

Introduction

Lisa Dilling

University of Colorado—Boulder

Susanne C. Moser

National Center for Atmospheric Research

It is June 23, 1988, a sweltering day in Washington, DC, and members of the US Senate Committee on Energy and Natural Resources are settling into their seats. What they are about to hear will change the direction of American politics forever. Up to the podium steps a six-foot middle-aged scientist, a little hoarse, a little nervous, and quietly vies for the attention of the eminent body.

The timing is perfect. Over 100 degrees outside and a deadly drought gripping much of the country, James E. Hansen, chief scientist of NASA's Goddard Institute for Space Studies, is here to nail the case for global warming. His message is simple and clear. "The greenhouse effect has been detected, and it is changing our climate now." He states "with 99 percent confidence" that the evidence was in — the world was indeed getting warmer, and model projections pointed to worse heat waves and droughts in the future. As observers later recalled, "Besieged by the media afterward, [Hansen] said, 'It's time to stop waffling so much and say that the greenhouse effect is here and affecting our climate now.' Suddenly global warming — and Hansen — became world news."¹

And world news it was. Not because of the news value of climate change — global warming had been buzzing around for a while — but because rarely if ever before did a scientist's warning set off such a determined response. The June hearing was just the beginning. Seven hearings in the Senate and five in the House followed, each adding to the persuasiveness and urgency of the scientists' warning. Skeptical voices faded away in the storm of those convinced that America should take the lead in moving the world toward binding global greenhouse gas emission reductions. By 1992 world leaders signed on to the UN Framework Convention on Climate Change which the US Senate ratified shortly thereafter. The administration and Congress committed funding to the tune of hundreds of millions of dollars in incentives for renewable energy and clean technology development. Efficiency standards and emission caps

were instituted as a matter of course. Industry – inspired to highest performance by competition and corporate responsibility – chose not to complain or resist, but ramped up its own R&D and by 1997 outperformed not only the emission targets but its own highest hopes.

Later that year, the Houston Protocol – the document implementing the Framework Convention – codified the US example as the global goal. It was signed and shortly thereafter ratified by Congress, becoming the standard of other international agreements. Under the strong leadership of the United States, China, India, and other major developing countries immediately signed on and joined the race for the cleanest economy in the world. The ever-strengthening science did not, however, only encourage real emission reductions. It also spurred developed nations into unprecedented support for developing nations, helping them leapfrog the fossil-fuel heavy development stages and offering compassionate assistance in dealing with the first impacts, the challenges of adaptation, and with building a resilient society. In 2000, more than two thirds of the US population pledged to partake in the Millennium Challenge – a program to reduce personal emissions by half in 15 years.

In June 2005, 17 years almost to the day after his first urgent wake-up call, Hansen returned to the Senate for another hearing. Greeted with the respect of a statesman, the now-nearly-gray man appeared before the legislators with another clear and simple message: “The world has responded. I am here today to report to you of the observable progress we are making. The challenge is not over and we must continue our work. But I am here today to thank you.”

This is not the story that historians will write – at least not with these dates and details. But we may yet write the history of a society heeding the ever-louder warnings about what many scientists agree is the biggest challenge humans have ever faced. The good news is that, in just the past few years more and more voices have joined those of scientists in calling for action to address climate change. And beyond just talk, signs of concrete action abound. Advocacy groups have launched new and smarter campaigns, many are coming together in novel coalitions, more and more in the business community are dropping their opposition to greenhouse gas (GHG) regulations, cities and states are taking action, and the US Congress is finally considering some modest policy proposals.

However, as the fundamental scientific consensus on human-induced climate change² has become stronger (Houghton *et al.*, 2001; Oreskes, 2004)

and the impacts from global warming are now being regularly documented at far-flung locations around the globe (McCarthy *et al.*, 2001), carbon dioxide and other heat-trapping GHGs continue to rise inexorably in the atmosphere,³ and people continue to lack adequate coping strategies for climate variability or change. This speaks to the magnitude of the challenge, the reality of the problem, and the lack of real progress as yet on effective solutions.

A persistent conundrum

Society at large does not appear to be deeply concerned with global warming, and as a result, is not yet acting on the ever-more urgent warnings emanating from the science and advocacy communities. Despite encouraging signs, ignorance, disinterest, apathy, and opposition are still prevalent. The resulting frustration among climate scientists and advocates runs high. They see the problem of global warming as urgent, difficult but not impossible to address, and needing immediate and substantial societal action. Yet their strategies to raise the sense of urgency in the public and among policy-makers don't seem to be working – at least not fast enough.

The familiar refrain goes something like this: “If only they understood how severe the problem is . . . If only we could explain the science more clearly, train to be better communicators, become more media-savvy, get better press coverage . . . The science of global warming is clear – why are we not acting as a society to combat the problem? Why are they not listening? Why is no one doing anything?”

Well, some things are being done, but not nearly enough to be commensurate with the magnitude of the problem. Thus, a persistent conundrum and challenging opportunity emerges: While the balance of available scientific evidence conveys an increasing sense of urgency, society as a whole – particularly in the United States – does not appear to view the problem as immediate, and certainly not as urgent. The often suggested remedy – by scientists and others – is the generic prescription: “better communication.” Better communication is seen as essential in leading us out of this conundrum, out of political gridlock, pointing a path forward, and energizing leaders and the broader public to mobilize for effective action.

