

THE POLLS—TRENDS

TWENTY YEARS OF PUBLIC OPINION ABOUT GLOBAL WARMING

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Abstract Over the past 20 years, there have been dozens of news organization, academic, and nonpartisan public opinion surveys on global warming, yet there exists no authoritative summary of their collective findings. In this article, we provide a systematic review of trends in public opinion about global warming. We sifted through hundreds of polling questions culled from more than 70 surveys administered over the past 20 years. In compiling the available trends, we summarize public opinion across several key dimensions including (a) public awareness of the issue of global warming; (b) public understanding of the causes of global warming and the specifics of the policy debate; (c) public perceptions of the certainty of the science and the level of agreement among experts; (d) public concern about the impacts of global warming; (e) public support for policy action in light of potential economic costs; and (f) public support for the Kyoto climate treaty.

Perhaps no other contemporary issue portends as many wide-ranging impacts as global warming. Spanning local, national, and international politics, global warming forces consideration of contentious policy measures that require major societal, economic, and lifestyle changes. Given the political stakes involved, the scientific findings specific to global warming have been selectively interpreted in ways that fit the political goals of elected officials, interest groups, and even scientists. The use and abuse of public opinion data is no exception to this trend. Over the past 20 years, there have been dozens of news organization, academic, and nonpartisan public opinion surveys on the topic, yet there exists no authoritative summary of their collective findings. As a consequence, survey results often become an ideological Rorschach Test, with one side in the

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policy debate citing polls as reflective of a public demanding action on global warming, while the other side claiming that polls reveal an American citizenry unwilling to bear the economic costs of cutting greenhouse gas emissions.

In this paper, our goal is to provide a reliable and systematic review of trends in public opinion about global warming. We sifted through hundreds of polling questions culled from more than 70 surveys administered over the past 20 years. In compiling the available trends, we summarize public opinion across several key dimensions including (a) public awareness of the issue of global warming; (b) public understanding of the causes of global warming and the specifics of the policy debate; (c) public perceptions of the certainty of the science and the level of agreement among experts; (d) public concern about the impacts of global warming; (e) public support for policy action in light of potential economic costs; and (f) public support for the Kyoto climate treaty.

Awareness of Global Warming as a Problem

Across dimensions of public opinion, we observed strong connections between patterns in media attention to global warming and shifts in poll trends. In no area is the connection clearer than the public's "discovery" of global warming as a problem. Given minimal news attention¹ to the issue during the first half of the 1980s, it is not surprising that when surveyed in 1986, only 39 percent of the public reported having "heard or read anything about the greenhouse effect." However, by September 1988, following record summer heat and a major upswing in media attention, awareness of the issue had spread to 58 percent of the public. As media attention to the issue increased, by the early 1990s, the segment of the public who had heard or read about global warming reached a stable upper limit, as responses varied slightly within the 80 percent range for the next decade, topping 90 percent in 2006 (table 1).

Featuring slightly different question wording and response categories, other polls offer alternative indicators of public awareness. In 1997, a combined 65 percent of the public reported hearing either a lot or some about global warming. Following up and down swings in media attention, during the summer of 2001, awareness of global warming had increased to a combined 75 percent of the public, with this figure dropping to 66 percent in 2003 and then rising to 78 percent in 2006 and 89 percent in 2007 (table 2). Measured slightly differently, surveys conducted by the Program on International Public Attitudes (PIPA) found that a combined 63 percent of Americans in 2004 and 72 percent of Americans in 2005 reported hearing either a great deal or some about global warming.²

1. Throughout this analysis, when we refer to shifts in media attention to global warming, we rely on several historical studies of patterns in news coverage (McComas and Shanahan, 1999; Shanahan and Nisbet, 2002; Trumbo, 1995). These studies have tracked coverage in the major newspapers as well as at the broadcast television networks.

2. PIPA asked: "How much have you heard about global warming or climate change? A great deal, a fair amount, only a little, or nothing at all?" In June 2004, 15 percent reported a great

Table 1. Have you heard or read anything about the “greenhouse effect,” or not?

	LA													
	Cambridge ^a	Harris ^b	Parents ^c	Analysis ^d	Cambridge ^e	Cambridge ^f	Cambridge ^{a,g}	CBS ^h	HarrisIT ⁱ	04/01	08/01	HarrisIT ⁱ	HarrisIT ⁱ	Pew
	07/86	10/86	09/88	09/88	05/89	02/90	09/92	11/97	08/00	04/01	08/01	09/02	05/06	
Yes (%)	39	45	58	58	68	74	82	85	89	82	88	85	91	
No (%)	55	55	40	42	28	22	17	14	10	14	11	14	9	
Not sure (%)	6		2		4	5	1	1	1	4	*	1	*	
N	1,500	1,273	1,000	1,001	1,502	1,250	1,250	953	1,010	813	1,017	1,011	1,001	

^aSample size is approximate.

^bHave you heard or read much about . . . greenhouse effect?

^cHave you heard or read anything about the greenhouse effect?

^dHave you heard anything about a “greenhouse effect”?

^eHave you heard anything about the greenhouse effect in the atmosphere that could cause global warming?

^fOn the subject of environment, have you heard anything about the greenhouse effect in the atmosphere that could cause global warming?

^gHave you heard or read anything about the enhanced greenhouse effect, also called global warming?

^hGlobal warming is a term used to describe changes in the earth’s climate. How much have you heard or read about global warming—a lot, some, not much, or nothing at all?

ⁱHave you ever seen, heard, or read about the theory of global warming—that average temperatures are rising slowly and will continue to rise mainly because of the burning of coal, oil, and other fuels?

^jHave you heard or read anything about the issue of global warming?

* Less than .5%.

Table 2. Global warming is a term used to describe changes in the earth’s climate. How much have you heard or read about global warming—a lot, some, not much, or nothing at all?

	CBS				
	11/97	06/01	9/03 ^a	5/06 ^a	4/07 ^a
A lot (%)	27	37	27	41	42
Some (%)	38	38	39	37	47
Not much (%)	20	19	23	16	9
Nothing at all (%)	14	6	10	6	3
Don’t know (%)	1	—	1	—	—
<i>N</i>	953	1050	675	1241	1052

^aGlobal warming is a term used to describe changes in the temperature of the earth’s atmosphere which could result in changes in the environment. How much have you heard or read about global warming—a lot, some, not much, or nothing at all?

