

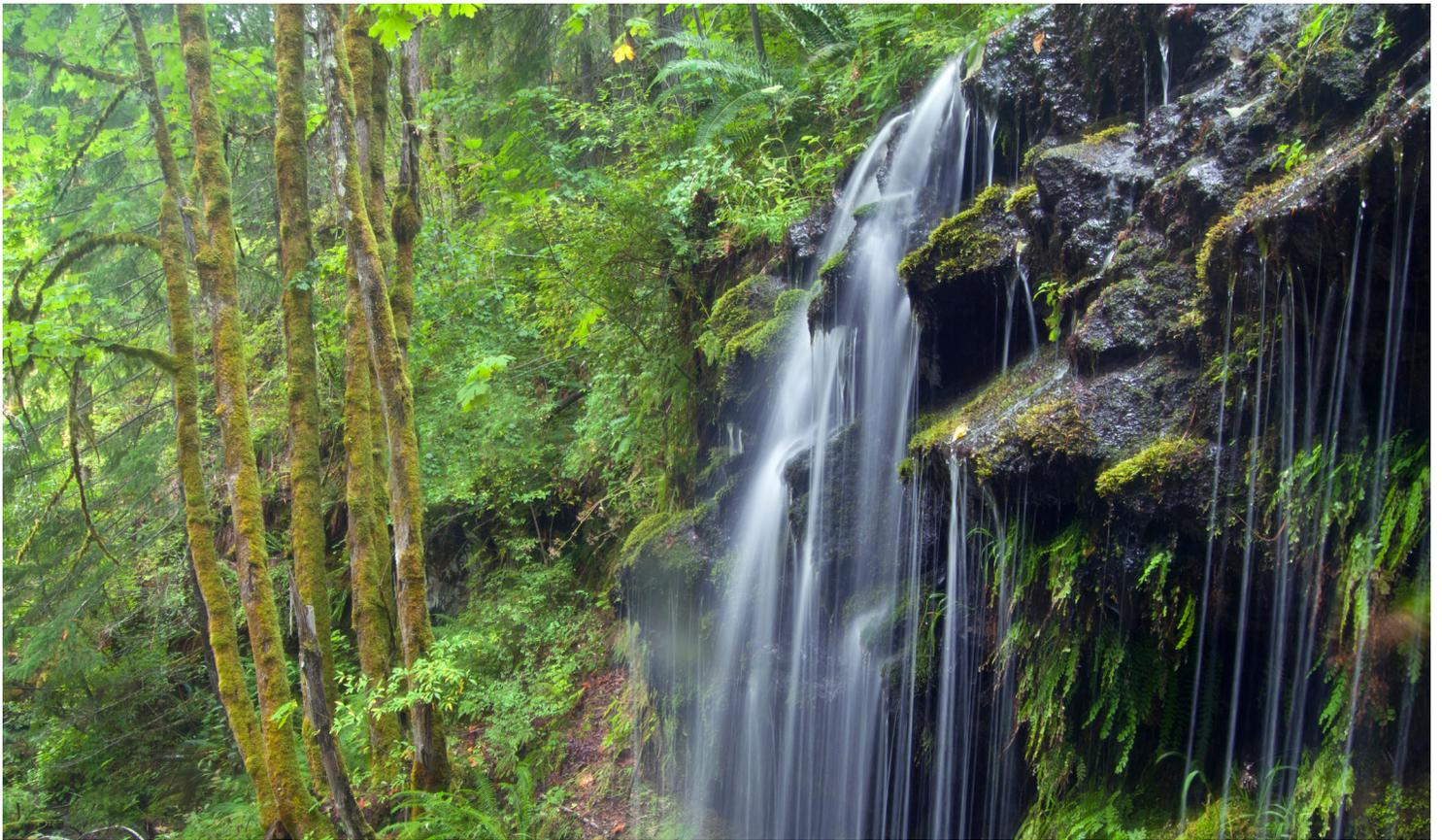


Interpreting Climate Change

Module 3 – Learning Companion Knowledge of the Audience

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Understanding Audiences

Knowledge of the audience is important to all interpretive services because it helps interpreters to understand the most effective ways to develop connections for that specific audience. Knowledge of the audience becomes more significant when interpreting critical resource issues, such as climate change, because it helps interpreters understand the often strong beliefs and opinions about the issue that visitors bring with them. Since the goal is to offer relevant information and meanings to meet your audiences where they are, knowledge of the audience informs the creation of more targeted interpretive opportunities and enables interpreters to tailor climate change content, messages and stories for these specific audiences. Some approaches that interpreters can use include the following:

- Interpretive planning to inform the development of a communication strategy for climate change. Knowledge of site-specific audiences should help determine what topics/stories will be interpreted -- where, when, how and for whom.
- Establishing visitor experience goals and specific program objectives.
- Identifying audience-relevant meanings and frames to connect with a wide range of audiences.
- Preparing to interpret multiple perspectives (with climate change, this does not mean giving equal time to climate deniers, as an NPS employee we represent the science standpoint. However, this does mean being aware and acknowledging that others have many different beliefs about climate change and how to respond to it).
- Learning where there are misconceptions or misunderstandings about the issue.
- Understanding various ways that people may interpret scientific data and terminology.
- Understanding how culture may affect the way in which an interpretive technique is received. Content or delivery that one audience finds controversial might be completely acceptable to another. No matter what interpretive method is used, interpreters must be sensitive to cultural beliefs and attitudes.
- Preparing opportunities to facilitate an audience's willingness to engage with climate change issues and park stewardship after their interpretive experience.
- Preparing to diffuse potential conflict and embrace/interpret controversy.