But what do we mean by “better communication”? For many, it simply means “explaining the issue more clearly” or “reaching more people.” But the evidence shows that lack of a widespread sense of urgency is not the result of people not knowing about the issue. It is also not just due to not

understanding it or lack of information. In fact, research has shown that the public is overwhelmingly aware of the problem of global warming. Over 90 percent of the US population has heard of it, some know the problem is related to energy use, and quite a high percentage can correctly identify impacts associated with global warming.⁴ Far fewer understand the physics of the greenhouse effect, but one could argue that this level of understanding is not particularly necessary for action – even those who do not understand the basics of electricity generation still use appliances. What such survey studies also find is that while many judge the problem to be serious or very serious (Seacrest *et al.*, 2000; Brewer, 2003), only about a third of Americans find the issue personally concerning or worrisome (Stamm *et al.*, 2000)⁵ – a percentage that has gone down in recent polls, rather than up (e.g., Kull *et al.*, 2004; Brechin, 2003). The disparity in these two findings – high awareness but low personal concern – shows that if creating urgency were just a matter of understanding the “facts,” we would not be in the current conundrum.

So, clearly, there is something in *how* we communicate climate change that is failing to mobilize a wider audience. Simply talking about climate change in the way that has been done for the past few decades is not creating a sense of urgency or effective action. Certainly, there is an important role still for making the science of global warming accessible to the public. This function has served well in raising the issue to the high level of awareness that it already enjoys. But simply providing more information or speaking more loudly about climate change is not enough.

New research, interdisciplinary connections, and the experience of pioneers moving forward to act on the climate change problem point to a new approach. A quick glance around the United States reveals pockets of activity and success in motivating action in many different types of institutions – municipal and state governments, businesses, faith-based organizations, educational institutions, and the like. What can we learn from these examples about what works and why? How do we best draw together these lessons to inform others who do feel the problem is urgent and wish to promote appropriate action? We believe that the characteristics of the problem itself, the way people perceive and process information, and the motivators and barriers to action need to be examined through a new lens – one that integrates multidisciplinary knowledge on communication and social change. We look at what works – and what doesn't – on the ground, in different sectors, at different levels of governance, and let these practical experiences inform our communication and social change strategies and theories. Together scholarship and practice provide hope for a way out of the

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Why is climate change not perceived as urgent?

This book highlights stories of success in communicating and action on climate change, while taking a realistic look at the challenges before us. The champions we celebrate certainly have faced tough hurdles in their efforts. Without a doubt, global climate change is a difficult topic to talk about, a tough issue to spark interest among non-experts. First detected and defined by scientists, human-induced climate change has been called by many names: a carbon dioxide problem, an energy problem, global warming, an “enhanced greenhouse effect” – all abstract, benign-sounding, and utterly ... uninteresting, at least to most non-climate scientists (Clark *et al.*, 2001; Scheurs *et al.*, 2001).

In 1895, Svante Arrhenius, a Nobel laureate in chemistry laid the theoretical groundwork describing how fossil-fuel energy use could result in a warming atmosphere. As early as the 1950s, scientists in the United States, Europe, and elsewhere began to sound the alarm on climate change and potential impacts as they realized how human activities were altering the atmosphere, and therefore potentially the climate, of the entire Earth, but it would be decades before this scientifically defined problem would be more widely recognized and make it onto the public and policy agendas (Weart, 2003; Scheurs *et al.*, 2001). Why was it then, and why does it now continue to be, so difficult to make climate change relevant and important in light of the climate’s central role as a life support system? The climate change problem has several characteristics that make it difficult to understand and communicate, much less to be perceived as urgent.

Lack of immediacy

Carbon dioxide and other GHGs are invisible and at atmospheric concentrations (even rising ones) have no direct negative health impacts on humans as do other air pollutants. Moreover, it has taken a while (in most places) for impacts on the environment to be detected. Most people do not connect driving their cars or flipping on a light-switch with emitting CO₂ into the atmosphere. As a social problem, then, it is just not visible or experienced directly (yet) in the same way that job losses, obesity, or traffic congestion are.

Remoteness of impacts

The impacts of global warming are typically perceived as remote. Images of ice receding in the Arctic and sea-level rise affecting distant tropical islands in the Pacific, while dramatic, do not personally affect most of the world's population (McCarthy *et al.*, 2001; Rayner and Malone, 1998; O'Brien and Leichenko, 2000). And in most economically-advantaged societies, a perception prevails, supported by much science and even more political rhetoric, that society will be able to adapt to any adverse changes once they arrive (e.g., Voice of America, 2004). In many less-advantaged societies that are facing immediate, grave risks from disease, poverty, unsanitary conditions, warfare, and so on, global warming simply cannot compete against these direct personal threats and concerns.⁶

Time lags

The reason that scientists feel it is urgent to act on global warming involves the enormous lags in the climate system. Over time the accumulation of GHGs in the atmosphere will cause large-scale changes such as warming of the ocean and changes in the climatic system that are not easily reversible (Houghton *et al.*, 2001). The human systems that create these emissions – such as the energy and transportation systems – also change only over periods of decades, making it difficult to reduce GHG emissions instantaneously should society decide to make it a priority (Field *et al.*, 2004). But these lags in the system that so alarm the scientific community also work against making the problem urgent in the eyes of the general public.

Solution skepticism

The proposed solutions to solving the climate change problem also do not engender a sense of urgency. Solutions are rarely discussed in scientific presentations of the problem, leaving the audience to fill in their own (often incorrect) concepts of what those solutions might be.⁷ When they are discussed, suggestions such as reducing home energy use or using public transportation can provoke skepticism and resistance as it is hard for individuals to see how alternatives could be made to work or how those small actions could make any discernible difference to this global problem (AGU, 1999; Bostrom, 2001). Similar skepticism – fed by political rhetoric, ignorance, and some truth – prevails over international policy instruments such as those codified in the Kyoto Protocol.

