

# Communication and Public Engagement

## RESEARCH REPORT

### Audience segmentation as a tool for communicating climate change: Understanding the differences and bridging the divides

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#### **DUE TO THE IMPACTS OF GLOBAL CLIMATE CHANGE,**

it has become increasingly challenging for the National Park Service (NPS) to uphold its mission to conserve the nation's most treasured landscapes for future generations. The Park Service has responded by targeting communication as one of four management areas in its Climate Change Response Strategy (NPS 2010). Thus, while the agency is working to expand research on impacts on parks' increasing ecosystem resilience, and assisting species in transitioning to new climate regimes, it is also focused on conveying this information to diverse audiences both in and outside the organization.

This is both an enormous communication challenge and an opportunity for the National Park Service with implications for the almost 300 million people who visit its nearly 400 sites each year. Climate change poses a multitude of inherent problems to communicators: the topic is politically polarizing (Dunlap and McCright 2008), the science is complex (Moser 2010), and most Americans perceive its impacts to be primarily on people and places far removed from themselves (Leiserowitz 2006). Over the past few decades, social science research across many fields—including public health and social marketing (Hornik 2002; Maibach and Parrot 1995; McKenzie-Mohr and Smith 1999)—has begun to determine which communication strategies most successfully engage the public in solving broad societal problems. This research is now being applied to climate change. Over just the last four years, the field of climate change communication, which addresses the issue's communication challenges and how to facilitate social change in related areas such as energy conservation (Moser and Dilling 2007), has developed a rapidly growing academic literature. Yet few studies address the specific problems that public land managers face (Schweizer et al. 2009; Schweizer and Thompson in press).

In reaching out to visitors, NPS interpreters rely on a traditional toolkit of resources and techniques: evening programs, guided walks, roving interpretation, school programs and teacher workshops, multimedia products, publications, and exhibits. Though interpreters and education staff may strive to follow Freeman Tilden's first principle—"Any interpretation that does not some-

#### **Abstract**

Communicating climate change to 300 million national park visitors each year represents both an enormous challenge and an opportunity for the National Park Service. Informal and formal audience assessment techniques allow communicators to develop strategies and messages that are tailored to certain subsets of the population, or crafted to resonate with all groups, thereby increasing the probability of influencing individuals' attitudes, beliefs, and behaviors. This article reviews audience segmentation research developed by the Yale Project on Climate Change Communication and the Center for Climate Change Communication, and applies it within the context of the National Park Service's designation of communication as one of its four management areas in the Climate Change Response Strategy. A case study on communicating climate change at Pictured Rocks National Lakeshore illustrates some of the ways that one park is already using social science research-based strategies to increase the effectiveness of its outreach programs.

**Key words:** audience segmentation, climate change, communication, global warming, public opinion, surveys

how relate what is being displayed or described to something within the personality or experience of the visitor will be sterile" (Tilden 1957)—without audience research it is difficult to ascertain information about visitors beyond license plate observations. In this article we offer ideas for evaluating where audiences stand on the issue of climate change, and information on shaping messages that will most appeal to those groups. The data presented here are derived primarily from public opinion research conducted at the George Mason University Center for Climate Change Communication (4C) and the Yale Project on Climate Change Communication, based at the Yale School of Forestry and Environmental Studies.

#### **Global warming's "Six Americas"**

Thinking about Americans in terms of a smaller subset of audiences, distinguishable by their attitudes, beliefs, and behaviors,

enables communicators to develop messages that resonate more deeply with individuals, whether the topic is politics (Weigel 2006), HIV/AIDS (Yun et al. 2001), or climate change (Maibach et al. 2011b). Moreover, creating tailored programs and materials based on this type of research has been shown to be successful in influencing individual behavior change (Noar et al. 2007), likely by increasing the relevance and salience of the message.

Based on a nationally representative survey of 2,164 adults in the United States that was fielded from 7 October to 12 November 2008, the Yale/Mason team used a statistical technique termed “latent class analysis” to evaluate how people cluster around a set of global warming beliefs, issue involvement variables, behaviors, and societal response preferences. Six distinct audience segments, called “Global Warming’s Six Americas,” were generated from the study (Maibach et al. 2009). Research by Yale and Mason in the winter of 2009–2010, spring 2010, and spring 2011 is continuing to track these unique audiences. Tools that can be used to segment audiences with sets of either 15 or 36 survey questions are freely available. The Six Americas audience segmentation has been found to be a better predictor of global warming federal policy support than either demographics or political ideology (Maibach et al. 2011b). Indeed, regression analysis of the segmentation as a predictor of a scale derived from nine federal policy options for the reduction of greenhouse gas emissions revealed that it explained as much variance (41%) as a combination of political ideology, demographics, and the segmentation.

