

**TOWARD A DEEPER ENGAGEMENT OF THE U.S.
PUBLIC ON CLIMATE CHANGE: AN OPEN LETTER TO
THE 44TH PRESIDENT OF THE UNITED STATES OF
AMERICA**

Susanne C. Moser, Ph.D.

*Institute for the Study of Society and Environment
National Center for Atmospheric Research
Boulder, CO 80307, USA
Email: smoser@ucar.edu*

Abstract

The next president of the United States of America will need to seriously address climate change. This paper argues that his or her success will require active public engagement. Climate change communication in the U.S. to date has produced high problem awareness and expressions of generic policy support but only shallow understanding, a still limited sense of urgency, and little active engagement beyond the first few easy steps on the long road of climate protection.

This paper reviews indicators of public sentiment and understanding and discusses the implications for a comprehensive national outreach and engagement campaign. Seven principles of audience-specific “retail” communication are proposed to guide future efforts to more deeply engage the American public.

Keywords

communication campaign, US public understanding of climate change,
political engagement, behavior change

1. Introduction

Dear Mr. or Ms. President

On January 20, 2009 you will assume the highest political office in the United States of America. The many tasks ahead of you are daunting, demanding your full attention, and all at once. Undoubtedly, leaders from all over the world will knock on your door to press you to quickly reengage the United States in constructive international negotiations on a binding climate treaty. Of course, climate change and energy security were already part of your election platform,¹ and during your candidacy you met with representatives of the Presidential Climate Action Project.² They handed you a plan with numerous compelling suggestions for climate actions you could take in the first 100 days of your presidency.

This plan barely touched on the fact that you will need the American public squarely on your side for climate action, supporting your leadership, understanding the enormity of the challenge, engaging constructively in public debate over policy and technological solutions, voting for, sanctioning and implementing those that are ultimately chosen, envisioning a future worth fighting for, and actively doing their part in reducing their own emissions. Public opinion polls seem to suggest Americans are on your side, but I am writing this letter because the polls could mislead you. The kind of support you will need will require a far deeper level of engagement than we have seen in this country to date.

Climate change will affect everything you will need to deal with – energy, the environment, public health, jobs and economic performance, national security, natural disasters, international relations, and stability in the world. In fact, the urgency is growing in ways that could make climate change the unifying theme of your entire presidency.³ It will be up to you to make the links apparent to the American people.

¹ For Sen. J. McCain (Republican nominee) see <http://www.johnmccain.com/Informing/Issues/>; for Sen. H. Clinton (Democratic contender) see <http://www.hillaryclinton.com/issues/energy/>, and for Sen. B. Obama (Democratic contender) see <http://www.barackobama.com/issues/energy/#restore-us-leadership>.

² David Orr, Oberlin College (pers. communication with author, February 2008); for more information on the Presidential Climate Action Project, see: www.climateactionproject.com, last accessed March 2008. Public outreach and education is a regrettably underdeveloped aspect of this action plan, with only minor mentions in Section 1 (http://www.climateactionproject.com/chapters/Section_1.pdf, p.27) and Section 9 (http://www.climateactionproject.com/chapters/Section_9.pdf, p.8) (Laurette Reiffe, PCAP project; pers. communication with author, March 2008).

³ See, e.g., the growing urgency expressed by scientists on irreversible tipping phenomena in the Earth system (Lenton et al. 2008), and the most recent consensus reports from the Intergovernmental Panel on Climate Change (Solomon et al. 2007; Parry et al. 2007).

In the pages below I offer you and your communications experts a summary of American opinions and attitudes toward global warming, explain why more and new forms of outreach and communication are needed, and suggest several ways in which you could initiate a compelling nationwide global warming outreach campaign. I hope you will see that such deeper public support and engagement is essential for ensuring your success. Beginning to develop a comprehensive communications strategy should not be relegated to the backburner of your attention.

With best wishes for your presidency at this critical time in our country's and the Earth's history.