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Threats to values and self-interests

At the national and international levels, solutions to global warming are seen as intensely political. In the United States, climate change remains a highly contested political issue as proposed solutions and policy mechanisms are viewed by some as conflicting with closely held values, priorities, and interests such as national sovereignty, economic growth, job security, and the "American way of life."⁸ As a highly contested issue with an elusive, distant payoff, tackling climate change solutions is a challenge that most politicians would rather avoid unless political gain can be had from taking a position.⁹

Imperfect markets

The economic system of market-dominated capitalism relies on the straightforward notion of supply meeting demand, but it is well known that markets exhibit failures in accounting for externalities such as pollution.¹⁰ These failures currently prevent the market from adequately accounting for externalized damages to the environment (and society). In addition, economic taboos such as assumptions about the role of consumption and economic growth are rarely discussed as they are central to the current conception of the economic engine.

Tragedy of the commons

The problem of global warming is maybe the ultimate "commons" problem (Hardin, 1968; NRC, 2002; Dietz, Ostrom, and Stern, 2003). The nations of the world all share one atmosphere. When GHGs are emitted from anywhere, they affect the climate of the Earth as a whole. Rules about using the atmosphere for the discharge of GHGs are only slowly being defined, while monitoring, accountability, and consequences for "overusing" the global atmospheric commons are extremely difficult to ensure and implement.

Political economy and injustice

The ethical implications of sharing one atmospheric commons go further. Some regions are disproportionately affected by climate change, and societal vulnerability to these negative impacts is also highly uneven due to differential levels of exposure and sensitivity to the risks, and differential ability to cope and adapt (Agyeman, Bullard, and Evans, 2003; Kasperson,

Kasperson, and Dow, 2001; Kasperson and Dow, 1991). Whether the decision is taken to maintain the status quo or undertake aggressive action to mitigate global warming, the burden and benefits of outcomes are unequally shared across nations and generations. Unfortunately, those who currently benefit from the status quo and who perceive themselves to be less severely impacted have little incentive to push for action (Agyeman, Bullard, and Evans, 2003; Kasperson, Kasperson, and Dow, 2001; Kasperson and Dow, 1991; Kasperson and Kasperson, 1991). Those, on the other hand, who are likely to be impacted more severely – the poor within developing and developed countries – have much incentive but little power and even fewer means to influence policy-making.

In summary, the inherent natural characteristics and deep societal roots of climate change stack the deck against the issue being recognized as an urgent and actionable problem. Communicators who have succeeded in motivating action to address this problem have been able to negotiate these challenges and still find a way to excite and engage different audiences constructively. Throughout this volume we find examples and strategies that have worked in preventing audiences from getting bogged down in these characteristics of the problem in different settings.

Communication and its impacts on the public's perception of urgency

Experience shows that the conundrum of the growing urgency of the problem vis-à-vis the lack of action is compounded by common communication practices of scientists, communicators, and advocates in the arena of climate change. Many of these are not unique to the problem of global warming – issues such as uncertainty, complexity, media practices, organized opposition, and people's mental models often play a role in controversial social issues. Those who are skilled in communicating and moving toward action have found modes of operating that recognize these pitfalls and remain focused on strategies that appeal to the constituencies they are working with. We discuss some of the most common communication pitfalls next.

Uncertain science as a political battlefield

For many years – especially in the United States, but to a lesser extent also in Europe and Australia – the rhetorical battle over the reality, causes, and solutions of global warming has been carried out within the arena of science. Scientists and others claiming authority on the issue took sides over whether or not the science itself was true or certain enough to act upon, whether the

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problem warranted precautionary or only adaptive action, and who should carry the financial burden. While legitimate scientific debate was and is useful and warranted, many of these "scientific" battles mask the true nature of the debate: namely one over values such as the responsibility of the present generation to future generations, the responsibility of economically advantaged nations towards less advantaged ones, the role of governments in regulating human choices over anything from energy use to development in hazardous areas, the rights of humans versus those of the non-human world, and so on (Briscoe, 2004; Sarewitz, 2004; Jamieson, 1996; Shackley and Wynne, 1996). Opponents of action on climate change have successfully organized and hired "their" experts (often called skeptics or contrarians) whose modus operandi has been to raise doubts about the overwhelming consensus on the state of the science while disproportionately highlighting the remaining unknowns (e.g., McCright and Dunlap, 2001, 2003). Even mainstream, credible scientists convinced of the seriousness of climate change have contributed to this emphasis on the unknown, often focusing more on "what we don't know yet" than on "what we do know." Scientists' professional culture, standards of conduct, and self-interest tend to emphasize uncertainty in standard communications (Briscoe, 2004; Shackley and Wynne, 1996). The result of these long-standing debates carried out on the back of science is a sad legacy: the trust in science is further eroding; those listening to the debates as media consumers are confused about the science, economics and politics; scientific uncertainty has hardened as a justification for inaction (Jamieson, 1996; Shackley and Wynne, 1996); and surveys show that the frequently partisan nature of the debate more often than not makes listeners turn away from the issue in disgust (ibid.).