The surveys were conducted using Knowledge Networks’ online panel of U.S. adults, initially recruited using a random-digit dial-

ing technique. The online panel tracks the U.S. Census Bureau’s Current Population Survey (CPS) on demographic variables such as age, race, Hispanic ethnicity, geographic region, and employment. In order to adjust for noncoverage or nonresponse biases, the data were weighted to reflect CPS distributions of age, race, gender, and education. The survey measures were constructed using the term “global warming,” as it has been used predominantly in U.S. public opinion surveys over the past few decades (Akerlof and Maibach 2011). The survey defines global warming as “the idea that the world’s average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world’s climate may change as a result” (Maibach et al. 2011a).

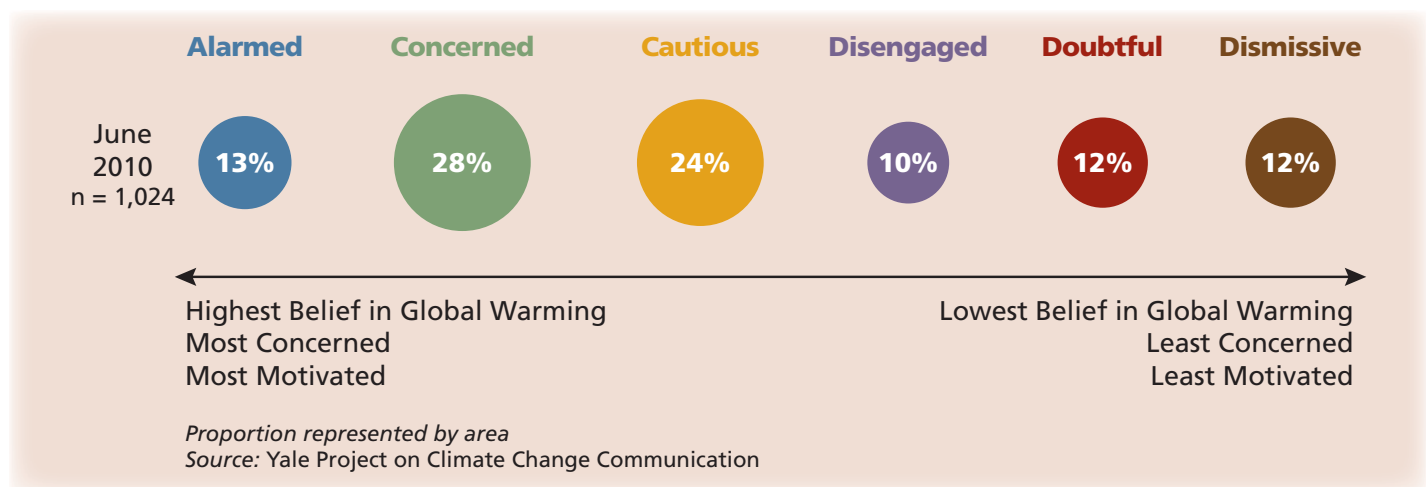
The Six Americas span a spectrum of beliefs about global warming, from the “Alarmed” to the “Dismissive” (fig. 1).

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***There is a great need at this time for messages that communicate the complexities of climate change and the actions that can be taken.***

*—National Park Service Director  
Jon Jarvis, 2009*

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**Figure 1.** U.S. audiences can be divided into six distinct groups according to their global warming beliefs, issue involvement, behaviors, and societal response preferences. This figure represents the audience sizes as percentages of the American public according to data from a nationally representative survey of adults fielded in May–June 2010 (n = 1,024).  
Source: Leiserowitz et al. 2010b

The **Alarmed** are the most concerned about global warming, the most personally involved in the issue, and the most motivated to do something about it. They are certain that global warming is happening, and believe that it is mostly human caused and that there is scientific consensus that it is occurring. The Alarmed view themselves as knowledgeable about the topic and are unlikely to change their minds. This group is the most likely to see global warming as an imminent and severe threat, and to be taking steps both as consumers and as citizens to encourage companies and politicians to respond to the issue. The Alarmed are supportive of a wide range of potential federal policies that would reduce greenhouse gas emissions.