Respectfully,

SCM

2. Synopsis of Trends and Current Perceptions among Americans of Global Warming

In the cover letter above, the normative and politically pragmatic argument is made that public support and engagement is required for any political leader to be able to move forward with climate policies. Civic organizations and individuals must actively advocate, support, vote for, or at least quietly consent to changes. Moreover, political leaders frequently gauge public opinion to assess whether or not to take action on an issue. Society and individuals also play an important practical (behavioral) role in that they must adopt into their daily lives the changes, policies, technologies and shifting consumer choices which policies and markets set in motion. A society that has achieved an 80% reduction of greenhouse gas emissions by 2050 (a target date and level commonly discussed by scientists and policy-makers) will be structured fundamentally different than modern societies today in terms of transportation, energy production and use, land use, consumerism, agricultural production, and so on. Such a fundamental transformation will only be realized through active participation and adoption of these new ways by the members of our society. The dual premise of this paper therefore is that, first, "the public" plays a critical role in bringing about the political and societal changes required to stabilize the climate, and second, it is therefore important to know where the public is in order to engage people effectively in the political process and unfolding social changes.

Over the past 20-25 years, many researchers and polling organizations have assessed public knowledge and opinion on the issue of global warming. Purposes for conducting these surveys, and exact wording of the survey questions, have often differed, which makes direct comparison of findings over time sometimes difficult. The findings, however, can be grouped into larger categories in which trends are rather consistent. In a recent systematic

review of this survey and polling literature⁴, Nisbet and Myers (2007) found several significant trends in the American public's attitudes, opinions, and understanding, which are summarized next with more recent surveys and analytic papers added for greater nuance and up-to-date detail. Together they give a reasonably accurate picture of the state of American public opinion several years into the 21st century, which sets the stage for the subsequent discussion of the next generation of needed outreach and communication efforts.

Public awareness of global warming

- The general upward trend in public awareness of global warming over the past few decades has been modified by considerable variability due to the ups and downs in media attention to the issue (Downs 1972; Ungar 1992; Henry and Gordon 2001).
- While only 39% of the American public had “heard or read anything about the greenhouse effect”⁵ in 1986, by the late 1990s a high and relatively stable segment of the population showed at least some level of problem awareness: in the 1990s and early 2000s, around 80% said they were aware of global warming, and 90% said so in 2006.
- When survey respondents were asked to indicate whether they had heard “a lot” or at least “some” about global warming, similar upward trends and media-related variations could be observed, but cumulative numbers were slightly lower than those for mere „awareness“.
- Public awareness of the Kyoto Protocol has been found to remain relatively low over the relevant review period (1997-today) (Nisbet and Myers 2007: 444-447).

Public understanding of the problem and of possible solutions

- Despite the remarkable growth in scientific understanding of climate change-related issues, Nisbet and Myers (2007: 447) conclude soberly, “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.”
- For years only a very small proportion of Americans said that they understood the issue of global warming “very well.” This number reached its highest level of 22% in a Gallup Poll in 2007.
- Between the mid-1990s and 2000, the proportion of the population that answered correctly that the burning of fossil fuels contributes to the greenhouse effect did not

⁴ Nisbet and Myer's (2007) review is based on 70 published surveys conducted between 1986 and 2007 of nationally representative samples of the U.S. population. Details on the surveys can be found in the review article's appendix and each of the underlying sources.

⁵ In polls, global warming and the greenhouse effect are frequently introduced and used interchangeably. In this paper, when citing or referring to survey findings, the terms are used as in the original polls. For a discussion of the adequacy of any popularly used term, see (Moser and Dilling 2007b).

increase with statistical significance. Similarly, the percentage of people erroneously believing that the stratospheric ozone depletion (“the ozone hole”) is the cause of global warming declined by only 3% over the same period.

- In a poll conducted as recently as July 2007, 57% of respondents correctly believed that global warming was mostly caused by human activities, but 30% believed it to have mostly natural causes, and 12% volunteered it probably results from both (Leiserowitz 2007).
- The American public is similarly ignorant about the U.S. position on the Kyoto Protocol: as recently as 2005 less than half of survey respondents knew that the Bush Administration had withdrawn U.S. support from the international treaty (Nisbet and Myers 2007: 447-450).

