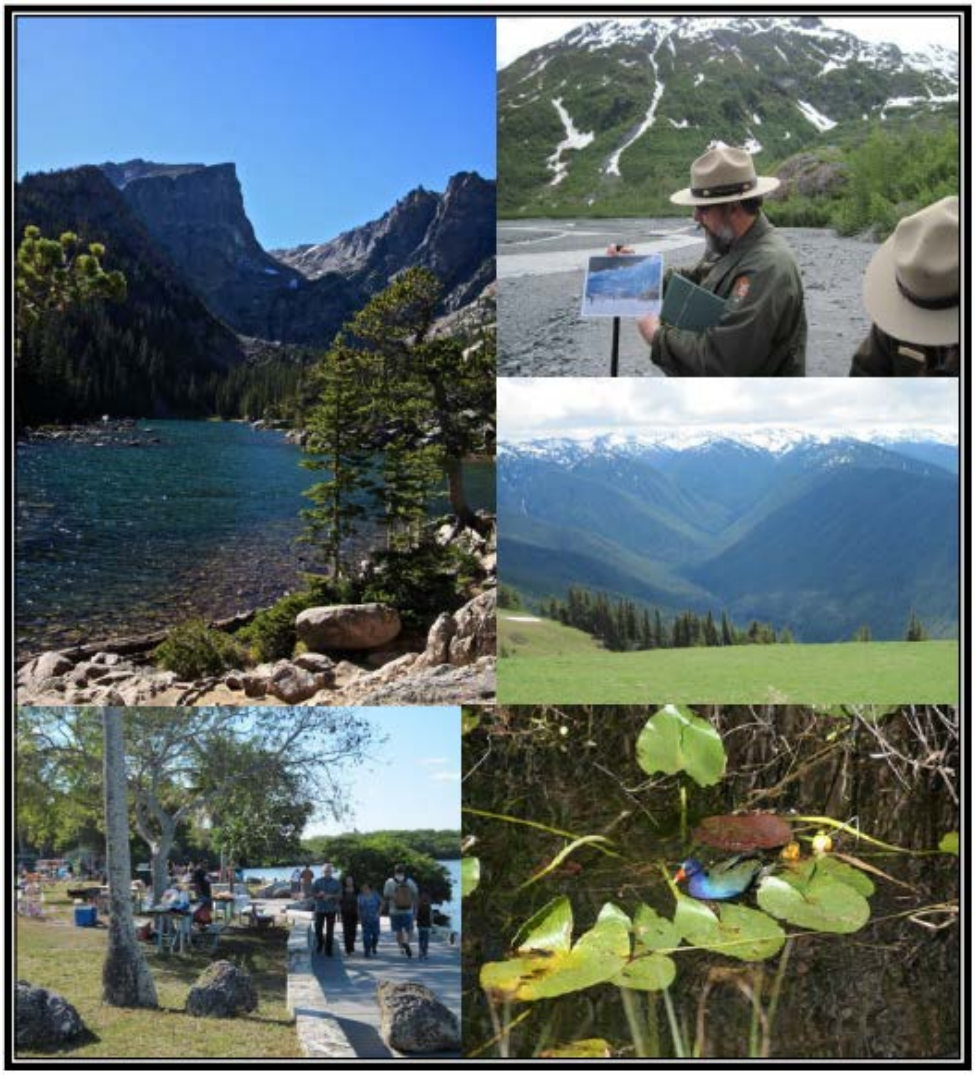
# Climate Change Education Partnership Visitor Survey Summary Report

By Shawn Davis, Stefan Karg, & Dr. Jessica Thompson



This research is funded through a grant from the National Science Foundation, award number DBI-1059654.

# Executive Summary

National parks and wildlife refuges offer a prime opportunity to improve citizen understanding of climate change science and the impacts on local landscapes through informal education. Through the lens of protected areas, visitors can witness and experience the impacts of climate change in a place they know and love, a place where they expect to have learning experiences. Despite the extensive climate change research being conducted, there are few successful examples of connecting the science to citizens. The goals of this Place-based Climate Change Education Partnership (CCEP) project were to assess visitor knowledge and opinions on climate change, willingness to take mitigating actions, perceptions of climate change impacts, and desire for climate change education. Through an improved understanding of the visitor audience, parks and refuges may be better equipped to communicate the science and impacts of climate change to their visitors.