The **Concerned** also believe that climate change is a serious issue and that we need to take action. However, this group is less personally involved than the Alarmed and feels less personally threatened. The Concerned are sure that global warming is happening and that human activities are the main cause, but that it will not harm people for another decade or more. This group is active primarily in using its power as consumers to enact change within the marketplace, but is supportive of policies to lessen emissions.

The **Cautious** are only somewhat likely to say that global warming is occurring, and they are of mixed opinion on whether it is caused by human beings. Regardless, the Cautious see global warming as a removed threat. As a result, they are not likely to be taking action either as consumers or as citizens on this issue, though they are somewhat supportive of potential federal climate and energy policies.

The majority of the **Disengaged** respond “don’t know” to whether global warming is occurring and whether it will harm people. They have not thought a lot about this issue, do not feel well educated on the topic, and say they could easily change their minds. This group tends to be of lower income and education levels. The Disengaged are also somewhat supportive of federal climate and energy policy options.

The **Doubtful** are unsure whether climate change is occurring, but if it is, they are fairly sure that it is caused by natural changes. This group perceives global warming as a very distant threat, if it is indeed a real phenomenon. Consequently they do not attach much personal importance to it. The Doubtful believe that scientists are in disagreement on global warming, and that they themselves are well informed about the issue. They say they are unlikely to change their minds, but are supportive particularly of policies that would expand domestic energy sources.

The **Dismissive** believe global warming does not exist and are actively working against policies to reduce greenhouse gas emis-

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*For National Park Service interpreters ... it is difficult to deduce what any individual’s beliefs about climate change are likely to be without first initiating a conversation.*

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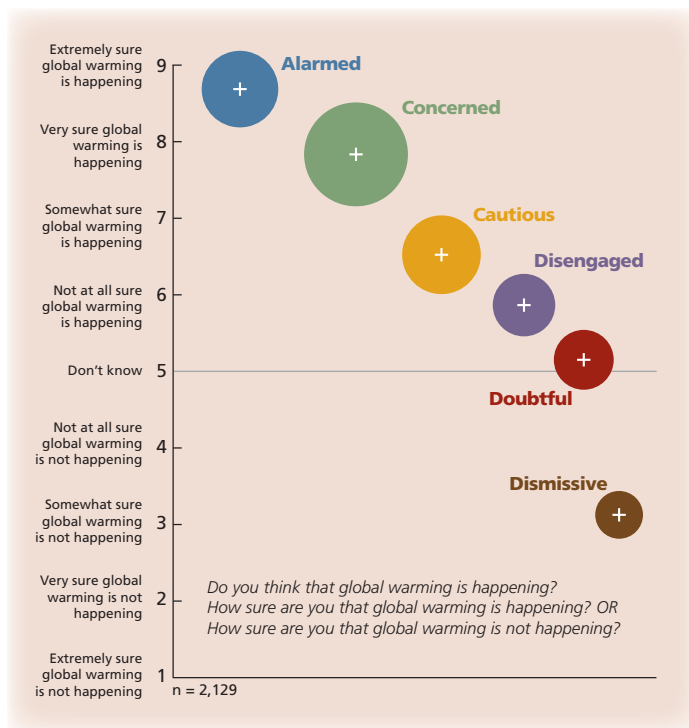
sions. Like the Alarmed, they have given it a lot of thought, and they are very certain in their views. This group believes it is well educated about global warming, and that there remains much disagreement on the issue among scientists. They support an even more limited range of potential policy options than the Doubtful, primarily increased drilling for oil and the building of nuclear power plants.

As of spring 2010, the Six Americas’ segment sizes ranged from 10% to 28% of the population (Leiserowitz et al. 2010b). The differences among these groups by demographics—gender, ethnicity and race, and age—are not large; the greatest variance lies in the societal values to which they ascribe (Maibach et al. 2009). The Alarmed and the Concerned are more likely to hold liberal, egalitarian views while the Doubtful and the Dismissive are more likely to be conservative and individualistic in their beliefs. For National Park Service interpreters, this means that it is difficult to deduce what any individual’s beliefs about climate change are likely to be without first initiating a conversation. Audience analyses to determine the prevalence of the Six Americas among park visitors may be a useful strategy for developing targeted communication materials and programs, but can also be time-consuming and require approval of the Office of Management and Budget. Engaging small groups in open-ended discussions to address two questions is an easy way to roughly ascertain where audiences fall along the spectrum of the Six Americas:

“Do you think that global warming is happening?”

