Visitor Perceptions of Climate Change: A National Park Service and U.S. Fish and Wildlife Service Study, Rocky Mountain National Park

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Between 2011 and 2012, a collaborative survey was conducted across 16 national parks and national wildlife refuges to assess visitor perceptions and attitudes about climate change. This foundational work—led by researchers at Colorado State University in partnership with the National Parks Conservation Association, the National Park Service (NPS), and the U.S. Fish and Wildlife Service—provided valuable insights into public understanding of climate change and its relevance to visitor experiences. Published findings from the 2013 study have since informed climate change communication strategies and justified continued education efforts within parks and refuges.

More than a decade later, we propose to replicate and update this survey to capture current visitor attitudes, measure shifts in public perception over time, and understand how climate change is impacting visitor experiences and expectations. This new effort will inform evidence-based communication tools, educational programming, and strategic investments in interpretation and engagement across public lands. As the nation's largest provider of informal education, the NPS has both a responsibility and an opportunity to lead meaningful dialogue about climate change. Climate change is not a distant threat—it is a present and pervasive force affecting every acre of land managed by the NPS. Melting glaciers, rising seas, altered ecosystems, and cultural site degradation are all visible impacts that underscore the urgency of public understanding and involvement. To that end, parks serve not only as places of recreation and inspiration, but also as powerful venues for climate literacy—helping visitors discover personal relevance, connect with science, and make informed decisions.

This renewed survey initiative aligns with the NPS *Climate Change Response Strategy* and the *National Climate Change Interpretation and Education Strategy*, which emphasize collaborative stewardship and communication. Engaging visitors in climate conversations is critical to fostering a climate-literate public and developing actionable responses to the most pressing environmental challenge of our time. The updated survey will support these goals by capturing how visitors perceive climate change today, how it shapes their park experiences, and how they expect the NPS to respond.

Ultimately, this research will strengthen the NPS's ability to communicate the story of climate change with clarity, authenticity, and purpose—ensuring our public lands remain not only protected landscapes, but also essential platforms for public education and engagement.

Introduction of Study

Methods

Project leads from Northern Michigan University will survey visitors at up to 9 target NPS sites, and 4 FWS sites across varying geographic regions. Target parks will be identified in consultation with the NPS and FWS to reach a robust number of respondents comparable to the 2012 survey.

Figure 1. *Participating Parks and Refuges in the 2025 Visitor Perceptions on Climate Change Study*

Southern Florida and the Keys

Biscayne National Park (FL)

Everglades National Park (FL)

Southwest Region

Joshua Tree National Park (CA)

Lake Mead National Recreation Area (NV)

Northern California

Yosemite National Park (CA)

Golden Gate National Recreation Area (CA)

Don Edwards National Wildlife Refuge (CA)

Western Mountain Region

National Elk Refuge (WY)

Grand Teton National Park (WY)

Rocky Mountain Arsenal National Wildlife Refuge (CO)

Rocky Mountain National Park (CO)

Upper Peninsula Michigan

Pictured Rocks National Lakeshore (MI)

Central Minnesota

Minnesota Valley National Wildlife Refuge (MN)

Survey Development. The survey used in this study was created using the data collection software from ArcGIS Survey123, which is compatible with the Samsung Tab A9+ tablets. The ArcGIS app allows for the electronic survey to be viewed and completed on the Samsung Tab A9+ tablets. The survey team administered the survey on 12 tablets and gathered approximately 400 survey responses in each location during the permitted survey timeframe/period. All surveys were saved, synced, and uploaded to the password-protected ArcGIS platform, where the results were generated and viewable by the survey team.

Procedure. Approximately, 5,000 surveys were administered over the course of 8 months by the Northern Michigan University Climate Change Survey Team. The team used the following script to recruit willing and anonymous respondents:

"Hello, I am a student from Northern Michigan University working with the National Park Service and the U.S Fish and Wildlife Service conducting visitor surveys at this park/refuge. This survey is about visitors' perceptions of climate change at this Park and takes about 5-7 minutes to complete. Your participation is completely voluntary and anonymous. You can stop taking the survey at any time. Would you be willing to help the National Park Service better understand visitors' opinions by taking this survey?"

The survey team was available to answer any technical questions that pertained to the operation or navigation of the survey on the tablet and any necessary clarification respondents may need to complete the survey. However, the survey team was not to offer any opinions or insight regarding specific questions while the survey was being conducted.

Survey Sites. The on-site survey locations were predetermined and permitted by our partners at the NPS and USFWS. The permitted locations varied at each park or refuge; however, many of the targeted areas included popular trailheads, visitor centers, and campgrounds. Upon arrival at each location, the survey team consulted with park rangers and location managers to determine the most appropriate sites to survey at that specific park or refuge. Most surveys were collected during the weekends due to the increased visitation and convenience at that time; however, weekdays are also represented at each location.

