National Park Service
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Natural Resource Stewardship and Science

The Social Sciences of Climate Change Collaboration

Advancing Social Science Contributions to Climate Change Response Planning in the Central Rockies

Natural Resource Report NPS/XXXX/NRR—20XX/XXX

ON THE COVER
Visitor using the shuttle bus at Rocky Mountain National Park, an example of a climate change mitigation behavior, which requires visitor support and action.
Photograph by: Josh Thompson, August 2010

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Natural Resource Report NPS/XXXX/NRR—20XX/XXX

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Executive Summary

The goal of this research project was to facilitate the integration of social science research on climate change and adaptation planning for protected areas. This process was enabled by two events; a transdisciplinary thinkshop and a multiagency workshop. Both events have contributed to a deeper understanding of the potential and opportunities for integrated social science research on climate change, with a specific focus on adaptation action planning for protected area managers.

This report is organized in two main sections, the first describes the social science thinkshop process and outcomes of that event. The second half illustrates an example of multi-agency, transdisciplinary dialogue and collaboration on adaptation planning for the Central Rockies, from which opportunities for integrated social science research on climate change adaptation strategies were generated. Ultimately, the outcomes of both events have contributed to an integrated and grounded understanding of agency needs for social science research related to climate change and adaptation planning in protected areas.

The first event, entitled, *Protected Areas & Climate Change Thinkshop*, was a thinkshop hosted by Colorado State University (CSU) and the National Park Service (NPS). The thinkshop was held November 3-4, 2010 in Fort Collins, Colorado and engaged over 25 key social science researchers, climate scientists, and managers from Rocky Mountain National Park in brainstorming a list of social science research priorities.

The objectives of the integrated social science thinkshop were to:

1) Review of the state of knowledge on the probable impacts of global climate change in the Central Rockies area.

2) Understand the management institutions and systems including an overview of their primary responsibilities.

3) Discussion of the disciplinary perspectives on the issues; and how they may inform monitoring and informing decisions for the area.

4) Delineate the characteristics and criteria that would be present in a transdisciplinary social science approach to adaptation planning in Rocky Mountain National Park.

The second event, which is an illustration of transdisciplinary and multiagency collaboration in action, was entitled *Border Crossing: Preparing for & Adapting to Climate Change Effects in Northern Colorado*, This two-day workshop was held November 16-17, 2010 in Estes Park, Colorado. More than 50 participants attended, representing Rocky Mountain National Park, Arapaho and Roosevelt National Forest, Pawnee National Grassland, Routt and Medicine Bow National Forest and Thunder Basin Grassland, Colorado Department of Wildlife, the City of Estes Park, Bureau of Land Management, National Park Service Climate Change Response Program, USGS, Rocky Mountain Research Station, Pacific Northwest Research Station, and Colorado State University. Workshop participants worked to build capacity and improve

coordination of climate change management and adaptation efforts among management agencies in Northern Colorado.

The objectives of the adaptation planning workshop were to:

1) Increase awareness of the extent of observed and projected climate change impacts in northern Colorado;

2) Provide the opportunity for practitioners to gain experience with climate change adaptation and to consider a range of adaptation options available for resource management;

3) Increase and reinforce trust to work across jurisdictional and disciplinary boundaries;

4) Develop a shared vision and set of priorities for managing shared resources that will help build resilience to climate change.

From these two events, participants generated a list of research priorities (see Table 1) and adaptation actions (see Table 2) all of which have social science components.

Table 1. Top Priorities for Social Science Collaboration on Climate Change Adaptation at Rocky Mountain National Park

1. Identify and integrate activities in response to change (environmental, social, cultural & climate related). What processes are needed to prioritize, focus & evaluate effectiveness of climate change response strategies? How do managers best respond to the relationship of cultural resources and climate change?
2. How do we evaluate alignment of managers' perception of mandates responding to climate change with public perspective of what the NPS mandate should be?
3. How can managers inform and accommodate for unintended or unknown consequences (collateral effects) of actions in response to climate change?