“How sure are you that global warming is (or is not) happening?”

As can be seen in figure 2, the combination of these two questions efficiently captures the spread of the average responses from people across the Six Americas. Addressing a third question, “Do you take actions at home to conserve energy?” may serve to point out similarities across even diametrically opposed audience segments. In doing so, interpreters can quickly ascertain where their audience members may be in the Six Americas, without undergoing a formal survey and recording individual information.



**Figure 2.** The Six Americas, on average, span from being extremely sure that global warming is happening (Alarmed) to being somewhat sure that global warming is not happening (Dismissive). *Source:* Maibach et al. 2009

For parks or other organizations that are conducting formal surveys, the measures and statistical algorithms used to determine Global Warming's Six Americas may be obtained from the Center for Climate Change Communication and the Yale Project on Climate Change Communication for use in segmenting audiences. A 36-question version places individuals in the correct segment on average 91% of the time, while a 15-item screener is accurate on average 84% of the time (Maibach et al. 2011b). These tools are run using SAS or SPSS statistical software scripts, or an Excel spreadsheet, and are available at <http://climatechangecommunication.org/SixAmericasManual.cfm>. Surveys that are conducted, funded, or sponsored by the National Park Service must be processed through the NPS Social Science Program, which assists in determining which types of approval are needed (e.g., the Department of the Interior or the Office of Management and Budget). For more information and review guidelines, see <http://www.nature.nps.gov/socialscience/>.

## What do they know, and what do they want to know?

When the Six Americas were graded on their knowledge of climate change by the Yale Project on Climate Change Commu-

nication in 2010, 49% of the Alarmed received a passing grade (70% or above) based on their percentage of correct answers (Leiserowitz and Smith 2010). The other audiences fared worse, with only 33% of the Concerned, 16% of the Cautious, 5% of the Disengaged, 17% of the Doubtful, and 4% of the Dismissive passing. Those least likely to believe that global warming is occurring and attributed to human activities—as concluded unequivocally in the Intergovernmental Panel on Climate Change's 2007 assessment report (IPCC 2007)—did not uniformly score the worst. The Doubtful and the Dismissive were the most likely to know that the greenhouse effect refers to gases in the atmosphere that trap heat (74% and 79% respectively). The Dismissive were also the most likely group to understand that the terms "weather" and "climate" do not have the same meaning (63%).

Stratospheric ozone depletion and climate change have long been confused by the public. The Alarmed and the Concerned were the most likely to misperceive the ozone hole as a significant contributor to global warming (63% and 49%), and to believe that aerosol cans are a significant cause of climate change (49% and 36%).

Unsurprisingly, those skeptical that climate change is occurring—such as the Doubtful and the Dismissive—said they were less interested in learning about it. Less than a third of Dismissives would like to learn more, as opposed to more than three-quarters of the Alarmed. They also have different questions they would like experts to answer (Leiserowitz et al. 2010b). The Alarmed and the Concerned most want to know what the United States can do to reduce global warming, whereas the Cautious, Doubtful, and Dismissive groups want to know how we know it is happening. The Disengaged most want to ask experts what harm global warming will cause.

