence that Earth is getting warmer*

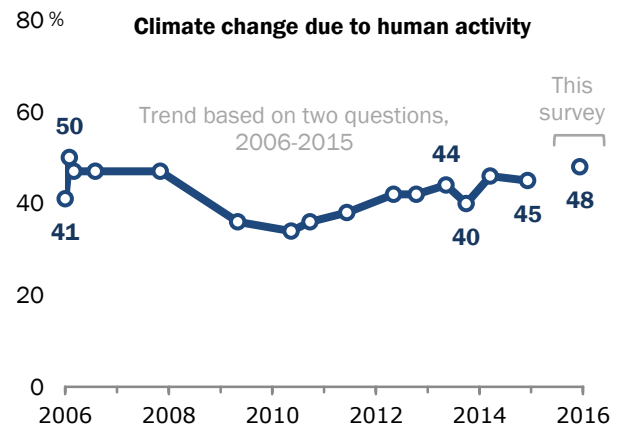


Note: Beliefs about climate change include those who “lean” toward each response. Those who did not give an answer are not shown. Source: Survey conducted May 10-June 6, 2016. “The Politics of Climate”

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### 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”

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**There is a broad public expectation that climate change will have negative effects on animal and plant life, shorelines and weather patterns**

Large majorities of Americans think global warming will lead to an array of negative effects for the Earth’s ecosystems. At least three-quarters of Americans say that harm to animal habitats and plant life is very or fairly likely to occur. A similar share expects storms to become more severe and damage to shorelines or more frequent droughts to occur.<sup>1</sup>

Americans who believe global climate change is the result of human activity are far more likely than other Americans (those who believe climate change results from natural patterns or that there is no evidence of global warming) to say each of these effects is very likely.

A 61% majority of the public expects Americans will make major changes to their ways of life in order to address problems from climate change within the next half century,

while 38% do not expect this to occur. The public, as a whole, sides to optimism (55% to 44%) that new technological solutions will arise within the next 50 years that can solve most of the problems from climate change.

**Many Americans expect harms from climate change**

*% of U.S. adults who say it is \_\_\_\_ that each of these will occur due to global climate change*

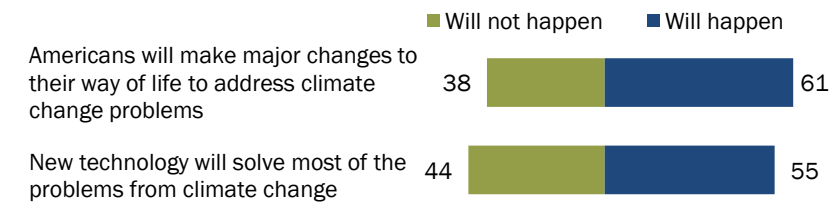
	Very likely	Fairly likely	Not too likely	Not at all likely
Harm to animal wildlife and their habitats	43	36	15	5
Storms become more severe	42	36	16	6
Damage to forests and plant life	42	35	16	6
More droughts and water shortages	42	34	17	6
Rising sea levels erode beaches and shorelines	41	35	17	6

Note: Respondents who did not give an answer are not shown.  
Source: Survey conducted May 10-June 6, 2016.  
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**Most Americans expect major changes to their way of life in the coming years**

*% of U.S. adults who say \_\_\_\_ in the next 50 years*



Note: Respondents who did not answer are not shown.  
Source: Survey conducted May 10-June 6, 2016.  
“The Politics of Climate”

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<sup>1</sup> A 2015 Pew Research Center survey asked Americans which of several effects of global climate change concerned them the most; 50% said droughts or water shortages, 17% said rising sea levels, 16% said severe weather, like floods or intense storms, and 11% said long periods of unusually hot weather.

## Roughly half of U.S. adults say restrictions on power plant emissions, international agreements can bring change; a sizeable minority sees individual efforts as effective too

There are a number of different proposals to address climate change. The Pew Research Center survey explored people's views about whether each of several policy and individual actions can be effective at addressing climate change.

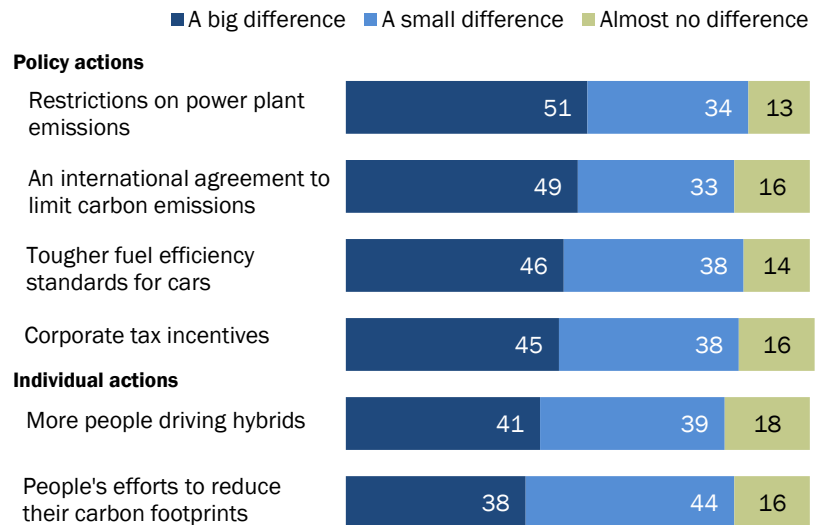
Americans are largely optimistic that restrictions on power plant emissions (51%) and international agreements to limit carbon emissions (49%) can make a big difference to address climate change. [The Obama administration announced stricter limits](#) on power plant emissions in 2015. This year, [more than 175 countries](#), including the U.S., have signed the Paris Agreement, which aims to reduce carbon emissions around the world.

Public assessments of other policy proposals are similar. Some 46% say tougher fuel efficiency standards for cars and trucks can make a big difference in addressing climate change; 45% say corporate tax incentives that encourage businesses to reduce carbon emissions caused by their actions can too.

About four-in-ten Americans (41%) say having more hybrid and electric vehicles on the road can have a big effect; 38% think people's efforts to reduce their own "carbon footprints" as they go about daily living can make a big difference, while another 44% say this can make a small difference.

### About half of Americans say power plant restrictions and international agreement on carbon emissions can have big impact on climate change

% of U.S. adults who say each of these proposals can make ...



Note: Those who did not give an answer are not shown.

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

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## Who do Americans want most at the policy table? Climate scientists, followed by the public. Fewer say elected officials, international political leaders should have a major role

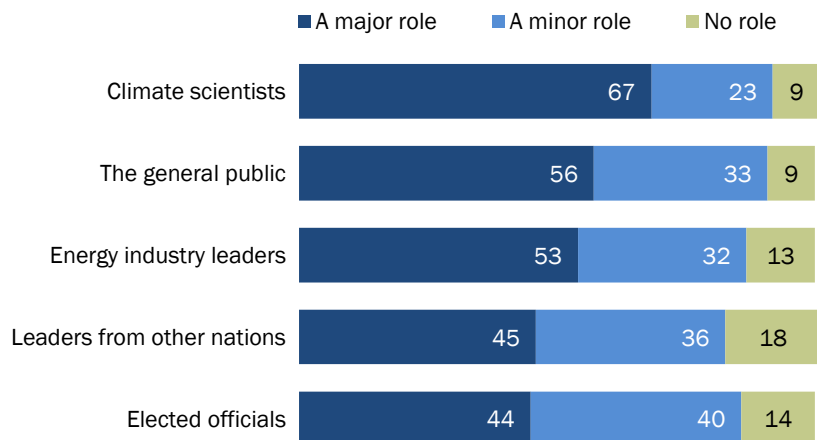
A majority of Americans say that climate scientists should have a role in policy decisions about climate issues. Two-thirds (67%) of U.S. adults say climate scientists should have a major role and 23% say they should have a minor role. Just 9% say climate scientists should have no role in policy issues regarding global climate change.

Following scientific experts on the list, 56% of adults say the general public should have a major role in policy decisions about climate issues, followed by 53% that name energy industry leaders.

By comparison, fewer Americans believe elected officials should have a major role in climate policy decisions. In all, 44% of U.S. adults say elected officials should have a major role, another four-in-ten (40%) say elected leaders should have a minor role in climate policy-making.

### Most Americans want climate scientists to have major role in policymaking

*% of U.S. adults who say each of these groups should have \_\_\_\_ in making decisions about policy issues related to global climate change*



Note: Respondents who did not answer are not shown.

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

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Public views about the role of elected officials in policy decisions on climate issues may tie with deep [public cynicism about the federal government](#), generally. Or, as shown later in this chapter, those beliefs could tie to distrust that elected officials provide full and accurate information about the causes of climate change.

People's normative views about the place of international leaders in these decisions are similar to that for U.S. leaders.

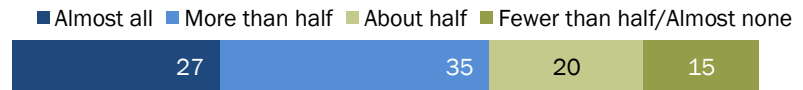
## Minority of public sees consensus among climate scientists over causes of global warming

Scientists first noted the possibility that the burning of greenhouse gases, such as fossil fuels, could increase temperatures back in the 1800s. A report from National Academy of Sciences in 1977 warned that the burning of fossil fuels could result in average temperatures increases of 6 degrees Celsius by the year 2150.<sup>2</sup> While there was a period of debate over these issues in the scientific community, there is now very strong, near universal, consensus among climate scientists that human activity, such as the burning of fossil fuels, is the predominant factor contributing to warming temperatures.

The Intergovernmental Panel on Climate Change (IPCC), which reflects scientific opinion on the topic, stated in the forward to its 2013 report, “the science now shows with 95 percent certainty that human activity is the dominant cause of observed warming since the mid-20th century.”<sup>3</sup> And, several analyses of scholarly publications suggest widespread consensus among climate scientists on this point.<sup>4</sup>

### A minority of Americans perceive scientific consensus on causes of climate change

*% of U.S. adults who say \_\_\_ climate scientists say that human behavior is mostly responsible for global climate change*



Note: Those who did not give an answer are not shown.

Source: Survey of U.S. adults conducted May 10-June 6, 2016. “The Politics of Climate Change”

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Similarly, a [Pew Research Center survey of members of the American Association for the Advancement of Science \(AAAS\)](#) found 93% of members with a Ph.D. in Earth sciences (and 87% of all members) say the Earth is warming mostly because of human behavior.<sup>5</sup>

But, in the public eye, there is considerably less consensus. Just 27% of Americans say that “almost all” climate scientists hold human behavior responsible for climate change. Another 35% say more than half of climate scientists agree about this, while an equal share says that about

<sup>2</sup> [Energy and Climate: Studies in Geophysics](#), 1977. The National Academy of Sciences.

<sup>3</sup> [Climate Change 2013: The Physical Science Basis](#), 2013. Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

<sup>4</sup> An analysis of peer-reviewed scientific articles published in 2013 and 2014 found virtually all authors supported human-caused climate change; just 0.2% rejected that view. See James Lawrence Powell, 2015, Climate Scientists Virtually Unanimous Anthropogenic Global Warming is True, *Bulletin of Science, Technology & Society*, vol. 35 (5-6). An analysis of peer-reviewed articles published between 1991 and 2011 found 97% of articles to take a position consistent with human-caused climate change. See John Cook et al, 2016, Consensus on consensus: a synthesis of consensus estimates on human caused global warming, *Environmental Research Letters*, vol. 8 (2).

<sup>5</sup> Other surveys of scientists have also found strong majorities in agreement on the causes of climate change. See Bart Verheggen et al, 2014, Scientists’ Views about Attribution of Global Warming, *Environmental Science & Technology*, vol. 48 (16) and P.T. Doran and M.K. Zimmerman, 2009, Examining the Scientific Consensus on Climate Change, *Eos*, vol. 90 (3).

fewer than half (20%) or almost no (15%) scientific experts believe that human behavior is the main contributing factor in climate change.

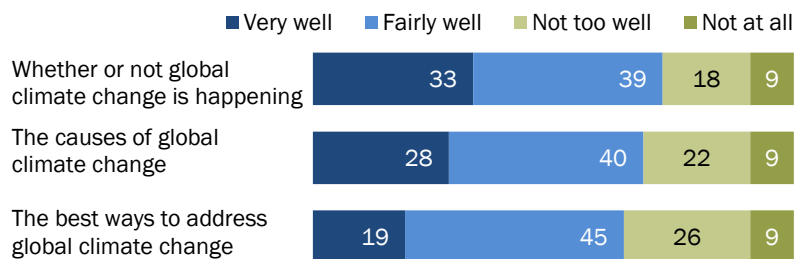
Consistent with [previous Pew Research Center studies](#), people’s perceptions of consensus among climate scientists are closely related to their beliefs about global climate change. Among those who say climate change is due to human activity, many more say scientists are in agreement on the main cause of climate change.

## U.S. public is largely skeptical of climate scientists’ understanding of climate change

Americans appear to harbor significant reservations about climate scientists’ expertise and understanding of what is happening to the Earth’s climate. One-in-three adults (33%) say climate scientists understand “very well” whether climate change is occurring, another 39% say scientists understand this “fairly well” and some 27% say scientists don’t understand this “too well” or don’t understand it at all.

### Minorities think climate scientists understand these aspects of global climate change very well

*% of U.S. adults who say climate scientists understand ...*



Note: Respondents who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted May 10-June 6, 2016.  
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Just over a quarter of the public – 28% – says climate scientists have a solid understanding of the causes of climate change. And even fewer, 19%, of adults say the same about climate scientists’ understanding of the best ways to address climate change.

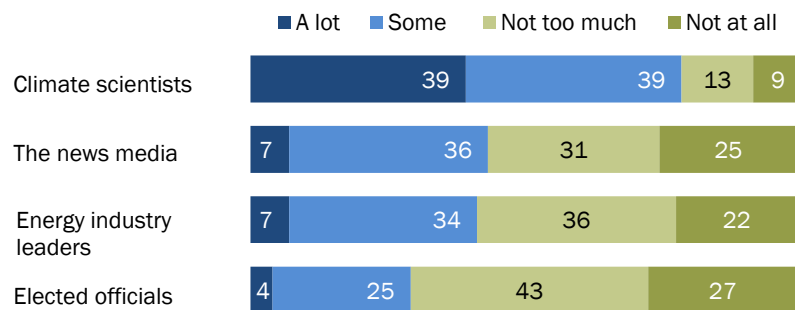
## While Americans trust information from climate scientists more than that from other key players, fewer than half have “a lot” of faith that they are getting full and accurate information

Americans hold relatively positive views about climate scientists, compared with other groups, as credible sources of information. Far more Americans say they trust information from climate scientists on the causes of climate change than say they trust either energy industry leaders, the news media or elected officials. But in absolute terms, public trust in information from climate scientists is limited.

Some 39% of Americans say they trust climate scientists a lot when it comes to providing information about the causes of climate change. About a fifth of Americans (22%) hold no trust or not too much trust in information from climate scientists. Another 39% report “some” trust in climate scientists to give a full and accurate portrait of the causes of climate change.

### Americans most likely to trust information from climate scientists about causes of climate change

*% of U.S. adults who say they trust \_\_\_ to give full and accurate information about the causes of global climate change ...*



Note: Respondents who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted May 10-June 6, 2016.  
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Public trust in information from the news media, energy industry leaders and elected officials is significantly lower, however. A majority of Americans report having not too much or no trust in information from these groups about the causes of climate change.

## Few say climate research findings reliably undergirded by the best available evidence; similar shares say other, more negative factors influence climate research

This survey included a series of questions that tapped into Americans' beliefs of potential influences on climate research, and the findings suggest some skepticism and mixed assessments from the public. A minority of 32% of Americans say climate research is influenced by the best available evidence "most of the time," 48% say this occurs some of the time and 18% take a decidedly skeptical view that the best evidence rarely or never influences research findings.

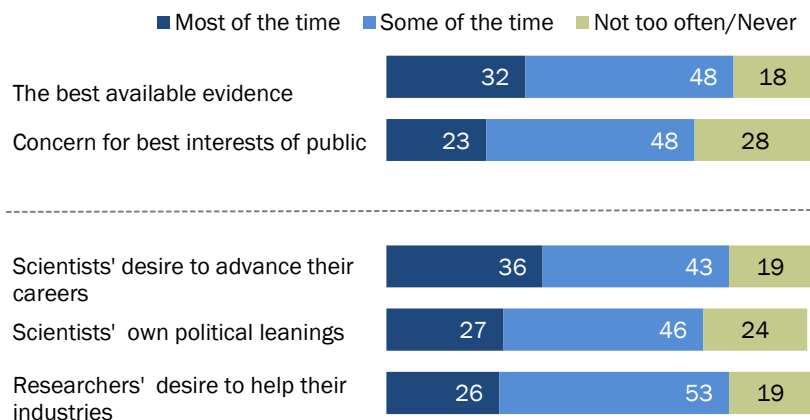
A similar share of Americans say that scientists' career aspirations influence their research most of the time (36%). A smaller share of adults say scientists' political leanings (27%) or their desires to help related industries (26%) influence climate research findings most of the time. But majorities say these less germane motivations influence results at least some of the time.

While most Americans say the public's best interest factors into climate change research at least some of the time, only 23% of Americans

say climate research is influenced by concern for public interests most of the time. Overall, 28% say this occurs not too often or never and 48% of Americans take a middle position, saying this sometimes influences climate research findings.

### As many Americans say the best evidence influences climate research as say negative factors are at work

*% of U.S. adults who say research findings about global climate change are influenced by each of these ...*



Note: Respondents who did not give an answer are not shown.

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

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## Politics is the central factor shaping people’s beliefs about the effects of climate change, ways to address warming, trust in climate scientists

Political divides are dominant in public views about climate matters. [Consistent with past Pew Research Center surveys](#), most liberal Democrats espouse human-caused climate change, while most conservative Republicans reject it. But this new Center survey finds that political differences over climate issues extend across a host of beliefs about the expected effects of climate change, actions that can address changes to the Earth’s climate, and trust and credibility in the work of climate scientists. People on the ideological ends of either party, that is liberal Democrats and conservative Republicans, see the world through vastly different lenses across all of these judgments.

### Why we include “leaners” in the Democratic and Republican groups

Throughout this report, Republicans and Democrats include independents and other non-partisans who lean toward the parties.

[Partisan leaners tend to have attitudes and opinions very similar to those of partisans.](#)

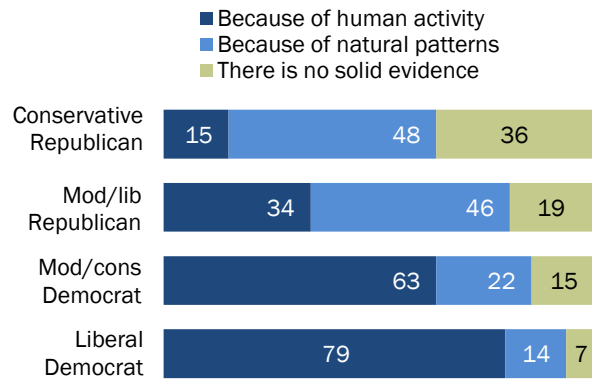
On questions about climate change and trust of climate scientists, there are wide differences between those who lean to the Democratic Party and those who lean to the Republican Party. And leaners and partisans of their party have roughly the same positions on these questions.

## Political groups differ widely over beliefs about climate and ways to address warming

As with previous [Pew Research Center surveys](#), there are wide differences among political party and ideology groups on whether or not human activity is responsible for warming temperatures. A large majority of liberal Democrats (79%) believe the Earth is warming mostly because of human activity. In contrast, only about one-in-six conservative Republicans (15%) say this, a difference of 64 percentage points. A much larger share of conservative Republicans say there is no solid evidence the Earth is warming (36%) or that warming stems from natural causes (48%).

### Political groups are worlds apart in their beliefs about climate change

*% of U.S. adults in each group who say climate change is mostly due to human activity/mostly due to natural patterns/there is no solid evidence that Earth is getting warmer*



Note: Beliefs about climate change include those who “lean” toward each response. Republicans and Democrats include independents and other non-partisans who “lean” toward the parties. Respondents who do not lean toward a political party and those who did not give an answer are not shown.