Table 2. Top Priorities for Multi-agency Collaboration on Climate Change Adaptation in Northern Colorado

Wildlife
1. Identify Climate Vulnerable Species and Prioritize Appropriate Actions.
2. Identify Vulnerable Corridors and Prioritize Appropriate Actions.
3. Restore Habitat for Cutthroat Trout.
4. Strengthen Adaptation Collaboration and Planning for Limber Pine Habitat.
Water
5. Adopt Landscape and Long-Range Planning for Aquatic Ecosystems through Collaborative Aquatic Ecosystem Sensitivity Assessments and Vulnerability Analyses.
6. Expedite Watershed Restoration through Vegetation and Road Management Analyses.
7. Re-evaluate Structures and Development in Floodplains Leading to Floodplain Assessments.
Vegetation
8. Increase Resilience by Diversifying the Species on the Landscape.
9. Conduct Multi-agency Vulnerability Assessments; Use Scenario Planning and Adaptation Planning in Multi-agency Contexts
10. Use Fire as a Management Tool to Build Climate Change Resilience.
People
11. Develop a Coordinated and Consistent Suite of Messages Across Agencies – For Internal and External Audiences.
12. Incorporate Place-based Climate Change Education Into Interpretation and Public Communication Messages.
13. Incorporate Human Health Concerns into the Context of Climate Change Messages.
14. Build and Engage in Collaborative Governance Structures Across Agencies.

This project was intended to contribute to advancing social science research on global climate change, and thus advancing the research capacity and collaboration among the social sciences

and agency partners working on this topic. From the thinkshop and workshop outcomes, several products have been initiated. First, a manuscript describing the complexity of adaptation planning in protected areas from an integrated social science perspective, lead authored by Dr. Christopher Lemieux at the University of Waterloo. Second, an outline for a edited book led by Dr. Michael Manfredo, is scheduled to be compiled and produced for the International Symposium on Society and Resource Management in June 2013. Finally, Colorado State University will host the 19th International Symposium on Society and Resource Management with the theme: *A Time for Integration*, which will host numerous sessions that build directly on the results of the integrated social science thinkshop and adaptation planning workshop. All of these products are focused on reporting and facilitating a deeper discussion about the current challenges, opportunities and strategies for integrating social science research to meet the needs of land management agencies as they work to develop climate change adaptation plans.

Through this collaborative effort, which included insight from multiple disciplinary social scientists and multiple agency resource managers, we present an integrated and contemporary understanding of the human dimensions of adaptation planning for the Central Rockies in a era of global change. The thinkshop and workshop participants outlined a series of priorities for integrating our social science perspectives and our climate change adaptation management approaches, which will guide us as we collaboratively advance our disciplinary perspectives and management strategies in a changing climate.

Acknowledgments

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Project Background

The national park system was created to conserve unimpaired magnificent landscapes, enshrine our nation's enduring principles, and remind us of the tremendous sacrifices Americans have made on behalf of those principles. While some impacts of climate change have already been documented, we are only beginning to grasp the possible long-range consequences. These are likely to include, for example, the loss of native species, arrival of new species and new plant and animal diseases, loss of coastal resources to rising levels and warming water, and changes in snowpack, streamflow, and fire seasons. Land managers will need to determine to what extent their staff can and *should* take action to protect the parks' current resources while allowing the ecosystems in which they are located to adapt to new conditions. As species assemblages and communities adapt to shifting climate regimes, fundamental management assumptions will be challenged. Social science research is necessary to assess the types of actions that are appropriate for management by agencies such as NPS and to evaluate and facilitate societal understanding of and response to potential agency responses to climate change.

With human disruption of the climate posing the greatest threat ever to the United States' national parks, NPS is deeply engaged in climate change research, adaptation, and communication. A report entitled *National Parks in Peril: The Threats of Climate Disruption* released in 2009, by the Natural Resources Defense Council and the Rocky Mountain Climate Organization outlined hazards due to rising temperatures in 25 out of 351 national parks. The top risks to the parks include loss of snow and water, rising sea levels, more extreme weather, loss of plants and wildlife, and additional air pollution. Endangered parks include some of the nation's most popular, such as Great Smoky Mountain, Yellowstone and Yosemite. The science behind the report was based on the United Nations' Intergovernmental Panel on Climate Change from 2007 and the U.S. Global Change Research Program report, *Global Climate Impacts in the United States*, released earlier in 2009.