In contrast to global warming generally, public awareness of the Kyoto Protocol has remained relatively low. Consider that in November 1997, a month before the Kyoto meetings, just 7 percent of the public reported hearing either a lot or a fair amount about the pending conference. Even in the months following the meeting, according to a PIPA survey employing slightly different question wording, only a combined 25 percent of the public had either heard a great deal or some about Kyoto (table 3).

Public Knowledge of Global Warming

Twenty years after scientists and journalists first alerted the public to the potential problem of global warming, few Americans are confident that they fully grasp the complexities of the issue, and on questions measuring actual knowledge about either the science or the policy involved, the public scores very low. As of 1992, only 11 percent of the public answered that they understood the issue of global warming “very well,” and across Gallup surveys taken each year between 2001 and 2005, this figure ranged between only 15 percent and 18 percent of respondents, increasing to 22 percent of respondents in 2007 (table 4). Asked slightly differently, in separate polls taken in 2006 and 2007, ABC News found that only 11 percent of Americans felt they knew “a lot” about global warming, an increase from 5 percent in 1997 (table 5).

deal, 48 percent a fair amount, 28 percent only a little, and 10 percent nothing all. In June 2005, responses broke down in the same order as 22 percent, 50 percent, 20 percent, and 8 percent. (*N* = 688; *N* = 812). Surveys were conducted by Knowledge Networks using a RDD recruited sample of its nationally representative panel of citizens provided Web TV access to complete on-line surveys.

Table 3. Later this year (1997) an international conference on global warming, including representatives from governments around the world, will be held in Kyoto, Japan. How much, if anything, have you heard about this conference, known as the Kyoto conference? A lot, a fair amount, not very much, not at all.

	Gallup 11/97	PIPA ^{a,b} 02/98–04/98
A lot/great deal (%)	2	5
A fair amount/some (%)	5	20
Not very much (%)	22	39
Not/nothing at all (%)	70	35
Don't know/refused (%)	*	2
N	1,004	2,747

^aAs you may know recently there was a world conference in Kyoto on the problem of global warming. How much have you heard about this conference . . . a great deal, some, not very much, or nothing at all?

^bThe poll was conducted in three waves: a first wave of 1,201 respondents February 13–17, 1998, a second wave of 600 respondents March 15–17, 1998, and a third wave of 946 April 16–20, 1998.

*Less than .5%.

Table 4. Next, thinking about the issue of global warming, sometimes called the “greenhouse effect”, how well do you feel you understand this issue-would you say very well, fairly well, not very well, or not at all?

	Gallup							
	01/92	11/97	03/01	03/02	03/03	03/04	03/05	03/11–03/14/07
Very well (%)	11	16	15	17	15	18	16	22
Fairly well (%)	42	45	54	52	53	50	54	54
Not very well (%)	22	28	24	25	27	26	24	19
Not at all (%)	22	10	6	6	5	6	6	4
No opinion (%)	3	1	1	*	–	–	*	–
N	1,032	1,003	1,060	1,006	1,003	1,005	1,004	1,009

*Less than .5%.

Table 5. How much do you feel you know about global warming, a lot, a moderate amount, a little, or nothing?

	OSU		ABC	
	10/97	2/98	03/06	04/07
A lot (%)	5	5	11	11
Moderate amount (%)	38	39	47	51
Little (%)	51	46	36	33
Nothing (%)	7	10	6	4
N	688	753	1,002	1,002

Table 6. (And for each these statements, just check the box that comes closest to your opinion of how true it is—definitely true, probably true, probably not true, definitely not true. In your opinion, how true is this?) . . . Every time we use coal or oil or gas, we contribute to the greenhouse effect.

	GSS	
	01/94–05/94	02/00–05/00
Definitely true (correct) (%)	14	18
Probably true (correct) (%)	47	44
Probably not true (%)	21	19
Definitely not true (%)	4	5
Can't choose (%)	14	15
<i>N</i>	2,992	2,817

Table 7. (And for each these statements, just check the box that comes closest to your opinion of how true it is—definitely true, probably true, probably not true, definitely not true. In your opinion, how true is this?) . . . The greenhouse effect is caused by a hole in the earth's atmosphere.

	GSS	
	01/94–05/94	02/00–05/00
Definitely true (%)	16	17
Probably true (%)	41	37
Probably not true (correct) (%)	16	18
Definitely not true (correct) (%)	11	12
Can't choose (%)	17	16
<i>N</i>	2,992	2,817

In terms of measures of actual knowledge, when quizzed by the General Social Survey (GSS) in 1994 and again in 2000, 61 percent and 62 percent of the public could at least answer correctly that using coal or gas contributed to the greenhouse effect (table 6). Yet in 1994, when asked by the GSS, 57 percent of the public still confused the issue with ozone depletion, erroneously believing that the greenhouse effect was caused by a hole in the earth's atmosphere. This erroneous belief remained at 54 percent in 2000 (table 7).³ Beyond the basic science of global warming, the public is similarly in the dark when it

3. Confusion over the linkages between the greenhouse effect and ozone depletion are also apparent in the following February 1994 question asked by Harris: "The Ozone hole is due to . . ." with 5 percent answering "the greenhouse effect," 13 percent answering an "increase in chlorofluorocarbons or CFCs," 13 percent answering the "burning of tropical rainforests," 2 percent answering the "burning of tropical rainforests," 56 percent answering "all of the above," and 24 percent answering "Not sure," (*N* = 1,255).

Table 8. Just based on your impressions, do you think President Bush favors or opposes the United States participating in the Kyoto agreement to reduce global warming?

	PIPA		
	10/02	09/04 ^a	06/05 ^a
Favors United States participating (%)	48	42	43
Opposes United States participating (correct answer) (%)	42	48	43
No answer (%)	11	11	14
<i>N</i>	1,091	1,195	812

^aSurvey conducted by Knowledge Networks using a RDD recruited sample of its nationally representative panel of citizens provided Web TV access to complete on-line surveys.

comes to understanding the U.S. position on the Kyoto Protocol. In surveys taken in 2002, 2004, and 2005, when asked about the specifics of the Bush administration’s decision on whether or not to participate in the Kyoto Treaty, less than half of Americans correctly answered that the Bush administration had decided to withdraw U.S. support (table 8).