Social Science and Human Dimensions

Social science is an umbrella term that encompasses a broad range of fields beyond the natural sciences, among them anthropology, archeology, criminology, economics, political science, sociology, and psychology. Human dimensions of natural resources is a field of study in the social sciences that focuses on understanding and attending to the needs and values of humans, human society, and culture as it relates to the natural environment. Research in this field relies on theories and methodologies employed by social scientists (for a deeper understanding, see **Appendix I** on cognitive hierarchy). All of these fields share a common interest in studying how people react and adapt to issues that affect their lives, including economic, environmental, educational, political, scientific, and energy concerns. For interpreters, social science research in informal or formal capacities offers a foothold for targeting interpretive techniques and content that will connect with specific audience sectors.

Cultural Values

Culture is foundational to social science research, and an understanding of culture is critical to knowledge of the audience. Every audience member brings his or her cultural experiences to an interpretive opportunity. Culture differs from place to place, with cultures overlapping within a place, and it changes over time. Culture includes learned behaviors, values, actions, feelings, and ways of thinking that are shared among a group of people. It encompasses elements such as language, ceremony, religion, and social order, as well as material culture (the tangible evidence of culture). Knowing how local culture(s) have influenced the way that people make decisions and perceive risk can help interpreters to craft ways to better engage visitors in the stewardship of resources affected by climate change.

- **Example:** Climate scientists have concluded that the current rapid pace of climate change is largely a result of human activities. Americans' cultural values are one reason that greenhouse gases contributing to climate change are increasing. This is part of the National Park Service's history as well. For example, Americans love their personal automobiles and see them as symbols of freedom. In the early days after the NPS was established, we created roadways, viewpoints, and parking areas so all American's with a vehicle could experience their parks. The NPS ran a powerful campaign to get people to parks in their automobiles. Americans' preference for interstate roadways and suburban sprawl instead of public transportation and smart-growth communities has enhanced the output of greenhouse gases and this was something the NPS encouraged for many years. These values are part of the American culture and belief system. Today, however, the NPS is beginning to shift in our values to creating parks that use more alternative forms of transportation and more walking and biking options. As American's and the NPS becomes more aware of the future changes due to climate change, our values and belief system are slowing shifting to ones that use less greenhouse gases.

Research into audiences can help interpreters understand the relationships between culture and what people know, or think they know, about climate change. People are not dispassionate consumers of information. Instead, their motivational states, their values and preferences, influence what information they pay attention to, how they evaluate data, and the conclusions they draw. As a result, people are often inclined to accept data and interpretations that appear to validate their prior views. They may look for any evidence supporting their preferred conclusion and stop listening once confirmation is found. By contrast, people tend to view data that contradict their preferences and beliefs with suspicion. They give greater scrutiny to and look for reasons to reject the validity of contradictory claims. A good article on the way that people react to contrary information can be found in the article **"How Facts Backfire."** Most bodies of evidence, and certainly those related to climate change, have flaws, inconsistencies, complexities, and ambiguities. These vagaries allow people desiring to accept or reject a claim to often find at least some validity for doing so. By knowing your audience, you can thus infer what motivates members to support (or oppose) conservation activities or sustainable practices (adapted from **Leiserowitz, Maibach, et al, 2010**).

In a note of caution, interpreters should be aware of the limitations of research and remember that each person has individual characteristics and should avoid reducing visitors to caricatures or stereotypes or over generalizing attributes based on broad statistical data. Interpreters should be able to critically read social science literature and recognize that additional personal observation or experience may be required to really understand individuals.

The Research Process

Gaining audience knowledge relies on identifying what information is needed, choosing appropriate research techniques, conducting the research, and applying it to an interpretive product. Interpreters should be able to apply their findings to identify the interpretive techniques most appropriate for the intended audience, and to strengthen connections between that audience, the park, and the resources.

Within the NPS, formal research requires a peer-review process to ensure that DOI and NPS policies are followed and neither park resources nor humans are negatively impacted, so conducting this type of research is typically beyond an interpreter's purview. On the other hand, interpreters may conduct research on their audiences in a more informal way that still provides useful information and utilizes techniques from the social sciences or humanistic fields. Informal research includes techniques used by interpreters as part of their everyday activities to learn about audiences and can be both quantitative and qualitative in nature.

Informal Research

Before beginning an informal research project, interpreters should determine what they want to learn from visitors, their intended goals and outcomes, and who they will engage. They should define specific audiences: what are their common interests, needs, and behaviors?

Example: an interpreter working in Mount Rainier NP could make the assumption that most visitors to their park are local residents from the Puget Sound and that the connection between people and their homeplace is strong in the area. They may have a strong association to the local percentage of annual rainfall to a sense of home. To learn if these assumptions are correct, an interpreter could:

- Identify the audience to engage: Families
- Identify what they wanted to learn from their audience: "What themes does each member of a family attach to the area related to home?"
- Goal: Refine or select messages on climate change that relate to visitor's experiences and park resources
- Outcome: A stronger connection to place and awareness of potential future change
- Approach: Before a program interact with audience member that are together in a family unit and have informal discussions with them about historic rain levels and what they think the future may look like.