While NPS has begun to put resources toward better understanding the biological and physical effects of climate change, few resources have been allocated for social science research to understand the human dimensions of climate change. Yet, the involvement of the social sciences in climate change research has important ramifications for successful land management decision-making and is growing rapidly. During the 1990s there was a rapid increase in reflexive studies of climate science, assessments and policy that have explored, for example, how scientific knowledge about climate change is socially constructed. Nearly two decades later disciplinary experts are still struggling to link their expertise to help inform the social science of climate change; however, with a focused, management-based topic, such as adaptation planning, there is potential for the social sciences to collaborate and contribute in a very practical manner.

The social sciences are critical because only intentional and concerted human effort can slow down or reverse the intensifying trajectory of climate change. A report from the National Research Council (2009) concluded that our ability to address climate change problems effectively is hindered by the lack of social science research and the lack of integration of that research with natural science research in the U.S. Climate Change Science Program. Top priorities identified in the NRC report are heavily connected with social science implications: 1) understanding the interactions among climate, human, and environmental systems and supporting societal responses to climate change; 2) establishing a U.S. climate observing system

(defined as including physical, biological, and social observations); 3) developing the science base and the infrastructure to support a new generation of coupled socio-ecological Earth system models to provide predictions of impacts affecting adaptive capacities and vulnerabilities of environmental and human systems; 4) strengthening research on adaptation, mitigation, risk and vulnerability; and 5) initiating a national assessment process with broad stakeholder participation to determine the risks and costs of climate change impacts on the United States and to evaluate options for responding. However, the growing recognition of the need for an increased social science contribution to climate change research is not only taking place in the United States, but also in many other parts of the world. The implications of these NRC recommendations reach beyond the US and could effectively contribute to a broader international effort. Broadening the scope of the NRC agenda beyond the US would contribute to the larger unified international approach that is needed to mitigate global climate change. The 7th International Science Conference on the Human Dimensions of Global Environmental Change, held in April 2009, focused on the Social Challenges of Global Change, including climate change, and drew about 1000 participants. During his keynote presentation at this conference Dr. Hans Joachim Shellnhuber, a well known physicist, longstanding member of the Intergovernmental Panel on Climate Change (IPCC), and Director of the Potsdam Institute for Climate Impact Research (PIK), urged social scientists to become more involved in climate change research. “Speaking as a natural scientist,” he said, “I think 90% of research on…managing the transitions…and alleviating the impacts of climate change…will have to be done by the social scientists” (IHDP 2009).

Thinkshop Description & Process

The *Protected Areas & Climate Change Thinkshop,* brought together about 25 leading social scientists and expert agency advisors. The core team of social scientists, which included social, cognitive and behavioral scientists and those from the humanities represented a diverse array of disciplines and traditions. The expert advisors provided technical information about the effects of climate change, and specific issues related to climate change in the Central Rockies. The core social scientists shared presentations describing their disciplinary perspective and identifying primary characteristics and criteria necessary to consider in developing an integrated social science approach to adaptation planning in protected areas. The expert advisors were responsible for helping ground-truth and guide the social scientists as they constructed recommendations for applicable research agendas.

The overarching goal of this event was to unify the social sciences around climate change in order to provide valuable tools for advancing successful adaptation programs at protected areas. This process also provided a common platform to galvanize support for integrating the social sciences and building a collaborative platform to launch from. The open, discussion-based forum focused on addressing impacts and issues at Rocky Mountain National Park, as a case study for the Central Rockies. The thinkshop created a foundation for developing an integrated social science research program at Rocky Mountain National Park as a demonstration site, for regional or national protected area systems.

The process for the thinkshop event was designed so that participants could:

5) Review of the state of knowledge on the probable impacts of global climate change in the Central Rockies area.

6) Understand the management institutions and systems including an overview of their primary responsibilities.

7) Discussion of the disciplinary perspectives on the issues; and how they may inform monitoring and informing decisions for the area.