From the months of May, 2011to January, 2012 the Place-based CCEP survey team from Colorado State University collected a total of 4,181 visitor surveys on climate change at 16 different National Parks and Wildlife Refuges across the nation. The on-site surveys were administered in an innovative fashion using iPads, rather than pencil and paper, with a response rate of 70%. The collective sample from all sites reflects the total population of visitors at a 99% confidence level with $\pm$2% margin of error. Survey results reveal a population of visitors who care deeply about these natural landscapes and differ significantly from the broader American public in regards to their knowledge and opinions on climate change, willingness to take mitigating actions, perceptions of climate change impacts, and desire for climate change education.

Most respondents stated that the National Parks and National Wildlife Refuge system is extremely or very important to themselves and their family (95%) and were equally concerned about the future of the National Parks and National Wildlife Refuges (74%). Most visitors surveyed indicated that they think climate change will harm the National Park /Wildlife Refuge they visited a great deal (42%) and that it is being harmed now (32%).

When asked about their perceptions of climate change, many visitors surveyed were sure that climate change is happening (77%). Most visitors stated that the issue is important (84%), indicating the salience of the issue. In addition, many respondents asserted that they feel responsible for contributing to climate change (54%).

The majority of survey respondents believe they can already see the effects of climate change at National Parks and Wildlife Refuges (70%) and most visitors would like to learn more about climate change at these places (67%). Many visitors indicated that they have not received any information on the subject at the park or refuge they visited (66%) but would prefer to receive this information via trailside exhibits (42%) or online (46%). According to most respondents, actions visitors can take to reduce climate change is the most important topic for parks/refuges to address (78%). Additionally, most visitors are willing (91%) to change their behaviors in the park or refuge they visited to mitigate climate change.

Based on our research, it is apparent that the visitors to National Parks and Wildlife Refuges care deeply for this protected land, see how climate change is affecting it, and want to be engaged in protecting these parks and refuges themselves. This audience wants to learn more about climate change and the actions they can take to mitigate its effects on these treasured landscapes. With proper education, visitors can become important advocates in the need to respond to climate change, both within the parks and refuges, and their communities.

**Contents**

**Figures & Tables**

## Project Introduction

The Climate Change Education Partnership (CCEP) is a National Science Foundation funded research project involving Colorado State University, the National Park Service, the U.S. Fish and Wildlife Service, and the National Parks Conservation Association. The purpose of this nationwide, collaborative effort is to scope the communication challenges, opportunities, and needs among park and refuge staff when discussing climate change impacts on America's public lands. This effort is funded as a "Phase 1 Project", and the data we have gathered regarding our regional site partners and site-specific information will inform a "Phase 2 Proposal" to be submitted in March 2012. If funded, Phase 2 of the CCEP would provide the resources to implement ideas generated through our Phase 1 research.

We have five pilot site areas across the country (northern Colorado, Puget Sound in western Washington, southern Florida, Washington D.C. and Kenai Fjords in Alaska). We have engaged each region in a similar process, beginning in late March 2011 and continuing through January of 2012. These sites were selected because agency leadership at the Washington office highlighted these parks and refuges as important places to invest resources in building capacity or enhance ongoing efforts to communicate about climate change.

Because our goal is to engage staff, managers, volunteers and partners at adjacent public lands in a "landscape-scale" approach to climate change education, a significant part of our effort to achieve this goal has been to collect quantitative and qualitative data regarding national park and wildlife refuge visitor perceptions of specific effects of climate change on America's public lands. During our visits, we conducted 4,181 surveys. This report provides a short description of our visitor survey and a summary of our results. The survey data we have collected at each park or refuge within our pilot site locations is very important as we begin to brainstorm and collaboratively develop education tools for this unique visitor population.

## Introduction of Study

### Methods

The CCEP core team developed an on-site visitor survey to assess national park and wildlife refuge visitors' awareness and knowledge of place-specific climate change impacts, as well as their level of concern and willingness to act in response to these impacts. Over a one year period, our survey team administered this visitor survey at each park and refuge within our five pilot site locations. Each of these national parks and refuges are listed in the table below.