Opportunities to conduct informal research exist with each visitor contact and everywhere the public interacts with a park's resources. Interpreters can gather information by using the informal research methods listed below:

- A **conversation** provides interpreters with an opportunity to ask questions of the audience, be it in-person or over the phone. Interpreters may start an interpretive talk with casual conversation about where the audience is from, what they know (or think they know) about climate change, and their degree of involvement in park stewardship. For example:
 - Climate change is a complex topic. What are you interested in learning more about? (This is a neutral question that does not assess whether or not they are a believer.)
 - What worries you about climate change? (This assesses their perception of risk.)
- **Observation** is a technique to understand visitor-use patterns of behavior and movement. An interpreter watches audiences move through a park or an exhibit, or interact amongst themselves. It may help, for example, in answering questions about audience interest in exhibits on climate change or about the kind of discussions generated among families after a ranger talk.
- **Participant-observation** involves joining an event as both audience and observer. (Because the NPS uniform calls attention to an individual, the interpreter might be able to wear street clothes with permission.)
- **Responses from interpretive or educational programs** might also provide interpreters with information about their audience. Interpreters might gather generalized information from materials submitted for a student art project related to a climate change issue, or from feedback in visitor comment books, etc.
- **Local newspapers** may include journalistic articles about climate change or opinion pieces. Interpreters should review both online and print versions, as the comment section of online editions may yield insights into a range of beliefs about climate change.
- **Engage with local communities** to gather a greater understanding of local perspectives on climate change and park issues. Engaging with the local community shows that the park is invested in the health of the region and does not stand apart.
- **Social media** provide another opportunity for qualitative research:
 - Blogs: Search blogs or write a blog to gain a variety of perceptions about climate change in a public journal format. Check out the comments, as well, to see how people respond.
 - Twitter: Post a tweet about climate change and see what happens.
 - Facebook: Follow responses to posts about climate change.
 - Flickr: Create a group or photo contest where people can share and comment on photos related to relevant climate change issues.

Collecting information about audiences using these methods may involve:

- Taking field notes
- Recording audiences' answers to questions
- Photographing visitor usage of spaces
- Drawing maps
- Reviewing visitor logs and response cards

Interpreters might apply informal research to a range of audiences, from one-time visitors to park website visitors to community residents who have had long-term engagement with the park. Given the range of audiences, how can an interpreter know if the findings are valid? Sometimes the results will be loud and clear as individuals communicate their positions or patterns develop in relationship to particular situations. Other times, the results may be more ambiguous. As discussed in the Knowledge of the Resource section, ambiguity and uncertainty can be healthy because they encourage further inquiry.



Formal Research

Formal research provides another perspective on NPS audiences. Interpreters generally do not conduct formal research themselves but may benefit from data and assessments from academic, private, or other circles. Formal research sources and data include the following:

- **Academic literature:** Peer-reviewed, scholarly texts published by various organizations and in various venues provide a rigorous and analytical treatment of the human responses to climate change. Interpreters should hold a critical eye to the research process and its results, just as they would to climate change science.
 - For example, researchers have been studying people’s perceptions of the risk that climate change poses. Risk perception informs how people make decisions about acceptable climate change impacts, policy directions, and personal behaviors. (Leiserowitz 2006) found that most Americans considered climate change to be a moderate risk most likely to affect distant people and places sometime in the future if at all. For as long as this moderate perception of risk exists, interpreters should emphasize that climate change is currently affecting parks and that it is not a distant—in time or space—phenomena. Interpreters should also stay current of people’s perception of climate change risks in order to craft effective interpretive opportunities.
 - Peer-reviewed journal articles can be accessed through local universities. Some can be accessed online using a search engine such as Google Scholar and JSTOR.org. Interpreters should confirm that the articles have been peer-reviewed to minimize the likelihood of digesting biased research. Some key words to use in the search include: climate change, attitudes, values, risk perception, beliefs, opinions, behaviors, and communication.
 - Since 2002 more than 1,100 peer reviewed journal articles, books and book chapters have been published related to climate change communication (Thompson & Beard, 2014) —and that is just communication research, not the whole realm of climate change social science. This literature review summarizes the most relevant research for guidance on effective communication in a place-based setting.
- **Oral histories:** Parks may have oral histories in their collections that record personal observations of previous conditions or changes in conditions that may be relevant to climate change issues. These recorded histories can provide personal stories that may be told to visitors. In addition, interpreters may identify people from their audiences that can provide oral histories of observed changes their park. Interpreters should work with their park’s oral history experts to have these stories taped, transcribed, and added to the park collections.
- **Climate change webinar series:** The Climate Change Response Program hosts a monthly webinar on a wide range of climate change–related topics, including social science. The webinar is held the second Thursday of every month at 2 p.m. Eastern Time. Contact climate_change@nps.gov to be included on the mailing list.
- **George Mason University Center for Climate Change Communication** uses social science research methods—experiments, interviews, surveys, and other methods—to find ways to effectively engage the public in the issue of climate change. The center has published a number of reports especially useful for gaining a better understanding of people’s perceptions of climate change, including Global Warming’s Six Americas survey and the Climate Change in the American Mind series, which can be accessed from their website. They also have a number of other useful reports and a searchable database of academic journal articles.
- **ClimateAccess** is an online forum built specifically to share the most recent social science research on climate change and to actively engage members. Registration is free and allows you to participate in blogs, learn tips for reaching new audiences, download resources, and more.