Response Rates. The survey response team collected a total of 403 surveys at Rocky Mountain National Park.

Visitor Survey Results

Visitor Demographics

The majority of participants were U.S. residents (93%), with the most common age groups being 18-24 years old (20%) and 25-34 years old (20%). Most respondents were highly educated, with (69%) holding a bachelor's degree or higher, and the racial demographic was predominantly White (87%), with limited representation from other racial groups. Additionally, (61%) of participants were visiting the park or refuge for the first time, suggesting a large proportion of newcomers in the sample.

Table 1

Demographic Characteristics of Participants

Characteristics	n	%
Are you a resident of the United States? (n=393)		
Yes	365	93
No	25	6
Do not wish to answer	3	1
Age (n=400)		
18-24 years old	80	20
25-34 years old	79	20
35-44 years old	56	14
45-54 years old	75	19
55-64 years old	62	16
65-74 years old	43	11
75 years or older	5	1
Highest level of education completed? (n=396)		
Less than high school/Some high school	11	3
High school graduate	40	10
Vocation/trade school certificate	6	2
Some college	42	11
Associates degree	23	6
Bachelor's degree (BA, AB, BS, etc.)	146	37
Master's degree (MA, MS, Med, MSW, MBA, etc.)	83	21

Professional degree (MD, DDS, DVM, LLB, JD, etc.)	19	5
Doctorate degree (PhD. EdD. etc.)	23	6
Do not wish to answer	3	1
Are you Hispanic or Latino? (n=395)		
No	363	92
Yes	22	6
Do not wish to answer	10	3
Which of these categories best indicates your race? Please select one or more. (n=392)		
American Indian or Alaska Native	8	2
Asian	27	7
Black or African American	3	1
Native Hawaiian	1	0
White	342	87
Other race or ethnicity	5	1
Do not wish to answer	15	4
Is this your first visit to this Park/Refuge? (n=393)		
No	154	39
Yes	239	61
Including this visit, approximately how many times have you visited this park in the last 12 months?		
The average number of visits over a 12 month period was 2 visits.		

Visitor Concerns about Impact of Climate Change

Respondents were asked to rate their level of concern on the impact of climate change, both in a general sense and in the Park/Refuge, respectively.
Percentages may not add up to 100% due to rounding for readability.

Table 2

Please choose the issue you are most concerned about regarding this Park/Refuge (n=380)

Categories	Response Percentage (%)
Overcrowding	40
Climate Change	38
Invasive Species	7
Air Pollution	5
Water Pollution	4
Light Pollution	4
Noise Pollution	2

The most pressing concerns among visitors were overcrowding and climate change, which together accounted for the vast majority of responses. Overcrowding slightly edged out climate change as the top issue, highlighting how immediate, visible impacts on the visitor experience can rival broader environmental concerns. Other issues such as invasive species, pollution (air, water, light, and noise) were mentioned far less frequently, indicating they are of lower perceived urgency for most respondents.

Table 3

How worried are you about climate change? (n=389)

Categories	Response Percentage (%)
Very Worried	47
Somewhat Worried	30
Not Very Worried	15
Not at all Worried	8

Under half of respondents (47%) reported being very worried about climate change, while an additional (30%) were somewhat worried, indicating that (77%) of visiors are worried about climate change in this park. Approximately (23%) of participants reported being not very worried or not at all worried.

Table 4

How important is the issue of climate change to you personally? (n=390)

Categories	Response Percentage (%)
Extremely Important	37
Very Important	23
Somewhat Important	25

Not too Important	8
Not at all Important	7

A majority of respondents (60%) consider climate change to be either extremely or very important to them personally. Meanwhile, a smaller portion, about (15%), view the issue as either not too important or not at all important.

Table 5

How much do you think climate change will harm the following?

	Response Percentage (%)				
Statement	A Great Deal	A Moderate Amount	Only a Little	Not at All	Don't Know
You personally (n=354)	24	34	27	12	3
Future Generations of People (n=349)	62	19	9	7	3
This Park/Refuge (n=342)	56	25	9	7	3

The data indicates that concern about climate change is highest when considering its impact on future generations, with (62%) of respondents believing it will harm them "a great deal." Concern is also substantial for the park or refuge itself, with (56%) selecting "a great deal." In contrast, fewer respondents perceive personal harm, with only (24%) indicating that climate change will affect them "a great deal," suggesting a greater perceived threat to others and the environment than to themselves personally.

Table 6

How much do you agree with the following statement?