Figure 1.
*Participating parks and refuges in the 2011 – 2012 Visitor Concerns about Climate Change Survey*

| |
|---|
| **Rocky Mountain Region** |
| Rocky Mountain Arsenal National Wildlife Refuge (CO) |
| Rocky Mountain National Park (CO) |
| **Southern Florida and the Keys** |
| Biscayne National Park (FL) |
| Everglades National Park (FL) |
| National Key Deer Refuge (FL) |
| Ten Thousand Islands National Wildlife Refuge (FL) |
| **Washington D.C. Area** |
| Harpers Ferry National Historic Park (WV) |
| National Capital Parks-East (DC) |
| Prince William Forest Park (VA) |
| **Southern Alaska** |
| Kenai Fjords National Park (AK) |
| Kenai National Wildlife Refuge (AK) |
| **Puget Sound Area** |
| Dungeness National Wildlife Refuge (WA) |
| Mount Rainier National Park (WA) |
| Nisqually National Wildlife Refuge (WA) |
| North Cascades National Park (WA) |
| Olympic National Park (WA) |

***Survey Development***. The survey used in this study was first created in paper form using basic word processing software, and was later converted into an electronic form using an online template from iSURVEY and an accompanying app for Apple iPads. The iSURVEY app allows for the electronic survey to be presented on iPads as well as other handheld electronic devices. Following the purchase of this app, the survey team was able to administer the survey on each of 10 iPads and gather an unlimited number of responses within the allowable one-month license period, which we renewed as necessary. All of the results are saved, synced and uploaded to an automatically generated data file, accessed on the iSURVEY password protected website.

***Procedure.*** Over four thousand (4,181) surveys were administered in 16 different refuges and parks from May 6, 2011 to January 8, 2012, using a convenience sampling method. The total response rate for the sample was 70%. The following script was used by the survey team for recruiting participants:

> Hello, we are students from Colorado State University conducting visitor surveys at [this Park/Refuge]. Would you like to take our survey about landscape changes at this [Park/Refuge]? The survey takes about ten minutes to complete. Your participation is completely voluntary and you can stop taking the survey at any time.

The survey team protocol for answering participants' questions during the course of the survey was to answer any question that pertained to technical operation of the iPads and to supply any needed clarification regarding questions and response options. The survey team was not to offer any opinions or facts pertaining to specific questions while the survey was in progress. When all of the iPads were in use, the survey team protocol was to administer paper versions of the same survey. Most visitors surveyed (93%) completed the electronic version of the survey on an iPad while the remaining 280 participants (7%) completed the survey on paper.

***Survey Sites.*** On-site survey administration locations were unique at each refuge and park, though the team targeted popular trailheads, visitor centers, campsites, and viewpoints. Recommendations were sought and followed from managers at each site for popular and diversified locations for surveying. Most surveys were collected during the weekends for greater visitor numbers and convenience; however, efforts were made to have both weekends and weekdays represented at each site.

***Response Rates and Confidence Level.*** The survey team collected a total of 4,181 surveys. The average response rate for this sample was 70%. The sample reflects the total population of visitors at a 99% confidence level with $\pm$2% margin of error using a 50/50 split.

## Visitor Survey Results

### Visitor Demographics

The following demographic characteristics were gathered from respondents: age, gender, education, ethnicity, political affiliation, and frequency of visits. Most visitors surveyed were in the age bracket of 56-65 (20%). The highest percentage of visitors surveyed were male (51%). Many respondents had completed a graduate or professional degree (41%). Most visitors surveyed self-identified as white or Caucasian (86%) as well as Democratic (37%, Table 1). On average, visitors surveyed have visited the parks or refuges 14 times. Many visitors indicated that this was their first visit (53%).

Table 1

*Demographic Characteristics of Participants*

| Characteristic | *n* | % |
|---|---|---|
| Age at time of survey (years) (N = 3,956) | | |
| 10 – 18 | 241 | 6 |
| 19 – 25 | 353 | 9 |
| 26 – 35 | 727 | 18 |
| 36 – 45 | 635 | 16 |
| 46 – 55 | 788 | 20 |
| 56 – 65 | 806 | 20 |
| 66 – 75 | 351 | 9 |
| 76 – 85 | 51 | 1 |
| 86 – 95 | 4 | 0 |
| Gender (N = 4,011) | | |
| Male | 2,065 | 51 |
| Female | 1,945 | 49 |