An Overview of the Six Americas Survey

The **Six Americas survey** report from Yale and George Mason Universities was first published in 2009. This group continues to repeat the survey and provide updates a couple times each year. Unlike the black and white perspective that the media portrays about climate change, the Six Americas survey reveals a spectrum of beliefs and opinions relating to this issue. Under the six distinct categories the perspectives range from those who are aware of climate change but do not know how to be involved, to those having other daily concerns causing them to be uninformed on the topic, to those that completely dismiss the idea that climate change is real. Each of the six groups have their own motivations and biases, enabling interpreters to better understand their audiences and to tailor interpretive products to be relevant to either a specific audience, if it is known, or to broad spectrum of visitors that may attend an interpretive program. Interpreters should take caution, however, to not stereotype visitors based on how they may be initially perceived to fit into one of these categories again emphasizing the importance of additional informal research.

The six categories identified in the study are ALARMED, CONCERNED, CAUTIOUS, DISENGAGED, DOUBTFUL, AND DISMISSIVE. Results from the different survey years indicate that percentages in each category shift slightly from survey to survey, as new evidence runs through the media, scandals like “Climategate” come to light, or memorable weather phenomena sweep the nation. Read the most current **Six Americas** survey and the initial **2009 audience segmentation** to better understand the characteristics of the different categories and their current population percentages.

The stereotypical image of a park visitor might fall into the CONCERNED and CAUTIOUS categories, which also represent a majority of the public, so the likelihood of someone in that category visiting the park is fairly high. But the particular demographics near individual parks may trend toward other categories (consider the differences between Golden Gate NRA near San Francisco and Tallgrass Prairie National Preserve in Kansas), so it is critical that interpreters strive to understand who are their specific audiences.

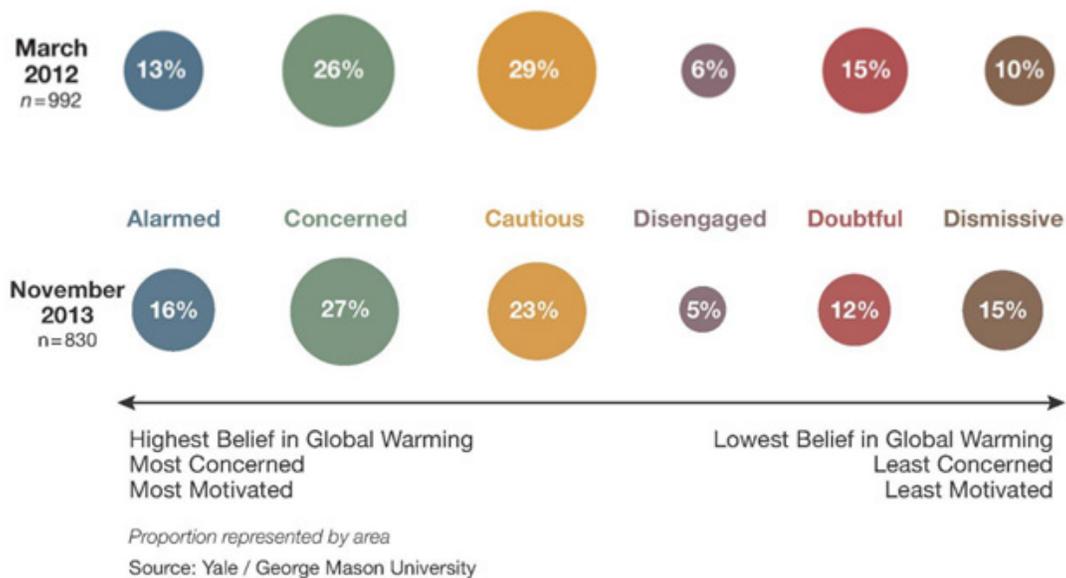


Figure 1: Proportion of the U.S. adult population in the Six Americas in November 2013 and compared with March 2012.

Interpreters should keep in mind as they use the Six Americas report and begin to engage audiences on climate change, that it is not their goal to change people’s minds or try to move them further to the left on the graph of the Six Americas. They must, however, try to identify the audiences coming to their parks and recognize that everyone has their own beliefs and motivations. When aware of audience motivations, interpreters can deliver a more relevant message that may provoke people to listen actively. By providing more resource knowledge, climate literacy, and perspectives for audience members to consider, interpreters can develop an opportunity for their audiences to move toward stewardship actions and behaviors on their own grounds, regardless of what category they may fall into.

Being passionate about a topic, interpreters often feel they need to change people’s minds and have them immediately embrace an issue. But a large shift in knowledge or perception on an issue takes time. Take prescribed fire, for example. When the NPS first began this management practice, there was widespread panic, criticism, and disbelief that this was a good way to manage our forests. If there was a fire in a park, it was usually thought that the park should be evacuated. Thirty years into applying prescribed fire in parks, the general opinion is now favorable on this issue. Unlike prescribed fire, however, climate change offers a suite of actions that visitors can take to become personally involved in the solution, perhaps turning the tide of public apathy on this subject much faster than that of prescribed fire.