Media practices and trends

Most Americans receive their information on climate change from mass media outlets such as television and newspapers. As researchers have pointed out, the tendency of the media to report two opposing viewpoints means that the mainstream consensus view is typically "balanced" by an opposing contrarian viewpoint. In practice, this amounts to a "bias" since the viewpoints of a handful of contrarians are given equal weight to the thousands of scientists who hold a general agreement with the consensus view of the IPCC (Boykoff and Boykoff, 2004; Mooney, 2004; Dearing, 1995). In addition, the number of independent outlets presenting news is dwindling, there is a sizable distrust of news sources among readers, and reporters deplore the challenges of good reporting under increasing economic pressures

and the editorial policies that they give rise to (Eastland, 2005; France, 2004). Science reporting is increasing if measured by the number of stories alone (Pellechia, 1997). Yet the number of US newspapers with dedicated science sections has shrunk down to one, the number of reporters with science or environmental beats is declining, and reporters' understanding of climate science is very limited (Major and Atwood, 2004; Wilson, 2000; Bell, 1994; Wilkins, 1993).¹¹

Inappropriate frames and mental models

People absorb new information through pre-existing frames of reference, or cognitive structures (so-called mental models), to order information (Kempton, 1991). They intimately affect people's understanding, perceptions, and reactions to information. For example, if climate change is reported on TV accompanied by images of weather disasters, the "weather" frame may be triggered. This frame suggests that climate change can neither be caused nor solved by humans, but is an "act of God." By focusing on large scale "weather"-like impacts, there is thus a danger that the communication may invoke a sense of helplessness or resignation — after all, who can control the weather (Morgan *et al.*, 2002; Bord, O'Connor, and Fisher, 2000; Bostrom *et al.*, 1994; Read *et al.*, 1994)?

Cultural barriers

Unlike many other socially defined problems of the twentieth century, global warming does not clearly resonate with any current cultural icons or values. There is no clear "brand" or "cultural whirlwind" defining the problem in a way that allows the public to easily relate (Ungar, 1992, 2000). It's not the subject of dinner-table conversations, and appears rarely in non-expert blogs or TV reality shows. At those recent times when it has entered popular culture, the problem is mischaracterized (either overblown or minimized) and the audience is left with additional confusion.¹²

Alarmism and other ineffective ways to create urgency

To make any issue a personal concern or even worry, it would have to affect one's own or one's family's well-being, or rise to moral significance (e.g., Hannon, 2005; Schultz, 2001). As British statesman Sir Crispin Tickell noted, it is difficult for climate change to appear urgent except in cases of catastrophe or disaster (Tickell, 2002). However, trying to create urgency by

appealing to fear — of disaster in prompting behavior change — is the opposite from the desire to act, and can in fact create greater resistance (Dilling, 2004).

Another persuasive strategy is to appeal to individuals into changing their behavior. A key criterion needed to activate behavior change is the perceived cost of inaction. Pointing the finger at wasteful ways is ubiquitous, but to promote behavior change, such appeals tend to be ineffective in the long run, with wild rationalization and annoyance at such manipulation (Moser and Dilling, 2004).

Given these many pitfalls, how can we mobilize action? How can people do not feel a personal stake in this book have found? How can we and manage to circumvent

The fundamental claim of this book is that more knowledge, or more information, does not lead to desirable social change. A deeper understanding has an impact, but it can keep barriers to behavior change in place or sufficient. Research has shown that levels of knowledge about climate change in changing their attitudes and behaviors is often unaltered. The barrier can be internal to an individual, or external, such as a specific act, such as reducing energy use (e.g., lack of public transportation, etc.). These conditions experience these obstacles. Successful communication therefore must take into account these conditions and their social and cognitive factors. They effectively do with

appealing to fear — of disasters, health risks, or the like — is unreliable at best in prompting behavior change. Frequently, this technique leads to the exact opposite from the desired response: denial, paralysis, apathy, or actions that can in fact create greater risks than the one being mitigated (Moser and Dilling, 2004).

Another persuasive technique commonly used is trying to shame individuals into changing their behavior. This taps into the second possible criterion needed to activate a personal worry or concern — the moral dimension. Pointing the finger at SUV owners or those who use energy in seemingly wasteful ways is ubiquitous among champions and advocates trying to promote behavior change. Yet guilt appeals, even more so than fear appeals, tend to be ineffective in generating the desired behavior. Most of us react with wild rationalizations for our behavior, with rejection, resentment, and annoyance at such manipulation attempts rather than with better behavior (Moser and Dilling, 2004; O'Keefe, 2002a,b; Nabi, 2002).

Given these many pitfalls in common communication practice that work against mobilizing action on climate change, it is no surprise that most people do not feel a personal urgency on the issue. The successful innovators in this book have found ways to communicate that recognize these pitfalls and manage to circumvent or avoid them in practice.

Barriers to action

The fundamental claim of this book is that better information dissemination, more knowledge, or more effective communication alone will not necessarily lead to desirable social changes. While we strongly believe that better understanding has an important role to play, communication that does not keep barriers to behavior and social change in mind is unlikely to be effective or sufficient. Research has demonstrated that even if participants have high levels of knowledge about the problem and the community has invested in changing their attitudes through advertising or educational campaigns, behavior is often unaltered (McKenzie-Mohr, 2000). Barriers to action can be internal to an individual (lack of knowledge on how to implement a specific act, such as replacing a thermostat) or external to an individual (e.g., lack of public transportation infrastructure). Organizations and institutions experience these obstacles to change in response to global warming as well. Successful communication that mobilizes action on climate change therefore must take into account the options that people have for action and their social and cognitive characteristics — in other words, what can they effectively do with the information they are given? The stories of this

volume illustrate how effective communication for social change has taken into account these barriers and can therefore make a positive difference on climate. Some of the barriers to be aware of and overcome include the following.