8) Delineate the characteristics and criteria that would be present in a transdisciplinary social science approach to adaptation planning in Rocky Mountain National Park.

To achieve these objectives in two days, the event was structured around a series of presentations from nationally recognized social scientists. Most of the participants came from the western United States; however, several participants represented land management agencies and research networks in Mexico and Canada, as well as representatives from international conservation and aid agencies supporting climate change adaptation and mitigation strategies in protected areas.

Finally, in February 2011, a subset of the core science and expert advisor participants gathered for a one-day writing workshop to outline a list of publishable products based on the insight and expertise shared at the thinkshop and the following adaptation planning workshop.

Overview of Collaborating Social Sciences

This section briefly summarizes the core social scientists' presentations.

Anthropological Perspective on Climate Change Adaptation

Kathleen Galvin, Ph.D.

Anthropology addresses past (archaeology and evolutionary /biological anthropology) and current adaptations to climate change through a place-based analysis, providing a detailed understanding of local conditions. Galvin used Integrated Assessment Scenarios for Kenyan pastoralist communities, which looked beyond the local level to incorporate regional, national, and global factors that affect the local capacity to adapt to climate change.

Political Science and Climate Change Governance

Andreas Rechkemmer, Ph.D.

Institutional fit, interplay, and scale of climate change governance issues impact current research in the political science of climate change. There is a need to conduct further research on climate change governance to improve decisions making and increase resilience in ecological and social subsystems.

Risk and Decision Science in Responding to Climate Change

Meredith Gore, Ph.D.

Risk and decision science is an s field moving toward engagement-based processes. When it comes to climate change, an alternative to fear and risk based messages is needed, and should focus on adaptation and mitigation efforts and appeal those to people's emotions. Understanding public values, perceptions, and emotions can lead to meaningful public engagement and have potential to ultimately increase citizen understanding of complex issues such as climate change.

Social Psychological Perspective on Climate Change Adaptation

Tara Teel, Ph.D.

Major conceptual domains in social psychology include: (1) values, (2) basic beliefs, (3) attitudes, (4) norms, (5) behavioral intentions, and (6) behaviors to help guide management approaches toward treating and informing people of climate change. To affect change, we need to understand the factors at the root of human behavior. Desired climate change behaviors must be linked to a person's values, beliefs and attitudes regarding the behavior.

Climate Change Communication for Protected Areas

Jessica Thompson, Ph.D.

Several common public communication tactics are *not* effective for delivering climate change messages, they include: (1) fear appeals and doomsday prophecies, (2) arbitrarily balanced positions in media reports, (3) technical and scientific language, explanations coded in jargon, (4) predictions couched in uncertainty and ambiguity, and (5) references to people and animals far away. The top ten strategies for creating effective messages about climate change include: (1) know your audience, (2) know what type of claim you are asserting, (3) connect the message to cultural values and beliefs, (4) make the message meaningful, (5) lead with your strongest argument, (6) make the message empowering, (7) link global patterns to local action, (8) partner with other organizations, (9) start from the inside and inspire action within your

organization/agency, and (10) communicate about actions you/your agency is already taking to mitigate and adapt to climate change.

The Role of Ecological Economics in Climate Change Adaptation

Josh Goldstein, Ph.D.

Ecological economics unifies economic, environmental, and social factors under an ecological paradigm focused on ecological sustainability, social equity, and economic efficiency. The main contribution of ecological economics to climate change research is it's ability to understand the economic values of nature in our lives. It is important to understand how different land uses and management practices can have a strong impact on how ecosystem services are provided.

Environmental Sociological Perspective on Climate Change Adaptation

Steve Brechin, Ph.D.

Environmental sociology is a very diverse discipline designed to examine complex relationships between social systems and their natural environment. Sociologists study climate change in relation to governments, private interests, civil society actors, and organizations. Ultimately, federal land management agencies should continue to form collaborative governance mechanisms to strengthen their overall capacity and relationships with non-governmental organizations and civil society.

The Potential for GIS and Modeling Tools to Assist in Adaptation Planning

Randy Boone, Ph.D.