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

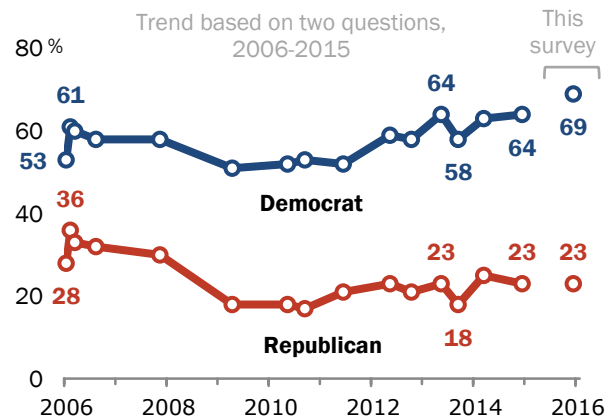
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Pew Research Center surveys have found these kinds of wide political gaps in previous years. In the [2015 Center](#) survey, using somewhat different question wording, there was a 41-percentage-point difference between partisans; 64% of Democrats said climate change was mostly due to human activity, compared with 23% among Republicans.

### A decade of political divides over climate change

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



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: Surveys conducted May 10-June 6, 2016.

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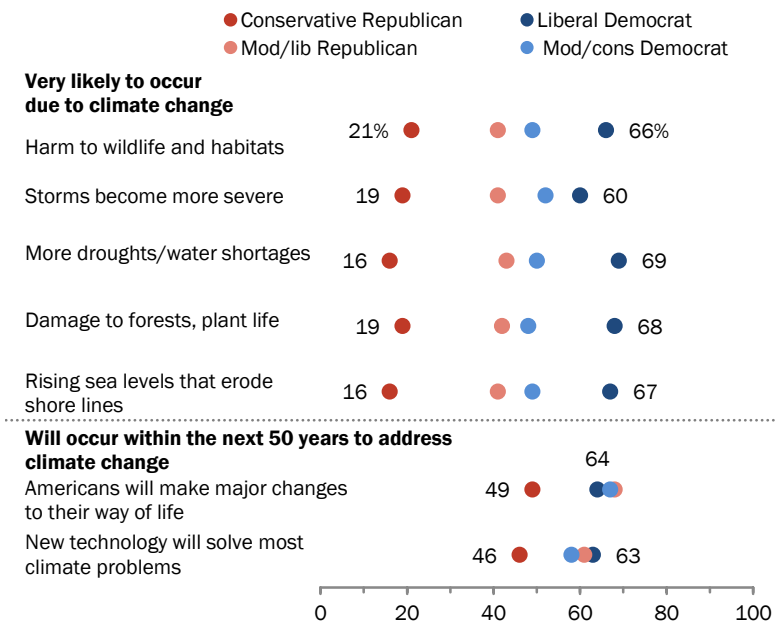
*Most liberal Democrats think negative effects from global climate change are likely*

People’s beliefs about the likely effects of climate change are quite uniformly at odds across party and ideological lines. About six-in-ten or more of liberal Democrats say it is very likely that climate change will bring droughts, storms that are more severe, harm to animal and plant life, and damage to shorelines from rising sea levels. By contrast, no more than about two-in-ten conservative Republicans say each of these possibilities is “very likely”; about half consider these possibilities not too or not at all likely.

There are more modest differences when it comes to people’s expectations that technological breakthroughs will solve climate problems in the future or that the American people will make major changes to their way of life as a result of climate change. A majority of Democrats think technological changes will help address climate change within the next 50 years; views among moderate/liberal Republicans are similar. Some 46% of conservative Republicans think this will probably or definitely occur. Similarly, about half of conservative Republicans (49%) expect Americans to make major changes to their way of life to address climate issues within the next five decades, as do majorities of other party and ideology groups.

**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 conservative Republicans say each of six actions to address climate change would have small or negligible effects; most liberal Democrats believe each can make a big difference*

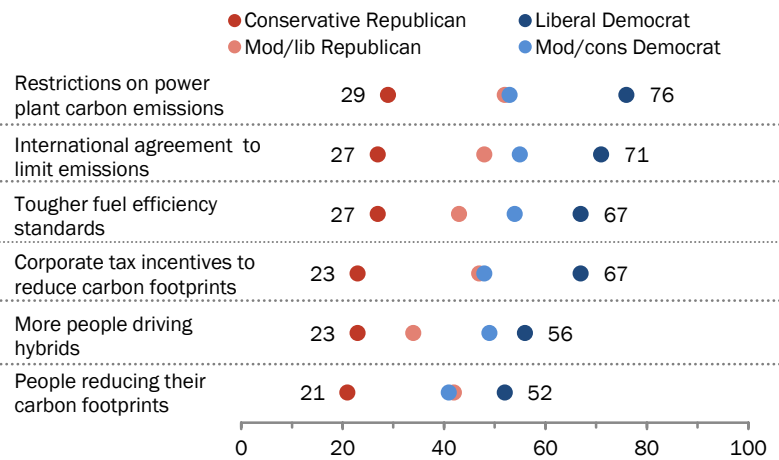
There is wide gulf between liberal Democrats and conservative Republicans when it comes to beliefs about how to effectively address climate change. Liberal Democrats are optimistic that a range of policy actions can make “a big difference” in addressing climate change including: power plant emission limits, international agreements about emissions, tougher fuel efficiency standards for vehicles, and corporate tax incentives to encourage businesses to reduce emissions resulting from their activities. And, at least half of liberal Democrats say that both personal efforts to reduce the carbon footprint of everyday activities and more people driving hybrid and electric vehicles can make a big difference in addressing global warming.

By contrast, conservative Republicans are largely pessimistic about the effectiveness of these options.

Most conservative Republicans say each of these actions would make a small difference or have no effect on climate change. About three-in-ten or fewer conservative Republicans say each would make a big difference.

**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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**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**

More than three-quarters of Democrats and most Republicans (69% among moderate or liberal Republicans and 48% of conservative Republicans) say climate scientists should have a major role in policy decisions related to climate issues. Few in either party say climate scientists should have no role in these policy decisions.

But there some differences among party and ideology groups in their relative priorities about this.

Conservative Republicans give a higher comparative priority to the general public in policy decisions about climate change issues. Democrats and moderate/liberal Republicans prioritize a role for climate scientists.

Relative to other groups rated, fewer Americans think elected officials should have a major say in climate policy.

Conservative Republicans stand out as being disinclined to support a major role for elected officials or leaders from other nations in climate policy.

**Conservative Republicans favor major role for public in climate policy; others prioritize scientists' role**

*% of U.S. adults who say each group should have a major role in making decisions about policy issues related to global climate change*

Cons Rep	Mod/lib Rep	Mod/cons Dem	Liberal Dem
General public 56%	Climate scientists 69%	Climate scientists 76%	Climate scientists 80%
Climate scientists 48	Energy industry leaders 60	Energy industry leaders 60	Leaders from other nations 59
Energy industry leaders 42	General public 52	General public 59	General public 58
Leaders from other nations 29	Leaders from other nations 43	Leaders from other nations 50	Elected officials 55
Elected officials 29	Elected officials 41	Elected officials 55	Energy industry leaders 51

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 who did not answer, and other responses are not shown.

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

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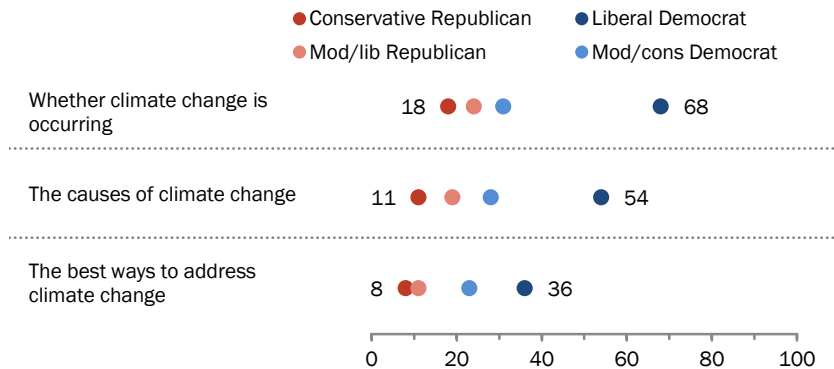
## There are wide opinion differences over whether scientists understand climate change

People's assessments of scientific understanding about climate also ties strongly to their political perspectives. Most liberal Democrats rate climate scientists as understanding "very well" whether climate change is occurring (68%) and about half say scientists understand "very well" the causes of climate change (54%). By contrast, just 11% of conservative Republicans judge climate scientists as understanding very well the sources of climate change. Fully 63% of this group says climate scientists understand the causes of climate change "not too" or "not at well."

Fewer in either party think climate scientists understand ways to address climate change. Some 36% of liberal Democrats say climate scientists understand this "very well" and 49% say scientists understand this "fairly well." Conservative Republicans are particularly skeptical of climate scientists' understanding of ways to address climate change; just 8% say scientists understand how to address climate change "very well," 28% say "fairly well" and 64% rate scientific understanding of this as "not too well" or "not at all well."

### Deep political divides over how well climate scientists understand climate-related issues

*% of U.S. adults in each group who say climate scientists understand "very well" ...*



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 who did not answer, and other responses are not shown.

Source: Survey conducted May 10-June 6, 2016.  
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## Liberal Democrats are most likely to see widespread agreement among climate scientists

American's perceptions of scientific consensus on climate change are also related to political divides, as has also been found in past Pew Research Center surveys.<sup>6</sup>

Liberal Democrats are far more likely than any other party or ideology group to see strong consensus among climate scientists. Some 55% of liberal Democrats say almost all climate scientists agree that human behavior is mostly responsible for climate change.

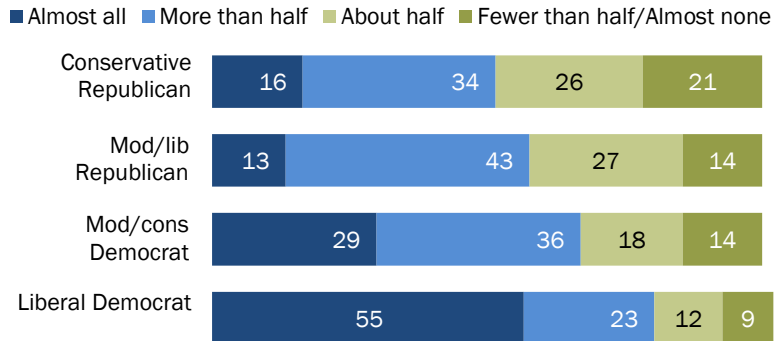
Much smaller shares of other groups see widespread

consensus among climate scientists. Some 29% of moderate/conservative Democrats say almost all climate scientists agree that human behavior is responsible for climate change, while some 16% of conservative Republicans and 13% of moderate/liberal Republicans say the same.

People's perceptions of scientific consensus, even among liberal Democrats, are at odds with the near unanimity expressed in climate research publications that human activity is mostly responsible for climate change, however.<sup>7</sup>

### Perceptions of scientific consensus highest among liberal Democrats

*% of U.S. adults in each group who say \_\_\_ climate scientists agree that human behavior is mostly responsible for global climate change*



Note: "Fewer than half" and "almost none" responses combined. Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean toward a political party, those who did not answer, and other responses are not shown.

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

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<sup>6</sup> In a [2014 Pew Research Center](#) survey that asked a related question, 70% of Democrats said scientists generally agree on climate change. Republicans were more closely divided with 45% saying scientists generally agree and 49% saying scientists do not agree about this.

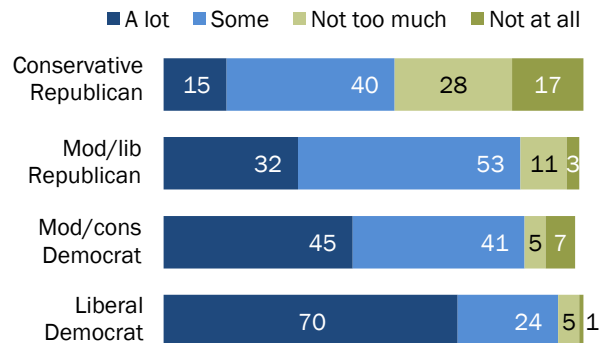
<sup>7</sup> An analysis of peer-reviewed scientific articles published in 2013 and 2014 found virtually all authors supported human-caused climate change; just 0.2% rejected that view. See James Lawrence Powell, 2015, "Climate Scientists Virtually Unanimous Anthropogenic Global Warming is True", *Bulletin of Science, Technology & Society*, vol. 35 (5-6). An analysis of peer-reviewed articles published between 1991 and 2011 found 97% of articles to take a position consistent with human-caused climate change. See John Cook et al, 2016, "Consensus on consensus: a synthesis of consensus estimates on human caused global warming", *Environmental Research Letters*, vol. 8 (2). Surveys of scientists have also found strong majorities in agreement on the causes of climate change. See Bart Verheggen et al, 2014, "Scientists' Views about Attribution of Global Warming", *Environmental Science & Technology*, vol. 48 (16) and P.T. Doran and M.K. Zimmerman, 2009, "Examining the Scientific Consensus on Climate Change", *Eos*, vol. 90 (3). A [Pew Research Center survey of members of the American Association for the Advancement of Science \(AAAS\)](#) found 93% of members with a Ph.D. in Earth sciences (and 87% of all members) say the Earth is warming mostly because of human behavior.

## Deep political divide over whether to trust information from climate scientists

Public trust in information from climate scientists about the causes of climate change varies widely among political groups. Seven-in-ten (70%) liberal Democrats trust climate scientists a lot to provide full and accurate information about this, another 24% report some trust in information from climate scientists. In contrast, just 15% of conservative Republicans say they trust climate scientists a lot to give full and accurate information, four-in-ten (40%) report some trust and 45% have not too much or no trust in information from climate scientists. Moderate or liberal Republicans and moderate or conservative Democrats fall in the middle between these two extremes in their level of trust.

### Trust in information from climate scientists is strongly related to politics

*% of U.S. adults in each group who say they trust climate scientists \_\_\_\_\_ to give full and accurate information about the causes of 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 giving no answer, and other responses are not shown.

Source: Survey conducted May 10-June 6, 2016.  
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**Liberal Democrats see the influences and motivations behind climate research findings in a mostly positive light; conservative Republicans are much more negative**

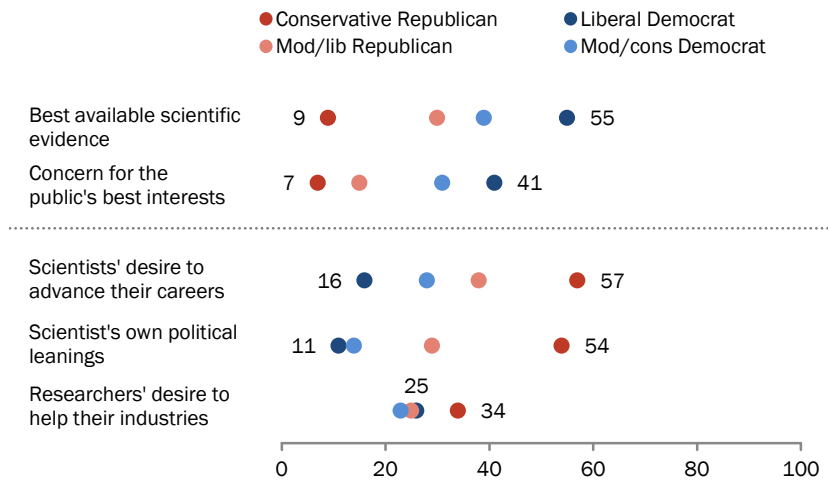
American’s judgments about the credibility of climate research findings are also tied with people’s political party and ideological orientations. At least half of liberal Democrats (55%) say climate research is influenced by the best available evidence most of the time, and 39% say this occurs some of the time. By contrast,

just 9% of conservative Republicans say the best evidence influences climate research most of the time, though 54% say this occurs some of the time.

Conservative Republicans are particularly skeptical about the factors influencing climate research. Some 57% of conservative Republicans say climate research is influenced by researchers’ career interests most of the time and 54% say the scientists’ own political leanings influence research findings most of the time. A much smaller share of liberal Democrats say either of these factors influence scientific research most of the time, although many say scientists’ career interests or personal political leanings influence the findings some of the time (54% for each).

**There are wide political divides over the credibility of climate research findings**

*% of U.S. adults in each group who say research findings on climate issues are influenced by each of these most of the time*



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 not giving an answer, and other responses are not shown.  
 Source: Survey conducted May 10-June 6, 2016.  
 “The Politics of Climate”

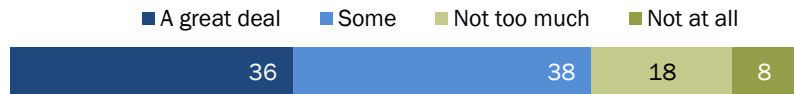
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## More than a third of Americans are deeply concerned about climate issues; their views about climate change and scientists differ starkly from the less concerned

The public's level of concern about climate matters varies. The Pew Research Center survey finds 36% of Americans particularly concerned, saying they care a great deal about the issue of global climate change. An additional 38% express some interest, while 26% say they care not too much or not at all about the issue of climate change.

### 36% of Americans care a great deal about climate change

*% of U.S. adults who say they care \_\_\_\_\_ about the issue of global climate change*



Note: Those who did not give an answer not shown.

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

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Not surprisingly, those who care a great deal about global climate change issues are more attentive to climate news. Some 26% of those who care about climate issues a great deal follow climate news reports very closely, compared with just 3% among those less concerned about these issues.



## A profile of climate-engaged Americans

Those most concerned about climate issues come from all gender, age, education, race and ethnic groups. Those more concerned about climate issues are slightly more likely to be women than men (55% vs. 45%). And, they are more likely to be Hispanic than the population as whole.

Politically, those who care more deeply about climate issues tend to be Democrats. They include about equal shares of moderate or conservative Democrats (37%) and liberal Democrats (35%). Some 24% are Republicans.

## Profile of Americans most concerned about climate change

	Care about issue of climate change			U.S. adults
	A great deal	Some	Not too much/Not at all	
Men	45%	49	54	48%
Women	55	51	46	52
White	57	67	74	65
Black	12	10	11	12
Hispanic	22	11	9	15
Other race	8	10	5	8
18-29	26	16	19	22
30-49	29	38	30	34
50-64	26	27	30	26
65+	20	19	21	19
College degree or more	33	31	24	28
Some college	35	32	30	31
H.S. degree or less	33	36	46	41
Republican	24	45	66	44
Democrat	72	52	26	52
Conservative Rep	13	20	54	27
Mod/lib Rep	12	25	12	17
Mod/cons Dem	37	36	22	30
Liberal Dem	35	16	5	22

Note: Republicans and Democrats include independents and other non-partisans who “lean” toward the parties. Respondents who do not lean toward a political party are not shown. Whites, blacks and other racial categories include only non-Hispanics; Hispanics are of any race.

Source: Survey conducted May 10-June 6, 2016. Demographic comparisons with non-institutionalized U.S. adults from the 2014 American Community Survey (IPUMS).