Public perceptions of the scientific consensus on climate change

- Concerning people’s belief that global warming is „real“, a poll in 1992 indicated that 68% of respondents felt it was; a proportion that had declined to 57% by 1994. Asked in a slightly different manner in the early 2000s, more than 70% in ABC News polls, and well over 80% in the April 2007 ABC News/Stanford University poll believed in the reality of rising CO₂ and global temperatures (ABC News, Washington Post, and Stanford University 2007). In July 2007, 72% of Americans were personally convinced that global warming was real and happening (Leiserowitz 2007).
- Public perceptions of whether or not scientists shared a consensus about the reality, causes and seriousness of global warming have varied significantly over time. This variability reflects both the accumulation and strengthening of scientific conclusions on the one hand and the efforts by conservative politicians, media, think tanks, and fossil-fuel funded activists to undermine public confidence in these findings on the other (McCright and Dunlap 2001, 2003; Davidson 2008).
- One series of polls showed that agreement with the statement “most scientists believe that global warming is occurring” had increased from 28% in 1994 to 65% in 2006. Other polls, asking slightly differently, indicate that the public perceives far greater disagreement among scientists than is factual reality. As late as April 2007 -- after the widely reported release of the Intergovernmental Panel on Climate Change’s Fourth Assessment report -- an ABC News/Stanford University poll found that 56% of respondents perceived “a lot of disagreement” among scientists about whether or not global warming is happening (Nisbet and Myers 2007: 450-454).

Public concern about the impacts of global warming

- After years of significant doubt, the proportion of people believing that the effects of global warming had already begun rose to 60% in 2007. Fifteen percent expect signs of change soon, while another 15% continue to believe that they will not experience impacts within their lifetime, but future generations may see some; an additional 10% believe there will never be any effects. When asked slightly differently (“do you think that global warming will pose a threat to you or your way of life in your lifetime?”) 62% in 2006 answered “no.”

- When asked about the threat global warming represents to the environment and their families, between 35 and 43% of respondents view climate change as extremely or very dangerous to the environment, while the larger proportion of respondents expect low to moderate threats.
- Indications of “worry” about global warming varied considerably over time, reflecting reporting cycles in the media and competing worries (such as the state of the economy or the terrorist attacks of 2001 in the United States) (Weber 2006). In a 2007 Gallup poll, the proportion saying they worried “a great deal” about global warming had reached the highest percentage to date with 41%; however, the combined proportion of those worrying “a great deal” and “a fair amount” (65% in 2007) was only 2% higher than when the measure was first taken in 1989 (Nisbet and Myers 2007: 455-456).

Level of concern about the global warming, causes and comparisons to other problems

- Series of polls over the past decade or more show that “personal” importance and concern over global warming has grown significantly, with the percentage of survey respondents saying that global warming is either “extremely” or “very” important to them personally having grown from 27% in 1997 to 52% in 2007.
- In surveys (not included in Nisbet and Myers) conducted in 2002/03 and again in 2007, Leiserowitz found that this “moderate level of public concern about climate change [...] appears to be driven primarily by the perception of danger to geographically and temporally distant people, places and non-human nature” (Leiserowitz 2006: 53; see also Leiserowitz 2007; Leiserowitz 2005). In the July 2007 survey, the proportion of respondents expecting a “very serious” threat was highest for “plants and animals” (52%), “people in other countries” (40%) and “people elsewhere in the United States” (30%), while far fewer expected a very serious threat to “you and your family” (19%) and “your community” (18%). In other words, climate change by and large is not perceived as a personal threat (Leiserowitz 2007).
- In a careful analysis of the causes of why people judged global warming as *nationally* serious or not, Krosnick et al. (2006) found that Americans were most motivated by potential impacts on sea-level rise, and food and water shortages, i.e., on shelter and sustenance, rather than by impacts on them *individually*.
- When Americans are asked to rank the importance of global warming relative to a list of other environmental problems (such as pollution of drinking water, toxics in the environment, maintenance of water supplies, or air pollution), global warming consistently ranks well below these more tangible, geographically near, or more visible problems.
- In open-ended questions about what the world’s biggest environmental problem is at this time, ABC/Stanford polls in 2006 and 2007 (for the first time) found global warming to be the most frequently mentioned problem. In 2008, poll data resumed the more familiar pattern described just above (Jones 2008). In fact, the salience of global warming increased significantly between the 2006 and 2007 polls, with 33% of Americans naming global warming as the No. 1 global environmental problem in 2007 (compared to 16% saying so in 2006) (Nisbet and Myers 2007: 456-460; ABC

News, TIME Magazine, and Stanford University 2006; ABC News, Washington Post, and Stanford University 2007).