GIS mapping and model simulations on carrying capacities, animal distributions, ecosystem models, spacial variations, and temporal variation have potential to aid communities and parks in developing their climate change response strategies. Boone shared an example of how landscape fragmentation and climate change have altered forage acquisition in animals in the Serengeti.

Social Science, Climate Change, & the Central Rockies

This section briefly summarizes the expert advisors' presentations.

Climate Change and Biophysical Effects in the Central Rockies

Jill Baron, Ph.D.

Baron gave an in-depth presentation featuring ecological changes researchers have observed in the Central Rockies including direct effects of temperature, snowpack, precipitation, glacier wasting, and forest die back and indirect effects of either natural (bark beetle) or human caused impacts (nitrogen deposition). Baron discussed further projected changes of reduced snowpack, increased invasion of non-native species and the decrease of native species, increased stress on fisheries due to warming water, and biome shifts due to warmer temperatures. She reminded the audience that change is occurring now and emphasized the importance of minimizing current problems such as fragmentation and pollution and as a result ecosystems and park managers will be better prepared for further climate change stressors. Climate change adaptation will require new management goals and strategies to address uncertainty in climate change.

The National Park Service's Climate Change Adaptation Response Strategy

Melanie Wood

Climate change presents significant social and ecological challenges to national parks. Wood spoke of the challenge it creates in achieving the 1916 Organic Act of NPS to leave park resources unimpaired for future generations. While NPS has large decisions ahead, Wood discussed four crosscutting elements of the National Park Service's Climate Change Response Strategy: (1) science, (2) adaptation, (3) mitigation, and (4) communication. NPS has also implemented scenario planning workshops to envision alternate futures and identify policies and actions that will be most effective across a range of potential futures. Social Scientists have been essential in facilitating scenarios on broad socio-political drivers within NPS. Wood concluded her presentation by emphasizing strengths the NPS has as a leader in making this topic relevant to visitors and stakeholders. She stressed how climate change provides the common thread that is needed to work across multiple mission's jurisdictions and authorities.

Climate Change Challenges for Resource Management at Rocky Mountain National Park

John Mack

Mack spoke about 29 research projects with climate change components in Rocky Mountain National Park (RMNP) and discussed climate change indicators such as seasonal advances in runoff, phytoplankton blooms, and neotropical migrant birds, exotic expansion of Cheatgrass, decreases in Pika populations, beetle kill, and reductions of permafrost that managers are observing in RMNP. Mack echoed the challenge in communicating the uncertainties of climate change as he explained how particular glaciers have shrunk since 1940 but others have remained the same size. Climate examples similar to this often cause doubt, uncertainty, and confusion for the public. Demonstrating action and leading by example is one of the strongest management tools available to RMNP. In 2007, the RMNP Green Team was formed and committed the park to reduce emissions to 17 percent below 2005 levels by the year 2017. Mack highlighted a few strategies the park is implementing in order to achieve this goal: increase climate change outreach, documenting sustainable practices, buying hybrid and fuel efficient vehicles,

expanding visitor shuttle systems, improving waste and energy efficiency, and developing management plans to address climate change.

Thinkshop Outcomes: Integrated Social Science Research Priorities

During full-group discussions and presentations, participants gained a deeper appreciation and understanding of what issues protected area managers are facing when it comes to human dimensions of climate change and adaptation planning. The thinkshop engaged key social science researchers and managers from Rocky Mountain National Park in brainstorming a list of social science research priorities. Participants identified three social science research priorities for Rocky Mountain National Park (see Table 1). In order for these priorities to be feasible it is essential for social scientists to take the next step and determine: (1) overlapping research strategies; (2) potential funding opportunities; and (3) a long-term collaborative research process to pursue tangible results for the agency partners.

Table 1. Top Priorities for Social Science Collaboration on Climate Change Adaptation at Rocky Mountain National Park

1. Identify and integrate activities in response to change (environmental, social, cultural & climate related). What processes are needed to prioritize, focus & evaluate effectiveness of climate change response strategies? How do managers best respond to the relationship of cultural resources and climate change?
2. How do we evaluate alignment of managers' perception of mandates responding to climate change with public perspective of what the NPS mandate should be?
3. How can managers inform and accommodate for unintended or unknown consequences (collateral effects) of actions in response to climate change?