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**Those most concerned about climate issues hold beliefs that differ starkly from those who are less concerned**

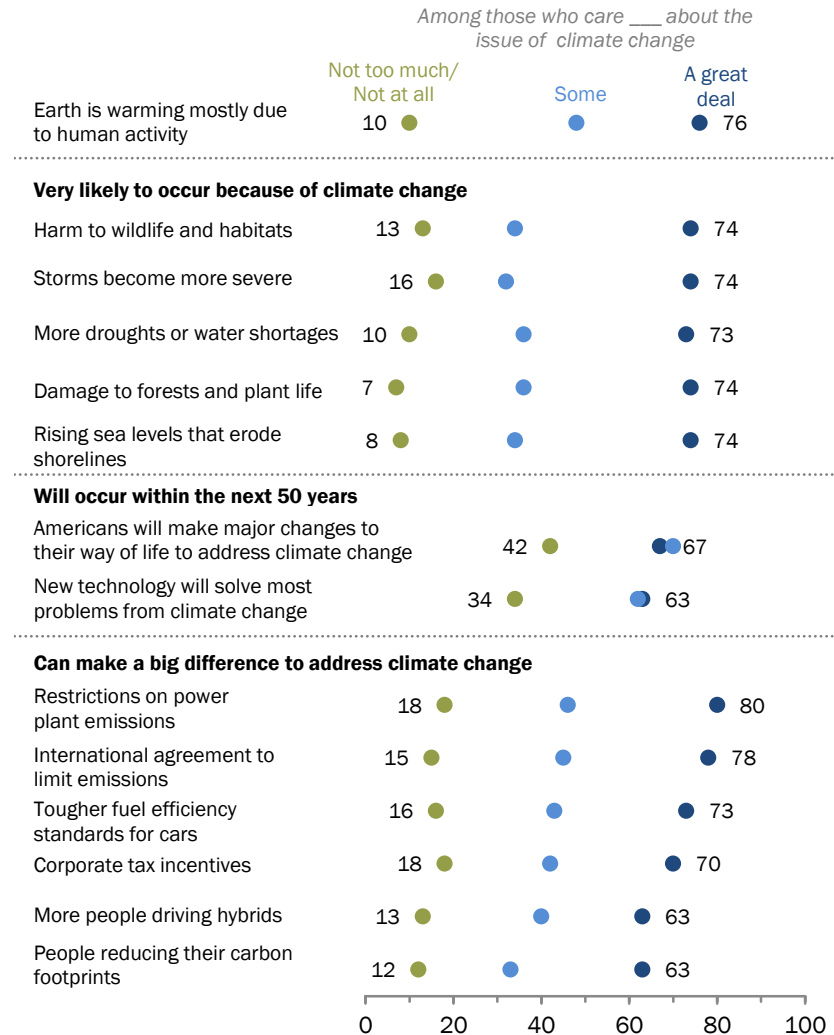
Political party affiliation and ideology are not the only factors that shape people’s views about climate issues and climate scientists. People who say they care a great deal about this issue are far more likely to believe the Earth is warming because of human activities, to believe negative effects from climate change are likely, and that proposals to address climate change will be effective. This group also holds more positive views about climate scientists and their research, on average. Differences between those more concerned and less concerned occur among both Republicans and Democrats.

About three-quarters of Americans who care deeply about climate change say the Earth is warming because of human activity (76%), this compares with 48% among those who care some and just 10% among those who do not care at all or not too much about this issue.

Differences between those

**Climate-engaged think harms are very likely and a wide range of proposals can make a big difference**

*% of U.S. adults in each group who say the following ...*



Note: Beliefs about climate change include those who “lean” toward each response. Respondents who gave other responses or did not answer are not shown. Source: Survey conducted May 10-June 6, 2016. “The Politics of Climate”

who care more and less about climate change issues occur among both Republicans and Democrats. Some 44% of Republicans who care a great deal about climate issues believe human behavior is causing temperatures to rise, compared with just 17% of Republicans who care some or less about this issue. Similarly, among Democrats, 87% of those who care a great deal about climate issues believe human activity is mostly responsible for global climate change, compared with 52% among those who care some or less about the issue of climate change.

Large majorities of those who care most about this issue think it is very likely that climate change will hurt the environment. Roughly three-quarters of those deeply concerned about climate issues think climate change will very likely bring harm to animal life (74%), damage to forests and plants life (74%), more droughts (73%), more severe storms (74%), and damage to shorelines from rising sea levels (74%). By contrast, roughly a third of those who care “some” about this issue say each of these possible effects is very likely. Many of those who do not care at all or not too much about the issue of climate change say the evidence of warming is uncertain; this group is particularly skeptical that any of these harms will come to pass. Differences among the more and less concerned about climate issues occur both among Republicans and Democrats alike.

There are smaller differences when it comes to people’s expectations that Americans will make major changes to their way of life in order to address climate change. About two-thirds of those who care a great deal about climate issues (67%) expect this to occur within the next 50 years, as does a similar share of those who care some about this issue (70%) and 42% of those who do not care at all or not too much about the issue of climate change. And, 63% of the more climate-engaged Americans expect new technological solutions to address most problems stemming from climate change. Those who care some about climate issues hold similar views; 62% expect technological solutions. Those who have little personal concern about the issue of climate change are more skeptical; 34% expect technological solutions, 64% do not.

*People who are especially concerned about climate issues are optimistic that both policy and personal efforts can be effective at addressing climate change*

Majorities of climate-engaged Americans are optimistic that a range of both policy and individual actions can make a big difference in addressing climate change. Those less personally concerned about climate issues are considerably more pessimistic, by comparison.

About eight-in-ten of those more deeply concerned about climate issues say restrictions on power plant emissions (80%) and an international agreement to limit carbon emissions (78%) can make a big difference in addressing climate change. Some 73% of this group says tougher fuel efficiency standards for cars and trucks can make a big difference, and seven-in-ten (70%) say the same

about corporate tax incentives to encourage businesses to reduce the carbon emissions stemming from their activities. By contrast, no more than two-in-ten American who are not at all or not too personally concerned about climate issues think each of these policy actions can make a big difference, although a sizeable minority among this group says each can make a small difference. Those who care “some” about the issue of climate change fall in between these two extremes; roughly four-in-ten of this group say each of these policy actions can make a big difference; a roughly similar share says each can make a small difference.

The same pattern occurs when it comes to individual efforts to address climate change. Among those who care deeply about climate issues, 63% believe individual efforts to reduce the “carbon footprint” linked with one’s daily activities can make a big difference. Among those who care some about this issue, about half as many say this can make a big difference (33%), and most (58%) say it can make a small difference. Just 12% of those with little personal concern about climate change say individual efforts of this sort can make a big difference, 42% says this can make a small difference, and 43% says this will have almost no effect. Similarly, some 63% of those personally concerned about climate issues say more people driving hybrid and electric vehicles can make a big difference in addressing climate change, compared with 40% among those who care some about climate issues and just 13% among those who do not care at all or not too much about climate issues.

**Climate-engaged public is far more likely to trust climate scientists' information and understanding of climate issues, see climate research findings as rooted in the evidence**

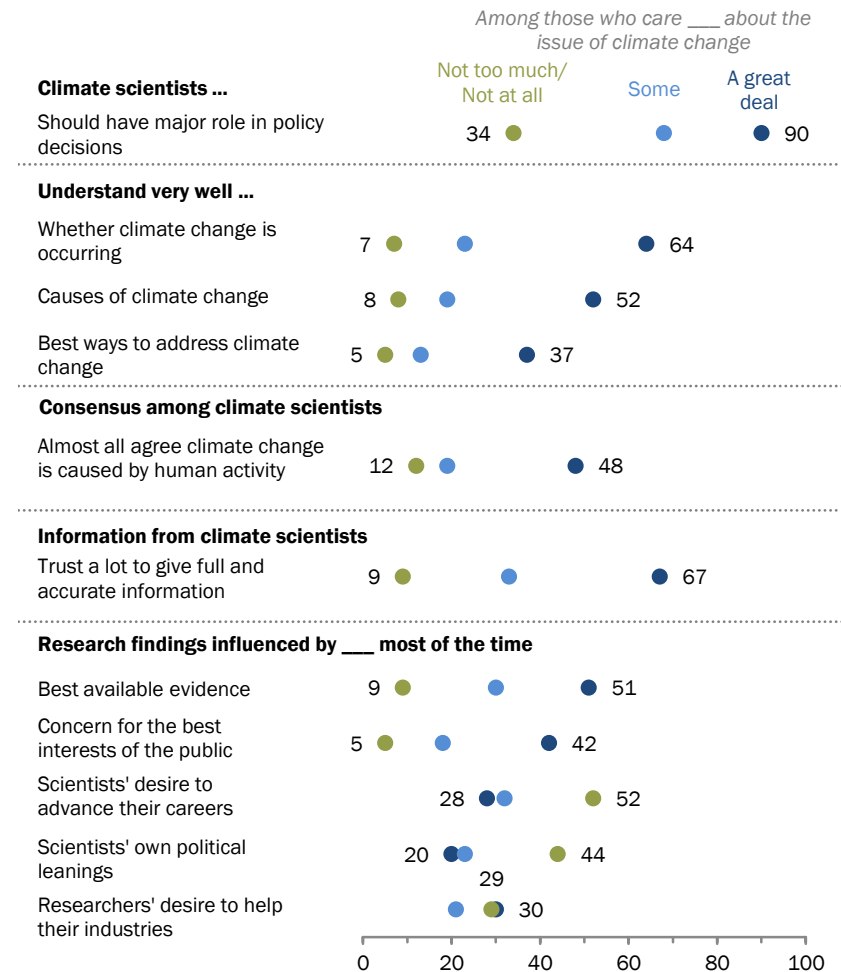
People who care more deeply about climate issues are also more likely than others in the general public to see climate scientists' and their work in a positive light.

Nearly all (90%) Americans who are deeply concerned about climate change issues support a major role for climate scientists in related policy decisions, as do 68% of Americans with some personal concern about climate issues. About a third (34%) of those with not too much or no personal concern about climate issues say climate scientists should have a major role, and 41% say scientists should have a minor role in climate policy.

This pattern holds among both Democrats and Republicans. For example, some 87% of Republicans who care a great deal about climate issues say climate scientists should have a major role in climate policy. This compares with 48% among other Republicans.

**Americans concerned about this issue see climate scientists' and their research in a more positive light**

*% of U.S. adults in each group who say the following about global climate change ...*



Note: Respondents who gave other responses or did not answer are not shown.

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

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Those who care a great deal about climate issues are much more likely than other Americans to say climate scientists understand very well whether change is occurring (64% vs. 23% among those care some and 7% among those do not care at all or not too much about this issue). About half of those deeply concerned about climate issues (52%) say climate scientists understand very well the causes of climate change, compared with just 19% among those with some personal concern and just 8% among those with no or not too much personal concern about this issue.

More Americans who care a great deal about climate issues say scientists understand the best ways to address climate change very well (37%) or fairly well (48%). Many fewer of less climate-concerned adults say the same. Just 13% of those with some personal concern about climate issues say scientists understand very well how to address climate change, while 56% say scientists understand this fairly well. And, just 5% of those with no or little personal concern about climate issues say scientists understand very well how to address climate change, 25% say scientists understand this fairly well and 68% say scientists do not understand this at all or not too well. Differences over climate scientists' understanding occur among both Democrats and Republicans who are relatively more and less concerned about climate change.

Similarly, people who care more about climate issues are more inclined to see consensus among scientists about the causes of climate change. Some 48% of the climate-concerned public says that almost all climate scientists agree that human activity is responsible for climate change; this compares with just 19% saying almost all scientists agree about this among those who care some about climate issues and 12% among those who do not care at all or not too much about climate issues.

*Two-thirds of Americans deeply concerned about climate issues trust information from climate scientists*

Those more concerned about global climate issues are far more trusting of information from climate scientists than are those less concerned about these issues. Two-thirds of the public who cares a great deal about climate issues (67%) say they trust climate scientists a lot to provide full and accurate information on the causes of global climate change. In contrast, 33% of those who care some about climate issues trust scientists' information a lot, while 53% trust it some. Just 9% of those with little or no personal concern about climate issues trust scientists' information a lot, 36% trust it some and 55% have not too much or no trust in information from climate scientists about this.

Democrats and Republicans who care a great deal about climate issues are more than twice as likely as their fellow partisans to hold a lot of trust in information from climate scientists. Among

Republicans who care about climate issues, 46% trust climate scientists' information a lot compared with 16% among other Republicans. Among Democrats, fully 76% of those who care about climate issues a great deal say they trust climate scientists' information a lot compared with 34% among other Democrats.

*Those deeply concerned about climate issues are more inclined to see research findings as rooted in the best available evidence, fewer say other motives of scientists underlie the research findings*

Americans who are more concerned with climate issues are inclined to think research findings on climate are influenced by the best available evidence; about half of this group (51%) says research is influenced by the best evidence most of the time and 39% say this occurs some of the time. In contrast, three-in-ten (30%) of those with some personal concern about climate issues say the best evidence influences climate research findings most of the time, 60% say this occurs some of the time. Just 9% of those with no or not too much personal concern about climate issues say the best evidence influences climate research findings most of the time, 42% say this occurs some of the time and 45% say this occurs not too often or never.

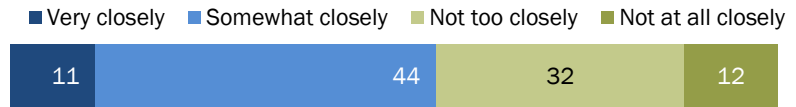
By the same token, there are similar differences in views about negative influences on research between those who care deeply about climate issues and those who do not; the climate-concerned public is less inclined to see such research as influenced by scientists' personal political leanings, a desire to help their industries or their careers.

## Public views of news coverage about global climate change

The news media are a key source of information about climate issues. The Pew Research Center survey finds only a small minority (11%) of Americans follow news about climate matters very closely. Another 44% follow somewhat closely, and an equal share follows news not too (32%) or not at all closely (12%).

### Few Americans follow global climate change news very closely

*% of U.S. adults who follow news about global climate change ...*



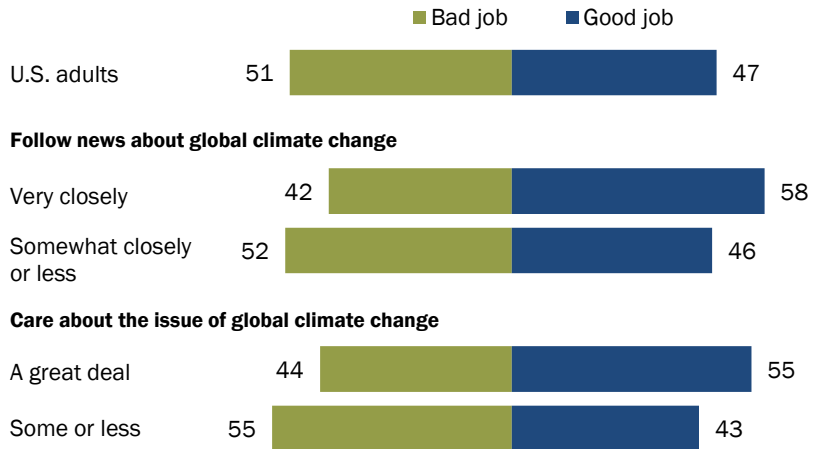
Note: Respondents who did not answer not shown.  
Source: Survey conducted May 10-June 6, 2016.  
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Overall, Americans are closely divided in their assessments of media coverage on climate issues. Some 47% say the news media do a very or somewhat good job, while 51% say they do a bad job covering climate issues.

### Americans are divided in their assessment of how well the media covers global climate change

*% of U.S. adults who say the news media do a \_\_\_\_\_ in covering issues about global climate change*



Note: Very good/bad and somewhat good/bad responses combined. Respondents who did not answer are not shown.  
Source: Survey conducted May 10-June 6, 2016.  
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These findings stand in contrast to American’s views about the media overall. [As shown elsewhere in this report](#), just 5% say they have a great deal of confidence in the news media, generally, to act in the public interest. A [2013 Pew Research Center report](#) documents the steep decline in public regard for media accuracy, fairness and independence over the past two decades.

People who say they closely

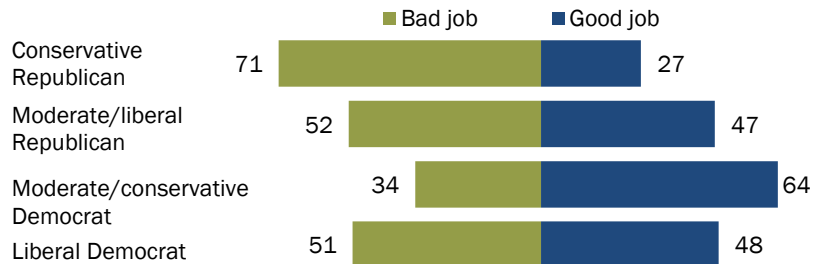


follow climate news tend to give the media somewhat higher marks for coverage in this area as do those who say care a great deal about climate issues.

Public views about media performance also tend to divide along political lines. Conservative Republicans are especially critical of media coverage on climate issues with 71% of this group saying the media do a bad job. Moderate and liberal Republicans are closely divided in their overall evaluations of news coverage on climate (47% say they do a good job and 52% say they do a bad job). The balance of opinion is more positive among moderate and conservative Democrats (64% good to 34% bad) though liberal Democrats are closely divided (48% to 51%) on this issue. This pattern is broadly consistent with other [Pew Research Center studies](#) on views of the media.

### Most conservative Republicans are negative about climate change media coverage

*% of U.S. adults who say the news media do a \_\_\_\_\_ in covering issues about global 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 or who did not answer are not shown. Very good/bad and somewhat good/bad responses combined.  
Source: Survey conducted May 10-June 6, 2016.  
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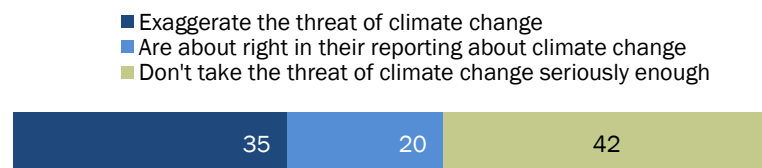
The public divide over media performance in this area could link to the balance of coverage on climate issues. The Pew Research Center survey included two additional questions exploring people's views about news coverage.

Overall, some 35% of Americans say the media exaggerate the threat from climate change while a roughly similar share (42%) of adults says the media do not take the threat seriously enough. Two-in-ten (20%) adults says the media are about right in their reporting about climate.

The same pattern occurs on a question about the balance of attention to those skeptical of climate change. Four-in-ten (40%) adults say the media give *too little* attention to skeptics, while a slightly smaller share (32%) says the media give skeptics *too much* attention. A quarter of Americans (25%) say the media are about right in their coverage of those skeptical about climate change.

## 42% of Americans say the media do not take the threat of global climate change seriously enough

% of U.S. adults who say the news media generally ...



Note: Respondents who did not answer are not shown.

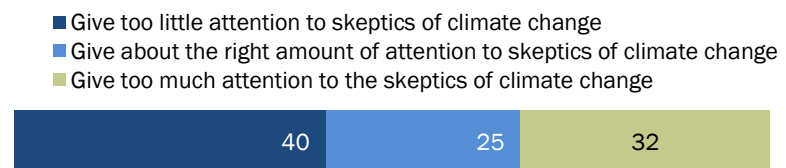
Source: Survey conducted May 10-June 6, 2016.

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## 40% of Americans say reporters give too little attention to skeptics of global climate change

% of U.S. adults who say the news media generally ...



Note: Respondents who did not answer are not shown.

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

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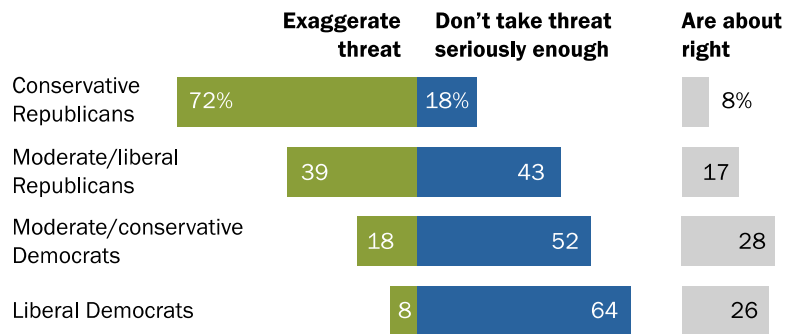
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In keeping with the wide political divides on beliefs about climate issues, there are strong political differences in views about media coverage of climate change. A majority of conservative Republicans (72%) say the media exaggerate the threat of climate change, while some 64% of liberal Democrats say the media do not take the threat seriously enough.

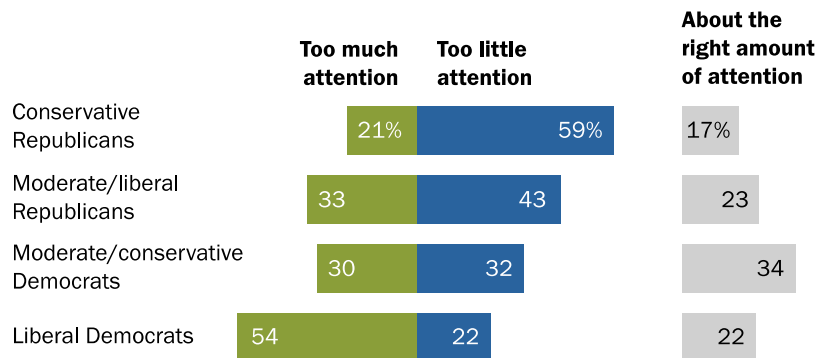
Opinions about media coverage of skeptics follow a similar pattern. Some 59% of conservative Republicans say the media give *too little* attention to skeptics of climate change. In contrast, about half of liberal Democrats (54%) say the media give *too much* attention to skeptics of climate change.