Belief in the Reality of Global Warming and in Scientific Consensus

Although a strong majority of Americans believe that global warming is real, that temperatures are rising, and that the release of carbon dioxide is a cause, the public remains relatively uncertain about whether the majority of scientists agree on the matter. Depending on how the question is asked, belief that scientists have reached a consensus view ranges from only a third of Americans to more than 60 percent.

Specific to judgments about whether or not the greenhouse effect or global warming is real, as early as 1992, 68 percent answered in the affirmative. Yet this number declined in 1994 to 57 percent, a trend likely promoted by the strategic communication efforts of conservative think tanks to boost skepticism about the problem (McCright and Dunlap, 2000).⁴ However, when asked about the topic slightly differently, in 2000, 2001, and 2002, more than 70 percent of

4. Cambridge Reports/Research International asked: “Some people believe that the enhanced greenhouse effect—or the gradual warming of the earth’s atmosphere—is caused by carbon dioxide and other gases accumulating in the atmosphere and preventing heat from the earth’s surface from escaping into space. They also believe that global warming could lead to harmful changes in ocean levels and weather patterns. Other people think the evidence that points to a gradual warming of the earth’s atmosphere is far from conclusive and feel that predictions about harmful changes in ocean levels and weather patterns are exaggerated. Given what you have heard and know, do you think the enhanced greenhouse effect or global warming really exists? (*N* = 1,250 for both years).

Table 9. Do you believe the theory that increased carbon dioxide and other gases released into the atmosphere will, unchecked, lead to global warming and an increase in average temperatures, or not?

	Harris 12/97	HarrisIT 08/00	NSB 02/01–03/01	HarrisIT 08/01	HarrisIT 09/02
Believe (%)	67	72	77	75	74
Do not believe (%)	21	20	12	19	19
Don't know (%)	12	9	11	6	7
<i>N</i>	1,009	1,010	1,574	1,017	1,011

Table 10. How convinced are you that global warming or the greenhouse effect is actually happening—would you say that you are completely convinced, mostly convinced, not so convinced, or not convinced at all?

	ABC	
	06/05	09/05
Completely convinced (%)	23	23
Mostly convinced (%)	36	33
Not so convinced (%)	24	22
Not at all convinced (%)	16	17
No opinion (%)	2	4
<i>N</i>	1,002	1,019

Americans said that they believed that if left unchecked, the release of carbon dioxide would lead to global warming and a rise in temperature (table 9).

More recent polling asks the public how convinced they are that global warming and the greenhouse effect are actually happening. In these ABC polls taken in June and September 2005, in both surveys, 23 percent of Americans answered they were completely convinced; whereas 36 percent and 33 percent answered they were mostly convinced (table 10). In alternative measures, surveys conducted by Ohio State University and ABC News in 1997, 1998, 2006, and 2007 asked respondents whether they believed that the world's temperatures have been going up slowly over the past century. Across the four surveys, 76 percent, 80 percent, 85 percent, and 84 percent answered in the affirmative (table 11).

The public, however, is less certain about where scientists stand on global warming. Examining consistent question wording posed in Cambridge and Gallup surveys, the percentage of the public answering that “most scientists believe that global warming is occurring” increased from 28 percent in 1994 to 46 percent in 1997 to 61 percent in 2001 and then to 65 percent in 2006. During this period, statements from the Inter-Governmental Panel on climate change

Table 11. You may have heard about the idea that the world’s temperatures may have been going up slowly over the past 100 years. What is your personal opinion on this—do you think this has probably been happening, or do you think it probably hasn’t been happening?”

	OSU		ABC	
	10/97	2/98	03/06	04/07
Probably happening (%)	76	80	85	84
Probably not happening (%)	22	18	13	13
Don’t know (%)	2	2	2	3
<i>N</i>	688	753	1,002	1,002

Table 12. On the environmental issue known as global warming, just your impression, which one of the following statements do you think is most accurate: Most scientists believe that global warming is occurring, most scientists believe that global warming is not occurring, or most scientists are unsure about whether global warming is occurring or not?

	Cambridge	Gallup		
	09/94 ^a	11/97 ^b	03/01 ^b	03/06 ^b
Most believe is occurring (%)	28	46	61	65
Most believe is not occurring (%)	8	12	4	3
Most unsure (%)	58	37	30	29
No opinion (%)	6	5	5	3
<i>N</i>	1,250	1,019	1,060	1,000

^aSample size is approximate.
^bJust your impression, which one of the following statements do you think is most accurate? Most scientists believe that global warming is occurring. Most scientists believe that global warming is not occurring. Most scientists are unsure about whether global warming is occurring or not.

shifted in 1995 from a tentative “balance of evidence” view that humans were influencing global climate to a much stronger consensus view issued in 2001 (table 12). Yet in 2004 and 2005, when PIPA asked about the perception of expert agreement slightly differently, they found that only 43 percent and 52 percent of the public across the two years believed that there was a “consensus among the great majority of scientists that global warming exists and could do significant damage” (table 13). Similarly, according to polls by OSU and ABC News only 35 percent of respondents in 1997, 30 percent in 1998, 35 percent in 2006, and 40 percent in 2007 believed that “most scientists agree with one another about whether or not global warming is happening,” compared to 62 percent, 67 percent and 64 percent of respondents across the two surveys who perceived “a lot of disagreement” (table 14). Trust in scientists likely

Table 13. Which of the following statements is closest to your own opinion? There is a consensus among the great majority of scientists that global warming exists and could do significant damage. There is a consensus among the great majority of scientists that global warming does not exist and therefore poses no significant threat. Scientists are divided on the existences of global warming and its impact.

	PIPA	
	06/04 ^a	06/05 ^a
Consensus that GW exists and poses threat (%)	43	52
Consensus that GW does not exist and poses no threat (%)	4	5
Scientists are divided on existence and impact (%)	50	39
No opinion (%)	4	4
N	688	812

^aSurvey conducted by Knowledge Networks using a RDD recruited sample of its nationally representative panel of citizens provided Web TV access to complete on-line surveys.