The priorities, which all thinkshop participants voted upon, were used to inform discussions at the second event, a workshop focused on climate change adaptation planning in Northern Colorado.

Climate Change Collaboration in Action

The multi-agency workshop, *Border Crossing: Preparing for and Adapting to Climate Change Effects in Northern Colorado*, was held November 16-17, 2010 in Estes Park, Colorado. More than 50 participants attended, representing Rocky Mountain National Park, Arapaho and Roosevelt National Forest, Pawnee National Grassland, Routt and Medicine Bow National Forest and Thunder Basin Grassland, Colorado Department of Wildlife, the City of Estes Park, Bureau of Land Management, National Park Service Climate Change Response Program, USGS, Rocky Mountain Research Station, Pacific Northwest Research Station, and Colorado State University.

The workshop included pre- and post- consultation with multiple stakeholders; an online survey assessed participants' understanding of: 1) the scientific findings related to climate changes impact on federal lands; 2) multi-jurisdictional climate change adaptation, planning, and communication strategies, including assessment and monitoring tools; 3) organizational support for implementation of adaptation strategies; and 4) organizational support for cross-jurisdictional collaboration.

The objectives of the workshop were to: 1) increase awareness of the observed and projected climate change impacts in northern Colorado, 2) provide the opportunity for practitioners to gain experience with climate change adaptation, 3) to increase and reinforce relevance to work across jurisdictional boundaries, and 4) to begin to develop a shared vision and set of common approaches for managing shared resources that will help build resilience to climate change. The workshop included short presentations on climate change impacts in the Central Rockies, natural resource management and planning challenges and opportunities in an era of climate change, agency tools for climate change adaptation planning, and a multi-agency adaptation case study on the Olympic Peninsula in Washington. The workshop included several facilitated topic-focused working group sessions, charging participants to identify what climate change effects related to (1) wildlife, (2) water, (3) vegetation, and (4) human dimensions issues cross the boundaries they manage. During working group discussions, participants identified what adaptation options might be feasible and identified top priorities most ready for collaboration across neighboring lands (see Table 2). Follow this link to find out more about this workshop: https://sites.google.com/site/climatechangeadaptationnoco/

Several of the top priorities for multi-agency collaboration require an integrated social science perspective to deepen the land managers' understanding of the related social impacts and issues. This list of priorities completes the platform created at the thinkshop, by providing a tangible, "on the ground" context to situate the integrated social science research agenda. The subset of the core social science and expert advisory participants, who met for a writing workshop on February 15, 2011, identified key social science research aspects for each adaptation priority listed on Table 2.

Table 2. Top Priorities for Multi-agency Collaboration on Climate Change Adaptation in Northern Colorado

Wildlife
1. Identify Climate Vulnerable Species and Prioritize Appropriate Actions This requires an understanding of decision-making theory, the ethics of triage, public policy, philosophy for the practice of prioritizing and public engagement and communication theory for involving the public in decision making or communicating decisions with the public.
2. Identify Vulnerable Corridors and Prioritize Appropriate Actions Similar to vulnerable species, enacting protection for corridors also requires an understanding of decision-making theory, the ethics of triage, public policy, philosophy and public communication theory when announcing or engaging the public in agency decisions.
3. Restore Habitat for Cutthroat Trout This issue has cultural and local values embedded in it, and different audiences will be concerned about restoration techniques and outcomes. Social science expertise in social psychology, recreation and tourism, ecological economics and public communication will be critical to informing managers on best practices for communicating this adaptation action item to sister agencies, user groups, and other audiences.
4. Strengthen Adaptation Collaboration and Planning for Limber Pine Habitat This issue has two social science components: 1) The multiagency collaboration requires expertise in public policy, conflict management, group decision-making and organizational communication. The planning for limber pine habitat, much like cutthroat trout habitat requires expertise in social psychology, recreation and tourism, ecological economics and public communication.
Water
5. Adopt Landscape and Long-Range Planning for Aquatic Ecosystems through Collaborative Aquatic Ecosystem Sensitivity Assessments and Vulnerability Analyses. Landscape and long-range planning requires integrated expertise in organizational communication, sociology, conflict management, and group decision-making. Vulnerability analyses can be better informed through expertise in philosophy, decision science, economics, and ethics.
6. Expedite Watershed Restoration through Vegetation and Road Management Analyses. Watershed-level collaboration requires proper facilitation and could benefit from the perspective of multiple social science disciplines, including: sociology, collaboration, group decision-making, and ecological economics.