## What are they already doing?

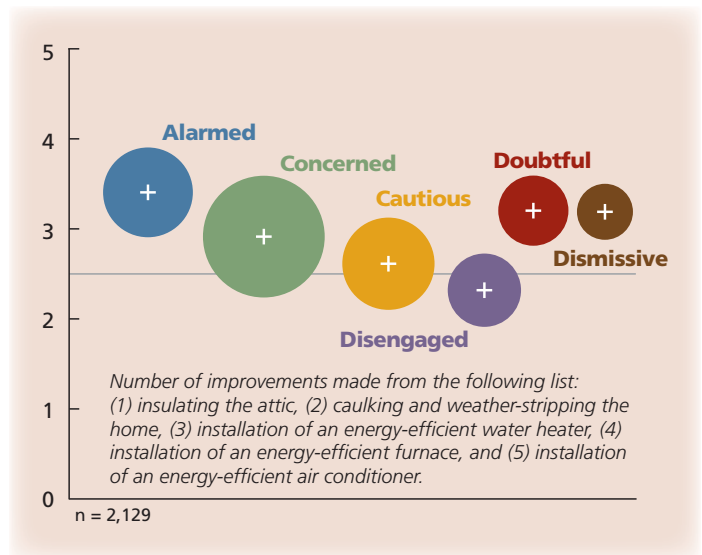
In terms of lessening the impacts of climate change, perhaps even more important than what people know and how people think about the issue is how they choose to act. Individual and household energy consumption in the United States accounts for 30% to 40% of the nation's greenhouse gas emissions (Vandenbergh et al. 2008; Vandenbergh and Steinemann 2007), and thus represents a large source of potential emission reductions. As one of the foci of the Do Your Part! for Climate Friendly Parks initially established by the National Park Service, the Environmental Protection Agency, and private-sector contractor ICF International, and now administered by the National Parks Conservation Association, it also represents a topic that has been a component of NPS outreach programs.

One of the most surprising research results from the October–November 2008 nationally representative survey data ( $n = 2,129$ ) was the commonality across the Six Americas with regard to their actions on saving energy (Maibach et al. 2010a). Although people across the Six Americas strongly disagreed about global warming, they concurred on the importance of saving energy and demonstrated similar behavior patterns in regard to energy conservation and efficiency (see figs. 3 and 4). When it came to such behaviors as installing energy-efficient appliances and insulating the attic, the Alarmed (mean [ $M$ ] = 3.35, 95% confidence interval [CI] [3.16, 3.55]) and the Concerned ( $M = 2.87$ , 95% CI [2.72, 3.01]) were statistically indistinguishable from the Doubtful ( $M = 3.17$ , 95% CI [2.89, 3.45]) and the Dismissive ( $M = 3.20$ , 95% CI [2.90, 3.51]). The Cautious ( $M = 2.62$ , 95% CI [2.42, 2.83]) and the Disengaged ( $M = 2.26$ , 95% CI [1.98, 2.54]) undertook slightly fewer total home improvements than the Alarmed, Doubtful, and Dismissive groups, likely because these audiences tend to be in lower-income groups.

The behaviors of the Six Americas are even more similar in energy conservation habits that require no up-front financial investment. On average, people in all the groups said in fall 2008 that they “always” or “often” practiced two to three behaviors, such as turning off unneeded lights, adjusting their thermostat upward or downward to save energy, or biking instead of driving. For these actions—requiring more of a lifestyle and behavioral commitment than do energy efficiency improvements—the Alarmed reported higher levels of engagement ( $M = 2.95$ , 95% CI [2.83, 3.06]) than the other five groups, whose means were slightly, though distinctly, lower (Concerned,  $M = 2.51$ , 95% CI [2.43, 2.59]; Cautious,  $M = 2.32$ , 95% CI [2.20, 2.43]; Disengaged,  $M = 2.43$ , 95% CI [2.27, 2.58]; Doubtful,  $M = 2.13$ , 95% CI [2.00, 2.26]; Dismissive,  $M = 2.38$ , 95% CI [2.19, 2.56]).

Programs such as Do Your Part! that address changing individual energy behaviors may thus appeal to the entire spectrum of the American public in ways that climate change messages may not, while still engaging people in behavioral changes to lessen greenhouse gas emissions and ameliorate the impacts of climate change. Large majorities of all Americans in the December 2009–January 2010 survey ( $n = 1,001$ ) said that conserving resources and energy in their everyday activities is important, yet for some behaviors—such as unplugging electronics and using public transportation—the majority have not made those actions habitual (Leiserowitz et al. 2010a).

The significance of Americans’ energy efficiency and conservation activities—and their widespread appeal—is that it and other messages that point to a new model of low-carbon living can be framed both as solutions to climate change for Alarmed and Con-



**Figure 3.** The average total number of home energy-efficiency improvements made by members of the Six Americas ranged from two to four, according to the October–November 2008 nationally representative survey ( $n = 2,129$ ).