Table 14. Do you think most scientists agree with one another about whether or not global warming is happening, or do you think there is a lot of disagreement among scientists on this issue?

	OSU		ABC	
	10/97	02/98	03/06	04/07
Most agree (%)	35	30	35	40
A lot of disagreement (%)	62	67	64	56
No opinion (%)	3	3	1	3
N	688	753	1,002	1,002

remains a factor in perceptions of the scientific evidence relative to global warming. According to ABC News polls taken in 2006 and 2007, in each year, only 32 percent of Americans answered that they trust the things scientists say about the environment “completely” or “a lot” compared to 24 percent and 27 percent who trust what scientists say “little” or “not at all.” (table 15).

Related to the topic of scientific uncertainty, when asked by Gallup in surveys taken between 1997 and 2006 to evaluate the performance of the news media in accurately conveying the seriousness of global warming, the public appears split, with approximately a third believing that news coverage is “generally exaggerated,” approximately a third believing that news coverage is “generally correct,” and a final third believing that in news coverage the problem is “generally underestimated.” In this final category, however, there does appear to be some significant change since 1999, with the proportion of Americans believing that news reports generally underestimate the global warming

Table 15. How much do you trust the things that scientists say about the environment—completely, a lot, a moderate amount, a little, or not at all?

	ABC	
	03/06	04/07
Completely (%)	5	5
A Lot (%)	27	27
Moderate amount (%)	41	43
A Little (%)	22	19
Not at all (%)	5	5
N	1,002	1,002

Table 16. Thinking about what is said in the news, in your view is the seriousness of global warming—generally exaggerated, generally correct, or is it generally underestimated?

	Gallup							
	11/97	03/01	03/02	03/03	03/04	3/05	3/06	3/11–3/14/07
Generally exaggerated (%)	31	30	31	33	38	31	30	33
Generally correct (%)	34	34	32	29	25	29	28	29
Generally under-estimated (%)	27	32	32	33	33	35	38	35
Don't know/refused (%)	8	4	5	5	4	5	4	4
N	1,003	1,060	1,006	1,003	1,005	1,004	1,000	1,009

problem shifting from 27 percent in 1997 to 38 percent and 35 percent in 2006 and 2007, respectively (table 16).

The Perceived Immediacy of Global Warming Impacts

Scientists have long lamented the problems of communicating to the public the urgency of global warming. Several studies have documented the tendency of Americans to discount the threat of climate change due to its “creeping nature,” an environmental problem with consequences that are perceived to be far off in the future (Moser and Dilling, 2004). Poll trends back up these conclusions. For example, Gallup asked respondents to evaluate the timeline for global warming effects. Queried in 1997, and then each year between 2001 and 2005, only a bare majority of Americans answered that the effects of global warming had already begun, with this figure rising to 60 percent in 2007 (table 17). Other survey trends show that only about a third of the public believe that global warming will pose a threat within their lifetime (table 18).

Table 17. Which of the following statements reflects your view of when the effects of global warming will begin to happen? They have already begun to happen. They will start happening within a few years. They will start happening within your lifetime. They will not happen within your lifetime, but they will effect future generations. They will never happen.

	Gallup									
	11/97	03/01	03/02	03/03	03/04	03/05	03/06	03/23–3/25/07		
Have already begun (%)	48	54	53	51	51	54	58	60		
Will start within few years (%)	3	4	5	6	5	5	5	4		
Will start within lifetime (%)	14	13	13	12	12	10	10	7		
Will not happen in lifetime, but effect future generations (%)	19	18	17	17	18	19	15	15		
Never happen (%)	9	7	9	10	11	9	8	11		
Don't know/refused (%)	7	4	3	4	3	3	3	3		
N	1,003	1,060	1,006	1,003	1,005	1,004	1,000	1,007		

Table 18. Do you think that global warming will pose a threat to you or your way of life in your lifetime?

	Gallup	Gallup ^a		ABC ^b	Gallup ^a
	11/97	03/01	03/02	06/05	03/06
Yes (%)	25	31	33	33	35
No (%)	69	66	65	66	62
Don't know/refused (%)	8	3	2	1	2
N	1,003	1,060	1,006	1,002	1,000

^aDo you think that global warming will pose a serious threat to you or your way of life in your lifetime?

^bDo you think the effects of global warming will pose a serious threat to you or your way of life in your lifetime, or not? Yes, will pose a threat; no, will not pose a threat; no opinion.

In 1993, 1994, and 2000, the GSS measured public perceptions not only of the dangers of the greenhouse effect for the environment but also the perceived dangers to the respondent and his/her family. Regardless of whether or not the environment or the individual is referenced in the question, the percentage breakdowns for these questions are remarkably consistent and do not shift appreciably across 1993, 1994, and 2000. Approximately 15 percent of the public believed that both the environmental and the personal impacts of the greenhouse effect were “extremely dangerous,” up to approximately 25 percent believed the impacts to be “very dangerous,” 34–36 percent “somewhat dangerous,” 10–15 percent “not very dangerous,” and 3 percent or less believe the impacts to be “not dangerous at all”(table 19).

Concern about Global Warming Compared to Other Problems and Issues

One series of surveys show that the “personal importance” of global warming has increased considerably over the past decade, with the proportion of Americans who say that global warming is either personally “extremely important” or “very important” shifting from 27 percent in 1997 to 52 percent in 2007 (table 20). Yet how does this perceived importance compare to concern over other environmental issues?

One source for contextualizing the public’s concern is a set of items administered by Gallup across years spanning 1989 to 2006. In these surveys, Gallup asked respondents how much they “worry” about a number of specific environmental problems. For the greenhouse effect or global warming, between 1989 and 1991, about a third of respondents indicated that they worried “a great deal” about the issue. When next asked in the fall of 1997, this figure had dropped to 24 percent, but then increased to 34 percent in 1999 and to

Table 19. In general, do you think that a rise in the world’s temperature caused by the “greenhouse effect” is . . . extremely dangerous for the environment, very dangerous, somewhat dangerous, not very dangerous, or, not at all dangerous for the environment?