Cognitive barriers

The way people think about issues and how they process information can either help or hinder making appropriate choices and taking conscious action. This begins with the metaphorical "getting the foot in the (mental) door." In the context of information overload, constant and ever-faster stimulation via TV and other news media, advertisement, email, the web, and so on, the primary barrier is to get on someone's radar screen, i.e., to cognitively register with a person. That in itself is not a given, even if exposure through the media occurs (Crane *et al.*, 1994). Getting through the information filters, triggering appropriate mental models and hence response options, and engaging people via encouraging frames of reference all play important roles (Morgan *et al.*, 2002; Bostrom *et al.*, 1994; Read *et al.*, 1994). An ability to weigh and sort out real or perceived conflicts between action choices is critical, as is the development of sufficient will to take an action. In short, individuals acting in their personal lives or making decisions for organizations face similar cognitive challenges.

What adds to these cognitive challenges is the fact that most adults' educational experiences do not prepare them well to deal with integrated, interdisciplinary problems that require agile responses and systems-thinking capabilities. In an educational system that over time evolved to emphasize the recall of details of separate subject areas rather than the connections between them, most children even today do not receive truly integrated education.

Psychological barriers

Psychological reactions to information are critical components of our processing and willingness to act; they can be as and sometimes even more powerful than the way we think about an issue (Dillard and Pfau, 2002). Certain strong emotional responses can end all further thinking — such as massive fear, despair, or a sense of being completely overwhelmed and powerless (Nicholsen, 2002; Macy and Brown, 1998).¹³ Other emotions — such as guilt or other ways of feeling manipulated — can provoke staunch resistance. While emotional reactions are difficult to foresee

with certainty, they are a key part of any communications strategy.

Change is hard simply because it triggers fear of the unknown. The hassle of having to do something new, especially if it is not credible, thus does not come from a trusted or personally familiar source; those from familiar sources; those who understand one's situation and backgrounds. Often, it takes a competing firm to sponsor initiatives such as social (to name a few) employment and maybe a greater ser-

Organizational

Parallel to the resistance to change also often encountered (Senge, 1990). Organizational procedures ingrained over even with strong leadership or time, which may be hard to change, it is often easier for the champion for action on government or corporate level than several other separate organizations to take action.

Lack of

The US political system is set up for stability. While intergenerational, and difficult to change, it has been and continues to be a source of constituents favor incre-

with certainty, they are fatal to ignore when crafting an effective communications strategy.

Lack of peer support

Change is hard simply because it is a break in the routine, habit, or tradition. It triggers fear of the unknown, or aversion to risk, or simply resistance to the hassle of having to do something differently. New information, however credible, thus does not easily persuade individuals to act in new ways unless it comes from a trusted source (Mutz, 1998; Rogers, 1995). Generally, personally familiar sources are more trusted than more distant and less familiar sources; those coming from similar circumstances are believed to understand one's situation better than those coming from very different backgrounds. Often, it takes observing the actions by a neighbor, a friend, or a competing firm to spur action (Rogers, 1995). Many (behavior) change initiatives such as social marketing, weight loss, and rehabilitation programs (to name a few) employ peer support and pressure, mutual accountability, and maybe a greater sense of responsibility to great success (Cialdini, 2001).

Organizational inertia and resource constraints

Parallel to the resistance in individual behavior, organizational behavior change also often encounters active or passive resistance (Doppelt, 2003; Senge, 1990). Organizations have inertia of their own, and practices or procedures ingrained over time are often difficult to change or overcome, even with strong leadership. If the change requires extra funding, attention, or time, which may be hard to in times of limited budgets or under pressure, it is often easier for the organization to let innovations pass by. Even if a champion for action on global warming exists in one department of a city government or corporate division, for example, she may have to convince several other separate departments and key individuals in order for her organization to take action.

Lack of political will and leadership

The US political system – like many others – with its checks and balances is set up for stability. While examples can be found where long-term, intergenerational, and delayed-payoff policies and budget decisions have been and continue to be made, election cycles and accountability to constituents favor incrementalism (e.g., Hayes, 2001; Lindblom, 1959).¹⁴

accounted for. A fuller understanding of the role of communication and how it intersects with social change is necessary. While a high level of basic awareness has been achieved, understanding can (and some would argue *should*) still be deepened significantly. But a high level of awareness and a better understanding of the science underlying climate change do not directly or necessarily translate into concern or action (e.g., voting, behavior changes, policy support, or other forms of engagement). Differently put, "better communication" goes beyond simply designing more effective ways of conveying information from an expert to a lay audience.

Yet observation of current efforts suggests just that. For better or worse, a large share of the responsibility for communicating climate change still falls to scientists and others who lay claim to scientific or technical expertise. Among many of these communicators, the tripartite conviction that (1) climate change is essentially a scientific issue, (2) experts understand it and others don't, and (3) the purpose of communication thus is to educate the ignorant is, in short, still alive and well. Communication on global warming based on these assumptions thus creates an abiding rift between listener and speaker, preventing the listener from truly gaining ownership of the problem because of its alleged purely technical nature and the implicit hierarchy of expert/lay person in which it is approached.