### There is a party ideological divide in evaluating balance of media coverage on climate issues

*% of U.S. adults who say the news media generally \_\_\_\_\_ in reporting on climate change*



*% of U.S. adults who say the news media generally give \_\_\_\_\_ to skeptics of climate change*



Note: Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who did not answer are not shown.

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

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## 2. Public opinion on renewables and other energy sources

Americans' concerns about climate change have put energy production of fossil fuels and the carbon gases these fuels emit at the center of public discussions about climate and the environment. Those debates coupled with long-standing economic pressures to decrease reliance on other countries for energy needs have raised attention to renewable forms of energy including solar and wind power.

Public opinion about energy issues is widely supportive of expanding both solar and wind power but more closely divided when it comes to expanding fossil fuel energies such as coal mining, offshore oil and gas drilling, and hydraulic fracturing for oil and natural gas. While there are substantial party and ideological divides over increasing fossil fuel and nuclear energy sources, strong majorities of all party and ideology groups support more solar and wind production.

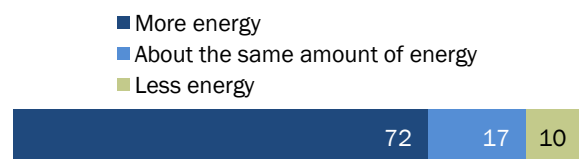
### Most Americans know the U.S. is producing more energy today

Most Americans are [aware of America's ongoing energy boom](#). The United States is producing more energy from fossil fuels and has ticked up production of renewable sources such as wind and solar. A large majority of Americans (72%) say the United States is producing more energy than it did 20 years ago. Far smaller shares say the U.S. is producing the same level (17%) or less energy (10%) than it did 20 years ago.<sup>8</sup>

Majorities across demographic, educational and political groups say the U.S. is producing more energy today. Awareness of this trend is especially high among those with postgraduate degrees (86% compared with 64% among those with high school degrees or less). Men are more inclined to say the U.S. is producing more energy than women (79% vs. 66%), while Democrats are modestly more likely than Republicans to say this (79% vs. 65%).

### Majority of Americans are aware that U.S. energy production has increased

*% of U.S. adults who say compared with 20 years ago, the U.S. is producing \_\_\_\_ today*



Note: Respondents who did not answer are not shown.

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

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<sup>8</sup> Pew Research Center in 2014 asked a related question – whether the amount of energy produced in the United States had been increasing, decreasing or staying the same in recent years. In that survey, 54% of Americans said the amount of energy produced had been increasing, while 27% said it had been staying the same and 10% said it had been decreasing.

## Strong public support for more wind and solar, closer divides over nuclear and fossil fuels

Large majorities of Americans favor expanding renewable sources to provide energy, but the public is far less supportive of increasing the production of fossil fuels, such as oil and gas, and nuclear energy.

Fully 89% of Americans favor more solar panel farms, just 9% oppose. A similarly large share supports more wind turbine farms (83% favor, 14% oppose).

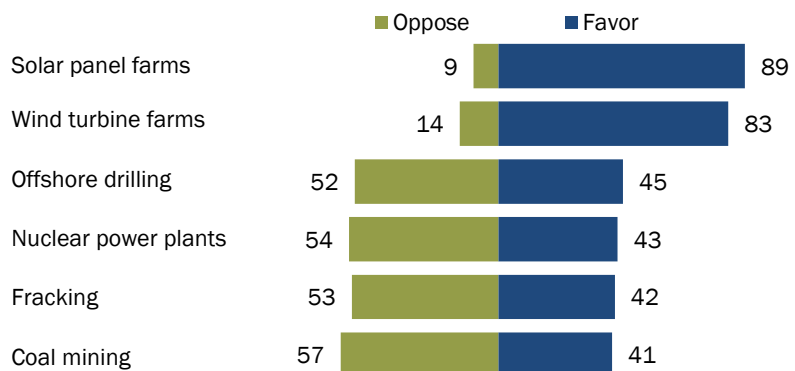
By comparison, the public is more divided over expanding the production of nuclear and fossil fuel energy sources.

Specifically, 45% favor more offshore oil and gas drilling, while 52% oppose. Similar shares support and oppose expanding hydraulic fracturing or “fracking” for oil and gas (42% favor and 53% oppose). Some 41% favor more coal mining, while a 57% majority opposes this.

And, 43% of Americans support building more nuclear power plants, while 54% oppose. Past Pew Research Center surveys on energy issues, using somewhat different question wording and survey methodology, found opinion broadly in keeping with this new survey. For example, the balance of opinion in a [2014 Pew Research Center survey](#) about building more nuclear power plants was similar (45% favor, 51% oppose), and some 52% of Americans favored and 44% opposed allowing more offshore oil and gas drilling in that survey.

### Strong public support for expanding wind, solar power

*% of U.S. adults who say they favor or oppose expanding each energy source*



Note: Respondents who did not answer are not shown.

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

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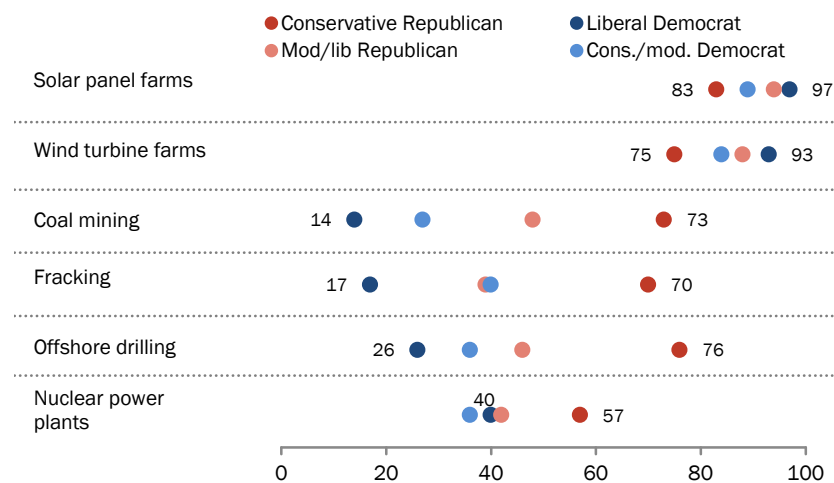
## Most Republicans and Democrats favor expanding renewables; there are strong divides over expanding fossil fuels

Across the political spectrum, large majorities support expansion of solar panel and wind turbine farms. Some 83% of conservative Republicans favor more solar panel farms; so, too, do virtually all liberal Democrats (97%). Similarly, there is widespread agreement across party and ideological groups in favor of expanding wind energy.

Consistent with past Pew Research Center surveys, this new survey finds there are deep political divides over expanding fossil fuel energy sources. Conservative Republicans stand out from other party and ideology groups in this regard. At least seven-in-ten conservative Republicans support more coal mining (73%), fracking (70%) and offshore drilling (76%). A majority of Democrats oppose expanding each of these energy sources while moderate/liberal Republicans fall somewhere in the middle on these issues.

### Strong political divide over expanding fossil fuels; but mostly agreement on renewable energies

% of U.S. adults who say they favor expanding each energy source



Note: Republicans and Democrats include independents and other non-partisans who “lean” toward the parties. Respondents who do not lean toward a political party and other responses on each question are not shown.  
 Source: Survey conducted May 10-June 6, 2016.  
 “The Politics of Climate”

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The political divide over expanding nuclear energy is smaller. Some 57% of conservative Republicans, and 51% of all Republicans, favor more nuclear power plants. Democrats lean in the opposite direction with 59% opposed and 38% in favor of more nuclear power plants.

As also found in past Pew Research Center surveys, women are less supportive of expanding nuclear power than men, even after controlling for politics and education. Some 34% of women favor and 62% oppose more nuclear plants. Men are more closely divided on this issue: 52% favor and 46% oppose. Men and women hold more similar views on other energy issues.

## Many Americans are giving serious thought to having solar panels at home

America's solar power industry is growing. In 2016, [solar is expected to add more electricity generating capacity](#) than any other energy source in the United States. Just 4% of Americans report having home solar panels but many more – 37% – say they are giving it serious thought.

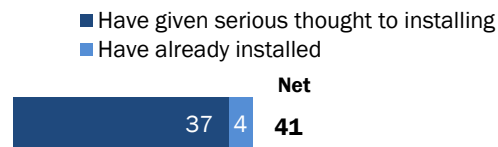
These figures are similar among homeowners. Some 44% of homeowners have already installed (4%) or have given serious thought to installing (40%) solar panels at home.

Western residents and younger adults are especially likely to say are considering, or have installed, solar panels at home. Some 14% of homeowners in the West have installed solar panels at home and another 52% say they are considering doing so. By contrast, 35% of homeowners in the South say they have installed (3%) or given serious thought to installing solar at home (33%).

Some 55% of homeowners under age 50 say they have given serious thought to installing or have already installed solar panels at home. Fewer homeowners ages 50 and older say the same (36%).

### Sizeable minority of Americans are considering solar panels for home

% of U.S. adults who say they \_\_\_ solar panels at home



Note: Other responses and those not giving an answer are not shown.

Source: Survey conducted May 10-June 6, 2016.  
"The Politics of Climate"

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### Many younger, western homeowners considering solar panels for home

	Among U.S. adults	Among homeowners
Have given serious thought to or have installed home solar panels	41%	44%
West	53	66
South	36	35
Midwest	40	42
Northeast	38	40
18-49	50	55
50 and older	31	36

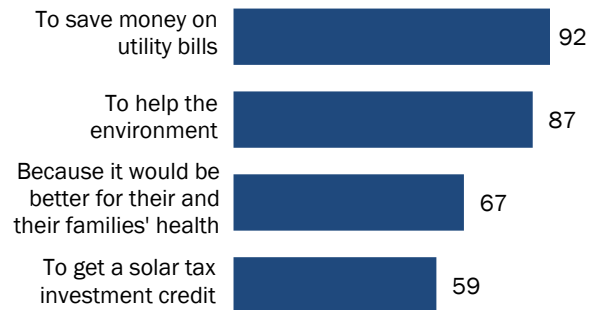
Source: Survey conducted May 10-June 6, 2016.  
"The Politics of Climate"

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The key reasons people cite for considering solar are financial followed by concern for the environment. Among all who have installed or given serious thought to installing solar panels, large majorities say their reasons include cost savings on utilities (92%) or helping the environment (87%). Smaller shares of this group, though still majorities, say improved health (67%) or a solar tax investment credit (59%) are reasons they have or would install home solar panels.

### Reasons among those considering solar at home: cost savings, environment

*% who say each is a reason they have or would install solar panels at home, among those who have given serious thought to or have already installed solar panels*



Note: Based on those who have already installed or have given serious thought to installing solar panels at home. Those saying there is not a reason and those not giving an answer are not shown. Source: Survey conducted May 10-June 6, 2016. "The Politics of Climate"

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### 3. Everyday environmentalism

While many Americans say they are concerned about the environment, a much smaller share — roughly two-in-ten — sees themselves as making an effort to live out that concern all the time. People focused on everyday environmentalism in this way also tend to be concerned about the issues of climate change but their beliefs about the causes of climate change closely match those of the public as a whole. And, perhaps contrary to conventional assumptions, they are not dominated by the liberal left but made up of the same mix of Republicans and Democrats as the population as a whole.

How different are the behaviors of these everyday environmentalists? Those who describe themselves as always trying to protect the environment are a bit more likely do things such as bring their own shopping bags, but most do so only sometimes, at best. And they are a bit more likely to have participated in a cleanup day at park or other neighborhood venue. But, they are no more likely than other Americans to reduce and reuse at home by composting, having a rain barrel, or growing their own vegetables. Environmentally conscious Americans are just as likely as other people to have spent hobby and leisure time hiking, camping, hunting or fishing in the past year; they are also about equally likely to have spent time caring for plantings in public parks or other public spaces.

People focused on living out their concern for the environment are more likely to have friends that share their environmentally conscious view, but they are also more bothered when *other people* fall short. For example, most in this group are bothered a lot by other people leaving lights and electronic devices on or throwing away things that could be recycled.

## One-in-five Americans always try to show environmental concern in their daily lives

Three-quarters of Americans say that they are particularly concerned with helping the environment as they go about their daily lives, while 24% say they are not particularly concerned.

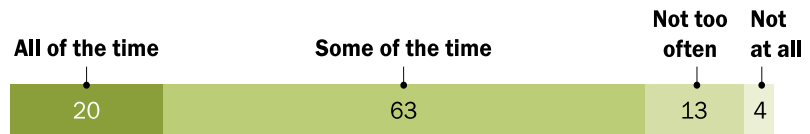
But just one-in-five Americans say they try to live in ways that help the environment “all the time.”

### Most Americans report concern for the environment; one-in-five try to act on that concern all the time

*% of U.S. adults who say that they are \_\_\_ about helping the environment as they go about their daily lives*



*% of U.S. adults who say they make an effort to live in ways that help protect the environment ...*



Note: Respondents who did not give an answer are not shown.

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

“The Politics of Climate”

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Nearly all Americans (96%) who report trying to protect the environment in their daily lives also describe themselves as particularly concerned about the environment. And, more among this group have a deep concern about climate issues; 57% say they care a great deal about climate issues compared with 30% among those who less frequently try to protect the environment in their daily lives. Beyond this difference, however, there is no relationship between effortful attention to helping the environment and beliefs about climate change. Opinion among more environmentally conscious Americans closely matches that among the public as whole. And environmentally conscious Americans are both Republican (41%) and Democratic (53%) in close proportion to that found in the population as a whole.

## Environmentally conscious Americans are mixed in political, climate beliefs

% U.S. adults

	Try to live in ways that protect environment ...		U.S. adults
	All the time	Some of time or less	
<b>Concern about helping the environment</b>			
Particularly concerned	96	70	75
<b>Care about climate issues</b>			
A great deal	57	30	36
<b>Beliefs about climate change</b>			
Due to human activity	51	47	48
Due to natural causes	28	31	31
No solid evidence of warming	16	21	20
<b>Party affiliation</b>			
Republican	41	44	44
Democrat	53	52	52

Note: Based on those saying they make an effort to live in ways that help protect the environment all the time. Beliefs about climate change include those who “lean” toward each position. Republicans and Democrats include independents and other non-partisans who “lean” toward the parties. Respondents who do not lean toward a political party, those who gave other responses and those who did not give an answer are not shown.

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

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Further, environmentally conscious Americans come from a wide mix of demographic, income and educational backgrounds. This group skews older rather than younger; in fact, they are less likely to be in the younger generations than the population as a whole.<sup>9</sup> They are about equally likely to live in urban, suburban and rural areas as is the population as a whole; there is no relationship between region and an effort to live in ways that protect the environment.

## Profile of those focused on protecting environment in their daily lives

% of U.S. adults

	Try to live in ways that protect environment ...		U.S. adults
	All the time	Some of time or less	
Men	46%	50%	48%
Women	54	50	52
White	58	67	65
Black	10	11	12
Hispanic	19	14	15
Other race	12	7	8
18-29	12	22	22
30-49	23	35	34
50-64	30	26	26
65 and older	35	16	19
College degree or more	30	30	28
Some college	31	33	31
H.S. degree or less	39	37	41

Note: Whites and blacks include only non-Hispanics; Hispanics are of any race. Respondents who did not give an answer are not shown.

Source: Survey conducted May 10-June 6, 2016. Demographic comparisons with non-institutionalized U.S. adults from the 2014 American Community Survey (IPUMS). "The Politics of Climate"

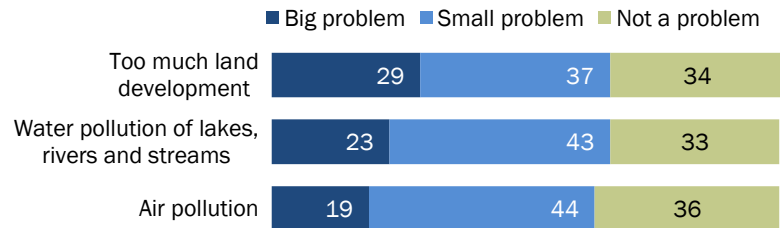
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<sup>9</sup> A [2014 Pew Research Center study](#) found millennials less likely to label themselves as "environmentalists" compared with GenXers and older generations.

In addition, environmentally conscious Americans are about equally likely to live in areas where pollution or overdevelopment of land is a large problem. Overall, some 29% of Americans say too much land development is a big problem in their communities, 37% say this is a small problem. Slightly smaller shares say that water pollution (23%) or air pollution (19%) is a big problem in their local areas.

### Public split over whether some key environmental issues are problems in their local communities

*% of U.S. adults who say that each of the following is a \_\_\_ in their local communities*



Note: Respondents who did not give an answer are not shown.

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

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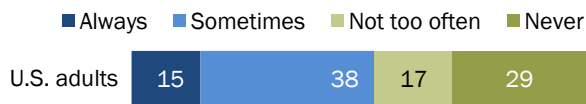
## Everyday actions aimed at helping the environment

The Pew Research Center survey included questions about a handful of ways people could “act on” their concern for the environment in daily life. Two examples: the practice of shoppers bringing their own bags for purchases in order to reduce waste and choosing cleaning products based on whether the ingredients would help or hurt the environment.<sup>10</sup>

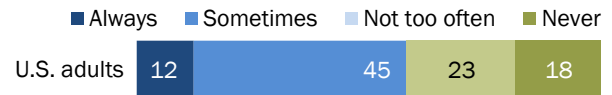
Few Americans say they do either of these things all the time: 15% always bring their own shopping bags and 12% always select cleaning products based on this goal. And some 29% of Americans say they never bring their own shopping bags in order to help the environment; 18% say they never making cleaning product purchases with this aim in mind.

### Environmentally conscious Americans bring their own shopping bags, buy cleaning products based on care for environment, but not all the time

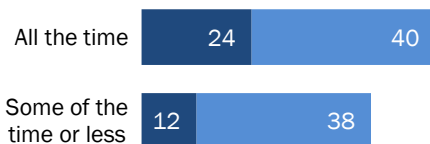
*% of U.S. adults who say they \_\_\_\_\_ use their own shopping bags because it is better for the environment*



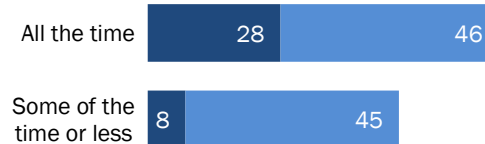
*% of U.S. adults who say they \_\_\_\_\_ buy cleaning products because they are better for the environment*



**Among those who try to live in ways that protect environment**



**Among those who try to live in ways that protect environment**



Note: Respondents who gave other responses or who did not give an answer are not shown.

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

“The Politics of Climate”

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<sup>10</sup> A [2014 Pew Research Center survey](#) asked about efforts to help the environment by recycling; roughly three-quarters of Americans said they recycle either “whenever possible” (46%) or “most of the time” (30%) in order to protect the environment. About one-in-five (19%) say they recycle only “occasionally,” and just 4% say they “never” make such efforts.

There is a modest tendency for people who express more environmental concern to take both of these actions more regularly. For example, among people who identify themselves as conscious about how to help the environment all the time, 65% say they at least sometimes bring their own shopping bags in order to reduce waste, compared with 53% of other adults.

Similarly, 74% of those who always try to help the environment say they purchase cleaning products with this in mind at least sometimes. This compares with 57% among other adults.

While most Americans have recycling bins at home, only a minority do things at home to reduce waste and reuse natural resources such as maintaining a compost pile (21%) or using a rain barrel or other catch for water (11%). About a third of Americans (33%) say they grow vegetables at home.

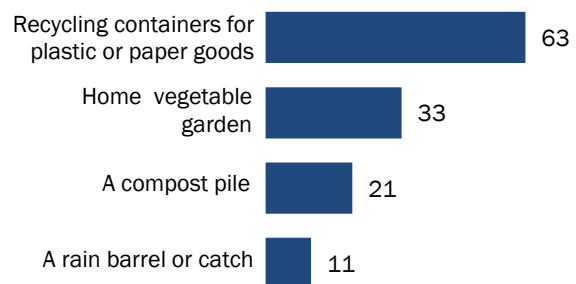
Homeowners are more likely to have each of these things at home. Some 67% have recycling bins, 43% have a vegetable garden, 28% compost, and 14% have a rain catch.