Source: Maibach et al. 2009

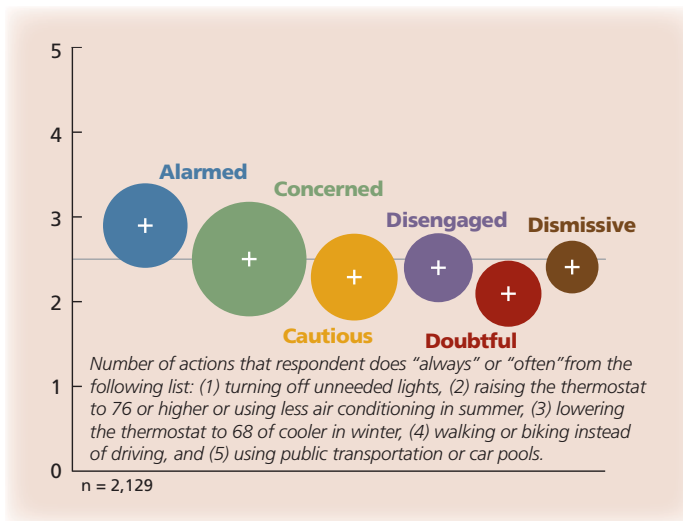
cerned segments and as a way of creating healthier communities for broader audiences.

## What messages work with what audiences?

The following section describes messaging strategies that could be used with the Six Americas based on an interpreter’s understanding of his or her audience using the tools described above, or to accommodate a broader range of segments. These messages have not been tested with these audiences, but are based on combining audience segment characteristics with insights from theoretical literature.

The questions about global warming for which members of the Six Americas most want answers reflect the two very *different conversations* about climate change that are currently occurring in the United States. Those who believe strongly that climate change is real want to discuss what to do about it, while those who are less sure or strongly believe it is not occurring prefer to discuss the basis for the science.

**Alarmed/Concerned.** Messages for the Alarmed and the Concerned therefore may be most effective when they focus on concrete behaviors that individuals and communities can undertake to reduce carbon emissions, perhaps using actions taken by parks as examples: public transportation, low-emission vehicles, and



**Figure 4.** The average total number of conservation actions that Americans take is two to three, according to the October–November 2008 nationally representative survey (n = 2,129).

Source: Maibach et al. 2009

reducing waste. These types of communication fit within the NPS Climate Change Response Strategy goal of “modeling and communicating sustainable practices that lead by example.” Many of these same actions can be effectively communicated to the entire spectrum of audiences, by discussing them within other frames than climate change.

**Cautious/Disengaged.** The Americans who are in the middle of the spectrum—the Cautious and the Disengaged—are less certain in their beliefs about climate change, and feel less informed on the issue (Maibach et al. 2009). These segments have fewer financial resources than either the Alarmed or the Dismissive. Messages that illustrate how to save money by adopting low-carbon lifestyles, and that help individuals to develop the knowledge and skills they need to accomplish these goals, are most likely to be effective in facilitating behavioral change and reducing emissions.

**Doubtful/Dismissive.** For members of groups who believe the evidence for climate change is not yet conclusive, research suggests that messengers who are viewed as having similar values and who use familiar narrative lines are the most apt to be heard by these audiences regardless of the factual content of their messages, and are able to communicate most effectively (Kahan 2010, Kahan et al. 2011). Interpreters may be able to achieve this by relating stories about the diverse people—spanning political ideology, race and ethnicity, age and gender—who have been involved in researching or combating climate change impacts in the national parks, and the values that motivate them. By using this strategy, interpreters suggest to their audiences that there is a wider sociodemographic and political range of messengers on the

### NPS climate change talking points

In its 2010 *Climate Change Response Strategy*, the National Park Service unveiled four core messages to be used Service-wide in external and internal communication. They are as follows:

- Climate change is happening and human activities are contributing to and accelerating it.
- Changing climate has consequences for parks, people, and the planet.
- The National Park Service is responding with practices that address climate change.
- The choices we make now may help to avoid catastrophic impacts in the future.