While it is not the goal of interpreters to move people from one category of the Six Americas to another, it is important to realize that people will naturally shift in the spectrum as they have new experiences. Many interpreters have likely gone through similar experiences where in the past they may have been disengaged, but a single event or experience could have shifted them personally to a category of more concern about the topic of climate change. Sharing these personal experiences may be an effective approach at providing an opportunity to raise awareness with a particular audience.

Additionally, one pitfall that interpreters who are just beginning to interpret climate change can fall into is interpreting from a place of fear. For many, the deniers or dismissive category looms large. They may tailor entire interpretive programs, opportunities, or products to address the climate denier. While this category will likely visit your park or attend your program, they make up a much smaller percentage – 10 to 15 percent in the general Six Americas study. The number is actually smaller for visitors coming to national parks, initial research results show that the dismissive only represent 7 percent of visitors coming to parks. If an interpreter tailors the conversation to this group, they risk alienating up to 93 percent of their audience in some cases. While it is important to provide opportunities for all audiences, it is also good to remember that the majority of park visitors are actually represented on the side of the spectrum that is already on board with climate change.

The lessons learned in the Six Americas report offers some hope for engaging park visitors in climate change communication. If interpreters can continue to be a trusted and credible source for information, they do not need to present the entirety of climate science. Instead, they should strive to begin the conversation, make it relevant to their parks and to the audiences’ visits, and provide information that can be used by their audience to make more informed decisions.



Recommended Message for the Six Categories

Based on the characteristics of each of the Six Americas categories, the following messages and communication approaches are suggested for each category.

- **ALARMED:** Primary message—“Here is what you can do.” Provide site-specific, concrete examples to convert good intentions into active stewardship.
- **CONCERNED:** Primary message—“Climate change is happening right here.” First, provide relevancy through personal tangible experiences in parks or interpretive narratives. Such experiential learning can solidify the analytical belief in climate change and reinforce the personal relevance of the issue for the visitor. Second, remind them that “They can make a difference.” Like the ALARMED, they need specifics on what they can do in their homes and communities to mitigate climate change and support park stewardship. This is the largest of the six Americans in population.
- **CAUTIOUS:** Primary message—“There is strong scientific agreement.” This group needs the most help to understand the science, think analytically, and analyze the issue. In addition to analytical learning, they would benefit from experiential learning to understand that “Climate change is happening right here.” Finally, this group needs to learn that they are empowered to “Make a difference.”
- **DISENGAGED:** Primary message—“There is strong scientific agreement.” This group has spent little time considering the science or engaging in the debate. Another important message is that “Climate change is happening right here and now.” This group sees climate change as a far off vague threat that won’t be noticed in their lifetime.
- **DOUBTFUL:** Primary message—“There is strong scientific agreement.” Nearly half of this group is truly undecided. Well-presented facts may have an effect upon their opinions. This group more than others is likely to be swayed by economics, so conveying the “financial benefits of reducing their carbon footprint” may be well received regardless of their opinion on the changing climate or its causation. Finally, common ground can be found by providing simple pragmatic actions and communicating “Here is what you can do.”
- **DISMISSIVE:** This group has strongly held beliefs and values that may make it difficult to communicate the science. They may react negatively to such a message. An alternative is to simply say “Here is what you can do” without expressing underlying purpose or reason. Simple pragmatic actions are likely to be considered and interpreters should provide a way to the stewardship pathway without getting hung up in politics or intractable debate. Consider too that this group is motivated the most to make energy-efficient choices that help save money. There may be ways to engage this group about energy efficiency and cost savings regardless of how they feel about climate change.

Results from the Climate Change Education Partnership

During 2011 the NPS was part of a pilot project that collected formal social science research in parks. This project was funded by the National Science Foundation (NSF) and was a partnership between the NPS, Fish and Wildlife Service (FWS), National Parks Conservation Association and Colorado State University (CSU). The team of researchers conducted a quantitative survey with 847 agency staff from both the NPS and FWS. They also conducted quantitative (multiple choice) and qualitative (open-ended) surveys of 4,181 park and refuge visitors. The questions asked were similar to the questions from the Six Americas surveys. When compared to the percentages in each of the Six Americas categories, our audiences heavily represented the left side of the spectrum and only 7 percent fell within the dismissive category.



Figure 2: Distribution of visitors to national parks and wildlife refuges in 2011

Additional, highlights from the 2011 survey has been very empowering to staff in the field when engaging in climate change communication. When agency staff was surveyed the question was asked, “Are your visitors concerned about climate change?” The majority of staff (84%) responded that they thought our visitors were not concerned or only slightly concerned about climate change. However, when we asked visitors “How concerned are you about climate change?” the majority of visitors (83%) responded that they were extremely to somewhat concerned. Next we asked agency staff and visitors, “Should the national parks and national wildlife refuges be communicating about climate change with visitors?” In this answer both staff and visitors alike overwhelmingly said “Yes.” Dispelling any assumptions that our visitors are on vacation they do not want to hear about a depressing topic like climate change.

The complete survey results have now been published and are available (see the Resources section at the end of this module). The NPS Climate Change Response Program is working to build from the initial survey efforts in 2011 and future surveys and results will be forthcoming.