	GSS				
	02/93–03/93		01/94–05/94		02/00–05/00
	Environment	Family ^a	Environment	Family ^a	Environment
Extremely dangerous (%)	17	15	14	13	17
Very dangerous (%)	24	24	21	20	26
Somewhat dangerous (%)	34	34	36	36	34
Not very dangerous (%)	12	15	14	16	10
Not dangerous at all for the environment/ family (%)	2	3	2	3	2
Can’t choose (%)	10	11	13	13	13
<i>N</i>	1,557	1,557	2,992	2,992	2,817

^aIn general, do you think that a rise in the world’s temperature caused by the “greenhouse effect” is . . . extremely dangerous for you and your family, very dangerous, somewhat dangerous, not very dangerous, or, not at all dangerous for you and your family?

Table 20. How important is the issue of global warming to you personally—extremely important, very important, somewhat important, not too important, or not at all important?

	OSU		ABC	
	10/97	02/98	03/06	04/07
Extremely important (%)	7	9	17	18
Very important (%)	20	21	33	34
Somewhat important (%)	47	49	32	30
Not too important (%)	20	15	18	17
Not at all important (%)	6	5	8	9
<i>N</i>	688	753	1,002	1,002

40 percent in 2000. However, after the terrorist attacks of 2001, the percentage who worried a “great deal” dipped again to 29 percent in 2002, remaining at 28 percent in 2003 and 2004. Public concern appeared to rebound in 2006 and 2007, with 36 percent and 41 percent saying that they worried a “great deal” (table 21).

Table 21. I'm going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about . . . the "greenhouse effect" or global warming?

	Gallup												
	05/89	04/90	04/91	10/97	03/99	04/99	04/00	03/01	03/02	03/03	03/04	03/06	03/11–3/14/07
Great deal (%)	35	30	35	24	28	34	40	33	29	28	28	36	41
Fair amount (%)	28	27	27	26	31	34	32	30	29	30	25	26	24
Only a little (%)	18	20	22	29	23	18	15	22	23	23	28	21	18
Not at all (%)	12	16	12	17	16	12	12	13	17	17	19	15	16
No opinion (%)	7	6	5	4	2	2	1	2	2	2	2	1	1
N	1,239	1,223	1,007	1,008	1,069	1,025	1,004	1,060	1,006	1,003	1,005	1,000	1,009

Despite renewed public concern, when asked specifically about a range of environmental issues, global warming remains at the lower end of worries, especially in comparison to water-related pollution. In 2006 and 2007, significantly more Americans worried a “great deal” about “pollution of drinking water” (54 percent and 58 percent, respectively), “pollution of rivers, lakes, and reservoirs” (51 percent, 53 percent), “contamination of soil and water by toxic waste” (52 percent, 52 percent), and the “maintenance of the nation’s supply of fresh water for household needs” (49 percent, 51 percent) than about global warming (36 percent, 41 percent) (Carroll, 2006, 2007; Saad, 2006).

However, the relative salience of global warming as an environmental problem appears to also vary according to how it is measured. In 2006 and 2007, instead of prompting respondents with a list of issues, ABC News asked respondents in an open-ended fashion to name “the single biggest environmental problem the world faces at this time?” In 2006, global warming ranked first, as 16 percent of respondents named the issue the biggest environmental

Table 22. What in your opinion is the single biggest environmental problem the world faces at this time?

	ABC	
	03/06	04/07
Global warming/greenhouse effect/climate change (%)	16	33
Air pollution (%)	13	13
Energy problems/dependence fossil fuels/lack of oil (%)	8	6
Toxic substances in environment (%)	7	6
Water pollution (%)	6	5
Pollution (unspecified) (%)	4	4
Misc. pollution mentions (%)	3	4
Destruction/fragmentation/loss of habitat, rain forests, wetlands, forests, open spaces, overdevelopment, logging, and mining (%)	7	4
Waste/landfills/not enough recycling (%)	9	3
Overpopulation/overconsumption (%)	4	3
Oil drilling/oil tankers (%)	2	1
Saving natural resources (%)	3	1
Tsunami/tidal wave/earthquake/natural disasters (%)	1	*
Acid rain (%)	*	*
Spread of invasive nonnative species (%)	*	*
Extinction of species (%)	*	0
None (%)	2	1
Other (%)	8	7
No opinion (%)	7	8
N	1,002	1,002

*Less than .5%.

problem, with the proportion of respondents more than doubling to 33 percent in 2007 (table 22).

Weighing the Costs of Action in Dealing with Global Warming

At the center of the public policy debate over global warming has been the perceived trade-offs between immediate action and the likely costs to citizens and the economy. Cambridge Research International were the first to gauge the public's view on this matter with a series of poll questions that began in 1986. According to these surveys, in the late 1980s the public expressed a preference for immediate action rather than simply more research. Yet during the early 1990s, as many advocates and political figures pushed the need for more research while exaggerating the possible negative economic impacts, public preference for immediate policy action sharply declined. This shift, however, should be interpreted cautiously given the slight changes in question wording across these surveys (table 23).

However, by the end of the decade, bolstered by a historically strong economy, public support for immediate action rebounded. In 1998, according to a PIPA survey, 39 percent felt that global warming was a serious enough problem that action should be taken *even if it involved significant costs*, while 44 percent preferred steps that would be lower in cost, and only 15 percent took the position that no steps with economic costs should be taken. Still, by 2004, faced with a weaker economy and the competing priorities of war and terrorism, 23 percent now favored the "no costs" position, and this response remained the preferred choice among 21 percent of Americans in 2005 (table 24).

CBS and PIPA survey questions administered in 1997, 2004, and 2005 reveal that the public's evaluation of policy options varies by the response categories that are offered. In these examples, respondents are forced to indicate which of two statements about action versus costs are closer to their opinion. The statements dichotomize policy choices into either helping or hurting the economy. Given these response options, more than two-thirds of the public across these three years indicated that they believed efforts to curb greenhouse gases would make the economy more competitive, compared to the less than a third of Americans who believed such efforts would cost too much money and hurt the economy (table 25).