But there are no differences, or only modest differences, among adults who are more and less environmentally conscious when it comes to composting, having a rain barrel or growing their own vegetables at home.

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### Most Americans have home recycling; fewer have a rain catch or compost pile

*% of U.S. adults who say they have \_\_\_\_\_ at home*



Note: Respondents who gave other responses or who did not give an answer are not shown.

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

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## Outdoor hobby and leisure time equally common regardless of politics or level of environmental consciousness

Americans' enjoyment of the outdoors is shared among both those who aim for everyday environmentalism and those less concerned with living in ways that protect the environment.

Overall, some 58% of Americans say they have participated in at least one outdoor activity (whether hiking, camping, or hunting or fishing). Outdoor enthusiasts come from all demographic, educational and political groups. Those who have spent hobby and leisure time outdoors in the past year are just as likely to be people focused on protecting the environment in their daily lives as those less focused on this.

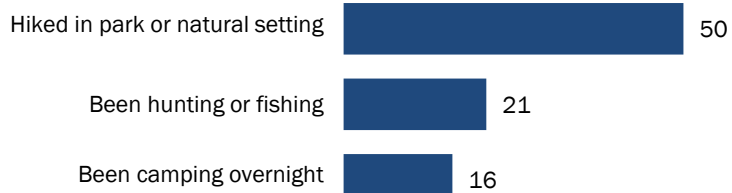
Half of the public (50%) says they have taken a hike in a park or natural setting outdoors over the past year. That figure is a bit higher (59%) among adults ages 18 to 49; four-in-ten people age 50 and older have been hiking. Hiking is a bit more common among those who express a great deal of

concern about climate change (56% of this group has been hiking in the past year compared with 47% of those with no or not too much personal concern about the issue of climate change.) But those who are focused on living in ways to protect the environment are equally likely as other Americans to have gone on a hike in a park or other natural setting in the past year.

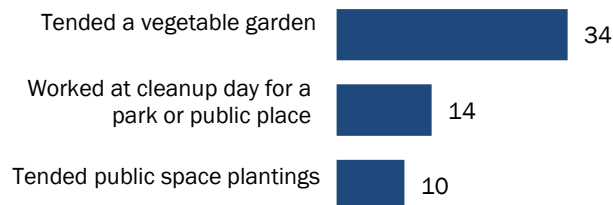
### Half of Americans have gone hiking in past year; far fewer have worked on cleanup efforts

*% of U.S. adults who say they have \_\_\_\_\_ in the last 12 months*

#### Outdoor hobby and leisure activities



#### Public space cleanup and vegetable gardening



Note: Respondents who gave other responses or who did not give an answer are not shown. Figures add to more than 100% because multiple responses were allowed.

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

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Some 21% of adults (27% of men and 14% of women) have been hunting or fishing in the past year. Some 29% of Republicans have done so (including 36% of Republican men and 19% of Republican women), as have 15% of Democrats (19% of Democratic men and 11% of Democratic women).

One-in-six Americans (16%) have been camping overnight in the past year. (The share doing at least one of these three outdoor activities is 58% because some people have done more than one.)

Some 14% of adults say they have spent time outdoors in order to clean up a park or other public space, and one-in-ten (10%) have worked to tend to public plantings in the past year. Some 23% of environmentally conscious Americans have participated in a cleanup day but tending to public plantings is equally common among those who are more and less environmentally conscious in their daily lives.

About a third of Americans (34%) have worked in a vegetable garden for their family's use. Four-in-ten (40%) homeowners have done so, including roughly equal shares of homeowners in urban, suburban and rural areas.

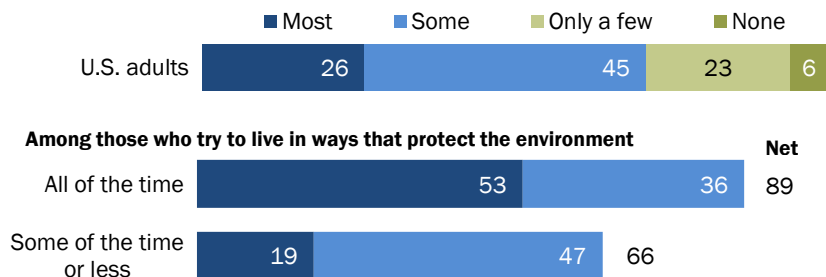
### Birds of an Environmentally Conscious Feather?

Social networks are often made up of those who share similar views. For example, [a Pew Research Center study on politics](#) finds that in the 2016 election, few Clinton supporters say they have close friends who are Trump supporters, and vice versa. The same pattern holds when it comes to concern about the environment.

About one-quarter (26%) of the public says most of their closest family and friends always try to live in ways that protect the environment. Some 29% of adults say none or only a few of their family and friends do this.

### Majority of Americans have at least some close friends who are environmentally conscious in daily living

*% of U.S. adults who say \_\_\_\_ of their closest family and friends always make an effort to live in ways that help protect the environment*



Note: Those who did not give an answer are not shown.

Source: Survey of U.S. adults conducted May 10-June 6, 2016.

"The Politics of Climate"

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But 53% of environmentally conscious Americans say most of their friends always try to live in ways that protect the environment.

## Americans bothered when others waste electricity and don't recycle

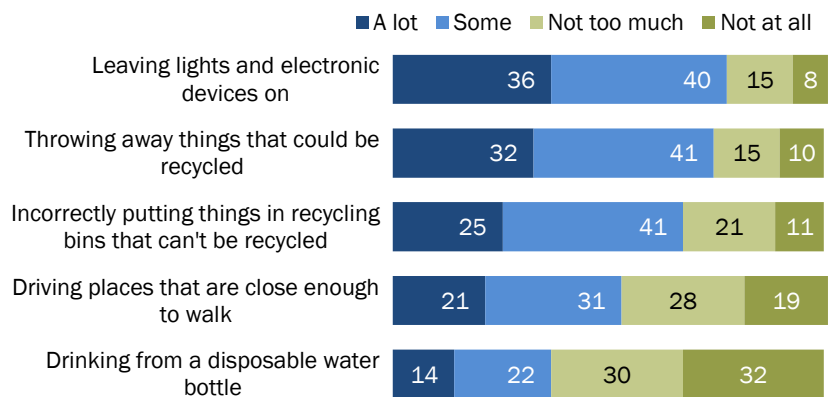
Everyday efforts to protect the environment often hinge on behaviors from many, if not all, individuals in society to work. The Pew Research Center survey included a set of six questions to explore people's reactions to their fellow citizens who waste natural resources or do not try to minimize waste in some way.

Overall, Americans are most likely to be bothered by others leaving lights and electronic devices on when no one is using them. Some 36% of U.S. adults say it bothers them "a lot" when people do this, and four-in-ten (40%) say it bothers them "some."

Similar shares say they are bothered a lot by people throwing away things that could be recycled (32%) or incorrectly putting things in recycling bins that can't be recycled (25%). Smaller shares say people driving places that are close enough to walk and drinking from disposable water bottles bothers them a lot (21% and 14%, respectively).

### Some Americans bothered when seeing others be wasteful

*% of U.S. adults who say it bothers them \_\_\_\_ when they see people doing each of these things*



Note: Respondents who did not give an answer are not shown.  
Source: Survey conducted May 10-June 6, 2016.  
"The Politics of Climate"

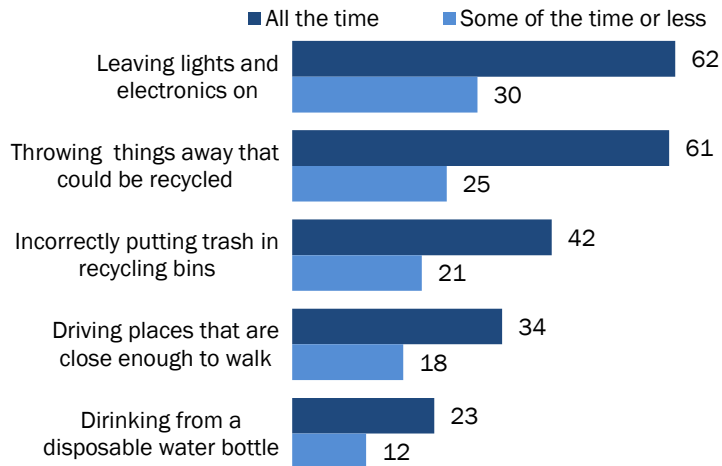
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Environmentally conscious Americans are bothered more by the failings of others around them to reduce waste than are people with less focus on environmental protection. Specifically, majorities of those who always try to live in ways that protect the environment say it bothers them “a lot” when others leave lights and electronic devices on (62%) or throw away things that could be recycled (61%); this compares with 30% and 25%, respectively, among those who are less focused on environmental protection in their daily lives. And, some 42% of this environmentally conscious group is bothered a lot when other people incorrectly put trash in recycling bins; while 34% are bothered a lot by people driving places that are close enough to walk.

## Environmentally conscious Americans are more bothered than others when they see people waste

% of U.S. adults in each group who say it bothers them ‘a lot’ when they see people ...

Among those who try to live in ways that protect the environment ‘all the time’ or ‘some of the time or less’



Note: Respondents who gave other responses or who did not give an answer are not shown.  
Source: Survey conducted May 10-June 6, 2016.  
“The Politics of Climate”

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## 4. Public knowledge about science has a limited tie to people's beliefs about climate change and climate scientists

Scholars have long debated the role knowledge about and understanding of science plays in shaping people's views on science issues. The common supposition is that when ordinary people have different views from those of experts that the differences stem from knowledge gaps: If people knew more, the argument goes, they would agree with the experts.

People's level of science knowledge is [closely related to their interest in science](#). Past Pew Research Center studies found people's knowledge of science sometimes has a direct role in explaining their attitudes on science-related issues but the magnitude of the impact [varies depending on the issue](#). And, the bulk of the research literature has shown only a modest relationship between science knowledge and people's attitudes.<sup>11</sup>

This new survey explored the role of science knowledge in Americans' beliefs about climate change, climate policies, and trust in climate scientists and climate research findings. Researchers compared those with relatively high levels of science knowledge on a new 9-item index to those with medium and lower levels of science knowledge. This chapter describes this measure in detail.

The effects of science knowledge tend to be modest and inconsistent in predicting people's views about climate change and climate scientists, especially in comparison with the clearer and more striking way that people's views are tied to their political party preferences, ideology and level of personal concern with climate issues. To the extent that science knowledge influences judgments related to climate change and trust in climate scientists, it affects views among Democrats, but not Republicans. In sum, Americans' science knowledge can sometimes influence their judgments about climate matters but, even in these cases, people's political orientations tend to take precedence.

To test whether the patterns from cross tabulations were robust, we also used statistical modeling techniques to examine the role of science knowledge as a predictor of people's views while simultaneously controlling for their political orientations, personal concern with the issue of climate change, education, gender, age, and race and ethnicity. The results of these analyses are summarized in this chapter and specifics are shown in [the detailed tables](#). The findings underscore a strong, substantive role for both party/ideological factors and issue-concern as predictors of

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<sup>11</sup> See review by National Academies of Sciences, Engineering and Medicine, 2016. "[Scientific Literacy: Concepts, Contexts and Consequences](#)."

people's views across this set of some 25 beliefs related to climate change or people's views of climate scientists.

## A new index of people's knowledge about science

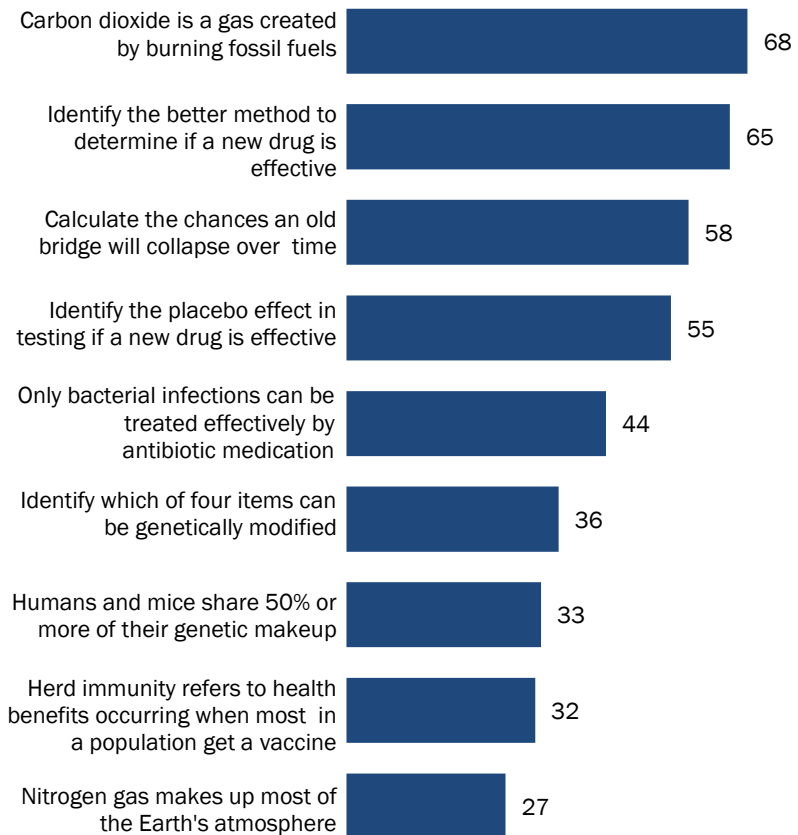
The Pew Research Center survey included a set of nine questions to tap people's overall knowledge of science topics. The set captures factual information related to Earth sciences and life sciences, including one question on numeracy and two related to understanding scientific methods.<sup>12</sup>

Most Americans can correctly identify carbon dioxide as a gas created by the burning of fossil fuels (68%), and a similar share, 65%, recognize that a comparison or control group is a better method for testing the effectiveness of a new drug than simply giving the drug to a single group.

Some 58% of Americans correctly calculated the conditional probability of a bridge collapsing over time. This question was adapted from literature measuring

### What Americans know about science topics

*% U.S. adults answering each question correctly*



Note: Respondents who gave other responses or who did not give an answer are not shown.

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

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<sup>12</sup> Eight out of the nine items were multiple choice questions. One asked respondents to calculate the probability of an old bridge collapsing requiring respondents to enter in a numeric response.

people's ability to use numerical concepts, a concept often linked with people's health literacy.<sup>13</sup>

A slight majority (55%) of Americans also identify the placebo effect in testing the effectiveness of a drug treatment.

While most Americans recognize that antibiotic medications can be effective treatments for bacterial infections (such as a strep throat), a sizeable share incorrectly believe that viral infections (such as a cold), fungal infections (such as athlete's foot), or allergic reactions to insect bites can be treated effectively with antibiotics. Some 44% correctly identify *only* bacterial infections from this set as effectively treated with antibiotic medications.

People's knowledge of items that can be genetically modified varies. A minority of adults – 36% – know that a mosquito, corn, an apple, and salmon can all be genetically modified. About a third of Americans (33%) know that humans share at least half of their genetic makeup with mice or that herd immunity refers to health benefits occurring when most people in a population get a vaccine (32%).

The most challenging question in this set: Which gas makes up most of the Earth's atmosphere? Some 27% of Americans correctly identify nitrogen.

To be sure, how Americans score in knowledge about science depends on the topics covered and the difficulty of the questions. The set of questions aims to capture people's tendency to know relatively more or less about science, generally. The average American got just below half of these questions correct. The mean score is 4.2 out of 9. About a fifth of adults (22%) have a relatively high level of science knowledge, answering at least seven questions correctly (including 4% with a perfect score). Some 48% of U.S. adults have a medium level of knowledge, getting three to six correct answers and 30% of adults have a low level of science knowledge, getting no more than 2 answers correct.

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<sup>13</sup> See Joshua A. Weller et al. 2013. "Development and Testing of an Abbreviated Numeracy Scale: A Rasch Analysis Approach," *Journal of Behavioral Decision Making*, vol. 26 (198-212) and a review of the literature on health literacy from the National Academies of Sciences, Engineering and Medicine 2016, "[Science Literacy: Contexts, Concepts and Consequences](#)"

## There are differences among educational and demographic groups in science knowledge

There are substantial differences in knowledge levels about science among subgroups of the general public, consistent with [previous studies by Pew Research Center](#) and others.<sup>14</sup>

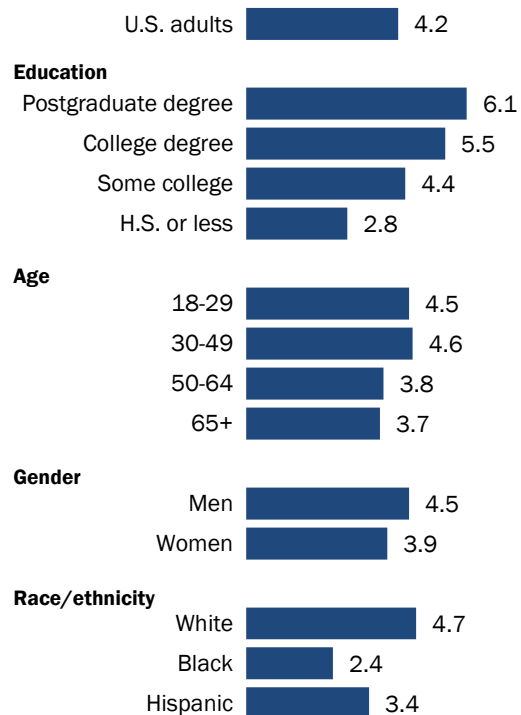
Science knowledge is closely linked with educational levels. People with postgraduate degrees answer more than twice as many questions correctly as those with high school degrees or less. The difference in knowledge between those with postgraduate degrees and those with high school degrees or less ranges from 29- to 45-percentage points across our nine questions. (See [the detailed tables](#)). There is a sizeable and significant role of education in predicting knowledge on the index even when controlling for gender, age, and race and ethnicity in a linear regression model.

But there are also differences by age, gender, and race and ethnicity in knowledge of science topics. Younger adults, ages 18 to 49, score higher on the index than those ages 50 and older. Those under age 50 are more likely than their older counterparts to answer eight of the 9 questions in the index correctly. The one exception to this pattern: awareness that antibiotics are effective in treating bacterial, but not other kinds of infections. Half of adults ages 65 and older (50%) answer this correctly, compared with one-third (33%) of those ages 18 to 29.

Men also score higher, on average, than women on the science knowledge index. Gender differences tend to vary across the individual questions. Men are more likely than women to answer four of the nine questions correctly. On one question the pattern is reversed; some 48% of

### Science knowledge varies by education and demographic factors

Mean number of correct answers



Note: Respondents who did not give an answer are not shown.

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

"The Politics of Climate"

PEW RESEARCH CENTER

<sup>14</sup> See [Science and Engineering Indicators](#), 2016. Chapter 7. And review from the National Academies of Sciences, Engineering and Medicine 2016, "[Science Literacy: Contexts, Concepts and Consequences](#)"

women correctly identify bacterial infections as the only type of infection effectively treated with antibiotics, compared with 40% among men. And, men and women are about equally likely to know the correct answers to the four other questions including those that tap understanding of the scientific process and biomedical topics.

There are also differences associated with race and ethnicity in the science knowledge questions. Whites are more likely than either Hispanics or blacks to answer more of these questions correctly; the mean number correct is 4.7 out of 9 for whites, 3.4 for Hispanics and 2.4 for blacks. Educational differences across race and ethnic groups may contribute to these differences. But even after controlling for education in a linear regression model, whites are predicted to answer more questions correctly than blacks and Hispanics. These differences are consistent with findings and analysis in the [2015 Pew Research Center report](#) on science knowledge.

Democrats and Republicans score about equally well on the nine-item index. However, liberal Democrats tend to score a bit higher than do other political groups, overall.