Similar messaging is also being implemented by the U.S. Fish and Wildlife Service and other organizations. The components of the key points—that climate change is occurring, that we are certain that it is occurring, that it will have negative consequences for people and the environment, that people’s activities are a primary cause, and that there are actions we can take to ameliorate its effects—are based on research that suggests that people who hold these beliefs and attitudes are more likely to be convinced of the seriousness of the phenomenon and of the importance of taking action (Krosnick et al. 2006). The study adapted a theoretical model of opinion formation to global warming using two surveys conducted in the mid- to late 1990s. The National Park Service may wish to evaluate the messaging strategy experimentally—as indeed recommended by the study’s authors—to assess whether or not providing this factual information increases audience engagement on climate change.

seriousness of climate change impacts than they may intuit from traditional mass media depictions, which emphasize issue conflict and polarization (Boykoff and Boykoff 2004). In presenting case stories of people of different backgrounds and sociopolitical views who nevertheless agree in large part on the causes and potential impacts of climate change, audience members are more likely to find at least one of the stories personally resonant.

**All audiences.** Messages that focus on outcomes that are perceived as beneficial instead of as threatening—such as potential for economic dislocations because of governmental regulation—are likely to be considered more equivocally by all audiences (Kahan et al. 2011). As previously mentioned, energy conservation and efficiency are areas that appeal across all of the Six Americas, including the Doubtful and the Dismissive, likely in part because

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of their salience to those who value thrift. Research also has shown that highlighting the human health benefits of addressing climate change tests well across the Six Americas (Maibach et al. 2010b). Many of the same activities that result in healthier people and communities—such as reducing air pollutants by burning less fossil fuel and using forms of active transportation like biking and walking—also result in decreased greenhouse gas emissions. A survey of residents in the gateway communities of Pictured Rocks National Lakeshore, Michigan, suggested that a large percentage (73%) associated taking action on global warming with improving people's health (76%) and protecting national parks, forests, and wildlife refuges (Akerlof 2010). As places where Americans engage in physical activities such as walking, find places for quiet reflection, escape the stress of normal daily life, and spend time with family members, the national parks could serve as important places to engage in conversations about ways to improve our communities that will make our everyday lives healthier.

## **Importance of place and trusted messengers**

The national parks are iconographic places to the American populace, and the National Park Service is one of the most trusted federal agencies (Wilkinson 2002). Images of Glacier, Mesa Verde, and Yosemite national parks are known across the country, even by people who have never visited them. Visible impacts of climate change on these treasured places may serve to heighten Americans' awareness that the threat of climate change is here and now. As the U.S. Climate Change Science Program reported, "National parks that have special places in the American psyche will remain parks, but their look and feel may change dramatically" (Baron et al. 2008). With 80% of Americans living in metropolitan areas (U.S. Census Bureau 2000), the national parks offer rare opportunities for the public to experience firsthand the impacts of climate change on wild natural areas, whether through visibly retreating

glaciers, lower lake and river water levels, declining native species of wildlife, or rising sea levels (Saunders et al. 2009). Studies indicate that people who experience the impacts of climate change are more likely to be concerned about the issue (Arctic Climate Impact Assessment 2004; Leiserowitz and Broad 2008).

Because of its position as one of the more esteemed federal agencies and an authoritative voice on the science occurring in the parks, the National Park Service may serve as a particularly trusted public source of information about climate change. One survey found that the Service was the third most trusted source of global warming information after scientists and local universities (Akerlof 2010). Four out of five Americans trust scientists on global warming (Leiserowitz et al. 2010b). Yet a plurality of the public—almost half—still believe there is a lack of scientific consensus that climate change is occurring. This may be partly because of media coverage that has portrayed the issue as scientifically controversial by giving equal weight to those who say climate change is occurring and those who do not, under the guise of balanced reporting (Boykoff and Boykoff 2004). Other authors have suggested it also may be caused by audiences who pay selective attention to the viewpoints of experts with whom they identify (Kahan et al. 2011). The disparity in levels of public trust in scientists, and in public understanding that more than 95% of climate experts believe that mean global temperatures have increased since before the 1800s and that human activity is a significant contributing factor (Doran and Zimmerman 2009), provides a potential messaging opportunity emphasizing the scientific consensus on climate change.

## **Conclusion**

"There is nothing more American," former NPS Director Roger Kennedy said, "than to support America's national parks" (Wilkinson 2002). Understanding both the differences and commonalities in regard to Americans' beliefs about global warming

is a first step in developing effective communication strategies on climate change. By serving as host to millions of Americans each year in many of the nation's iconic natural, cultural, and scenic areas, the National Park Service has a real opportunity to bridge these differences and speak to the science of climate change occurring in parks and the benefits of changing personal behaviors to lessen our carbon emissions and preserve these lands.

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