Staying current with audience research

People’s attitudes towards climate change are constantly evolving as it becomes a more common topic and as political winds or large national issues attract or distract people’s attention. The Six Americas report and the Climate Change in the American Mind series show the fluctuation of people’s responses. To provide interpretive services that best meet the needs of park visitors, it is important to keep up-to-date on people’s understanding of, and response to, climate change. This will allow interpretive services to be continually adapted to fit current audience perspectives (see the Resources section at the end of this module for a list of resources to help keep you informed). The same rigor that is applied to keeping up to date on resource information and climate change science should be applied to keeping abreast of current audience perspectives on climate change.

Putting It All Together – Applying Audience Knowledge

Communication Strategies

Audience research over time provides an in-depth understanding of visitors’ knowledge, values, beliefs, attitudes, and evolving opinions about climate change. This cumulative knowledge should be used to help inform the site’s overall communication strategies as well as throughout the development process of specific interpretive products. In addition, audience knowledge can significantly benefit the interpreter’s communication skills when interacting with a range of audience types. And it can help interpreters develop meaningful interpretive opportunities that more deeply connect to people’s values and have a stronger impact.

The application of audience knowledge might include situations like these:

- *Proactive and respectful* -- The Climate Change in the American Mind reports indicate that many people believe that scientists disagree about the existence of climate change. However, in reality there is strong agreement in the scientific community that climate change is happening and human caused; much of the public’s misunderstanding is a result of unbalanced reporting. This awareness can help interpreters plan proactive ways to acknowledge that multiple perspectives exist, and then offer statistics and sources of scientific agreement that encourage audience members to view the complete picture.
- *Positive and productive* -- For audience members who live in states where petroleum-based energy production is a primary provider of jobs and income, discussing alternative energy policies may result in strong responses. Since the NPS is not an expert on energy policy issues, interpreters can prepare if/when to carefully approach such topics using audience-relevant frames and keeping discussions focused on park resources and park-based examples of sustainability. Understanding the topics that are particularly emotional for visitors can allow interpreters to keep a discussion positive and constructive rather than devolving into discussions that are nonproductive and not directly relevant to the interpretive objectives.
- *Inclusive and creative* – Interpreters should be aware of demographic shifts in local community populations and be conscientious to learn about and reach out to underserved audiences. For example, understanding what local Hispanic residents think about climate change and its impacts to park resources will help determine creative ways to engage and collaborate on community communication projects.

Audience Relevance

The examples above highlight the importance of understanding what is meaningful and relevant to the audience. In addition to understanding the broad societal meanings or significance of site resources related to climate change (see the module on Knowledge of the Resource Issue), interpreters are also responsible for identifying the links between climate change and audience relevance. Interpreters can make climate change relevant to people's personal lives by connecting it to the things they care about. Why might the public be interested in the climate change story at your site? How does the climate change story relate to their personal interests and experiences? Identify the "so what" -- why should they care on a personal level? By answering these questions, you can begin to think strategically about how to help visitors connect in a personal way to your park's unique climate change story. However, in order to answer these questions, it will be important to ask and learn from visitors themselves, rather than making assumptions. Engage visitors and community members in informal conversations about climate change as an ongoing part of acquiring your knowledge of the audience.

In addition, when identifying relevant climate change stories, it is important to make connections between what is occurring in the park and in visitors' backyards. By sharing examples of actions the park is taking to address climate change, such as phenology monitoring and carbon reduction actions, interpreters can suggest actions visitors can take at home to be part of the solution. Social science studies on this topic have shown that keeping the message grounded in hope and specific actions is much more effective in terms of helping visitors want to take stewardship actions at home and within society at large.





Examples of potential stories, linking the meanings of climate change to the meanings of site resources -- significance and relevance:

- **Glacier National Park**
 - Significance to site resources – climate change is resulting in glacial recession and loss of alpine meadows
 - Relevance to site audiences – climate change is resulting in changing visitor experiences; our children will not be able to bring their children to see a glacier; some animals and flowers we enjoy seeing will become scarce or disappear; but we can use this park as an opportunity to learn from the past in order to make a better, more sustainable future for our children. Universal concepts: loss, change, beauty, consequences, family, sustainability, learning, future, hope

- **Joshua Tree National Park**
 - Significance to site resources – climate change is resulting in the loss of habitat suitable for Joshua trees
 - Relevance to site audiences – Deserts are places that teach the difficult lessons of adaptation and challenge the ability of every species to survive, including humans. What wisdom can we gain that may help us adapt and survive the changes caused by a shifting climate? What does the potential loss of the park’s namesake species mean to us as humans? Universal concepts: adaptation, survival, loss, extinction, uncertainty, challenge, wisdom, hope

- **Everglades National Park**
 - Significance to site resources – climate change is contributing to sea level rise and its impacts on wildlife and ecosystems
 - Relevance to site audiences – There are many reasons why humans have always built communities close to the sea and why we love to visit here. How will sea level rise change our communities? How will we interact with ocean ecosystems in the future? Universal concepts: community, cherished experiences, mystery and wisdom of the sea, change, endangerment, adaptation, hope

- **Fort Point National Historic Site**
 - Significance to site resources – the experience of the soldiers stationed here during the civil war can help inspire and teach us today how to effectively address our emotions around climate change
 - Relevance to site audiences – The challenging environment in San Francisco for the soldiers forced them to find ways to improve morale in the face of dreary, damp, uncomfortable conditions. Additionally, upon hearing of the onset of the Civil War, these soldiers undoubtedly faced an emotional crisis as they were asked to prepare to defend against an enemy that may never come while their friends and family fought and died 3,000 miles away. Many people may struggle with feelings of hopelessness and futility around climate change. The experience of the soldiers of Fort Point can inspire us to work together to seek a common purpose and find within us the strength and hope to continue to fight the battle against climate change. Universal concepts: loss, change, despair, hopelessness, hope, family, common purpose, future