| | | |
|---|---|---|
| Highest education level completed (N = 4,003) | | |
| Less than high school | 109 | 3 |
| Some high school | 108 | 3 |
| High school graduate | 248 | 6 |
| Some college | 500 | 13 |
| Two-year college degree | 279 | 7 |
| Four-year college degree | 1,133 | 28 |
| Graduate or professional degree | 1,625 | 41 |
| Ethnicity (N = 3,830) | | |
| American Indian or Alaska Native | 45 | 1 |
| Asian | 186 | 5 |
| Black or African American | 72 | 2 |
| Hawaiian or Pacific Islander | 14 | 0 |
| Hispanic or Latino/Latina | 141 | 4 |
| White or Caucasian | 3,291 | 86 |
| Other | 80 | 2 |
| Political Affiliation (N = 3,938) | | |
| Republican | 688 | 20 |
| Democrat | 1,296 | 37 |
| Independent | 653 | 19 |
| No affiliation | 737 | 21 |
| Other | 88 | 3 |

**Visitor Opinions on Parks/Refuges**

The following eight statements are 'sense of place' variables employed to assess visitor levels of place attachment and place dependence (Table 2). The first four statements listed are scalable items for the concept of place attachment while the last four statements are for the concept of place dependence. The more visitors agree with these statements, the more attached to and dependent upon the park/refuge they are respectively.

Table 2
*How much do you agree or disagree with the following statements?*

| | Response Percentage (%) | | | | |
|---|---|---|---|---|---|
| Statements | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
| This Park/Refuge is very special to me (*n* = 4139) | 40 | 40 | 19 | 1 | 1 |
| I identify strongly with this Park/Refuge (*n* = 4120) | 28 | 37 | 31 | 3 | 1 |
| I am very attached to this Park/Refuge (*n* = 4112) | 24 | 32 | 39 | 5 | 1 |
| This Park/Refuge means a lot to me (*n* = 4095) | 29 | 38 | 30 | 3 | 1 |
| This Park/Refuge is the best place for what I like to do (*n* = 4108) | 16 | 34 | 41 | 8 | 1 |
| No other place can compare to this Park/Refuge (*n* = 4103) | 13 | 23 | 44 | 17 | 3 |
| I get more satisfaction out of visiting this Park/Refuge than any other (*n* = 4103) | 8 | 17 | 49 | 21 | 4 |
| Doing what I do in this Park/Refuge is more important to me than doing it in any other place (*n* = 3732) | 8 | 18 | 49 | 21 | 5 |

Respondents were asked to rate the importance of the National Park System, the National Wildlife Refuge System, and the park/refuge they were visiting. Many respondents thought the National Park System was extremely important (70%) and that the National Wildlife Refuge System was extremely important (68%). Most respondents stated that the park/refuge they were visiting is extremely important to themselves and their family (53%, Table 3).

Table 3

*Please rate the importance of the following to you and your family.*

| Categories | Response Percentage (%) | | | | |
|---|---|---|---|---|---|
| | Extremely important | Very important | Somewhat important | Slightly important | Not important |
| Our National Parks System (*n* = 4137) | 70 | 25 | 4 | 0 | 0 |
| Our National Wildlife Refuge System (*n* = 4094) | 68 | 26 | 6 | 1 | 0 |
| This Park/Refuge (*n* = 4073) | 53 | 33 | 12 | 2 | 0 |

Respondents were asked to rate a number of different threats to parks and refuges as a whole as well as to the park/refuge they were visiting. Most respondents thought lack of funding was the greatest threat to National Parks and Refuges (49%). Visitors perceived that the greatest threat to the park/refuge they were visiting was lack of funding (37%, Table 4).

Table 4

*What do you think is the greatest threat to the following?*

| Categories | Response Percentage (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Lack of funding | Natural disasters | Invasive species | Pollution within the area | Pollution from nearby sources | Climate change | Overuse | Other |
| Our National Parks and Refuges (*n* = 4130) | 49 | 3 | 6 | 6 | 14 | 11 | 8 | 3 |
| This Park or Refuge (*n* = 4038) | 37 | 6 | 8 | 6 | 14 | 18 | 8 | 3 |

Respondents were asked to rate their level of concern for the future of the National Park System, the National Wildlife Refuge System, and the park/refuge they were visiting. Many respondents were extremely concerned about the future of the National Park System (39%) and were also extremely concerned for the future of the National Wildlife Refuge System (38%). Most respondents were very concerned about the future of the park/refuge they were visiting (29%, Table 5).

