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Edited by Susanne C. Moser and Lisa Dilling  
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## Introduction

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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."<sup>1</sup>

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 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 leap-frog 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 change<sup>2</sup> 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,<sup>3</sup> 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

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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.<sup>4</sup> 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)<sup>5</sup> – 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

conundrum, a way forward towards effective communication and empowered action.

### **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 CO<sub>2</sub> 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.<sup>6</sup>

### ***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.<sup>7</sup> 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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*Introduction*

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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.”<sup>8</sup> 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.<sup>9</sup>

***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.<sup>10</sup> 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,



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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



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

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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).<sup>11</sup>

### *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.<sup>12</sup>

### *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