Acceptance of Specific Economic Impacts, Taxes, and Regulatory Programs

Several surveys have asked Americans about support for policy action that might generate specific kinds of economic impacts, or that might create certain incentives for cutting emissions. Public support appears strongest for regulations that require emission limits on industry and automobiles and that would mandate the production of hybrid cars. The public favors tax incentive

Table 23. Some people have expressed concern that the greenhouse effect could result in some of the world's most productive agricultural areas becoming too arid for farming. Which of the following views about the greenhouse effect is closest to your own opinion? . . . (1) Based on the scientific community's current understanding of the greenhouse effect, the federal government should pass environmental laws to help solve the problem. (2) The federal government should pass some initial laws now to begin to curb the greenhouse effect but should avoid costly control programs until more research is done to find out exactly what causes the greenhouse effect and what its impact will be. (3) Before passing any new environmental laws to help curb the greenhouse effect, the federal government should finance more research efforts to find out exactly what causes the greenhouse effect and what its impact will be.

	Cambridge							
	07/86 ^{a,b}	07/88 ^{a,b}	07/89 ^{a,b}	12/90 ^a	09/91 ^a	09/92 ^a	09/93 ^a	09/94 ^a
Based on the scientific community's current understanding of the greenhouse effect, the federal government should pass environmental laws to help solve the problem (%)	18	29	28	14	14	15	12	10
The federal government should pass some initial laws now to begin to curb the greenhouse effect but should avoid costly control programs until more research is done to find out exactly what causes the greenhouse effect and what its impact will be (%)	28	30	28	39	42	35	33	33
Before passing any new environmental laws to help curb the greenhouse effect, the federal government should finance more research efforts to find out exactly what causes the greenhouse effect and what its impact will be (%)	32	24	31	42	40	45	46	48
Don't know (%)	22	17	13	6	4	5	9	9
N	1,500	1,500	1,500	1,250	1,250	1,250	1,250	1,250

^aSample size is approximate.
^bInterview method is face-to-face.

Table 24. There is a controversy over what the countries of the world, including the United States, should do about the problem of global warming. I'm going to read you three statements. Please tell me which statement comes closest to your own point of view. [ARO] (1) Until we are sure that global warming is really a problem, we should not take any steps that would have economic costs. (2) The problem of global warming should be addressed, but its effects will be gradual, so we can deal with the problem gradually by taking steps that are low in cost. (3) Global warming is a serious and pressing problem. We should begin taking steps even if this involves significant costs.

	PIPA		
	10/98	06/04 ^a	06/05 ^a
Should begin taking steps now even if involves significant costs (%)	39	31	34
Problem of global warming should be addressed but effects will be gradual, we can deal with problem by taking steps low in cost (%)	44	45	42
Should not take any steps that would have economic costs (%)	15	23	21
Don't know (%)	2	1	2
<i>N</i>	600	753	812

^aSurvey conducted by Knowledge Networks using a RDD recruited sample of its nationally representative panel of citizens provided Web TV access to complete on-line surveys.

Table 25. Which comes closer to your opinion?

	CBS	PIPA	
	11/97	06/04 ^a	06/05 ^a
Efforts in the United States to reduce the release of greenhouse gases will cost too much money and hurt the U.S. economy (%)	20	29	23
The U.S. economy will become more competitive because these efforts will result in more efficient energy use, saving money in the long run (%)	67	67	71
No answer (%)	11	5	7
<i>N</i>	953	753	812

^aSurvey conducted by Knowledge Networks using a RDD recruited sample of its nationally representative panel of citizens provided Web TV access to complete on-line surveys.

policies that encourage industry to increase energy efficiency but opposes increased taxes on gasoline or electricity that are intended to alter the behavior of consumers. Americans strongly favor increased investment in solar and wind energy but are split on expanding nuclear energy.

Table 26. (Now I am going to read you some things that might happen if the United States was the only country to take actions to prevent the greenhouse effect. As I read each one please tell me whether or not you think the United States should single-handedly take the actions to prevent the greenhouse effect, even if that thing happens.) . . . If it increased unemployment in the United States

	Cambridge		Gallup	HarrisIT	
	Unemployment		Unemployment	Inflation	Utility bill
	12/90 ^a	09/92 ^{a,b}	10/97 ^c	03/01 ^d	03/01 ^e
Yes, should take actions (%)	45	42	34	54	47
No, should not take actions (%)	45	50	54	39	49
Depends (vol.) (%)	–	–	5	–	–
Don't know/not sure (%)	9	8	7	7	4
N	1,250	1,250	1,008	1,025	1,025

^aSample size is approximate.

^bWould you, personally, be willing or not willing to have the United States take steps to reduce global warming if each of the following things happened as a result . . . if unemployment went up a great deal?

^c(Would you personally be willing to support tough government actions to help reduce global warming even if each of the following things happened as a result or wouldn't you be willing to do so?) . . . Unemployment increased.

^d(Would you personally be willing to support tough government actions to help reduce global warming even if each of the following things happened as a result or wouldn't you be willing to do so?) . . . There was a mild increase in inflation.

^eWould you personally be willing to support tough government actions to help reduce global warming even if each of the following things happened as a result or wouldn't you be willing to do so? . . . Your utility bills went up.

A series of poll items taken in 1990, 1992, and 1997 asked respondents whether the United States should take actions to prevent the greenhouse effect even if it resulted in increased unemployment. With this economic impact in mind, in 1990 and 1992, 45 percent and 42 percent of respondents favored taking action, while in 1997, 34 percent favored action. However, notice the differences in question wording. In contrast to 1990 and 1997, respondents in 1992 are asked not if they would still favor action if it simply “increased unemployment,” but if “unemployment went up a great deal.” Relative to other economic impacts, in 2001, Harris asked whether the public would prefer “tough government actions” even if they resulted in inflation (54 percent supported, 39 percent opposed), or if utility bills went up (47 percent supported, 49 percent opposed) (table 26).

A second series of polls by Cambridge queried the public specifically about taxing gasoline, oil, and natural gas as an incentive to shift away from the use

Table 27. To help prevent the greenhouse effect, would you favor or oppose taxing oil, coal, and natural gas to provide economic incentives for shifting away from the use of fossil fuels?

	Cambridge					
	07/89 ^a	12/90 ^a	09/91 ^a	09/92 ^{a,c}	09/93 ^{a,c}	09/94 ^{a,c}
Favor (%)	47	65	62	56	52	43
Oppose (%)	32	28	31	37	40	49
Don't know (%)	22	6	7	7	8	8
<i>N</i>	1,500	1,250	1,250	1,250	1,250	1,250

^aSample size is approximate.