Table 5

*How concerned are you about the future of the following?*

| | Response Percentage (%) | | | | |
|---|---|---|---|---|---|
| Categories | Extremely concerned | Very concerned | Somewhat concerned | Slightly concerned | Not concerned |
| Our National Park System (*n*= 4178) | 39 | 39 | 18 | 4 | 1 |
| Our National Wildlife Refuge System (*n*= 4170) | 38 | 36 | 21 | 3 | 1 |
| This Park/Refuge (*n*= 4170) | 29 | 33 | 32 | 5 | 2 |

**Visitor Knowledge and Opinions on Climate Change**

Respondents were asked to select a degree to which they thought climate change was or was not happening. Current scientific consensus indicates that climate change is occurring. Most visitors surveyed were extremely sure that climate change is happening (35%, Table 6).

Table 6

*Do you think climate change is happening?* (*n* = 4174)

| Categories | Response Percentage (%) |
|---|---|
| Extremely sure it is happening | 35 |
| Very sure climate change is happening | 26 |
| Somewhat sure climate change is happening | 16 |
| Not sure | 11 |
| Somewhat sure climate change is not happening | 5 |
| Very sure climate change is not happening | 3 |
| Extremely sure it is not happening | 3 |

Respondents were asked how well informed they felt about the causes, consequences, and mitigation of climate change. Many visitors felt very informed about the causes of climate change (43%) and very informed about the consequences of climate change (43%). Most visitors also felt very informed about ways in which we can mitigate climate change (39%, Table 7).

Table 7
*Personally, how well informed do you feel about the following?*

| | Response Percentage (%) | | | | |
|---|---|---|---|---|---|
| Categories | Extremely informed | Very informed | Somewhat informed | Slightly informed | Not informed |
| The different causes of climate change (*n* = 4165) | 17 | 43 | 33 | 7 | 1 |
| The different consequences of climate change (*n* = 4162) | 16 | 43 | 33 | 7 | 1 |
| Ways in which we can reduce climate change (*n* = 4162) | 15 | 38 | 36 | 9 | 2 |

Respondents were asked to indicate the causes of climate change. Current scientific consensus is that climate change is mostly caused by human activities. Most visitors surveyed indicated that climate change was caused by both human activities and natural changes in the environment (48%, Table 8).

Table 8
*Assuming climate change is happening, do you think it is…* (*n* = 4037)

| Categories | Response Percentage (%) |
|---|---|
| Caused mostly by human activities | 35 |
| Caused mostly by natural changes in the environment | 15 |
| Caused by both human activities and natural changes in the environment | 48 |
| None of the above because climate change isn't happening | 3 |
| Other | 0 |

Respondents were asked to indicate how worried they are about climate change. This item, when combined with the following two items regarding importance and prevalence of thought, may be interpreted as visitor level of concern about climate change. Most visitors surveyed indicated they were very worried about climate change (34%, Table 9).

Table 9
*How worried are you about climate change?* (*n* = 4170)

| Categories | Response Percentage (%) |
|---|---|
| Extremely worried | 22 |
| Very worried | 34 |
| Somewhat worried | 27 |
| Slightly worried | 9 |
| Not worried | 8 |

Respondents were asked to rate how important the issue of climate change is to them. Most visitors surveyed indicated that climate change was very important to them (34%, Table 10).

Table 10
*How important is the issue of climate change to you personally?* (*n* = 4169)

| Categories | Response Percentage (%) |
|---|---|
| Extremely important | 21 |
| Very important | 34 |
| Somewhat important | 29 |
| Slightly important | 9 |
| Not important | 7 |

Respondents were asked how often they think about climate change. Most visitors surveyed indicated they thought about climate change occasionally (38%, Table 11).

Table 11
*How often do you think about climate change?* (*n* = 4170)

| Categories | Response Percentage (%) |
|---|---|
| All the time | 9 |
| Frequently | 36 |
| Occasionally | 38 |
| Rarely | 12 |
| Never | 5 |

Respondents were asked to indicate how responsible they felt for climate change. The three statements in Table 12 are scalable items for the concept of responsibility for climate change. The first statement, 'Because my contribution is very small I do not feel responsible for climate change' should be reverse coded when creating a scale as it is negatively worded comparative to the other two items. Therefore, visitors who feel responsible for climate change would generally disagree with the first statement and agree with the last two statements (Table 12).