- John Day Fossil Beds National Monument
 - Significance to site resources – modern anthropogenic climate change can be understood by comparing rates of change between the fossil record and today
 - Relevance to site audiences – The fossil record indicates that ancient species were affected by periods of changing climates, sometimes resulting in death and extinction. Does paleontology offer us glimpses of doom and gloom as we attempt to grapple with modern climate change or is there evidence for hope? Universal concepts: change, death, extinction, science, value, discovery, hope
- Montezuma Castle National Monument
 - Significance to site resources – changing climates have had consequences for cultures and civilizations of the past
 - Relevance to site audiences – Archaeologists have postulated that ancient cultures may have abandoned this place because of an increasingly harsh climate and competition for scarce water and food. Do we view the fate of past cultures as simply “ancient history” or does their experience link to our own? Universal concepts: survival, mystery, consequences, scarcity, competition, adaptation, hope
- Thomas Edison National Historic Site
 - Significance to site resources – the transformative power of scientific innovation has had both negative and positive ramifications related to climate change
 - Relevance to site audiences – As humans struggled to create a better world in the 1800s through technological inventions like automobiles, factories, and electric lighting, did they realize the long term environmental impacts of their actions? Today we look to technology as well to help us address climate change and continue to create a healthier world to live in. Universal concepts: awareness, insight, consequences, regret, empathy, family, sustainability, future, hope
- Antietam National Battlefield
 - Significance to site resources – the carbon footprint of the Army of the Potomac can be compared to help us grasp the scale of the carbon footprint of modern society
 - Relevance to site audiences – the burning of coal and other fossil fuels has long fueled society. These resources were essential to the Civil War effort and were often fought over commodities. When compared with the amount of greenhouse gases released in the atmosphere for one day of battle to the amount released in one present day, the numbers are startling and begin to illustrate the rapid rate of increase in the causes of climate change. Universal concepts: surprise, dismay, concern, consequences, learning, future, hope
- Rocky Mountain National Park
 - Significance to site resources – climate change is resulting in the loss of pine forests due to pine bark beetles and resulting fire dangers
 - Relevance to site audiences – At Rocky Mountain National Park in Colorado, more than 90% of the pine trees in the park have died in recent years. This is a dramatic change to the natural landscape at the park that is apparent to every visitor. Scientists have found this die-off is due to native pine beetles thriving under a warmer climate. This change is making a strong impression on the people who live in Colorado and recreate in Rocky on weekends. This is also resonating with visitors who have a special connection to Rocky, like those visiting the park with their parents decades after a memorable family vacation, and witnessing the dramatic change on the landscape evident before them or obvious in old photographs. Universal concepts: death, loss, family, science, challenge, hope

References and Resources

Just as it is important to stay up-to-date on the climate science information for your park, it is equally important to stay informed on the current social science research on audience perspectives. In addition to the resources already linked throughout this document, other useful tools are listed below.

- *Audience Beliefs and Attitudes about Climate Change* **powerpoint**
- *The Psychology of Climate Change Communication*, published by the Center for Research on Environmental Decisions at Columbia University
- *Climate Communications and Behavior Change* -- A Guide for Practitioners
- A 2011 study funded through the National Science Foundation, surveyed NPS and FWS staff and visitors on climate change perspectives read **the NSF summary** report
- An interesting look at how most people incorporate facts into their already established knowledge and beliefs, *"How Facts Backfire"* by Joe Keohane
- George Mason University Center for Climate Change Communication: **www.climatechangecommunication.org**
- The Yale project on climate change communication website includes an archive of all the **Six Americas reports** as well as the most up-to-date research.
- *Environment for the Americas. Connecting Cultures Study and Toolkit – A Project to Engage Latinos in Science Education*. 2013.
- Rudiak-Gould, Peter. *Climate change and anthropology: The importance of reception studies*. Anthropology Today 27:9 (2011), 9-12.
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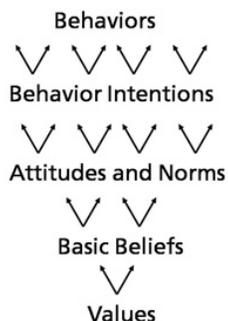
National Park Service, April 2014, *Interpreting Climate Change: Introduction – Module 1*. National Park Service Interpretive Development Program and Climate Change Response Program.

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APPENDIX I: The Cognitive Hierarchy

Climate change interpretation depends on understanding our audience's beliefs and attitudes in order to converse about the decisions and risks associated with behaviors that encourage or mitigate climate change. Understanding attitudes and beliefs enables interpreters to become conversant in where misunderstandings occur and why people are opposed to actions, such as energy policies intended to mitigate climate change.

One way for interpreters to understand the relationships between audiences, climate change, and civic engagement is through the cognitive hierarchy. The cognitive hierarchy is a structure developed in the social sciences to organize the cognitions that guide human behavior. Values form the foundation of the cognitive hierarchy. Basic beliefs, attitudes, norms, and behavioral intentions – all aspects of culture, by the way – are theorized to build upon one another. The cognitive hierarchy gives shape and purpose to understanding our audiences and guiding them towards civic engagement and stewardship. Below is a graph of the cognitive hierarchy.