The discussion above has demonstrated how this traditional approach to communication has failed to motivate – the public is aware of the term "global warming," but not energized by it to act. Climate change simply does not resonate deeply with the general public; it remains disconnected from people's daily lives, from their more immediate concerns. This suggests, then, that climate change has not been communicated effectively until communicators understand how to bridge this "gap of meaning." To do so, it seems to us, is impossible without understanding the "audience" more fully.

"Know thy audience," of course, is an old adage in communication practice. But the existing literature and the chapters in this book point to something more fundamental than simply going down a checklist of audience characteristics or surveying potential recipients of climate change information for what will resonate with them. We have come to see the importance of dialogue, of the genuine exchange among other-than-scientific viewpoints and needs, and the integration of climate change with other-than-climate-change concerns. This has led us to a broader definition of communication in support of social change as a *continuous and dynamic process unfolding among people that facilitates an exchange of ideas, feelings, and information as well as the forming of mutual understanding and common visions of a desirable future*. Communication – etymologically rooted in the same Latin word as

communion — points to meanings of participation and sharing, of imparting meaning, and making common (Harper, 2001).

This volume moves us toward this broader conceptualization, to a fresh approach. It takes stock of the communication and social change challenges, practices, and debates, as well as of pertinent research and practical experience to draw lessons and propose more effective strategies. Contributors offer deeper insight into why the problem of global warming is not seen as urgent, and, in turn, how to redesign communication efforts so that they can support action from the personal to the political, from the household to the national and international level, rather than, at best, be irrelevant, or, at worst, a hindrance. As such, this book offers ways to *improve on current practice* — designing communication strategies that empower rather than alienate — and ways to *envision new practices* — how to move beyond message delivery and toward dialogue and engagement.

Book organization and chapter preview

There is no dearth of research on various aspects of climate change communication (e.g., messaging, framing, the role of the media, and especially the resulting perceptions, attitudes, opinions, and levels of understanding of the issue among various audiences). Similarly, there is a vast scholarship on social change. In the realm of practice, there is also no lack of people communicating climate change, and — by trial and error — adapting their approaches or the content of their messages. And there are many who work on mobilizing various sections of the public to change their climate-relevant behaviors or to support or adopt policies that would address the growing risk of climate change. Over recent years, in fact, a movement of sorts has been building toward climate change action involving individuals, organizations, corporations and churches, cities and towns, a widening spectrum of advocacy groups, as well as states and some members of the US federal government (Isham and Waage, forthcoming).¹⁶ This growing and more diverse involvement of different players has broadened the conversation on climate change. People have tried on different framings, forged linkages between their traditional concerns and the global, systemic ones. As a result new coalitions are being forged, which involve finding new common denominators, mutually agreeable meanings, and action strategies.

To our knowledge, this book is the first comprehensive effort to assemble the insights from all this research and experience in one place and let these insights inform each other to extract lessons and improve strategies.

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The chapters that follow are organized into two major parts: one on communication, the other on social change.

In the first half of the book, we gather perspectives on communication from a variety of fields and experience such as risk perception, risk communication, framing, mental models, and message content and delivery, with reflections on the role, importance, and limitations of different messengers and communication channels. This section explores the question of which audiences have been and are left to be engaged. It also examines the emotional and cognitive reception of climate change information and people's responses to sometimes scary or overwhelming content. To understand audiences better and adjust messages accordingly, we begin by examining how people perceive the problem of global warming, what they understand, and how the problem fits into their existing beliefs (chapters by Bostrom and Lashof, and Leiserowitz). Moser examines the complementary perspective of how global warming evokes strong emotions that may inhibit effective action. Ungar examines the notion of issue culture – how it is created and fostered – and how to make climate change culturally more resonant by harnessing the powers and insights of advertising. He offers a different perspective on whether global warming has some of the critical elements needed to sustain mass action. Dunwoody then explore the challenges of trying to communicate the issue of climate change via the media and examines the advantages and limitations of communicating climate change through various mass media channels.

While the economy of scale of mass communication allows one to reach wide audiences, it may not allow one to reach – and persuade – specific audiences. The chapter by Pratt and Rabkin reports on the efforts of one city, San Diego, which sought first to elicit information on its citizens' concerns before embarking on a public education campaign in order to develop a more effective outreach plan. Agyeman *et al.* and McNeely and Huntington explore communication challenges with non-white, non-middle-class audiences, tapping into the environmental justice issues that intersect with global warming, and examining differential impacts and responsibilities. Bingham discusses the connection between climate change (science) and values in the context of communicating to religious communities. Her personal experience illuminates the tricky balance of talking about global stewardship without alienating congregations in faith-based settings.

Several chapters examine the role of scientists as messengers of climate change, including how scientific messages have reached the powerful in the past (Warner) and what lessons we can learn from that experience, and the delicate balance between scientific credibility and public engagement

(Cole with Watrous). McCright provides a glimpse of the operation and communication tactics of organized interests opposing action on global warming and offers strategies to deal with contrarians. Regan — building on interviews with scientists and non-experts — speaks to the need and challenge of broadening the conversation on global warming beyond the contentious and scientific to a new mode of dialogue. Finally, Chess and Johnson explore the need for trust in messengers and remind us of the limits of information to affect behavior, leading to some strategies for improving the chances of motivating change. Throughout, the contributors ask how communication can be directed effectively at actors and actions that could make a difference in bringing about social change required for meaningful climate change action.