Table 12
*How much do you agree or disagree with the following statements?*

| | Response Percentage (%) | | | | |
|---|---|---|---|---|---|
| Statements | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
| Because my contribution is very small I do not feel responsible for climate change (*n*= 4000) | 6 | 15 | 24 | 42 | 14 |
| I feel somewhat responsible for the presently occurring environmental problems (*n*= 3965) | 8 | 50 | 24 | 12 | 6 |
| I feel responsible for contributing to the condition of the climate (*n*= 3845) | 10 | 44 | 27 | 12 | 8 |

Respondents were asked to indicate the extent to which they believe climate change will harm future generations, themselves, and the park/refuge they were visiting. Of particular interest is how much visitors believe climate change is harming the Park/Refuge. Most visitors surveyed indicated that they think climate change will harm the park/refuge they were visiting a great deal (42%, Table 13).

Table 13

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

| Categories | Response Percentage (%) | | | | |
|---|---|---|---|---|---|
| | A great deal | A moderate amount | Only a little | Not at all | Don't know |
| Future generations of people (*n*= 4108) | 59 | 26 | 8 | 5 | 3 |
| You personally (*n*= 4066) | 11 | 47 | 29 | 11 | 3 |
| This Park/Refuge (*n* = 4038) | 42 | 37 | 11 | 5 | 5 |

Respondents were asked when they thought climate change would start to harm both people in the U.S. and the park/refuge they were visiting. Most visitors surveyed indicated that they think the park/refuge they were visiting is being harmed now (32%, Table 14).

Table 14

*When do you think climate change will start to harm the following* (*n* = 4165)

| Categories | Response Percentage (%) | | | | | | |
|---|---|---|---|---|---|---|---|
| | They are being harmed now | In 10 years | In 25 years | Don't know | In 50 years | In 100 years | Never |
| People in the United States | 34 | 16 | 13 | 21 | 7 | 5 | 6 |
| This Park/Refuge | 32 | 17 | 10 | 27 | 5 | 4 | 5 |

**Visitor Willingness to Help Mitigate Climate Change**

Visitors were asked, "*How much money, in addition to the entrance fees you currently pay, would you be willing to pay per visit to support additional conservation efforts related to climate change at this Park/Refuge?"* (*n* = 4093). The average amount of additional fees respondents were willing to pay was $5.00 per visit (see Table 15 for an alternative data representation). Similarly, visitors were asked, "*How much time, in days per year, would you be willing to volunteer at this Park/Refuge to support additional conservation efforts related to climate change?"* (*n*= 3774). Respondents gave an average of 10 days they would be willing to volunteer. Finally, visitors were asked how willing they were to change their behaviors to help reduce the impacts of climate change. Most respondents answered very willing (38%, Table 16).

Table 15

*How much money, in addition to the entrance fees you currently pay, would you be willing to pay per visit to support additional conservation efforts related to climate change at this Park/Refuge?* (*n* = 4093)

| U.S. Dollars | Response Percentage (%) |
|---|---|
| 0 | 5 |
| 1-5 | 73 |
| 6-10 | 8 |
| 11-15 | 2 |
| 16-20 | 2 |
| > 21 | 10 |

Table 16

*How willing are you to change your behaviors in this Park/Refuge to help reduce the impacts of climate change?* (*n* = 4174)

| Categories | Response Percentage (%) |
|---|---|
| Extremely willing | 29 |
| Very willing | 38 |
| Somewhat willing | 24 |
| Slightly willing | 4 |
| Not willing | 5 |

Respondents were asked to indicate what they have done from a list of individual actions known to mitigate climate change. Visitors were allowed to select as many actions that applied to them specifically. Most visitors indicated that they reduced energy use at home (70%, Table 17).

Table 17

*Which of the following actions have you taken?* (*n* = 3805)

| Actions | Response Percentage (%) |
|---|---|
| Switching from fossil fuels to renewable energy at home | 16 |
| Planting trees | 53 |
| Insulating your home | 58 |
| Switching from a gasoline to an electric or hybrid car | 12 |
| Driving less | 54 |
| Walking, riding a bike, or using public transportation instead of driving | 56 |
| Switching from regular (incandescent) to compact fluorescent bulbs | 68 |
| Reducing the amount of beef you eat | 35 |
| Reducing airplane travel | 17 |
| Reducing energy use at home | 70 |

*Note.* Percentages do not sum to 100 as multiple selections were allowed.