Americans who are deeply concerned about the issue of climate change are more likely to know that carbon dioxide is made as a consequence of burning fossil fuels (75% know this among those who care a great deal about the issue) as does a 65% majority of other Americans. People more concerned about the issue of climate change also tend to know more about science, generally.<sup>15</sup>

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### Knowledge about science is roughly the same for Democrats and Republicans

*Mean number of correct answers*

U.S. adults 4.2

#### Party affiliation

Republican 4.2

Democrat 4.3

#### Party by ideology

Conservative Republican 4.4

Moderate/liberal Republican 3.9

Moderate/conservative Democrat 3.6

Liberal Democrat 5.2

#### Concern about climate issue

Care a great deal about issue of climate change 4.6

Care some or less about issue of climate change 3.9

Note: Republicans and Democrats include independents and other non-partisans who “lean” toward the parties. Respondents who do not lean toward a political party are not shown.

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

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<sup>15</sup> Those who care a great deal about the issue of climate change have a higher mean score on the knowledge index even if the question on carbon dioxide is omitted from the index.



## The puzzle of when science knowledge matters for Americans' views about climate-related issues

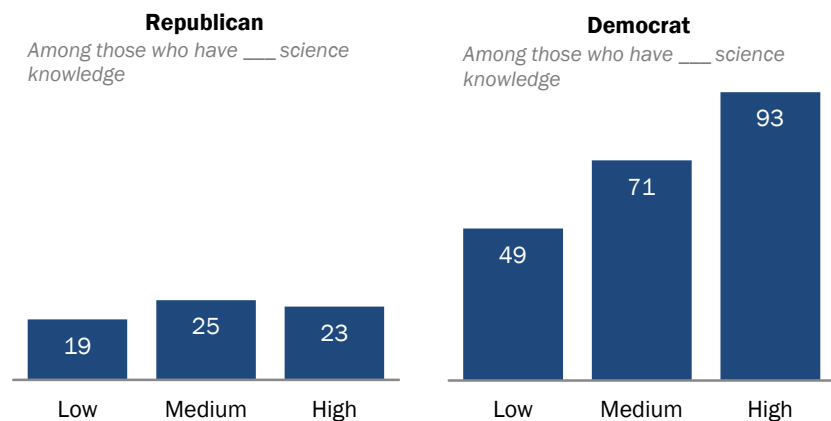
Americans' general knowledge about science is no more than modestly related to their views about climate matters. Pew Research Center used a series of statistical models to better understand the role of science knowledge, education and other factors in public opinion about these topics. The analysis finds no strong, direct connection between people's science knowledge and their beliefs about the causes of global warming or a host of other beliefs about climate-related matters, scientists and the factors influencing climate research. The results of all of these analyses are shown in [the detailed tables](#).<sup>16</sup>

The most common pattern is that people's level of science knowledge, or of education, has either no significant effect or only a modest effect compared with political party, ideology and issue-concern in predicting their beliefs across this set.

There are likely to be complex reasons why people's scientific knowledge is not strongly linked to their views on climate issues. For instance, to the extent that science knowledge influences judgments related to climate change and trust in climate scientists, it generally influences views among Democrats, but not Republicans.

### Most Democrats with more science knowledge believe climate change is due to human activity, but there is no difference by science knowledge among GOP

*% of Republicans or Democrats who say the Earth is warming due to human activity*



Note: Beliefs about climate change include those who "lean" toward each response. Those who did not give an answer not shown. Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean to a political party not shown.

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

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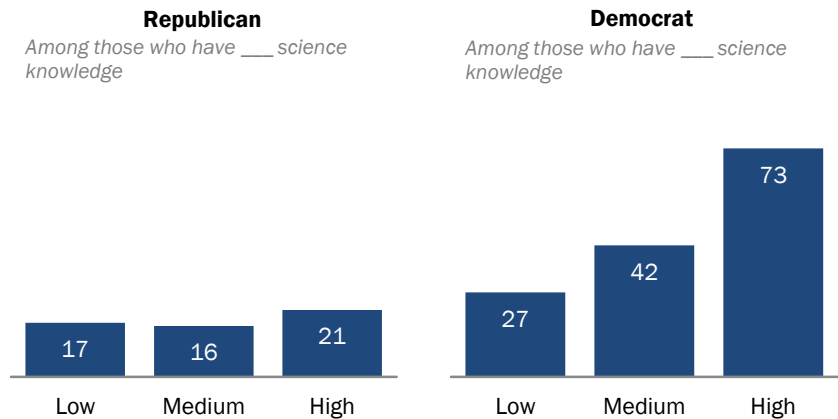
<sup>16</sup> One question in the science knowledge index refers directly to knowledge about climate change and the gas created by burning fossil fuels. We also examined the effect of science knowledge on climate beliefs with an index that omits this question but found substantively similar results.

Thus, it could be the case that people’s political orientations are an anchoring point for applying their knowledge – rather than the other way around.<sup>17</sup>

For example, Democrats who have higher science knowledge levels are more likely than those with medium or low knowledge levels to believe the Earth’s warming mostly stems from human causes. Fully 93% of Democrats with high science knowledge say the Earth is warming due to human activity, compared with 71% of Democrats with medium science knowledge and 49% of those with low science knowledge. By contrast, there are no differences by science knowledge among Republicans about the causes of climate change.

### Role of science knowledge in public perceptions that climate research reflects the best evidence depends on one’s political point of view

*% of Republicans or Democrats who say climate research findings are influenced by the best available scientific evidence most of the time*



Note: Respondents who gave other responses or who did not give an answer are not shown. Republicans and Democrats include independents and other non-partisans who “lean” toward the parties. Respondents who do not lean to a political party are not shown. Source: Survey conducted May 10-June 6, 2016. “The Politics of Climate”

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As might be expected, people’s views about whether there is scientific understanding about climate change tie more closely to their science knowledge and education levels. For example, people who know more about science also tend to perceive strong consensus among climate scientists that human activity is responsible for climate change. However, only Democrats, not Republicans, hold beliefs about scientific consensus which vary with their level of science knowledge. Democrats holding medium or high levels of knowledge are more inclined to perceive strong consensus among climate scientists than are those with low science knowledge levels. A similar pattern occurs in public views about scientific understanding. People’s beliefs about how well climate scientists understand whether climate change is occurring and the causes of climate

<sup>17</sup> Some scholarly research has also shown the influence of education or science knowledge varies across the two political parties consistent with a model of motivated reasoning. See for example, Kahan, Dan, Asheley R. Landrum, Katie Carpenter, Laura Helft, and Kathleen Hall Jamieson, forthcoming, “Science Curiosity and Political Information Processing” *Advances in Political Psychology*. And, Gauchat, Gordon, 2012. “Politicization of Science in the Public Sphere” *A Study of Public Trust in the United States, 1974-2010*. *American Sociological Review*, vol. 77(2): 167-187.

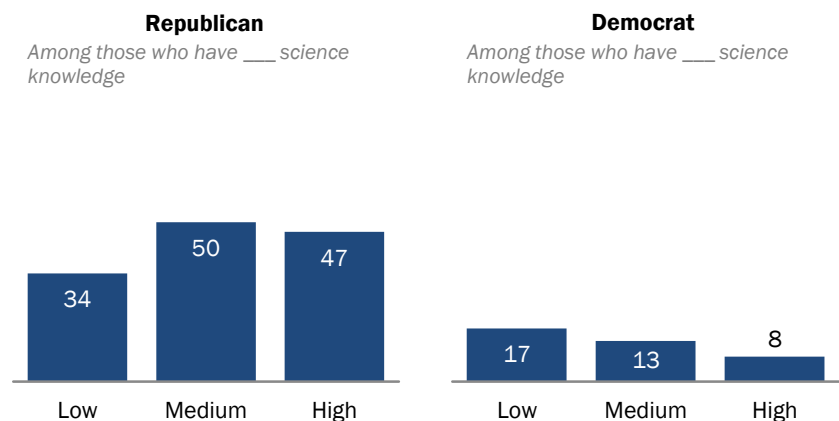
change are significantly linked with science knowledge among Democrats. But there is no difference among Republicans with high, medium or low levels of science knowledge in their perceptions of climate scientists' understanding of whether climate change is occurring or scientists' understanding of the causes of climate change. Similarly, there is a tendency for people with more science knowledge to expect harms to the Earth's ecosystem to occur because of climate change, but this pattern occurs only among Democrats.

The role of science knowledge in people's trust in climate scientists and their work also depends on people's political orientations. For example, Democrats with higher science knowledge are especially inclined to say the best scientific evidence regularly influences climate research findings. There is no difference among Republicans with high, medium or low knowledge levels in views about this.

And, when it comes to perceptions of other influences on climate research, Republicans with high or medium levels of science knowledge are more likely than those with low science knowledge to say that climate scientists' political leanings influence their research findings. But there is no relationship between people's science knowledge level and their views about the political motives of scientists' research findings among Democrats.

### Republicans with high and medium science knowledge are more inclined to see climate research as regularly influenced by scientists' political leanings

*% of Republicans or Democrats who say climate research findings are influenced by scientists' own political leanings most of the time*



Note: Respondents who gave other responses or who did not give an answer are not shown. Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean to a political party not shown. Source: Survey conducted May 10-June 6, 2016. "The Politics of Climate"

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## About this report

This is the first in a series of reports that details public views on science and scientists in areas that connect with American's daily lives. This report focuses on climate, energy and environment including the relationship between people's beliefs about these issues and their behaviors related to the environment in everyday life.

## Acknowledgments

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A number of outside experts helped guide the research in this report. We received valuable advice from John Besley, associate professor and Ellis N. Brandt Chair in Public Relations at Michigan State University, Karlyn Bowman, senior fellow and research coordinator, American Enterprise

Institute, Gordon Gauchat, assistant professor of sociology, University of Wisconsin-Milwaukee, Dan Kahan, Elizabeth K. Dollard Professor of Law, Yale University, and Carolyn Miller. While the design and analysis of the project was guided by our consultations with these advisers, the Pew Research Center is solely responsible for the design, interpretation and reporting of the data.

## Methodology

This report is drawn from a survey conducted as part of the American Trends Panel (ATP), a nationally representative panel of randomly selected U.S. adults living in households, created by Pew Research Center. Respondents who self-identify as internet users and who provided an email address participate in the panel via monthly self-administered web surveys, and those who do not use the internet or decline to provide an email address participate via the mail. The panel is being managed by Abt SRBI.

Data in this report are from the May wave of the panel, conducted May 10-June 6, 2016. Most findings in this report were conducted among 1,534 respondents (1,385 by web and 149 by mail) who were randomly assigned to complete one of three forms or sets of questions on the survey. The margin of sampling error for the sample of 1,534 respondents is plus or minus 4.0 percentage points.

Members of the American Trends Panel were recruited from two large, national landline and cellphone random-digit-dial (RDD) surveys conducted in English and Spanish. At the end of each survey, respondents were invited to join the panel. The first group of panelists was recruited from the 2014 Political Polarization and Typology Survey, conducted Jan. 23 to March 16, 2014. Of the 10,013 adults interviewed, 9,809 were invited to take part in

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### Margins of error

	Sample size	Margin of error in percentage points
Full sample in form 3	1,534	+/- 4.0
Men	748	+/- 5.7
Women	786	+/- 5.6
White	1191	+/- 4.5
Black	125	+/- 14.0
Hispanic	115	+/- 14.6
18-29	191	+/- 11.3
30-49	438	+/- 7.5
50-64	486	+/- 7.1
65 and older	417	+/- 7.6
<i>Party affiliation including leaners</i>		
Republican	661	+/- 6.1
Democrat	828	+/- 5.4
<i>Party by ideology</i>		
Conservative Republican	433	+/- 7.5
Mod/lib Republican	226	+/- 10.4
Mod/cons Democrat	408	+/- 7.7
Liberal Democrat	420	+/- 7.6

Note: Whites and blacks include only non-Hispanics; Hispanics are of any race. Republicans and Democrats include independents and other non-partisans who "lean" toward the parties.

The margins of error are reported at the 95% level of confidence and are calculated by taking into account the average design effect for each subgroup.

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

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the panel and a total of 5,338 agreed to participate.<sup>18</sup> The second group of panelists was recruited from the 2015 Survey on Government, conducted Aug. 27 to Oct. 4, 2015. Of the 6,004 adults interviewed, all were invited to join the panel, and 2,976 agreed to participate.<sup>19</sup>

Participating panelists provided either a mailing address or an email address to which a welcome packet, a monetary incentive and future survey invitations could be sent. Panelists also receive a small monetary incentive after participating in each wave of the survey.

The ATP data were weighted in a multistep process that begins with a base weight incorporating the respondents' original survey selection probability and the fact that in 2014 some panelists were subsampled for invitation to the panel. Next, an adjustment was made for the fact that the propensity to join the panel and remain an active panelist varied across different groups in the sample. The final step in the weighting uses an iterative technique that matches gender, age, education, race, Hispanic origin and region to parameters from the U.S. Census Bureau's 2014 American Community Survey. Population density is weighted to match the 2010 U.S. Decennial Census. Telephone service is weighted to estimates of telephone coverage for 2016 that were projected from the July-December 2015 National Health Interview Survey. Volunteerism is weighted to match the 2013 Current Population Survey Volunteer Supplement. It also adjusts for party affiliation using an average of the three most recent Pew Research Center general public telephone surveys. Internet access is adjusted using a measure from the 2015 Survey on Government. Frequency of internet use is weighted to an estimate of

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### Margins of error continued

	Sample size	Margin of error in percentage points
Full sample in form 3	1,534	+/- 4.0
Northeast	292	+/- 9.1
Midwest	340	+/- 8.5
South	533	+/- 6.8
West	369	+/- 8.1
<i>Care about the issue of climate change</i>		
A great deal	615	+/- 6.3
Some or less	915	+/- 5.2
<i>Make an effort to live in ways that help the environment</i>		
All of the time	332	+/- 8.6
Some of the time or less	1198	+/- 4.5

Note: The margins of error are reported at the 95% level of confidence and are calculated by taking into account the average design effect for each subgroup.  
Source: Survey conducted May 10-June 6, 2016.  
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<sup>18</sup> When data collection for the 2014 Political Polarization and Typology Survey began, non-internet users were subsampled at a rate of 25%, but a decision was made shortly thereafter to invite all non-internet users to join. In total, 83% of non-internet users were invited to join the panel.

<sup>19</sup> Respondents to the 2014 Political Polarization and Typology Survey who indicated that they are internet users but refused to provide an email address were initially permitted to participate in the American Trends Panel by mail, but were no longer permitted to join the panel after Feb. 6, 2014. Internet users from the 2015 Survey on Government who refused to provide an email address were not permitted to join the panel.



daily internet use projected to 2016 from the 2013 Current Population Survey Computer and Internet Use Supplement. Sampling errors and statistical tests of significance take into account the effect of weighting. Interviews are conducted in both English and Spanish, but the Hispanic sample in the American Trends Panel is predominantly native born and English speaking.

The margins of error tables show the unweighted sample sizes and the error attributable to sampling that would be expected at the 95% level of confidence for different groups in the survey. Sample sizes and sampling errors for other subgroups are available upon request.

In addition to sampling error, one should bear in mind that question wording and practical difficulties in conducting surveys can introduce error or bias into the findings of opinion polls.

The web component of the May wave had a response rate of 81% (4,091 responses among 5,053 web-based individuals in the panel); the mail component had a response rate of 77% (472 responses among 617 non-web individuals in the panel). Taking account of the combined, weighted response rate for the recruitment surveys (10.0%) and attrition from panel members who were removed at their request or for inactivity, the cumulative response rate for the May ATP wave is 2.9%.<sup>20</sup>

### Questionnaire development and testing

Pew Research Center developed the questionnaire for this study. The design of the questionnaire was informed by the results of nine separate pretests with a non-probability sample, as well as input from Pew Research Center staff and five external advisers on the project.

*Outside advisers:* Pew Research Center consulted with a number of expert advisers, listed in the acknowledgements section above, to inform the development of the questionnaire. We are grateful to this group for their input, though Pew Research Center bears full responsibility for the questionnaire design and analysis.

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### Margin of error continued

	Sample size	Margin of error in percentage points
All forms	4,563	+/- 2.3
<i>Science knowledge</i>		
High	1,357	+/-4.2
Medium	2,348	+/-3.2
Low	858	+/-5.3

Note: The margins of error are reported at the 95% level of confidence and are calculated by taking into account the average design effect for each subgroup.

Source: Survey conducted May 10-June 6, 2016.  
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<sup>20</sup> Approximately once per year, panelists who have not participated in multiple consecutive waves are removed from the panel. These cases are counted in the denominator of cumulative response rates.

## Measurement properties of the science knowledge index

The Pew Research Center survey included a set of nine questions to tap public knowledge of science across a range of principles and topics. The set of questions is evaluated here for the degree to which responses are internally consistent, reflect a single underlying factor or dimension, and differentiate people with higher and lower knowledge scores.

As shown in the accompanying table, the internal reliability or consistency of the scale as measured by Cronbach's alpha is 0.74. Each of the items in the scale is at least moderately correlated the other items.

An exploratory factor analysis finds one common factor explaining 77% of the shared variance in the items. The factor loadings show that each of the nine questions is moderately correlated with this single common factor. These indicators suggest that the set of items is measuring a single underlying dimension.

Note that all of the science knowledge questions are coded as binary variables. Both Cronbach's alpha reliability analysis and the factor analysis are based on a Pearson's correlation matrix. Pearson correlations with binary variables are restricted to a limited range, underestimating the association between two variables when compared with tetrachoric correlations. We do not anticipate the use of a Pearson's correlation matrix affects the unidimensional factor solution for the scale, however.

### Science knowledge scale reliability and factor analysis

Index of 9-items	Item-rest correlation	Alpha for scale	Variance explained by first factor
		0.74	77%
		Alpha if item is dropped	Factor loading
Identify which of four items can be genetically modified	0.46	0.71	0.56
Carbon dioxide is gas created by burning fossil fuels	0.46	0.71	0.55
Calculate the chances an old bridge will collapse over time	0.46	0.71	0.55
Herd immunity refers to health benefits occurring when most in a population get a vaccine	0.45	0.71	0.52
Nitrogen gas makes up most of the Earth's atmosphere	0.44	0.71	0.52
Humans and mice share 50% or more of their genetic makeup	0.41	0.72	0.48
Identify the placebo effect in testing if new drug is effective	0.40	0.72	0.47
Identify the better method to determine if a new drug is effective	0.37	0.72	0.44
Only bacterial infections can be treated effectively by antibiotic medication	0.30	0.74	0.35

Note: Figures based on Pearson correlations. N = 4,563.  
Source: Survey conducted May 10-June 6, 2016.  
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We also ran an item-response theory analysis (IRT) to check how well each question distinguishes between those who know relatively more or less on the scale. This analysis fits a two-parameter logistic model, allowing discrimination and difficulty to vary across items. Discrimination shows the ability of the question to distinguish between those with higher and lower science knowledge. Difficulty shows how easy or hard each question is for the average respondent. We did not include a guessing parameter in the model because the questionnaire offered respondents an explicit option of not sure on the survey.

As desired, the results show variation in both difficulty and discrimination across the nine questions. The questions with the strongest ability to discriminate between those who hold more or less science knowledge are 1) the question about which gas is made as a consequence of burning fossil fuels and 2) the question asking respondents to calculate the conditional probability of an old bridge collapsing over time. The question with the weakest ability to discriminate between those with higher and lower science knowledge is that on the effectiveness of antibiotics to treat bacterial, but not other kinds of infections.

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### Item response theory analysis of the science knowledge index

	% Correct	Difficulty	Discrimination
Carbon dioxide is gas created by burning fossil fuel	68	-0.61	2.08
Identify the better method to determine if a new drug is effective	65	-0.63	1.25
Calculate the chances an old bridge will collapse over time	58	-0.27	2.00
Identify the placebo effect in testing if new drug is effective	55	-0.20	1.56
Only bacterial infections can be treated effectively by antibiotic medication	44	0.31	0.88
Identify which of four items can be genetically modified	36	0.51	1.67
Humans and mice share 50% or more of their genetic makeup	33	0.79	1.17
Herd immunity refers to health benefits occurring when most in a population get a vaccine	32	0.69	1.60
Nitrogen gas makes up most of the Earth's atmosphere	27	0.84	1.83

Note: Based on a two-parameter logistic model. N = 4,563.

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

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The test information curve mirrors a normal curve centered around zero, suggesting that the science knowledge index provides the most information about Americans near the mean level of knowledge.