Public support for policy action

- Public support for immediate (unspecified) action to slow global warming versus simply doing more research has varied considerably over the past two decades. In recent years, a plurality of Americans appears to favor “action now” versus “wait and see” (or simply do more research).
- During weaker economic times and in the face of competing priorities such as war and terrorism, a small, non-trivial proportion of Americans (21% in 2005) favors actions, but only those that involve no cost. The majority (52%) believe taking actions involving “low costs” is the best way forward, and more than a third would accept actions even if they involved “significant” costs.
- When asked about specific policy measures, public support is consistently strongest for mandatory emission-limiting regulations on industry and automobile manufacturers. Especially higher auto emission standards are consistently favored by a majority of Americans, even if vehicle costs would increase.⁶
- A majority of Americans also support mandatory requirements that some portion of electricity be produced from renewable sources, and generally support more research and development funds for them. Americans are split on questions regarding boosting nuclear energy.
- Americans favor incentives (such as tax rebates) to encourage climate-relevant consumer purchases while strongly opposing higher taxes on gasoline or electricity. The most recent polling results produce some of the lowest percentages of support for tax increases, likely reflecting the reality of already high gasoline and fuel prices.
- The GfK Roper Yale survey on environmental issues, conducted in October 2007, found similarly strong support for mandatory policy changes and incentives for energy conservation, installation of solar panels, and other efficiency improvements enacted at the local/city level. Support declined sharply for all policy proposals that would affect individuals directly in their pocket books or restrict their personal choices (GfK Roper Public Affairs & Media and Yale School of Forestry & Environmental Studies 2007).

Regarding global climate treaties, around two-thirds of Americans have always favored that the U.S. participate and take a lead role in international climate treaties and assume a fair share of its responsibility for the problem. However, awareness of the policy process, specifics of the UNFCCC or the Kyoto treaty and its policy mechanisms have been consistently very low, suggesting that stated opinions reflect general attitudes about fairness, leadership, and responsibility rather than a deeper understanding of international policy issues (Nisbet and Myers 2007: 460-467).

⁶ Specific percentages here and in the next few bullets are not recited here as wording of poll questions varied significantly over time and among polling organizations, thus making specific trends of comparisons difficult to interpret.

3. Implications for Communication and Engagement with the Climate Issue

A critical assessment of what has been thus far achieved by public engagement efforts in the U.S. must acknowledge that the glass is both half full and half empty. Clearly, a steady drumbeat on climate change by scientists, the media, non-governmental organizations, high-profile celebrities (such as the efforts by former Vice President Al Gore in the U.S. and Australia, see Gaillard, this volume), and educational institutions has raised public awareness of the issue to near-saturation levels. While lagging behind the scientific community, a majority of Americans are now convinced that the issue is real, happening, human-caused, and very serious. Despite competing worries, concerns, and lack of in-depth understanding, public support for policy action at all levels and for responsible U.S. (re)engagement in international climate negotiations is strong.

Stealing Al Gore's notorious phrase, there are a number of "inconvenient truths," however, that must also be acknowledged. Public understanding of even the most basic causal mechanisms and scientific realities underlying anthropogenic climate change is still very low. Various indicators suggest the public is deeply unsure about what is true or not true about global warming (Corbett and Durfee 2004). Because of this lack of climate literacy, convictions are weak and vulnerable to misleading counterarguments, resulting in the observed fluctuations in convictions. Against the background of low general scientific and climate literacy (National Science Board 2008) and generally superficial information processing, misinformation campaigns have had a measurable impact on the American public, leaving a persistent and nagging doubt about the relevant impacts of global warming, human causation, and the level of scientific agreement in the American mind (Dunwoody 2007; Petty, Priester, and Brinol 2002).