**Visitor Perception of Climate Change Impacts and Education**

Respondents were asked to agree or disagree with four statements involving their desire to learn about climate change impacts and visible effects of climate change. Most respondents agree that they would like to learn more about climate change at the park/refuge they were visiting (46%). Many of the visitors surveyed agreed that the effects of climate change can already be seen at the park/refuge they were visiting (39%, Table 18).

Table 18
*How much do you agree or disagree with the following statements?*

| | Response Percentage (%) | | | | |
|---|---|---|---|---|---|
| Statements | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
| I would like to learn more about climate change impacts in our national parks/refuges (*n* = 4013) | 16 | 51 | 25 | 5 | 3 |
| I would like to learn more about climate change impacts in this Park/Refuge (*n* = 3987) | 15 | 46 | 30 | 5 | 4 |
| I believe that some of the effects of climate change can already be seen at our national parks/refuges (*n* = 3997) | 24 | 46 | 23 | 4 | 3 |
| I believe that some of the effects of climate change can already be seen at this Park/Refuge (*n* = 3964) | 18 | 39 | 35 | 5 | 3 |

Respondents were asked what specific effects of climate change they have seen in the park/refuge they were visiting. Some options will not apply to certain study areas, as the list is comprehensive of all areas included in the study.

Table 19

*What specific effects of climate change have you seen at this Park/Refuge?* (*n* = 3374)

| Effects of climate change | Response Percentages (%) |
|---|---|
| Increasing ocean temperature | 13 |
| Increasing areas affected by drought | 20 |
| Increasing air temperature | 25 |
| Thawing of permanently frozen soil | 16 |
| Loss of snow and/or ice | 33 |
| Increasing number of flooding events | 20 |
| Rising sea level | 12 |
| Coral bleaching on reefs | 9 |
| Change in plant and animal populations | 32 |
| More intense storms | 18 |
| None of the above | 23 |
| Other | 3 |

*Note.* Percentages do not sum to 100 as multiple selections were allowed

Respondents were asked to indicate any efforts to reduce impacts of climate change they have seen employed by the park/refuge they were visiting. The effort most visitors surveyed recalled seeing was recycling (68%, Table 20).

Table 20

*What specific efforts to reduce impacts of climate change have you seen employed at this Park/Refuge?*

| Efforts to reduce impacts | Response Percentage (%) |
|---|---|
| Use of hybrid or electric vehicles (*n* = 3590) | 15 |
| Energy efficient or LEED certified buildings (*n* = 3591) | 18 |
| Use of alternative renewable energy (ex: wind turbines, solar panels) (*n* = 3591) | 19 |
| Recycling (*n* = 3590) | 68 |
| None of the above (*n* = 3552) | 24 |
| Other (*n* = 3591) | 3 |

*Note.* Percentages do not sum to 100 as multiple selections were allowed.

Respondents were asked to indicate how they have received information on climate change at the park/refuge they were visiting as well as how they would like to receive information on climate change in the future. Most visitors surveyed indicated that they have not received any information on climate change (66%). Many visitors indicated they would like to learn about climate change in the park/refuge they were visiting via the Park website (46% each, Table 21).

Table 21

*How have you received information on climate change at this Park/Refuge and how would you like to receive information on climate change in the future?*

| | Response Percentages (%) | |
|---|---|---|
| Ways of receiving information | How have you received information about climate change at this Park/Refuge? (*n* = 3650) | In the future, how would you like to learn about climate change impacts and solutions at this Park/Refuge? (*n* = 3815) |
| Have not received any information on climate change from this Park/Refuge. | 66 | - |
| I do not want to learn about climate change impacts and solutions at this Park/Refuge | - | 13 |
| Indoor exhibits | 14 | 38 |
| Roadside exhibits | 7 | 26 |
| Trailside exhibits | 10 | 42 |
| Films, movies, videos | 9 | 31 |
| Living history/costumed interpretive programs | 3 | 14 |
| Park website | 9 | 46 |
| Printed materials (brochures, books, maps, etc.) | 12 | 32 |
| Electronic media/devices available to visitors | 3 | 23 |
| As a volunteer in the park | 2 | 11 |
| Children's activities | 2 | 15 |
| Ranger guided walks/talks | 6 | 26 |
| Self-guided tours | 6 | 21 |
| Other | 3 | 1 |

*Note.* Response percentages do not sum to 100 as multiple selections were allowed.