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## Appendix A: Detailed tables

The following tables detail public knowledge about science by education, age, gender, race and ethnicity for each of the nine questions in the science knowledge index.

These tables are followed by summary statistics showing the results of a series of statistical models predicting people's beliefs about climate change and their views of climate scientists from a set of explanatory or independent variables.

The regression analyses using a binary logistic model are based on the full sample of U.S. adults in the survey. The analysis is based on the weighted sample, thus adjusting for differences in the probability of selection and nonresponse differences across groups. Results are based on 0.05 level of statistical significance. The dependent variable omits respondents who gave no response to that question.

The independent variables used in each analysis are as follows: party affiliation (Democrats and leaning Democrats, those with no affiliation or leaning toward either party as compared with Republicans and leaning Republicans); political ideology (liberals, moderates as compared with conservatives); education (having a postgraduate degree, college degree or some college as compared with those having high school degrees or less education); science knowledge (those with a high or medium knowledge level as compared with those have a low knowledge level based on the nine-item index); age (ages 18-29, 30-49, 50-64 as compared with those ages 65 and older); gender (women compared with men); race and ethnicity (non-Hispanic blacks, Hispanics and other or mixed race as compared with non-Hispanic whites).<sup>21</sup>

The total number of respondents in each analysis ranges between roughly 1479 to a possible maximum of 1,534 respondents, depending on the number of respondents missing responses to either an independent variable in the model or to the dependent variable.

A separate set of analyses tested the effect of science knowledge separately among Republicans (and independents who identify with the Republican Party) and Democrats (and independents

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<sup>21</sup> Several of the conceptual independent factors such as age or education are tested with a set of independent variables. Factors are classified as significant if the most extreme category in each set is significant at the .05 level. The difference in predicted probabilities shown compare the most extreme category with the baseline comparison group. Race/ethnicity is classified as having a significant effect if either the variable for black or the variable for Hispanic is statistically different than non-Hispanic whites, the baseline comparison group.

who identify with the Democratic Party). These analyses are conducted with roughly 635 to a maximum of 661 Republicans and 808 to a maximum of 828 Democrats.<sup>22</sup>

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### There are large differences in science knowledge by educational level

*% answering each question correctly*

	Postgrad degree	College degree	Some college	H.S. or less	Difference
Calculate the chances an old bridge will collapse over time	83	77	63	38	+45
Identify the placebo effect in testing if new drug is effective	79	75	59	35	+44
Identify which of four items can be genetically modified	60	54	37	19	+41
Identify the better method to determine whether a new drug is effective	85	79	68	48	+37
Only a bacterial infection can be treated effectively by antibiotic medication	68	56	44	32	+36
Herd immunity refers to health benefits occurring when most in a population get a vaccine	54	44	33	18	+36
Carbon dioxide is gas created by burning fossil fuels	84	82	71	53	+31
Humans and mice share 50% or more of their genetic makeup	52	42	33	21	+31
Nitrogen gas makes up most of the Earth's atmosphere	43	40	29	14	+29

Note: Respondents who gave other responses or who did not give an answer are not shown.  
Source: Survey conducted May 10-June 6, 2016.  
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<sup>22</sup> We also ran a series of linear regression models for dependent variables with at least four categories; and a series of models using multinomial logistic regression or ordered logistic regression depending on the nature of the dependent variable. Results of those analyses are substantively similar to the findings from the binary logistic regression models shown in these tables.

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## Younger adults tend to know more about these science questions with one exception

*% answering each question correctly*

	<b>18-29</b>	<b>30-49</b>	<b>50-64</b>	<b>65+</b>	<b>Diff- erence</b>
Calculate the chances an old bridge will collapse over time	68	64	51	49	+19
Identify the placebo effect in testing if new drug is effective	62	64	49	43	+19
Herd immunity refers to health benefits occurring when most in a population get a vaccine	41	36	26	24	+17
Humans and mice share 50% or more of their genetic makeup	40	35	28	26	+14
Nitrogen gas makes up most of the Earth's atmosphere	34	32	20	20	+14
Identify which of four items can be genetically modified	38	43	32	28	+10
Carbon dioxide is gas created by burning fossil fuels	70	71	67	63	+7
Identify the better method to determine whether a new drug is effective	69	68	59	62	+7
Only a bacterial infection can be treated effectively by antibiotic medication	33	46	46	50	-17

Note: Respondents who gave other responses or who did not give an answer are not shown.

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

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## Men know more than women on some, not all of these science knowledge questions

*% answering each question correctly*

	<b>Men</b>	<b>Women</b>	<b>Difference</b>
Carbon dioxide is gas created by burning fossil fuels	76	60	+16
Calculate the chances an old bridge will collapse over time	66	51	+15
Identify which of four items can be genetically modified	44	29	+15
Nitrogen gas makes up most of the Earth's atmosphere	34	21	+13
Humans and mice share 50% or more of their genetic makeup	35	31	+4
Herd immunity refers to health benefits occurring when most in a population get a vaccine	34	30	+4
Identify the better method to determine whether a new drug is effective (give drug to half of them)	66	63	+3
Identify the placebo effect in testing if new drug is effective	57	54	+3
Only a bacterial infection can be treated effectively by antibiotic medication	40	48	-8

Note: Respondents who gave other responses or who did not give an answer are not shown.

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

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## Science knowledge varies by race, ethnicity

*% answering each question correctly*

	<b>White</b>	<b>Black</b>	<b>Hispanic</b>
Carbon dioxide is gas created by burning fossil fuels	73	47	62
Identify the better method to determine whether a new drug is effective	69	47	59
Calculate the chances an old bridge will collapse over time	65	31	48
Identify the placebo effect in testing if new drug is effective	63	32	40
Only a bacterial infection can be treated effectively by antibiotic medication	51	22	34
Identify which of four items can be genetically modified	43	18	19
Herd immunity refers to health benefits occurring when most in a population get a vaccine	36	16	23
Humans and mice share 50% or more of their genetic makeup	35	19	30
Nitrogen gas makes up most of the Earth's atmosphere	30	12	22

Note: White and black include only non-Hispanics; Hispanics are of any race. Respondents who gave other responses or who did not give an answer are not shown.

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

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## Political factors, issue-concern are strong predictors of people's beliefs about climate change

*Difference in predicted probabilities on a scale of 0 to 1 for each factor*

	Party	Ideology	Care about issue	Education	Science Knowledge	Age group	Gender	Race, ethnicity
<b>Beliefs about climate change</b>								
Predicting belief that Earth's warming is due to human activity								
Earth is warmer mostly due to human activity	+0.21	NS	+0.16	+0.13	NS	NS	NS	NS
<b>Very likely to occur due to climate change</b>								
Predicting very likely								
Storms become more severe	NS	NS	+0.46	NS	NS	NS	+0.16	NS
Rising sea levels that erode shorelines	+0.15	+0.23	+0.49	NS	+0.19	-0.16	+0.13	NS
Damage to forests and plant life	NS	+0.26	+0.46	NS	+0.20	NS	NS	NS
More droughts or water shortages	+0.13	+0.28	+0.43	NS	+0.21	NS	+0.10	NS
Harm to wildlife and their habitats	NS	+0.20	+0.44	NS	+0.21	NS	+0.12	NS
<b>Will occur within 50 years</b>								
Predicting will definitely or probably happen								
Americans will make major changes to their way of life	NS	NS	NS	NS	NS	NS	NS	NS
New technology will solve most climate problems	NS	+0.15	+0.11	NS	-0.15	NS	-0.10	NS
<b>Can make a big difference to address climate change</b>								
Predicting a big difference								
People reducing their carbon footprints	NS	+0.18	+0.35	NS	NS	NS	NS	+0.18 Hispanic
Restrictions on power plant emissions	NS	+0.27	+0.45	NS	NS	NS	NS	NS
More people driving hybrids	NS	NS	+0.31	NS	NS	+0.15	NS	+0.20 Hispanic
International agreement to limit emissions	NS	+0.27	+0.43	NS	NS	NS	NS	NS
Tougher fuel efficiency standards	NS	+0.22	+0.40	NS	NS	NS	NS	NS
Corporate tax incentives	NS	+0.32	+0.33	NS	NS	NS	NS	+0.21 Hispanic

Notes: Figures shown are differences between selected groups in the predicted probabilities of saying the response shown while other factors are held at their mean using binary logistic regressions. Positive and negative values indicate the direction of effects. NS indicates not statistically significant (based on a two-tailed  $p$  value <0.05).

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

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## Party, ideology and issue-concern are strong predictors of people's views about climate scientists

*Difference in predicted probabilities on a scale of 0 to 1 for each factor*

	Party	Ideology	Care about issue	Education	Science Knowledge	Age group	Gender	Race, ethnicity
<b>Climate scientists policy role</b>								
Predicting a major role								
Climate scientists should have a major role in climate policy decisions	NS	NS	+0.33	+0.14	NS	NS	NS	NS
<b>Climate scientists understand very well...</b>								
Predicting very well								
Whether climate change is occurring	NS	+0.31	+0.46	+0.19	+0.18	NS	NS	NS
The causes of climate change	NS	+0.20	+0.31	NS	NS	NS	NS	NS
The best ways to address climate change	+0.08	NS	+0.21	NS	NS	NS	NS	NS
<b>Perception of scientific consensus</b>								
Predicting almost all agree								
Almost all climate scientists agree that climate change is caused by human activity	+0.19	NS	+0.26	+0.14	+0.21	NS	NS	NS
<b>Information on causes of climate change</b>								
Predicting trust a lot								
Trust climate scientists a lot to give full and accurate information on causes of climate change	+0.19	+0.26	+0.37	NS	+0.25	NS	NS	NS
<b>Research findings are influenced by ____ most of the time</b>								
Predicting most of the time								
Best available scientific evidence	+0.19	+0.18	+0.21	NS	+0.22	NS	NS	-0.16 Black -0.14 Hisp.
Concern for best interests of public	+0.18	NS	+0.23	NS	NS	NS	NS	NS
Scientists' desire to advance their careers	-0.13	-0.23	NS	NS	NS	-0.28	-0.10	NS
Scientists' own political leanings	-0.18	-0.18	NS	-.10	NS	-0.31	NS	NS
Researchers' desire to help the industries they work with or work for	NS	NS	+0.09	NS	NS	NS	NS	NS

Notes: Figures shown are differences between selected groups in the predicted probabilities of saying the response shown while other factors are held at their mean using binary logistic regressions. Positive and negative values indicate the direction of effects. NS indicates not statistically significant (based on a two-tailed  $p$  value <0.05).

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

"The Politics of Climate"

PEW RESEARCH CENTER

## Exploring the role of education and science knowledge in explaining climate beliefs separately among Republicans, Democrats

Differences in predicted probabilities on a scale of 0 to 1 for each factor

	Among Republicans				Among Democrats			
	Conservative	Care about issue	Education	Science Knowledge	Liberal	Care about issue	Education	Science Knowledge
<b>Beliefs about climate change</b>								
Predicting belief that Earth's warming is due to human activity								
Earth is warmer mostly due to human activity	NS	+0.19	NS	NS	NS	+0.10	+0.11	+0.16
<b>Very likely to occur due to climate change</b>								
Predicting very likely								
Storms become more severe	-0.19	+0.38	+0.28	NS	NS	+0.51	NS	+0.33
Rising sea levels that erode shorelines	-0.21	+0.46	+0.19	NS	NS	+0.47	NS	+0.33
Damage to forests and plant life	-0.20	+0.43	NS	NS	NS	+0.46	NS	+0.23
More droughts or water shortages	-0.23	+0.30	NS	NS	NS	+0.46	NS	NS
Harm to wildlife and their habitats	-0.17	+0.32	NS	NS	NS	+0.47	NS	+0.31
<b>Will occur within 50 years</b>								
Predicting will definitely or probably happen								
Americans will make major changes to their way of life	-0.19	NS	NS	NS	NS	NS	NS	NS
New technology will solve most climate problems	-0.18	NS	NS	NS	NS	+0.14	NS	NS
<b>Can make a big difference to address climate change</b>								
Predicting a big difference								
People reducing their carbon footprints	-0.20	+0.40	NS	NS	NS	+0.33	NS	NS
Restrictions on power plant emissions	-0.24	+0.46	+0.26	NS	+0.15	+0.38	NS	NS
More people driving hybrids	NS	+0.23	NS	NS	NS	+0.30	NS	NS
International agreement to limit emissions	-0.22	+0.46	NS	NS	NS	+0.37	NS	NS
Tougher fuel efficiency standards	-0.17	+0.43	NS	NS	NS	+0.33	NS	NS
Corporate tax incentives	-0.24	+0.34	NS	NS	+0.14	+0.31	NS	NS

Notes: Figures shown are differences between selected groups in the predicted probabilities of saying the response shown while other factors are held at their mean using binary logistic regressions. Positive and negative values indicate the direction of effects. NS indicates not statistically significant (based on a two-tailed  $p$  value  $<0.05$ ). Estimated effects for gender, age, race and ethnicity are not shown.

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

"The Politics of Climate"

PEW RESEARCH CENTER

## Exploring the role of education, science knowledge in explaining views of climate scientists separately for Republicans and Democrats

Estimated effects from regression models predicting views about climate scientists separately for each party group

	Among Republicans				Among Democrats			
	Conservative	Care about issue	Education	Science Knowledge	Liberal	Care about issue	Education	Science Knowledge
<b>Climate scientists policy role</b>								
Predicting a major role								
Climate scientists should have a major role in climate policy decisions	-0.19	+0.35	+0.22	NS	NS	+0.24	NS	+0.13
<b>Climate scientists understand very well...</b>								
Predicting very well								
Whether climate change is occurring	NS	+0.42	NS	NS	+0.26	+0.46	NS	+0.39
The causes of climate change	NS	+0.27	NS	NS	+0.14	+0.33	NS	+0.36
The best ways to address climate change	NS	+0.18	NS	NS	NS	+0.23	NS	NS
<b>Perception of scientific consensus</b>								
Predicting almost all agree human activity is mostly responsible for climate change								
Almost all climate scientists agree that climate change is caused by human activity	NS	+0.12	NS	NS	+0.12	+0.33	+0.23	+0.34
<b>Information on causes of climate change</b>								
Predicting trust a lot								
Trust climate scientists a lot to give full and accurate information on causes of climate change	-0.14	+0.29	+0.21	NS	NS	+0.38	NS	+0.49
<b>Research findings are influenced by ___ most of the time</b>								
Predicting most of the time								
Best available scientific evidence	-0.16	+0.18	NS	NS	NS	+0.22	NS	+0.36
Concern for best interests of public	-0.05	+0.16	NS	NS	NS	+0.26	NS	NS
Scientists' desire to advance their careers	NS	-0.18	-0.25	+0.31	NS	NS	NS	-0.19
Scientists' own political leanings	+0.22	NS	NS	+0.20	NS	NS	NS	NS
Researchers' desire to help the industries they work with or work for	NS	NS	NS	NS	NS	+0.13	-0.16	NS

Notes: Figures shown are differences between selected groups in the predicted probabilities of saying the response shown while other factors are held at their mean using binary logistic regressions. Positive and negative values indicate the direction of effects. NS indicates not statistically significant (based on a two-tailed  $p$  value  $<0.05$ ). Estimated effects for gender, age, race and ethnicity are not shown.

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

"The Politics of Climate"

PEW RESEARCH CENTER

## Survey questionnaire and topline

### 2016 PEW RESEARCH CENTER'S AMERICAN TRENDS PANEL

WAVE 17 May

FINAL TOPLINE

May 10 – June 6, 2016

FORM 3 N=1,534

#### ASK ALL FORMS [N=4,563]:

TALK Thinking about conversations you have had in person, on the phone, or by email, text message or social media, which of these topics, if any, have you talked about in the PAST 7 DAYS?

	<u>Selected</u>	<u>Not selected /No answer</u>
a. The economy and job situation May 10-June 6,2016	46	54
b. Severe storms May 10-June 6,2016	37	63
c. Food and nutrition May 10-June 6,2016	47	53
d. The 2016 presidential election campaign May 10-June 6,2016	66	34
e. Health and medicine May 10-June 6,2016	53	47
f. Sports May 10-June 6,2016	36	64
g. None of these [ <b>EXCLUSIVE PUNCH</b> ] May 10-June 6,2016	7	93

#### ASK ALL FORMS [N=4,563] EXCEPT WHERE NOTED:

CONF How much confidence, if any, do you have in each of the following to act in the best interests of the public? [**RANDOMIZE ITEMS**]

##### a. Elected officials

May 10-June 6

2016

3	A great deal of confidence
24	A fair amount of confidence
54	Not too much confidence
19	No confidence at all
1	No answer

##### b. The news media

May 10-June 6

2016

5	A great deal of confidence
33	A fair amount of confidence
40	Not too much confidence
21	No confidence at all
1	No answer

**CONF CONTINUED...**

c. The military  
May 10-June 6

2016

33	A great deal of confidence
46	A fair amount of confidence
15	Not too much confidence
5	No confidence at all
1	No answer

**ASK FORM 1 [N=1,549]:**

d. Medical scientists  
May 10-June 6

2016

24	A great deal of confidence
60	A fair amount of confidence
12	Not too much confidence
3	No confidence at all
1	No answer

**ASK FORM 2 AND FORM 3 [N=3,014]:**

d. Scientists  
May 10-June 6

2016

21	A great deal of confidence
55	A fair amount of confidence
18	Not too much confidence
4	No confidence at all
1	No answer

e. Religious leaders  
May 10-June 6

2016

13	A great deal of confidence
39	A fair amount of confidence
32	Not too much confidence
14	No confidence at all
1	No answer

f. Public school principals and superintendents for grades K-12  
May 10-June 6

2016

13	A great deal of confidence
53	A fair amount of confidence
27	Not too much confidence
7	No confidence at all
1	No answer

**CONF CONTINUED...**

g. Business leaders

May 10-June 6

2016

4	A great deal of confidence
37	A fair amount of confidence
44	Not too much confidence
14	No confidence at all
1	No answer

**OTHER QUESTIONS HELD FOR FUTURE RELEASE OR PREVIOUSLY RELEASED****ASK FORM 3 [N=1,534] [RANDOMIZE ITEMS D-F]:**

LOCAL How much, if at all, is each of the following a problem in your local community?

**[RANDOMIZE ITEMS]**

d. Air pollution

May 10-June 6

2016

19	Big problem in my local community
44	Small problem in my local community
36	Not a problem in my local community
1	No answer

e. Water pollution of lakes, rivers and streams

May 10-June 6

2016

23	Big problem in my local community
43	Small problem in my local community
33	Not a problem in my local community
1	No answer

f. Too much land development

May 10-June 6

2016

29	Big problem in my local community
37	Small problem in my local community
34	Not a problem in my local community
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV1 Compared with twenty years ago, do you think the U.S. is producing...

May 10-June 6

2016

72	More energy today
10	Less energy today
17	About the same amount of energy today
1	No answer

**ASK FORM 3 [N=1,534]:**ENV2 Do you favor or oppose EXPANDING each of the following sources of energy in our country? **[RANDOMIZE ITEMS]**

May 10-June 6, 2016	<u>Favor</u>	<u>Oppose</u>	<u>No answer</u>
a. More offshore oil and gas drilling in U.S. waters	45	52	3
b. More nuclear power plants to generate electricity	43	54	3
c. More coal mining	41	57	3
d. More solar panel "farms"	89	9	2
e. More hydraulic fracturing or "fracking" for oil and natural gas	42	53	5
f. More wind turbine "farms"	83	14	3

**NO QUESTION ENV3****ASK FORM 3 [N=1,534]:**

ENV4 Have you given serious thought to installing solar panels to generate electricity for your home within the past 12 months, or haven't you done this?

May 10-June 6

2016

37	I have given serious thought to installing solar panels at home
4	I have already installed solar panels at home
56	I have not installed nor given serious thought to installing solar panels
3	No answer



**ASK IF "GIVEN SERIOUS THOUGHT TO INSTALLING SOLAR PANELS AT HOME" (ENV4=1) OR "HAVE ALREADY INSTALLED SOLAR PANELS AT HOME" (ENV4=2) [N=670]:**

ENV5 **[ASK IF "GIVEN SERIOUS THOUGHT TO INSTALLING SOLAR PANELS AT HOME" (ENV4=1):** Is each of the following a reason you would install solar panels at your home, or not? **/ASK IF "HAVE ALREADY INSTALLED SOLAR PANELS AT HOME" (ENV4=2):** Is each of the following a reason that you have installed solar panels at your home, or not? **[RANDOMIZE ITEMS]**

May 10-June 6,2016		<u>Yes, a reason</u>	<u>No, not a reason</u>	<u>No answer</u>
a.	To save money on utility bills	92	6	2
b.	To help the environment	87	12	1
c.	Because it would be better for my own health and my family's health	67	32	1
d.	To get a solar investment tax credit	59	38	2

**ASK FORM 3 [N=1,534]:**

On a different topic...