	Response Percentage (%)				
Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
The effects of climate change can already be seen at this Park/Refuge (n=379)	22	32	33	9	4
I would like to learn more about climate change topics in this Park/Refuge (n=377)	21	38	28	6	6
Relative to other topics, sharing climate change information should be a high priority at this Park/Refuge (n=372)	33	35	21	5	5

The data shows that while over half of respondents (54%) agree or strongly agree that the effects of climate change are already visible at the park or refuge, a large portion (33%) remain neutral, suggesting uncertainty or a lack of awareness. Interest in learning more about climate change is relatively strong, with (59%) expressing agreement, indicating a receptive audience for educational initiatives. Furthermore, (68%) believe that sharing climate change information should be a high priority, highlighting a clear public interest in climate communication at this site.

Visitor Interest in Climate Change Education/Adaptation

Table 7

Have you received any climate change information about this Park/Refuge? (n=381)

Statement	Response Percentage (%)
No	77
Yes	23

A majority of respondents (77%) reported not receiving any climate change information about the park/refuge, while only (23%) said they had. This suggests a significant communication gap regarding climate change at this site.

Table 8

From what sources have you received information about climate change at this park/refuge? (n=86)

Categories	Response Percentage (%)
Exhibits (indoor, roadside, trailside)	77
Ranger and staff-guided walks/talks/tours	20
Informal conversations with rangers and park staff	19
In-park videos, films, movies	13
Printed materials (brochures, books, maps, etc.)	37
Cell phone or audio tours	2
Park/Refuge website	22
Social media (Facebook, X, Instagram, etc.)	14
Online videos, films, movies, podcasts	16
Other	6

Most visitors reported receiving information about climate change through physical exhibits, making this the most common and influential source. Printed materials and the park/refuge website also played notable roles, while digital sources like social media, online videos, and audio tours were used far less frequently. Ranger-led programs and informal conversations contributed modestly, suggesting that while personal interaction has value, static and self-guided materials remain the primary channels for climate communication in the park or refuge setting.

Table 9

During your visit, how interested are you in learning about climate change topics at this Park/Refuge through the following sources?

Statement	Response Percentage (%)				
	Very Interested	Interest	Neutral	Not Very Interested	Not at all Interested
Exhibits (indoor, roadside, trailside) (n=389)	29	41	17	7	6
Ranger and staff-guided walks/talks/tours (n=389)	23	36	25	8	7
Informal conversations with rangers and park staff (n=388)	28	38	21	6	6
In-park videos, films, movies (n=387)	20	37	27	8	7
Printed materials (brochures, books, maps, etc.) (n=388)	21	36	26	10	6
Cell phone or audio tours (n=369)	18	27	28	17	10
Park/Refuge website (n=359)	23	37	23	10	7
Social media (Facebook, X, Instagram, etc.) (n=361)	21	30	27	13	9
Online videos, films, movies, podcasts (n=356)	24	38	21	9	7

Visitors show the greatest interest in learning about climate change at the park or refuge through direct, in-person experiences such as exhibits, guided tours, and informal conversations with staff. These interactive, place-based methods are more appealing than digital or remote sources. Interest in learning through videos, printed materials, and websites is moderate, while formats like cell phone tours and social media are the least favored. Overall, visitors prefer personal and engaging approaches over more passive or technology-based ones.

Table 10

Please indicate your level of interest in learning how climate change is affecting...

Categories	Response Percentage (%)				
	Very Interested	Interested	Neutral	Not Very Interested	Not at all Interested
Wildlife in this Park/Refuge (n=390)	51	34	9	3	4
Plants And Natural Features (forest, lakes, rivers, etc.) in this Park/Refuge (n=390)	47	35	11	3	4
Cultural And Historical Features (historical Indigenous sites, historical buildings, archaeology, etc.) in this Park/Refuge (n=385)	38	34	17	7	4
People (visitor safety, staff safety, human health, visitor experience, etc.) in this Park/Refuge (n=387)	27	35	25	8	5
Facilities (park buildings, roads, etc.) in this Park/Refuge (n=385)	25	30	30	9	5
Neighboring Communities (Indigenous people, local communities) (n=371)	30	35	22	7	5

Visitors showed the highest interest in learning how climate change affects wildlife (85%) interested or very interested and plants and natural features (82%). Cultural and historical features (72%) and neighboring communities (65%) also attracted moderate attention, while interest was notably lower for topics like facilities (55%). Overall, the natural environment draws the most concern, whereas impacts on people, infrastructure, and surrounding communities generate comparatively less interest.

Table 11

Please indicate your level of interest in learning about...