Many Americans continue to believe that the impacts of climate change are far into the future – a sense inconsistent with the growing body of accumulating evidence of environmental and social impacts already occurring now. A large number of Americans also expect the worst impacts to occur on other species, in other, far-away places, while expecting far less impacts closer to home (here and now, on themselves, their families, or communities). This may reflect common communication practices of framing the impacts of climate change with a reference to "2100" or "by the end of the coming/this century", but is also consistent with a common observation in risk perceptions studies that people tend to view themselves at less of a risk than they perceive others to be. For people to actively engage with the climate issue, they must prioritize it over other competing concerns (e.g., personal employment or health, education and safety of their children, national security, war, or the overall state of the economy). Such prioritization appears to be a function of perceptions of problem reality, expectations of negative impacts, a sense of responsibility, and perceptions about their personal and collective ability to affect the problem (Moser 2007b; Krosnick et al. 2006). While problem reality is increasingly accepted, perceptions of what global warming may mean remain misinformed or inappropriately skewed, and the sense of personal responsibility and efficacy remain low. Moreover, Rabkin and Gershon (2007) found that becoming informed about global warming can serve as a substitute rather than as an incentive for action on climate change.

It is barely surprising then that global warming has played little role in electoral decisions in the past and does so barely now (Leiserowitz 2007). In short, communication efforts to date have fallen short in simultaneously achieving a sense of urgency and empowering people to take or support effective action.

Commenting on the mass media approach that has dominated climate change communication in the U.S. to date, Dunwoody (2007: 94) argued, “while mediated channels such as television and newspapers may reach millions and provide a cost-effective source of information about global climate change, they may not convince individuals that such changes will influence them personally or that they can do something personally about the problem” (Dunwoody 2007). To increase a sense of urgency, communicators have used fear appeals and simply reported on potential negative impacts. The overwhelming nature of these impacts and the global scope of the problem (without clear and empowering, enabling messaging on solutions) are likely to have led to feelings of overwhelm, paralysis, cynicism and even hopelessness (Moser 2007b; Stoll-Kleemann, O’Riordan, and Jaeger 2001; Immerwahr 1999).

Despite the strong policy support suggested by polling data and the growing movement for climate protection observed in the U.S. (Moser 2007a)⁷, Americans clearly prefer measures that don’t hurt their pocket books, don’t restrict their personal freedoms, or require behavior change. Together with the lack of sense of responsibility (abrogated to scientists and engineers who are believed to find technological fixes) and a sense of being able to make a difference, it comes as no surprise that most Americans live their daily lives without much consideration of global warming in their daily decisions. Moreover, because of the lack of understanding of how long greenhouse gases remain in the atmosphere, and the general lack of systems thinking among even highly educated publics (Sterman 2002; Sterman and Booth Sweeney 2007), few Americans understand the gravity of the measures needed to avert “dangerous” climate change.

Finally, while a laudable number of U.S. cities, states, organizations, and businesses have made public commitments to reduce emissions (see the range of cases and far-reaching literature cited in Moser and Dilling (2007b)), and many have achieved measurable change already, the vast majority of communities, businesses and individuals have not yet begun. Few if any cities or states have achieved emission reductions below the 1990 benchmark – far from the drastic reductions argued for by many scientists and NGOs.

In summary, the American public’s or policy-makers’ engagement with climate change is superficial at best at this time. A pervasive sense of urgency remains lacking as does deeper engagement with the issue in ways that lead to active behavior change or policy actions at all levels of government. The ultimate goal thus for a comprehensive national outreach campaign on global warming is to go beyond greater understanding but to foster lasting engagement and real societal change in the political, professional and personal realms.

⁷ Since the publication of that paper, indicators of social activism on climate change have only increased since publication of that paper but space does not permit a systematic update here.

4. Critical Elements of a National U.S. Climate Outreach Campaign

The next generation of climate communication with the American public, if it is to achieve the goal of active engagement and lasting societal change, must be grounded in insights from relevant social sciences (e.g., Cialdini, this issue; McKenzie-Mohr, this issue). It must go beyond “business as usual” outreach; involve a bundle of different strategies that are audience-tailored, tested, refined, and evaluated; reach out to new, previously unengaged audiences, thereby crossing abiding social divides; aim not just at the “easy” behavior change targets (changing a light bulb), but also tackle the deeper social transformations ultimately needed; and involve a variety of “non-traditional,” creative and surprising strategies to break through information filters.