In the second half of the volume, we then focus on insights on change in individual behavior, organizations, local and state governments, businesses and the market, cities and neighborhoods, and political and legal systems. Many barriers and hopes for the future with respect to social change are discussed from the cultural, psychological, legal, and economic perspectives. The first two chapters focus on the individual — what is known about the factors and barriers that affect the behavior and change of behavior of individuals. Tribbia explores the cognitive, motivational, and other person-specific factors in the context of an individual's social milieu, while Michaelis takes a cultural-theoretical perspective to explore the larger context in which individuals act. Grotzer and Lincoln as well as Bateson explore the contributions that education can make by reaching young people early and throughout their lives. They discuss necessary changes in teaching methods and foci as well as the educational system and culture more broadly that might help students grow up to be more adept global citizens in a world of rapid global and climate change.

The next two chapters move from the individual to the organizational level. Rabkin and Gershon discuss the role of peer motivation, social marketing tools, and empowerment to achieve unexpected results in a Portland, Oregon neighborhood. James *et al.* discuss the importance of actively managing organizational change to support action on global warming. Such organizational changes, of course, are typically stimulated by and embedded in larger contextual changes — in the marketplace or in the policy environment. As Arroyo and Preston, and Atcheson point out, businesses and markets have an important role to play in solutions to global warming, and they explore in depth the motivations and strategies the business community has in responding to climate change. These optimistic perspectives are somewhat tempered by Dilling and Farhar, who critically

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The next four chapters focus on actions and strategies to combat global warming currently under way at the city, state, and regional level in the United States. Young discusses the International Council for Local Environmental Initiatives' Cities for Climate Protection campaign, a network of communities pioneering emission reduction strategies at the local level. She explores the conditions that got them involved, and the communication and mutual support among them. One example of such a forward-thinking community is Santa Monica, CA – a community that chose to address climate change without talking about it (Watrous and Fraley). We then hear from actors in the US Northeast (Tennis) and on the US West Coast (duVair *et al.*) of their leadership and institution-building efforts, and how these states and regional collaboratives have dealt with obstacles and resistance.

The last set of chapters in this part looks at tools and processes of social change at an even broader level yet. Averill discusses the role of litigation and related legal tools for promoting action and communicating global warming. Meyer reflects on how social movements arise, and how successful movements organize and communicate for their cause. The final chapter by Jamieson addresses the relationship of politics, ethics, and responsibility for global warming, and examines the political changes required to effectively address climate change in the United States.

Throughout Part II, we asked contributors to go beyond merely stating problems, challenges, or shortcomings in past efforts to foster social change, and lament the limitations in our understanding from research. We urged them to offer a clear assessment of what has worked, in what context, toward what end, and then suggest additional or promising ways to improve the communication of climate change. We asked them to address what role communication played; what was said, by whom, to whom, in what way to increase the chances that a particular behavior, institutional, policy, or other social change would take place. Those who achieved a particular change were asked to be transparent about the "how," and how particularly difficult obstacles were overcome.

The book concludes in Part III with thoughts on the way forward. Harriss extends on a well-received summary he first offered at the 2004 workshop which initiated this project. We then conclude with our own synthesis of practical next steps and research needs from listening to this diverse group of contributors.

What's left unheard and maybe unsaid

Even as diverse an anthology as this cannot cover everything. We did not intend to compile an all-encompassing collection of perspectives on climate change. We sought voices from many disciplines and experiences, from different regions, different generations, a range of philosophical convictions, and gathered diverse offerings of tools for communicating urgency and promoting social change. The common thread that weaves these voices together is collegial respect for these different perspectives and a clear recognition of the immensity of the challenge that climate change poses for society.

Yet some readers will find particular voices and insights missing such as that of federal government policy-makers and communicators, discussions of specific policy approaches and technological solutions, or – given the global scope of the problem – more on non-US activities. Others will look for a greater focus on adaptation – clearly an important and necessary complement of societal response to mitigating climate change.

Executive and legislative branches of the federal government of the United States play a key role in both researching and communicating climate change. We focus in this book on organizations and individuals who are deeply engaged and on the cutting edge of communication and social change on climate change. While the US federal government remains committed to research, it has played a less visible role in communicating about climate change in the past several years. We recognize, however, that the federal actors can play an extremely important role in both communication and social change.

With some important exceptions, the conversation about adaptation in the United States is even further behind than that on mitigation (Luers and Moser, 2006). Far less is known empirically, for example, about how people view our ability to cope with and adapt to climate change impacts, or how adaptation is communicated and heard. While many efforts are under way where climate impacts scientists are working with resource managers to raise their awareness and use of climate change information in their long-term decisions, the broader public remains largely untouched by these communicative interactions. One big exception is Alaska and other far-north regions, which are already experiencing the impacts of climate change. People in this region require less convincing of the reality and urgency of the issue, but are primarily concerned with what to do about it (this finding is clearly articulated by McNeeley and Huntington, Chapter 8). We consciously chose to focus on mitigation at this time, but suspect that many of the lessons

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Finally, we chose to focus largely on the United States, not because it is the only country where communication of this topic is needed – although it is needed here especially – but because our expertise is greatest in this cultural context. Many lessons contained in this volume are transferable to other cultural contexts only with careful consideration, adaptation, and testing for effectiveness. Our reading of climate change communication strategies emerging in other countries, however, gives us confidence that many of the principles if not the content carry over rather readily (see, e.g., Futerra, 2005a,b).¹⁷ For example, the need for credible messengers is as high in the United States as it is elsewhere, but what such a messenger would say to resonate with local audiences is highly context-specific.