The Cognitive Hierarchy: Values

Values are the foundation of the cognitive hierarchy because they shape people's belief systems and attitudes. Values as cognitions are concerned with desirable end states and modes of conduct. They represent basic life needs, and address only the limited number of fundamental social and biological needs of humans. Personal value priorities emerge and can change in response to people's circumstances. In addition to personal value priorities, social and ideological value systems also influence personality and social behavior. Examples of values include: peace, freedom, respect, security, equality, universalism, benevolence, conformity/tradition, security, power, achievement, hedonism, stimulation, and self-direction (Schwartz, 1992).

An understanding of values helps us to understand what is fundamentally important to a person and how it will shape their perception and views about climate change and NPS response. Understanding values can help an interpreter prepare for the responses he or she might receive to a program or conversation about climate change as well as frame the conversation in a way that most audiences will be receptive to. Particularly in terms of climate change, it is important to keep in mind that people can hold common values and orient them in different ways. One person is an environmentalist who wants to protect all living things. Another person is an environmentalist who hunts living things. Both can have a shared belief that climate change is real and will impact what they value – living things.

The Cognitive Hierarchy: Beliefs

Beliefs are expressions of what a person believes to be factual or true. They help people to form attitudes, which in turn shape behaviors.

- Example: most of the American public considers climate change a moderate risk that is more likely to impact people and places far distant in space and time (Leiserowitz, 2006).

Misinformation about climate change can lead people to believe that climate change is not happening, or is not caused by humans. They may, as a result, oppose climate change policy or not participate in the necessary mitigation steps.

Part of knowledge of the audience is an understanding of the kinds of misinformation available to audiences in order to counter it with examples from science using resources in national parks. It is critical that interpreters act as a credible source of scientific information and avoid anything that can be interpreted as biased or advocating because it will

undermine our audiences' trust in the National Park Service. Being able to ground the conversation in site specific examples of climate change, or in terms of how our parks and sites are being impacted and are responding, will increase our audiences' awareness and understanding so they may make more informed decisions about climate change. There is a correlation between those who are alarmed and convinced of the science with those who have "personally experienced global warming." Experiential Learning combined with tangible experience is a good way to help address misinformation. This is our forte as interpreters in place-based settings. Experiential learning is not just personal experience, but can also happen when we witness an event as opposed to being intimately involved in it, when trusted others relate an experience, or when a story is recounted to us.

- Example: According to a 2010 study from the Six Americas, despite the prevailing scientific agreement that global warming is happening, only a minority of Americans believed that most scientists think that global warming is happening. Nearly three-quarters of Alarmed Americans said most scientists agree that global warming is happening, and half of the Concerned segment, but the majority of the other segments believed either that there is a lot of disagreement among scientists, or said they don't know (Climate Change in the American Mind, 2010).

Assuming global warming is happening, do you think it is...		
	2010	2008
Caused mostly by human activities	47%	57%
Caused mostly by natural changes in the environment	36%	33%
None of the above because global warming isn't happening	9%	3%
Caused by both human activities and natural changes (volunteered)	6%	5%
Other	1%	1%
Don't know (volunteered)	1%	1%

The Cognitive Hierarchy: Attitudes

Beliefs form the basis for attitudes. Attitudes are positive or negative evaluations of or feelings about a person, object, or subject (Petty & Cacioppo, 1996). Different people may hold the same attitudes, but the attitudes may serve different purposes for them.

- Example: Mr. Smith may like solar hot water heaters because their use ties into his attitude that energy conservation is important. Mr. Jones may like solar hot water heaters because his attitude is that they are cost-effective.

People may hold the attitude that climate change is, without exception, bad. Other people may not hold a strong attitude about climate change. Instead, they believe certain policies will have a negative impact. Rather than focusing on people's attitudes towards climate change policy, an interpreter can craft programs that elicit positive attitudes towards natural and cultural resources and cite the impacts climate change is having. If we can illuminate that scientists agree climate change is happening and is having a negative impact on park resources, we can provide space for a conversation about what to do to protect park resources. This approach can also provide people who do not believe in climate change a way to save face: to protect park resources, we can continue managing them as we currently are, or we manage for the specific impact (e.g. drought) without attributing it to climate change. Knowledge of the audience can help interpreters craft programs that address positive attitudes towards resources.

- Example: Climate change will lead to a limited supply of water for boaters (utilitarian view of nature), waterfalls (aesthetic view of nature), ecosystems (ecologicistic-scientific view of nature).

The Cognitive Hierarchy: Risk Perception

People apply a combination of their values, attitudes, and beliefs to their perception of risk. Risk perception, in turn, informs the way that people make decisions, say, about climate change. A critical finding of recent research on risk perception is that public perceptions are influenced not only by scientific and technical descriptions of danger, but also by a variety of psychological and social factors, including personal experience, affect and emotion, imagery, trust, values and worldviews. Such elements of an individual's life intersect with those of their culture, or cultures. As a result, an individual or a group can compel or constrain political, economic, and social action to address particular risks.

- Example: Sea level rise poses significant threat to thousands of homes, buildings, and park facilities on the coast. The perception of this risk may compel enough people to push for policy and action to address the threat.