Categories	Response Percentage (%)				
	Very Interested	Interested	Neutral	Not Very Interested	Not at all Interested
Scientific Research on climate change in this Park/Refuge (n=387)	37	36	17	5	5

A majority of respondents (73%) expressed interest or strong interest in learning about scientific research on climate change at the park/refuge, while (10%) indicated little or no interest. This suggests that visitors are generally eager to engage with science-based information about climate change impacts in the park.

Table 12

How much do you agree or disagree with the following possible actions to adapt to climate change in ANY park/refuge?

Statement	Response Percentage (%)					
	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Don't Know
Wrap iconic trees in fire-resistant materials as wildfire approaches. (n=384)	21	36	23	10	5	6
Allow grasses and bushes to replace forests after wildfires rather than replanting trees. (n=383)	15	26	31	15	6	7
Relocate plants and animals to new areas to protect them from hotter conditions. (n=380)	11	30	29	16	7	6
Build seawalls around staff housing to protect against sea level rise. (n=383)	15	32	30	10	5	7
Move historic lighthouses inland to protect against sea level rise. (n=376)	12	25	37	13	7	6
Invest in structures for visitor use that can be moved if a hurricane is approaching. (n=381)	21	34	25	8	4	7
Abandon maintenance of roads and trails at repeated risk from flooding. (n=381)	12	28	26	17	10	7
Document (but don't remove) archeological	20	35	27	8	5	6

artifacts at imminent risk from flooding. (n=381)						
Remove archeological artifacts at imminent risk from flooding to store in museums. (n=326)	17	35	27	10	4	7

Respondents tended to support protective and adaptable measures, especially those that safeguard visitor experiences and cultural resources. Actions like wrapping trees, creating movable infrastructure, and documenting or relocating archaeological artifacts were generally viewed positively. In contrast, more transformative ecological strategies—such as allowing natural landscape shifts or relocating species—received mixed responses, reflecting uncertainty or concern about long-term impacts. Infrastructure-related decisions, like abandoning roads or moving historic buildings, also drew divided opinions.

Table 13

Have you noticed any efforts to reduce greenhouse gas emissions (renewable energy, hybrid or electric vehicles, mass transit, LEED-certified buildings, etc.) at this Park/Refuge? (n=386)

Statement	Response Percentage (%)
Yes	50
No	50

When asked if they had noticed any efforts to reduce green house gas emissions at this park, (50%) of respondents had noticed, and (50%) had not. This suggests that visitors are noticing these efforts and there is opportunity for education and awareness in the park regarding the efforts being made.

Table 14

How much do you agree or disagree with efforts to reduce greenhouse gas emissions at this Park/Refuge? (n=387)

	Response Percentage (%)				
Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
	39	32	21	4	4

A combined (71%) of respondents agree or strongly agree with the efforts to reduce greenhouse gas emissions at the park/refuge, indicating overall support for these initiatives. However, a notable portion (21%) remains neutral, and a small percentage (8%) disagree with or strongly disagree with these efforts, suggesting room for improvement in either the effectiveness or communication of such efforts.

Visitor Behavior

Table 15

Please indicate whether you have ever done any of the following in ANY Park/Refuge:

	Response Percentage (%)	
Statement	Yes	No
Visited a park/refuge to see iconic features or species that may disappear because of climate change (such as glaciers, Joshua trees, or puffins) (n=389)	61	39
Avoided places that have been impacted by climate change (such as places with lots of dead trees from fires or pests like pine beetles) (n=383)	32	68
Visited a park/refuge to experience extreme weather conditions (like extreme heat in Death Valley) (n=380)	39	61

A significant portion of respondents (61%) have visited a park/refuge specifically to see iconic features or species that may be impacted by climate change, showing a strong interest in the environmental changes occurring in these areas. On the other hand, fewer respondents have avoided climate-impacted locations (32%) or sought out extreme weather experiences (39%), suggesting that most visitors still prioritize the experience of nature despite climate-related changes.

Table 16

Because of extreme weather conditions (like wildfire/smoke, extreme heat, flooding, hurricanes, etc.) I have…

	Response Percentage (%)	
Statement	Yes	No
Canceled a trip to a park/refuge (n=389)	26	74
Visited a park/refuge less often (n=381)	27	73
Changed the timing of a visit (to a different day or season) (n=386)	54	46
Changed what I did while visiting a park/refuge (like not hiking on a very hot day, or not camping because of flooding) (n=378)	57	43

A notable portion of respondents have adjusted their park/refuge visits due to extreme weather conditions, with (57%) changing their activities (e.g., avoiding hiking in extreme heat) and (54%) altering their visit timing to avoid extreme weather. Additionally, (26%) have canceled trips altogether due to conditions like wildfire smoke or flooding, while (27%) report visiting parks less frequently because of such challenges, indicating that extreme weather is impacting visitor's park experience.

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