The following elements are offered as guiding principles for a more promising outreach and engagement approach (Moser and Dilling 2007a):

1. America is not, never will be, and does not need to be, a nation of Ph.D.s in atmospheric science to take action on climate change

One of the most persistent misconceptions among communicators and campaigners is the notion that information or knowledge alone will lead to the “right” action. This so-called information or knowledge deficit model has been found insufficient again and again (e.g., Kellstedt, Zahran, and Vedlitz 2008; Sturgis and Allum 2004; Bak 2001; Schultz 2002), yet educational information campaigns continue to be favored strategies (Al Gore’s early communication trainings of “1000 Voices for Climate Change” in the U.S. and Australia (Moser 2007c), his docu-drama “An Inconvenient Truth,” and many an educational outreach effort by scientists and NGOs represent this approach). Some basic understanding of climate change may be a necessary but insufficient condition for appropriate action, and without messages of empowerment and practical solutions may produce counterintuitive results.

2. Effective communication must begin with the audience

There is not one public or audience, but dozens. It is a strategic choice which to focus on at any one time or for different goals. Audiences differ in the language and framings that will resonate with them, the mental models they already hold about climate change, the values, persistent concerns and deeply held beliefs that matter, and the channels through which they receive information. Different audiences need to hear different messages and can hear them best from different messengers, as those are believed and trusted to varying degrees, can serve as role models for social norms and as sources of social influence and power. Consequently, even under a unifying umbrella campaign, messages will vary and be linked to what is resonant to specific audiences, including the social norms, aspirations, and underlying values that generate sustained motivation. The pool of messengers must be expanded and trained in climate change and effective communication.

3. *Create urgency, but do not dwell on fear*

A key objective of the next generation of outreach must be to convey a sense of urgency, but mere appeals to fear or guilt will not produce desired results of active engagement. Creating national and personal relevance (a sense of being impacted by climate, energy, or the measures to address them), fostering a sense of personal responsibility, and empowering and enabling audiences with practical and encouraging help to take meaningful action will more likely produce urgency and action than fear.

4. *Encourage, empower, enable (and sustain motivation for) people to act*

The importance of turning to solutions messages cannot be overstated, and a growing number of organizations and communicators now do so. A generic list of what could be done will not suffice. Solutions must be linked to what matters to audiences and include some actions the audience can affect directly. Communication on solutions must address disempowering beliefs – e.g., that individual actions don't matter, that U.S. actions don't matter without China. Importantly, communicators must illustrate the collective effort (needed and underway) to address the issue. Much behavior change is achieved more easily or sustainably in groups or communities (McKenzie-Mohr, this issue), and at different stages in the change process, needed motivational messages will differ.

5. *Address barriers and resistances to behavior, organizational, and policy change*

Most social change falters at the internal resistances and external barriers rather than on a lack of motivation to initiate a change in the first place (Moser and Dilling 2007a). Communication campaigns must be designed with these obstacles in mind, address them, and help audiences overcome them through specific messages, practical help, social support and modeling of alternative social norms.

6. *Communicate, and invite people to build their own, visions of a positive future*







If the world came together and actually achieved the level of emission reductions that would keep atmospheric CO₂ concentrations to 550ppm, still double pre-industrial levels, the climate would still change and produce numerous negative impacts. For all the efforts humanity will have made, the feedback from the environment and climate will still be negative. Psychologically and politically these are dark prospects for sustaining efforts over the coming decades. The social world, however, will have fundamentally changed, and in many ways for the better (e.g., less air pollution, less traffic congestion, integrated work-life worlds). To sustain social change efforts over the next few decades, a compelling vision of a world worth fighting for, and indicators of positive social change in that direction will be required. Political leaders and communicators must invite Americans into dreaming up images (goals) of a desirable future that can be called up to sustain motivation in difficult times.