^bInterview method is face-to-face.

^cTo help prevent global warming, would you favor or oppose taxing oil, coal, and natural gas that would raise the costs of these fuels, thus providing an incentive to shift away from the use of fossil fuels?

Table 28. For each of the following please tell me whether you favor or oppose it as a way for the federal government to try to reduce future global warming? Increased taxes on electricity so that people use less.

	ABC 03/06		ABC 03/07	
	Taxes on electricity	Taxes on gasoline ^a	Taxes on electricity	Taxes on gasoline ^a
Favor (%)	19	32	20	31
Oppose (%)	81	67	79	68
No opinion (%)	*	1	1	1
<i>N</i>	1,002	1,002	1,002	1,002

^aIncrease taxes on gasoline so that people either drive less, or buy cars that use less gas.

*Less than .5%.

of fossil fuels. Across the questions asked in 1989, 1990, and 1991, public support for such taxes was measured at 47 percent, 65 percent, and 62 percent, respectively. In the survey items asked over the next three years, 1992 to 1994, there was a slight change in question wording. For these years, public support for gasoline, oil, and natural gas taxes was 56 percent, 52 percent, and 43 percent, respectively (table 27). ABC News polls taken in 2006 and 2007 provide more recent data relative to support for gas and energy taxes. As a way for the Federal government to reduce future global warming, only 19 percent and 20 percent of Americans across the two years support increased taxes on electricity and only 32 percent and 31 percent support increased taxes on gasoline (table 28).

Other recent surveys have asked about emissions standards for automobiles and industry, mandatory limits on CO₂ emissions from industry, and investment in alternative energy sources. In these Gallup polls taken across years since 2001, more than 70 percent of Americans have consistently favored setting higher auto emission standards and roughly 80 percent have consistently favored higher standards for industry. More than 75 percent of Americans say they support mandatory limits on CO₂ emissions and a similar proportion support spending more government money on solar and wind energy. In 2006 and 2007, 55 percent and 50 percent of Americans support expanding the use of nuclear energy, a slight increase over the 41 percent support registered in 2001 (table 29).

Turning to the choice between financial incentives versus government requirements as a way to curb emissions and increase energy efficiency, according to PIPA polls from 2004 and 2005, more than 70 percent of the public across these two years favored tax incentives for utilities to sell solar and wind power to consumers, tax credits and rebates for households that upgrade to energy efficient appliances, tax credits for purchasing a hybrid car, and mandates requiring manufacturers to produce hybrids as half of all new cars by 2010 (table 30). In 2006 and 2007, ABC News asked directly about the choice between tax breaks and government requirements. Across both years, specific to increasing the energy efficiency of cars and appliances, the public is roughly split in its preference between incentives and mandates. Relative to the energy efficiency of homes and offices, 51 percent support tax breaks compared to 33 percent and 30 percent who support government requirements. However, when it comes to lowering greenhouse gas emissions from industry, the public has a clear preference, with 61 percent and 62 percent across the two years supporting government requirements (table 31).

Public Evaluations of the Kyoto Protocol

Besides domestic policy measures to counter global warming, the public has been asked across surveys their views on the longstanding efforts to negotiate international agreements on greenhouse gas emissions. As early as 1990, 8 out of 10 Americans believed that the United States should take the lead internationally in preventing the greenhouse effect.⁵ However, more than 10 years later, when asked about U.S. participation in the Kyoto climate agreement, given earlier findings relative to low levels of attention and knowledge about the treaty, it is not surprising that several surveys show that many citizens

5. In December of 1990, Cambridge asked: "Do you think the United States should take steps to prevent the greenhouse effect, even if other countries in the world do not take such steps?" with 80 percent answering "yes," 14 percent answering "no," and 5 percent answering "not sure" ($N = 1,250$).

Table 29. Next I am going to read some specific environmental proposals. For each one, please say whether you generally favor or oppose it. How about setting higher auto emission standards for automobiles?

	Auto emissions	Industry emissions ^a	Expanding nuclear energy ^b	Developing solar and wind ^c	Controls on CO ₂ emissions ^d
Gallup 03/01 (%)					
Favor	75	81	41	79	
Oppose	23	17	55	19	
No opinion	2	2	5	2	
N	1,060	1,060	1,060	1,060	
Gallup 03/02 (%)					
Favor	72	83	45		
Oppose	26	16	55		
No opinion	2	1	—		
N	1,006	1,006	1,006		
Gallup 03/03 (%)					
Favor	73	80	45		79
Oppose	24	19	51		19
No opinion	3	1	6		2
N	1,003	1,003	1,003		1,003
Gallup 03/06 (%)					
Favor	73	77	55	77	77
Oppose	25	22	40	21	21
No opinion	2	2	5	2	2
N	1,006	1,006	1,006	1,006	1,006
Gallup 03/07 (%)					
Favor	79	84	50	81	81
Oppose	18	15	46	17	17
No opinion	3	1	4	2	2
N	1,009	1,009	1,009	1,009	1,009

^aHow about setting higher emission standards for business and industry?

^bExpanding the use of nuclear energy?

^cHow about imposing mandatory controls on carbon dioxide emissions and other greenhouse gases?

^dSpending more government money on developing solar and wind power?

did not hold an opinion on the matter or that results differed across question wording.

Consider surveys conducted by the Chicago Council on Foreign Relations (CCFR), PIPA, and Gallup between 2002 and 2005. In each of the polls, respondents were asked if they believed the United States should participate in the Kyoto agreement on global warming. In the CCFR survey from 2002,

Table 30. Here is a list of possible approaches for reducing greenhouse gas emissions that may contribute to climate change. For each one please say whether you favor or oppose it: Provide tax incentives to utility companies to encourage them to sell environmentally clean energy, such as solar and wind power, to consumers.

	Utility tax incentives	Individual tax incentives ^a	Hybrid by 2010 ^b	Hybrid tax credit ^c
PIPA ^d 06/04				
Favor (%)	75	80	71	78
Oppose (%)	21	17	28	20
No answer (%)	3	4	1	2
N	753	753	753	753
PIPA ^d 06/05				
Favor (%)	81	81	70	77
Oppose (%)	16	16	26	19
No answer (%)	3	3	4	4
N	812	812	812	812

^aGive cash incentives like tax credits and rebates to individual households that upgrade to more energy efficient appliances like refrigerators and air conditioners.