ENV6 Which, if any, of the following have you done within the PAST 12 MONTHS?

*[Check all that apply]* **[RANDOMIZE ITEMS; item g always last]**

May 10-June 6,2016		<u>Selected</u>	<u>Not selected /No answer</u>
a.	Participated in a clean-up day at a park, public place, or neighborhood	14	86
b.	Worked in a PUBLIC SPACE tending to or planting flowers, trees or shrubs	10	90
c.	Worked to take care of a vegetable garden for your family's use	34	66
d.	Taken a hike in a park or natural setting outdoors	50	50
e.	Been camping overnight	16	84
f.	Been hunting or fishing	21	79
g.	None of these <b>[EXCLUSIVE PUNCH]</b>	27	73

**ASK FORM 3 [N=1,534]:**ENV7 How often, if at all, do you do the following? **[RANDOMIZE ITEMS]**

a. Use your own bags for shopping purchases because it is better for the environment

May 10-June 6

2016

15	Always
38	Sometimes
17	Not too often
29	Never
1	No answer

b. Buy a cleaning product because the ingredients in it are better for the environment

May 10-June 6

2016

12	Always
45	Sometimes
23	Not too often
18	Never
2	No answer

**ASK FORM 3 [N=1,534]:**

ENV8 Do you currently have any of the following in your home or yard?

*[Check all that apply]* **[RANDOMIZE ITEMS; item e always last]**

May 10-June 6, 2016

	<u>Selected</u>	<u>Not selected</u> <u>/No answer</u>
a. A compost pile	21	79
b. A rain barrel or catch for rainwater	11	89
c. A vegetable garden	33	67
d. Recycling containers for plastic or paper goods	63	37
e. None of these <b>[EXCLUSIVE PUNCH]</b>	24	76

**ENV9 THROUGH ENV15 HELD FOR FUTURE RELEASE OR PREVIOUSLY RELEASED**

**ASK FORM 3 [N=1,534]:**ENV16 How much, if at all, does it bother you to see... **[RANDOMIZE ITEMS]**

## a. People drinking from a disposable water bottle

May 10-June 6

2016

14	A lot
22	Some
30	Not too much
32	None
1	No answer

## b. People throwing away things in the trash that could be recycled

May 10-June 6

2016

32	A lot
41	Some
15	Not too much
10	None
1	No answer

## c. People incorrectly putting things in recycling bins that the local community does not recycle

May 10-June 6

2016

25	A lot
41	Some
21	Not too much
11	None
2	No answer

## d. People driving places that are close enough to walk

May 10-June 6

2016

21	A lot
31	Some
28	Not too much
19	None
1	No answer

## e. People leaving lights and electronic devices on when no one is using them

May 10-June 6

2016

36	A lot
40	Some
15	Not too much
8	None
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV17 How often, if ever, do you make an effort to live in ways that help protect the environment?

May 10-June 6

2016

20	All the time
63	Some of the time
13	Not too often
4	Not at all
*	No answer

**ASK FORM 3 [N=1,534]:**

ENV18 Would you describe yourself as particularly concerned or not particularly concerned about helping the environment as you go about your daily life?

May 10-June 6

2016

75	Particularly concerned about helping the environment
24	Not particularly concerned about helping the environment
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV19 Thinking about your CLOSEST FAMILY AND FRIENDS, how many of them always make an effort to live in ways that help protect the environment?

May 10-June 6

2016

26	Most of them
45	Some of them
23	Only a few
6	None of them
*	No answer

**ASK FORM 3 [N=1,534]:**

On the topic of climate change...

ENV20A Which of these three statements about the Earth's temperature comes closest to your view?  
**[RANDOMIZE OPTIONS 1 and 2; KEEP 3 and 8 LAST]**

May 10-June 6

2016

26	The Earth is getting warmer mostly because of human activity such as burning fossil fuels
45	The Earth is getting warmer mostly because of natural patterns in the Earth's environment
14	There is no solid evidence that the Earth is getting warmer
14	Not sure
1	No answer

**ASK IF NOT SURE OR NO ANSWER (ENV20A=8,99) [N=156]:**

ENV20B Even if you are not sure, which of these three statements about the Earth's temperature comes closest to your view? **[SAME ORDER AS ABOVE]**

May 10-June 6

2016

29	The Earth is getting warmer mostly because of human activity such as burning fossil fuels
20	The Earth is getting warmer mostly because of natural patterns in the Earth's environment
41	There is no solid evidence that the Earth is getting warmer
	No answer

**COMBINED RESPONSES ENV20A AND ENV20B [N=1,534]:**

May 10-June 6

2016

48	The Earth is getting warmer mostly because of human activity such as burning fossil fuels/lean The Earth is getting warmer mostly because of natural patterns in the Earth's environment/lean
31	The Earth is getting warmer mostly because of natural patterns in the Earth's environment/lean
20	There is no solid evidence that the Earth is getting warmer/lean
2	No answer

**ASK FORM 3 [N=1,534]:**

ENV21 How much do you, personally, care about the issue of global climate change?

May 10-June 6

2016

36	A great deal
38	Some
18	Not too much
8	Not at all
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV22 Thinking about the following proposals to address global climate change, how much difference, if any, do you think each can make? **[RANDOMIZE ITEMS]**

a. People's efforts to reduce their "carbon footprint," that is the amount of greenhouse gas emissions caused by their actions in everyday life

May 10-June 6

2016

38	A big difference
44	A small difference
16	Almost no difference
2	No answer

b. Restrictions on power plant carbon emissions

May 10-June 6

2016

51	A big difference
34	A small difference
13	Almost no difference
2	No answer

c. More people driving hybrid and electric automobiles

May 10-June 6

2016

41	A big difference
39	A small difference
18	Almost no difference
2	No answer

d. An international agreement to limit carbon emissions

May 10-June 6

2016

49	A big difference
33	A small difference
16	Almost no difference
2	No answer

e. Tougher fuel efficiency standards for automobiles and trucks

May 10-June 6

2016

46	A big difference
38	A small difference
14	Almost no difference
2	No answer

**ENV22 CONTINUED...**

f. Corporate tax incentives to encourage businesses to reduce their "carbon footprint," that is the amount of greenhouse gas emissions caused by their actions

May 10-June 6

2016

45	A big difference
38	A small difference
16	Almost no difference
2	No answer

**ASK FORM 3 [N=1,534]:**

ENV23 Do you think each of the following things will or will not happen in the NEXT 50 YEARS, that is before the year 2066? **[RANDOMIZE ITEMS A AND B]**

a. New technology will solve most of the problems from global climate change

May 10-June 6

2016

7	Will definitely happen
48	Will probably happen
37	Will probably NOT happen
7	Will definitely NOT happen
1	No answer

b. We will make MAJOR changes to our way of life in America in order to address the problems from global climate change

May 10-June 6

2016

14	Will definitely happen
47	Will probably happen
33	Will probably NOT happen
4	Will definitely NOT happen
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV24 **[ASK IF "EARTH IS GETTING WARMER" ENV20A=1,2 OR ENV20B=1,2]:** From what you have heard or read, how likely, if at all, are each of the following to occur because of global climate change?

**[ASK IF "NO SOLID EVIDENCE" ENV20A=3 OR ENV20B=3 OR NO ANSWER (ENV20B=99)]:**

From what you have heard or read, how likely, if at all, would each of the following be to occur because of global climate change? **[RANDOMIZE ITEMS]**

a. Storms become more severe

May 10-June 6

2016

42	Very likely
36	Fairly likely
15	Not too likely
6	Not at all likely
1	No answer

**ENV24 CONTINUED...**

b. Rising sea levels that erode beaches and shore lines

May 10-June 6

2016

41	Very likely
35	Fairly likely
17	Not too likely
6	Not at all likely
1	No answer

c. Damage to forests and plant life

May 10-June 6

2016

42	Very likely
35	Fairly likely
16	Not too likely
6	Not at all likely
1	No answer

d. More droughts or water shortages

May 10-June 6

2016

42	Very likely
34	Fairly likely
17	Not too likely
6	Not at all likely
1	No answer

e. Harm to animal wildlife and their habitats

May 10-June 6

2016

43	Very likely
36	Fairly likely
15	Not too likely
5	Not at all likely
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV25 What role, if any, do you think each of the following groups should have in MAKING DECISIONS ABOUT POLICY ISSUES related to global climate change? **[RANDOMIZE ITEMS]**

a. Elected officials

May 10-June 6

2016

44	A major role
40	A minor role
14	No role
2	No answer



**ENV25 CONTINUED...**

## b. The general public

May 10-June 6

2016

56	A major role
33	A minor role
9	No role
2	No answer

## c. Climate scientists

May 10-June 6

2016

67	A major role
23	A minor role
9	No role
2	No answer

## d. Energy industry leaders

May 10-June 6

2016

53	A major role
32	A minor role
13	No role
2	No answer

## e. Leaders from other nations

May 10-June 6

2016

45	A major role
36	A minor role
18	No role
2	No answer

**ASK FORM 3 [N=1,534]:**

ENV26 Thinking about what you have heard or read, how well do climate scientists understand...  
**[RANDOMIZE ITEMS]**

a. Whether or not global climate change is occurring

May 10-June 6

2016

33	Very well
39	Fairly well
18	Not too well
9	Not at all well
1	No answer

b. The causes of global climate change

May 10-June 6

2016

28	Very well
40	Fairly well
22	Not too well
9	Not at all well
1	No answer

c. The best ways to address global climate change

May 10-June 6

2016

19	Very well
45	Fairly well
26	Not too well
9	Not at all well
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV27 How much, if at all, do you trust each of the following groups to give full and accurate information about THE CAUSES of global climate change? **[RANDOMIZE ITEMS]**

a. Elected officials

May 10-June 6

2016

4	A lot
25	Some
43	Not too much
27	Not at all
1	No answer

b. Climate scientists

May 10-June 6

2016

39	A lot
39	Some
13	Not too much
9	Not at all
1	No answer

**ENV27 CONTINUED...**

c. Energy industry leaders

May 10-June 6

2016

7	A lot
34	Some
36	Not too much
22	Not at all
1	No answer

d. The news media

May 10-June 6

2016

7	A lot
36	Some
31	Not too much
25	Not at all
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV28 As far as you know, how many climate scientists say that human behavior is mostly responsible for global climate change?

May 10-June 6

2016

27	Almost all
35	More than half
20	About half
11	Fewer than half
4	Almost none
3	No answer

**ASK FORM 3 [N=1,534]:**

ENV29 How often, if ever, do you think research findings from climate scientists about global climate change are influenced by each of the following? **[RANDOMIZE ITEMS]**

a. The desire to help the industries they work with or work for

May 10-June 6

2016

26	Most of the time
53	Some of the time
16	Not too often
3	Never
2	No answer

**ENV29 CONTINUED...**

b. Concern for the best interests of the public

May 10-June 6

2016

23	Most of the time
48	Some of the time
22	Not too often
6	Never
1	No answer

c. Their own personal political leanings

May 10-June 6

2016

27	Most of the time
46	Some of the time
21	Not too often
3	Never
2	No answer

d. The desire to advance their career

May 10-June 6

2016

36	Most of the time
43	Some of the time
16	Not too often
3	Never
2	No answer

e. The best available scientific evidence

May 10-June 6

2016

32	Most of the time
48	Some of the time
15	Not too often
3	Never
2	No answer

**ASK FORM 3 [N=1,534]:**

ENV30 How closely, if at all, do you follow news about global climate change?

May 10-June 6

2016

11	Very closely
44	Somewhat closely
32	Not too closely
12	Not at all closely
1	No answer

**ASK FORM 3 [N=1,534]:**

ENV31 Overall, how would you rate the job news media do in covering issues about global climate change?

May 10-June 6

2016

6	Very good job
41	Somewhat good job
35	Somewhat bad job
16	Very bad job
2	No answer

**NO QUESTION ENV32****[RANDOMIZE ITEMS ENV33-ENV34]****ASK FORM 3 [N=1,534]:**

Thinking about the reporting you've seen or heard about global climate change...

ENV33 Do you think the news media generally... **[RANDOMIZE ORDER OF OPTIONS 1 AND 2 WITH 3 ALWAYS LAST]**

May 10-June 6

2016

35	Exaggerate the threat of climate change from global warming
42	Don't take the threat of climate change seriously enough
20	Are about right in their reporting
3	No answer

**ASK FORM 3 [N=1,534]:**

ENV34 Do you think the news media generally... **[RANDOMIZE ORDER OF OPTIONS 1 AND 2 WITH 3 ALWAYS LAST]**

May 10-June 6

2016

32	Give too much attention to skeptics of climate change
40	Give too little attention to skeptics of climate change
25	Give about the right amount of attention to skeptics of climate change
3	No answer

**ASK ALL FORMS [N=4,563]:**

Here's a different kind of question. (If you don't know the answer, select "Not sure.") As far as you know...<sup>23</sup>

**ASK ALL:**

KNOSCT22 Which is the better way to determine whether a new drug is effective in treating a disease? If a scientist has a group of 1,000 volunteers with the disease to study, should she...

**[RANDOMIZE OPTIONS 1-2]<sup>24</sup>**

May 10-June 6

2016

65	Give the drug to half of them but not to the other half, and compare how many in each group get better ( <i>Correct</i> )
35	NET Incorrect/Not sure/No answer
14	Give the drug to all of them and see how many get better
20	Not sure
1	No answer

**[RANDOMIZE ITEMS KNOSCT23 TO KNOSCT34; KNOSCT22 ALWAYS FIRST]****ASK ALL FORMS [N=4,563]:**

KNOSCT23 What gas is made as a consequence of burning fossil fuels? Is it ... **[RANDOMIZE OPTIONS 1-4]<sup>25</sup>**

May 10-June 6

2016

68	Carbon dioxide ( <i>Correct</i> )
32	NET Incorrect/Not sure/No answer
4	Hydrogen
1	Helium
2	Radon
24	Not sure
1	No answer

**NO QUESTION KNOSCT24, KNOSCT25 AND KNOSCT26**

<sup>23</sup> This set of questions include an option of "not sure" in keeping with the analysis by Roger Tourangeau, Aaron Maitland and Yanna Yan, 2016, "Assessing the Scientific Knowledge of the General Public: The Effects of Question Format and Encouraging or Discouraging Don't Know Responses," [Public Opinion Quarterly](#).

<sup>24</sup> For comparison, a Pew Research Center survey conducted March 7-10, 2013 found 75% of adults answering this question correctly over the telephone with no explicit option provided of saying don't know or not sure.

<sup>25</sup> A similar concept in a Pew Research Center survey conducted by telephone March 7-10, 2013 found 75% of adults identified carbon dioxide as the "gas which most scientists believe cause temperatures in the atmosphere to rise."

**ASK ALL FORMS [N=4,563]:**

KNOSCT27 If the chances that an old bridge will collapse starts at 1% in week 1 and doubles each week (as shown below), what is the chance that the old bridge will collapse during week 7?

Chances the bridge will collapse is ...

1% at Week 1  
2% at Week 2  
4% at Week 3  
8% at Week 4

Enter the % chance that the bridge will collapse at Week 7

May 10-June 6

2016

58 64% (*Correct*)<sup>26</sup>  
42 NET Incorrect/Not sure/No answer  
20 All other numeric responses  
19 Not sure  
2 No answer

**ASK ALL FORMS [N=4,563]:**

KNOSCT28 Which of the following conditions can be treated effectively by antibiotic medications?

[Check all that apply] **[RANDOMIZE ITEMS with ITEM e and f always last]**

May 10-June 6

2016

44 Bacterial infection only (*Correct*)  
56 NET Incorrect/Not sure/No answer

		<u>Selected</u>	<u>Not selected</u> <u>/No answer</u>
a.	Viral infections (such as a cold)	22	78
b.	Fungal infections (such as athlete's foot)	27	73
c.	Bacterial infections (such as strep throat infections)	81	19
d.	Allergic reactions to insect bites	17	83
e.	None of these <b>[EXCLUSIVE PUNCH]</b>	2	98
f.	Not sure <b>[EXCLUSIVE PUNCH]</b>	10	90

<sup>26</sup> This question is adapted from literature numeracy and its relationship with people's health literacy. See Joshua A. Weller et al. 2013. "Development and Testing of an Abbreviated Numeracy Scale: A Rasch Analysis Approach," Journal of Behavioral Decision Making, vol. 26 (198-212). Note that a few respondents mentioned that the correct answer could be ambiguous if respondents' interpret the question to use unconditional probabilities. The example solutions shown as part of the question for weeks 1 through 4 illustrate a solution based on conditional probabilities. No respondents who are classified as giving an incorrect answer gave a response that would be correct based on unconditional probabilities, however.

**ASK ALL FORMS [N=4,563]:**

KNOSCT29 If a scientist wants to determine if a new drug is effective at treating high blood pressure by giving half of a group of 1,000 volunteers a new medication and the other half a "sugar pill," she wants to rule out... **[RANDOMIZE OPTIONS 1-3]**

May 10-June 6

2016

55	A placebo effect ( <i>Correct</i> )
45	NET Incorrect/Not sure/No answer
3	A third person effect
17	A false consensus effect
23	Not sure
1	No answer

**NO QUESTION KNOSCT30****ASK ALL FORMS [N=4,563]:**

KNOSCT31 Which of these terms refers to health benefits occurring when most people in a population get a vaccine? **[RANDOMIZE OPTIONS 1-3]**

May 10-June 6

2016

32	Herd immunity ( <i>Correct</i> )
68	NET Incorrect/Not sure/No answer
8	Population control
33	Vaccination rate
26	Not sure
2	No answer



**ASK ALL FORMS [N=4,563]:**

KNOSCT32 Which of the following can be genetically modified?

*[Check all that apply]* **[RANDOMIZE ITEMS with ITEM e and f always last]**

May 10-June 6

201636 Selected all (*Correct*)  
64 NET Incorrect/Not sure/No answer

		<u>Selected</u>	<u>Not selected</u> <u>/No answer</u>
a.	An apple	59	41
b.	Salmon	51	49
c.	A mosquito	42	58
d.	Corn	70	30
e.	None of these <b>[EXCLUSIVE PUNCH]</b>	2	98
f.	Not sure <b>[EXCLUSIVE PUNCH]</b>	1	99

**ASK ALL FORMS [N=4,563]:**KNOSCT33 Humans and mice share the same genetic make-up by... **[RANDOMIZE ORDER LOW TO HIGH; HIGH TO LOW with NOT SURE ALWAYS LAST]**

May 10-June 6

201633 About 50% or more (*Correct*)  
67 NET Incorrect/Not sure/No answer  
7 Less than 10%  
14 Between 11% and 49%  
46 Not sure  
1 No answer**ASK ALL FORMS [N=4,563]:**KNOSCT34 Which gas makes up most of the Earth's atmosphere? **[RANDOMIZE OPTIONS 1-4]<sup>27</sup>**

May 10-June 6

201627 Nitrogen (*Correct*)  
73 NET Incorrect/Not Sure/No answer  
9 Hydrogen  
10 Carbon dioxide  
35 Oxygen  
17 Not sure  
2 No answer

<sup>27</sup> For comparison, a Pew Research survey conducted March 7-10, 2013 found 20% of adults answering this question correctly over the telephone with no explicit option provided of saying don't know or not sure.

**TOTAL NUMBER CORRECT KNOSCT22 THROUGH KNOSCT34:**

May 10-June 6

2016

4	9 out of 9
8	8 out of 9
10	7 out of 9
10	6 out of 9
13	5 out of 9
14	4 out of 9
11	3 out of 9
12	2 out of 9
10	1 out of 9
8	0 out of 9

22	High science knowledge (7-9 correct)
48	Medium science knowledge (3-6 correct)
30	Low science knowledge (0-2 correct)