7. Create forums for difficult dialogues

Mass media communication serves well to place an issue on the public and policy agenda, but fails to address communication needs of specific audiences, facilitate and sustain behavior change (better accomplished through unmediated face-to-face communication), or offer appropriate forums to explore and adjudicate between deeply engrained differences, values, beliefs, and solution preferences. Moreover, change in behavioral habits and social norms require repeated reinforcement and support over a long period of time. The deep societal transformation needed creates its own demands for processing and coping. And finally, one-way or passive mass media communication does not offer adequate forums for learning (e.g., about climate and energy problems, response options, social change needs and their implications) or for generating mutual understanding or the positive visions mentioned above. Thus, future communication cannot rest on one-way information delivery alone but must foster engaging dialogues in existing and newly created networks. Many of the dialogues needed to move ahead are likely to be “difficult dialogues” and may need skilled facilitation (e.g., the Ford Foundation-sponsored efforts at American campuses; in 2007-08, Clark University focused its Difficult Dialogues project specifically on climate change, see http://www.clarku.edu/difficultdialogues_2.cfm).

In conclusion, the audience-specific, two-way “retail communication” proposed here may seem costly, time-consuming, and inefficient, especially in light of the large and urgent challenge ahead. But there is little reason to believe that more money spent on yet another mass media campaign with similar content, targeted at the same audiences, will produce any better outcomes than their predecessors, thus resulting in a pricey waste of time and opportunity. Cost reduction measures can be achieved instead through collaboration with well-connected, credible educational and non-governmental organizations, and engagement of skilled communication and social change experts. But for Americans to engage more actively with climate change, communication with them has to reach them where they live, work, worship, and have fun. It must touch their minds and hearts, and it must rally them to rise to a challenge far greater than that to the Moon.

References

-  —, eds. 2007b. *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*. Cambridge, UK: Cambridge University Press.
-  —. 2003. Defeating Kyoto: The conservative movement's impact on U.S. climate change policy. In *Social Problems* 50: 348-373.
-  —. 2006. Climate change risk perception and policy preferences: The role of affect, imagery, and values. In *Climatic Change* 77: 45-72.
-  —. 2007. *American Opinions on Global Warming*. unpublished report.
-  —. 2007b. More bad news: The risk of neglecting emotional responses to climate change information. In *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*. Eds. S. C. Moser and L. Dilling, 64-80. Cambridge, UK: Cambridge University Press.
-  —. 2007c. *Training a Cavalry of “1,000 Voices for Climate Change” – Observations and Recommendations for Ongoing Support and Future Trainings*. Report to Vice President Al Gore and The Climate Project. Boulder, CO: NCAR.