In sum, this anthology distills the scholarship of researchers in a variety of disciplines and brings it together with the wisdom of practitioners “on the ground” in offices, communities, and states across the country. The chorus of these diverse voices helps us understand the complementary foundational elements of communication and social change that contribute to the status quo *and* point the way forward to a more productive understanding of the challenges and opportunities. Existing policies at the international and national level are insufficient to significantly slow down anthropogenic climate change and enhance people’s adaptive capacity to cope with its impacts. Clearly, we need a new way forward – a new way that actively engages and empowers the public, ignites a deeper debate, creates a vision of a future worth fighting for, and develops and implements the solutions that will allow us to get there. This volume, we hope, will help light the way.

Notes

1. The beginning of this imaginary story – up to this point – draws on actual facts (Hansen, 1988). The quote is from Boyle (1999), recalling the event in a feature story for *Audobon Magazine*.
2. We use the terms global warming and climate change interchangeably, but communicators disagree – less on the different meanings and implications – but more on which terms may be more effective in reaching various audiences. Most scientists prefer climate change, or anthropogenic climate change, to encompass the many related changes in the atmosphere and global climate. The term allows, for example, for the possibility that while global average temperatures are increasing, local or regional climates may cool. It also makes room for changes in precipitation, extreme climatic events, seasonal patterns, and so on. Many in the media, most advocates, and other public communicators, on the other hand, tend to use the term global warming, which is now widely recognized by, and resonates more than climate change with, the public. Several other terms have recently come into play, such as climate disruption and climate crisis. These latter terms have not been tested for audience response, leaving us hesitant to endorse them. Our primary

- concern in this book is not with finding the best term, but how to make the concept meaningful; we thus use the common and recognized phrases instead.
3. Data can be found from the US National Oceanic and Atmospheric Administration at: <http://www.cmdl.noaa.gov/ccgg/insitu.html>; accessed January 3, 2006.
 4. Note that the exact figures differ from study to study due to differences in questions, depth of study, and temporal variance. Reviews of studies on similar questions, however, reveal similar trends and orders of magnitude in their findings. We thus cite only rough approximations to indicate levels of concern or understanding. See also Leiserowitz (2003).
 5. Similar figures are found for Canadians; see Environics International (1998).
 6. These primary concerns were recognized by the United Nations in its Millennium Development Goals, including eradicating extreme poverty and hunger, reducing by half the proportion of people living on less than a dollar a day, ensuring that all boys and girls complete a full course of primary schooling, reducing child mortality, and so on. While environmental sustainability is part of these goals, climate change is not mentioned as an overriding concern.
 7. Research from FrameWorks Institute's "Climate Message Project" demonstrates that the messages told by environmental advocates consist predominantly of proof that the problem is real and of warnings of negative consequences. See <http://www.frameworksinstitute.org/clients/climatemessage.shtml>; accessed June 13, 2005. Solutions are frequently not part of the communication. As a consequence, individuals fill in with their own ideas. For example, Bostrom *et al.* (1994) found that individuals who thought that the ozone hole was related to creating global warming also thought that it did so by letting more heat from space in through the "hole." Some respondents thought that perhaps NASA spacecraft were punching holes through the ozone layer, and that NASA sends its spacecrafts up through the same hole, thereby not creating new "holes" and reducing the threat of global warming. This highlights how mental models and pre-existing beliefs color one's perception of possible solutions, in the absence of alternate ways of thinking about a problem.
 8. Historical data suggest a close correlation between gross domestic product (GDP) and energy use, over 85 percent of which is currently provided by fossil fuels in the United States (see DOE Energy Information Administration, 2005). Advocates for climate policy point out, of course, that there is no intrinsic necessity that this correlation between economic growth and energy be linked to the use of fossil fuels *per se* – alternative energy sources could also support economic productivity, but are currently less available (see, e.g., Union of Concerned Scientists website, "Clean Energy" (2005). Available at: http://www.ucsusa.org/clean_energy/renewable_energy/index.cfm, accessed June 9, 2005).
 9. Note that not only politicians with a desire to be re-elected have a tendency to postpone tough choices. Studies repeatedly find that people in general would prefer to "discount [their] concern," as one commentator recently called it. Things in the future, in far-away places, things that can't be known for sure, that can't be experienced with the senses, or that do not affect a person directly, are generally taken less seriously than their opposites (Hannon, 2005; Hendrick and Nicolaj, 2004).
 10. The notion of externalities was first introduced by Arthur Pigou (1932).
 11. *The New York Times* is one of the few among major US newspapers with a dedicated weekly science section. On media ownership trends, see the *Columbia Journalism Review* at: <http://www.cjr.org/tools/owners/>; accessed January 4, 2006.
 12. Recent examples include the blockbuster movie, *The Day After Tomorrow*, and the bestselling novel by Michael Crichton, *State of Fear*. For analyses of the effect of the movie on public perceptions of the problem in different countries, see, e.g., Leiserowitz (2004), Leaman and Norton (2004).
 13. In Macy and Brown (1998) especially pp. 26–32; in Nicholson (2002) especially Chapter 5.
 14. One example of long-term policy is the establishment of social security – an intergenerational program set up in the midst of crisis. Another example is investment in basic research, much of which has no immediate, and sometimes no discernible, payoff at

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15. For elaborations on this argument, see, e.g., Walker (1969), Kosloff *et al.* (2004), McKinstry (2003).
16. See also: <http://www.whatworks-climate.org>; accessed January 4, 2006.
17. A good example is the UK’s climate change communication strategy, which highlights similar needs and principles regarding effective communication. See also <http://www.climatechallenge.gov.uk/>; accessed January 4, 2006.

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