^bWould you favor or oppose requiring that by 2010, half of all new cars produced are hybrid-electric or some other type that is very fuel efficient?

^cDo you favor or oppose continuing the tax credit for purchasing a hybrid-electric car?

^dSurvey conducted by Knowledge Networks using a RDD recruited sample of its nationally representative panel of citizens provided Web TV access to complete on-line surveys.

and the PIPA surveys from 2004 and 2005, 64 percent, 65 percent, and 73 percent support participation (table 32). Yet consider two Gallup surveys that differ slightly in question wording, in both polls only 42 percent of Americans answered that the United States should abide by the treaty, while 36 percent and 35 percent in the two surveys volunteered that they were “unsure” or had “no opinion” (table 33).

Question wording effects are apparent across other surveys asking respondents to directly evaluate Bush’s 2001 decision to withdraw from Kyoto. In two Gallup questions from April and June of that year, Bush’s rationale that the Kyoto treaty would hurt the economy while demanding too little of developing countries was presented. In these polls, 41 percent and 40 percent said they approved of Bush’s decision to withdraw, while 48 percent disapproved. In contrast, when Pew asked in April 2001 about the decision to withdraw from Kyoto and when Gallup queried respondents in a separate July 2001 survey using the same question wording, no rationale was given. In these cases, in the absence of a specified justification, approval of Bush’s decision rested at 25 percent and 32 percent respectively, with disapproval at 47 percent and 51 percent (table 34).

Table 31. For the next items, please tell me for each one whether it’s something the government should require by law, encourage with tax breaks but not require, or stay out of entirely? Building cars that use less gasoline.

	Cars use less gasoline	Appliances use less electricity ^a	Homes and offices use less energy ^b	Lower releases from power plants ^c
ABC 03/06				
Require (%)	45	42	33	61
Encourage (%)	40	41	51	26
Stay out (%)	15	17	15	11
No opinion (%)	1	1	1	2
N	1,002	1,002	1,002	1,002
ABC 03/07				
Require (%)	42	36	30	62
Encourage (%)	44	43	51	26
Stay out (%)	14	19	17	10
No opinion (%)	*	1	9	9
N	1,002	1,002	1,002	1,002

^aBuilding air conditioners, refrigerators, and other appliances that use less electricity.
^bBuilding new homes and offices that use less energy for heating and cooling.
^cLowering the amount of greenhouse gases that power plants are allowed to release into the air.
*Less than .5%.

Table 32. Based on what you know, do you think the United States should or should not participate in the following treaties and agreements? . . . The Kyoto agreement to reduce global warming.

	CCFR	PIPA	
	06/02 ^a	07/04 ^b	06/05 ^b
Should participate (%)	64	65	73
Should not participate (%)	21	16	16
Don't know/refused (%)	15	18	11
N	3,262*	1,195	812

^aConsists of 2,862 telephone interviews and 400 in-person face-to-face interviews for a total of 3,262 adults.
^bSurvey conducted by Knowledge Networks using a RDD recruited sample of its nationally representative panel of citizens provided Web TV access to complete on-line surveys.
*Less than .5%.

Table 33. Next, turning to the agreement on global warming that was drawn up at a world conference in Kyoto, Japan several years ago . . . Based on what you have heard or read, do you think the United States should—or should not—agree to abide by the provisions of the Kyoto agreement on global warming? “No opinion” volunteered.

	Gallup	
	03/04	03/05
Should abide (%)	42	42
Should not abide (%)	22	23
No opinion (%)	36	35
N	1,005	1,004

Table 34. President (George W.) Bush recently announced that the United States will not adhere to the Kyoto international treaty, which sets voluntary limits on the production of carbon dioxide and other global warming related gases. Bush said that the treaty places too much of an economic burden on the United States while demanding little of developing countries. Do you approve or disapprove of Bush’s decision for the United States not to adhere to the Kyoto Treaty?

	Gallup	Pew	Gallup	
	04/01	04/01 ^a	06/01	07/01 ^a
Approve (%)	41	25	40	32
Disapprove (%)	48	47	48	51
No opinion (%)	11	28	11	17
N	1,025	1,202	998	1,038

^aAs you may know, George W. Bush has decided that the United States should withdraw its support from the global warming agreement, adopted in Kyoto, Japan in 1997. Do you approve or disapprove of this decision?

Appendix

DATA SOURCES AND ABBREVIATIONS

Many of the survey questions and results cited in this report were located from the public opinion online search engine (“Polls and Surveys”) of Lexis-Nexis, the Kaiser Health Poll Archive, and the data archive at Odum Institute of the University of North Carolina. Keywords such as “climate change,” “global warming,” “greenhouse effect,” “greenhouse gas” or “Kyoto” were used for the search. Further polls were retrieved from the data archives of “pollingreport.com” or through a Web search. The surveys cited are based

on nationally representative adult samples with sample size of approximately 1,000 or more, with exceptions as noted. The questions cited were drawn from surveys conducted by the following survey organizations, news organizations, or policy centers:

ABC:	ABC News
Analysis:	Analysis Group
Cambridge:	Cambridge Reports, Research International
CCFR:	Chicago Council on Foreign Relations
CBS:	CBS News
Gallup:	Gallup Organization
GSS:	General Social Survey
Harris:	Louis Harris & Associates
HarrisIT:	Harris Interactive
Kaiser:	Henry J. Kaiser Foundation, Harvard School of Public Health. Survey conducted by Princeton Survey Research Associates
LA Times:	Los Angeles Times
NBC:	NBC News
Newsweek:	Newsweek magazine
NSB:	National Science Board, Survey of Public Attitudes about Science and Technology
OSU:	Krosnick, J.A. & Visser P.S., 1997/1998. American public opinion on global warming. Survey conducted by the Ohio State University Survey Research Unit
Parents:	Parents Magazine. Survey conducted by Kane, Parsons & Associates
Pew:	Pew Research Center. Survey conducted by Princeton Survey Research Associates
PIPA:	The Program on International Policy Attitudes

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