- ABC News, TIME Magazine, and Stanford University. 2006. ABC News/TIME Magazine/Stanford Poll: *Global Warming*. Washington, DC: ABC News.
- ABC News, Washington Post, and Stanford University. 2007. *Global Warming Soars to Top Slot As Greatest Environmental Threat*. Report.
- Bak, H.-J. 2001. Education and Public Attitudes toward Science: Implications for the "Deficit Model" of Education and Support for Science and Technology. In *Social Science Quarterly* 82 (4): 779-795.
- Corbett, J. B., and J. L. Durfee. 2004. Testing Public (Un)Certainty of Science: Media Representations of Global Warming. In *Science Communication* 26 (2): 129-151.
- Davidson, M. D. 2008. Parallels in reactionary argumentation in the US congressional debates on the abolition of slavery and the Kyoto Protocol. In *Climatic Change* 86: 67-82.
- Downs, A. 1972. Up and Down with Ecology: The Issue-Attention Cycles. In *Public Interest* 28: 38-50.
- Dunwoody, S. 2007. The challenge of trying to make a difference using media messages. In *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*. Eds. S. C. Moser and L. Dilling, 89-104. Cambridge, MA: Cambridge University Press.
- T. Dietz and P. C. Stern. Examining the knowledge-deficit model of behavior change. In *New Tools for Environmental Protection: Education, Information, and Voluntary Measures* Washington, DC: National Academy Press: 67-82.
- GfK Roper Public Affairs & Media, and Yale School of Forestry & Environmental Studies. 2007. The GfK Roper Yale Survey on Environmental Issues. In *American Support for Local Action on Global Warming*. 10 pp. New Haven, CT: Yale University.
- Henry, G. T., and C. S. Gordon. 2001. Tracking Issue Attention: Specifying the Dynamics of the Public Agenda. In *Public Opinion Quarterly* 65 (2): 157-177.
- Immerwahr, J. 1999. *Waiting for a signal: Public attitudes toward global warming, the environment and geophysical research*. 18 pp.: AGU.
- Jones, J.M. 2008. *Polluted drinking water was no.1 concern before AP report. Global warming way down the list*. Gallup Poll, conducted March 6-9, 2008, Princeton, NJ.
- Krosnick, J.A., A.L. Holbrook, L. Lowe, and P.S. Visser. 2006. The origins and consequences of democratic policy agendas: A study of popular concern about global warming. In *Climatic Change* 77: 7-43.
- Leiserowitz, A. 2005. American risk perceptions: Is climate change dangerous? In *Risk Analysis* 25 (6): 1433-1442.
- Lenton, T. M., H. Held, E. Kriegler, J. W. Hall, W. Lucht, S. Rahmstorf, and H. J. Schellnhuber. 2008. *Tipping elements in the Earth's climate system*. Proceedings of the National Academy of Sciences: 0705414105.
- McCright, A. M., and R. E. Dunlap. 2001. Challenging global warming as a social problem: An analysis of the conservative movement's counter-claims. In *Social Problems* 47 (4): 499-522.
- Moser, S. C. 2007a. In the long shadows of inaction: The quiet building of a climate protection movement in the United States. In *Global Environmental Politics* 7 (2): 124-144.
- Moser, S. C., and L. Dilling. 2007a. Toward the Social Tipping Point: Conclusions. In *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*. Eds. S. C. Moser and L. Dilling, 491-516. Cambridge. UK: Cambridge University Press.
- National Science Board. 2008. Science and Technology: Public Attitudes and Understanding. In *Science and Engineering Indicators*. Arlington, VA: NSF: 7-1 to 7-49.

- Nisbet, M. C., and T. Myers. 2007. Twenty Years of Public Opinion about Global Warming. In *Public Opinion Quarterly* 71 (3): 444-470.
- Parry, M. L., O. F. Canziani, J. P. Palutikof, P. J. v. d. Linden, and C. E. Hanson, eds. 2007. Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the *Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.
- Petty, R. E., J. R. Priester, and P. Brinol. 2002. Mass media attitude change: Implications of the Elaboration Likelihood Model of persuasion. In *Media Effects: Advances in Theory and Research*. Eds. J. Bryant and D. Zillmann, 155-198. Mahwah, NJ: Erlbaum.
- Rabkin, S., and D. Gershon. 2007. Changing the world one household at a time: Portland's 30-day program to lose 5000 pounds. In *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*. Eds. S. C. Moser and L. Dilling, 292-302. Cambridge, MA: Cambridge University Press.
- Schultz, P. W. 2002. Knowledge, information, and household recycling.
- Solomon, S., eds. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the *Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Vol. 1. Cambridge, UK: Cambridge University Press.
- Sterman, J. D. 2002. Cloudy skies: Assessing public understanding of global warming. In *System Dynamics Review* 18 (2 (Special Issue))?
- Sterman, J. D., and L. B. Sweeney. 2007. Understanding public complacency about climate change: adults' mental models of climate change violate conservation of matter. In *Climatic Change* 80 (3-4): 213-238.
- Stoll-Kleemann, S., T. O'Riordan, and C. C. Jaeger. 2001. The psychology of denial concerning climate mitigation measures: Evidence from Swiss focus groups. In *Global Environmental Change* 11: 107-117.
- Sturgis, P., and N. Allum. 2004. Science in society: Re-evaluating the deficit model of public attitudes. In *Public Understanding of Science* 13: 55-74.
- Ungar, S. 1992. The rise and (relative) decline of global warming as a social problem. In *The Sociological Quarterly* 33: 483-501.
- Weber, E. U. 2006. Experience-based and description-based perceptions of long-term risk: Why global warming does not scare us (yet). In *Climatic Change* 77 (1-2): 103-120.