Respondents were asked to comment on their satisfaction with the quality and quantity of climate change education in the park/refuge they were visiting. Most visitors surveyed indicated that the quality of climate change education in the park/refuge they were visiting was average (48%). Most visitors indicated that the quantity of climate change education was also average (48%, Table 22).

Table 22
*Please rate your satisfaction with the current climate change education at this Park/Refuge.*

| | Response Percentages (%) | | | | |
|---|---|---|---|---|---|
| Categories | Very good | Good | Average | Poor | Very poor |
| Quality of education (*n* = 3503) | 9 | 27 | 48 | 13 | 3 |
| Quantity of education (*n* = 3403) | 8 | 26 | 48 | 15 | 4 |

Respondents were asked to specify how important they believe each of several climate change-related topics is for parks and refuges to address. Most visitors surveyed indicated that actions visitors can take is the most important topic for parks/refuges to address (78% said it is either very or extremely important, Table 23).

Table 23
*How important are the following topics for our parks/refuges to address?*

| | Response Percentages (%) | | | | |
|---|---|---|---|---|---|
| Topics | Extremely important | Very important | Somewhat important | Slightly important | Not important |
| Climate science and atmospheric processes (*n* = 3177) | 28 | 42 | 22 | 5 | 4 |
| Ways parks/refuges are reducing emissions (*n* = 3129) | 24 | 41 | 25 | 7 | 4 |
| Sources of greenhouse gas emissions (*n* = 3113) | 24 | 40 | 25 | 7 | 5 |
| Relevance for surrounding communities (*n* = 3128) | 30 | 41 | 21 | 5 | 3 |
| Impact(s) on places managed by parks/refuges (*n* = 3098) | 28 | 44 | 21 | 5 | 3 |
| Ways parks/refuges are adapting to climate change (*n* = 3109) | 27 | 45 | 20 | 5 | 3 |
| Actions visitors can take (*n* = 3137) | 40 | 38 | 15 | 4 | 3 |

Respondents were asked to agree or disagree with statements regarding how the survey was employed. The three statements listed scale into the concept of survey preference. Higher percentages in agree categories reflect a greater visitor preference for using an iPad to take surveys rather than paper (Table 24). Most visitors surveyed strongly agreed that they enjoyed taking the survey on an iPad (40%) and most also strongly agreed they would rather take surveys on an iPad than on paper (49%). Visitors also strongly agreed that they would enjoy taking future surveys on an iPad (47%).

Table 24

*How much do you agree or disagree with the following statements?*

| | Response Percentages (%) | | | | |
|---|---|---|---|---|---|
| Statements | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
| I enjoyed taking this survey on an iPad (*n*= 3790) | 40 | 38 | 18 | 3 | 1 |
| I would rather take surveys on an iPad than paper (*n*= 3699) | 49 | 28 | 13 | 6 | 4 |
| I would enjoy taking future surveys on an iPad (*n*= 3693) | 47 | 32 | 17 | 3 | 1 |

**Acknowledgements**

Shawn Davis, Department of Human Dimensions of Natural Resources, Colorado State University

Caroline Beard, Department of Human Dimensions of Natural Resources, Colorado State University

Nicole Tilley, Department of Environmental Communication, Colorado State University

Brent Ryndak, Department of Environmental Communication, Colorado State University

Stefan Karg, Department of Environmental Communication, Colorado State University

Dr. Jessica Thompson, Department of Human Dimensions of Natural Resources, Colorado State University

This project is funded through a grant from the National Science Foundation, Climate Change Education Partnership, award number DBI 1059654. The authors would also like to thank the members of the CCEP core research team, and Priscilla Williams and Aaron Edwards for their assistance and support in conducting this research.

Correspondence concerning this article should be addressed to Shawn Davis, Department of Human Dimensions of Natural Resources, Fort Collins, CO 80523.

Email: capt.shawndavis@gmail.com