7. Re-evaluate Structures and Development in Floodplains Leading to Floodplain Assessments

   The evaluation of structures and floodplain assessments are clearly rooted in specific natural resource management expertise; however the communication of changes and the negotiation of decisions and potential futures could be facilitated by the insight from communication, collaboration and public policy.

Vegetation

8. Increase Resilience by Diversifying the Species on the Landscape.

   Diversifying rangeland species to increase resiliency and mitigate invasive species, may require a public engagement effort, which could be informed by collaboration amongst experts in social psychology, public communication, collaboration, GIS modeling, as well as political science and philosophy.

9. Conduct Multi-agency Vulnerability Assessments; Use Scenario Planning and Adaptation Planning in Multi-agency Contexts

   Multi-agency vulnerability assessments and scenario planning requires integrated expertise in organizational communication, education, sociology, conflict management, and group decision-making. Adaptation planning and vulnerability analyses can also be better informed through expertise in philosophy, ethics, decision science, and economics.

10. Use Fire as a Management Tool to Build Climate Change Resiliency

    Fire has a long social and cultural history and managed fire sparks varying levels and types of public comment and controversy. This issue could be better understood and communicated through insight from social psychology, geography, sociology, communication, education, and public engagement practice.

People

11. Develop a Coordinated and Consistent Suite of Messages Across Agencies – For Internal and External Audiences

    Similar to all of the priorities of the People working group, integrated social science expertise can better inform the development of coordinated and consistent messages, especially through the lens of social psychology (in knowing the audience), public communication (in designing messages), organizational communication, sociology and collaboration (in facilitating the cross-agency creativity and message development).

12. Incorporate Place-based Climate Change Education Into Interpretation and Public Communication Messages

    Landscape and place-based messages require integrated expertise in geography, social psychology and communication. Input from ecological economics and philosophy would also be useful to create holistic communication strategy.

13. Incorporate Human Health Concerns into the Context of Climate Change Messages

    Expertise in public health, health communication, organizational communication, sociology, philosophy, as well as insight from geography, decision science, economics, and ethics could inform the development of relevant human health related messages about climate change.

14. Build and Engage in Collaborative Governance Structures Across Agencies

    The Olympic Peninsula Case Study is an example of a collaborative governance process that linked multiple land management agencies in adaptation planning. Assessing current policy changes; and the potential for collaborative governance in other parts of the country would require expertise in political science, geography, conflict management, sociology, and organizational communication.

Framework for Moving Forward

Effectively responding to the challenge of climate change requires thoughtful and coordinated responses by park employees as well as social scientists. This project aimed to unify the social sciences around climate change adaptation planning in the Central Rockies. The insights shared in this series of meetings provide valuable tools for advancing a social science-based research agenda for climate change adaptation planning for protected areas.

In order to advance an integrated social science research agenda on climate change; the following are recommended:

1) Writing funding proposals to finance the collaborative social science research with agency partners;

2) Developing mechanisms for conducting the research in an integrated fashion;

3) Analyzing and writing the results of the research for peer-reviewed publication and for key agency officials; and

4) Outlining a template or strategy for conducting similar research at additional sites, including international protected areas.

Together, diverse social scientists and protected area managers can advance our understanding of the social aspects of climate change, through focused attention on the human dimensions of adaptation planning. A concentrated focus on these aspects provides a foundation to elevate integrated social science research as well a platform to test new theories and insights gained from collaborative social science in practice – through implementation and assessment at protected areas in the Central Rockies and beyond.

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The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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