

Wyoming Survey on Climate, Water, and People



Introduction

The purpose of the Wyoming Survey on Climate, Water, and People was to understand Wyoming residents' perceptions on changing water resources and weather variability in Wyoming. Topics included perceptions of risk and vulnerability, experience with natural hazards, attitudes about adapting to a changing environment, perceptions of other people's opinions, trusted information sources for news about water and weather, and support for policy options, community plans, and the use of modeling to adapt to changes.

The survey was designed by a group of researchers from different fields at the University of Wyoming, such as environment and natural resources, geography, economics, and communication.

The Wyoming Survey and Analysis Center ([WYSAC](#)) recruited 500 Wyoming residents in June and July 2024 to take the survey. Men and women from all age groups and all counties in Wyoming are proportionally represented in the survey data. The final survey data has been weighted to reflect the actual population distribution in Wyoming on sex, age, county of residence, and education. The margin of error for the survey is plus or minus 4.38 percentage points, with 95% confidence that the true population responses fall within that margin.

This report was prepared for the Center for Rural Resilience and Innovation and [WyACT](#) (Wyoming Anticipating the Climate-Water Transition), which is an interdisciplinary five-year National Science Foundation-funded project led by the University of Wyoming. WyACT partners with Wyoming communities, practitioners, and decision-makers to understand, anticipate, and prepare for significant changes in climate and water and the impacts of those changes on interconnected human and natural systems.

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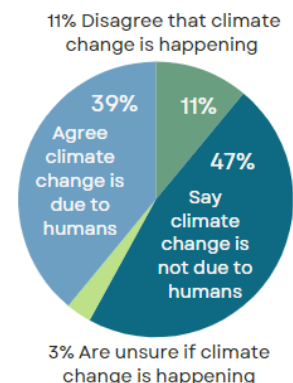
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Executive Summary

The Executive Summary highlights key findings from all major sections of the survey. Below the Executive Summary is the full survey report, with detailed tables and explanations of question wording.

1. Climate Change Beliefs, Risk Perceptions of Water Changes, and Approaches to Water

Respondents overwhelmingly believed that climate change is happening (86%), but they were split on the causes of climate change, with 46.8% of respondents saying that natural fluctuations in Earth's temperatures are the cause and 39.2% of respondents saying that humans are largely the cause. Only 11% of respondents disagree that climate change is happening and 3% of respondents are unsure.



Risk perception of changing water resources in Wyoming was high, with more than 80% of respondents reporting Wyoming is susceptible and 68.4% reporting their own local community is susceptible to changing water resources. Moreover, two-thirds of respondents (66.5%) believe there are dire consequences. However, under half of respondents

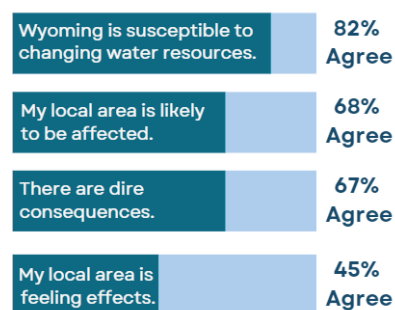


Figure 2. Wyoming residents overwhelming believe that climate change is happening, but they diverged on the causes.

(44.9%) reported their local area is currently feeling the effects of changing water resources, which shows many respondents do not see the problem of changing water resources as a “now problem” and instead see it as a future problem.

Figure 1. Wyoming residents believe Wyoming is at risk to changing water resources, but fewer residents think their local area is feeling effects.

Approaching water as a socio-ecological system (85.1%) and an economic asset (84.5%) were the most common approaches to water among a list of seven choices. The least common approaches were a dominion approach (i.e., God gives humanity the right to control water) at 28.0% and trust in God approach at 25.7%.

2. Knowledge and Experiences of Changing Water and Weather in Wyoming

Comparing current Wyoming weather and water to past trends and future scenarios revealed substantial uncertainty among respondents. Respondents were asked to reflect on three aspects of Wyoming's water and weather: (1) warm weather, (2) water availability, and (3) unpredictable and irregular weather. They were asked to compare today to the past 50 years, and they were asked to look ahead to the next 50 years. While a slight majority of respondents were sure

that Wyoming's weather patterns have gotten warmer compared to the past (53.2%), many respondents reported "I don't know" when asked if Wyoming's weather patterns will continue to get warmer (39.7%) and more unpredictable and irregular (41.0%).

Experience with water-related natural hazards is high among respondents.

Six out of ten respondents have experienced drought and heat waves. Almost half of respondents have experienced wildfire. Just over a third of respondents have experienced flooding. 22.5% of respondents have experienced all four hazards (drought, heat waves, flooding, and wildfire).

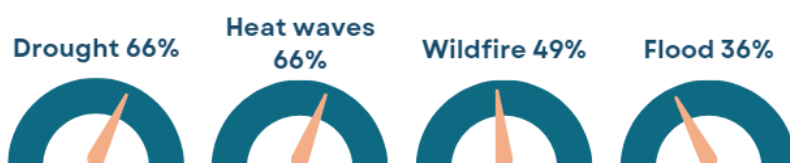


Figure 3. Most Wyoming residents have experienced drought and heat waves hotter than 90 degrees in the past 10 years.

3. Policy and Action on Water Changes in Wyoming

Most respondents want nearly all governmental and non-governmental groups to do more to address changing water resources in Wyoming.

The highest-ranking groups that respondents think should do more to address water changes were large corporations, energy, and mineral industries in Wyoming (75.9%), local and state government officials (74.4% and 72.4%, respectively), the Wyoming governor (66.9%), and regional water management boards (66.6%).

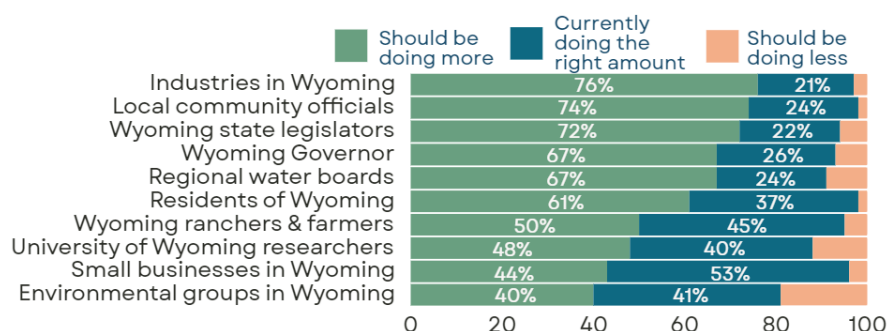


Figure 4. When asked who should be doing more to act on water changes, respondents reported desire for more action among most groups.

Respondents support a diverse set of policy options, believe policies are needed, and think costs would be expensive but worth the investment. Nine of the 15 policies had support greater than 50% of respondents. The policies with the most support were a public information campaign about water conservation (74.4%) and a state program to more efficiently use greywater (73.5%). The other seven policies that had greater than 50% of support dealt with wildlife management policies, K-12 education efforts, and increased funding for Wyoming water rights holders, communities, and researchers.

Policies that did not receive much support were mandated water reductions of Wyoming water rights holders (30.6%), as well as increasing the cost of water to individuals and businesses (19.4%) and funding to water-dependent businesses when they are struggling due to water changes (24.4%).

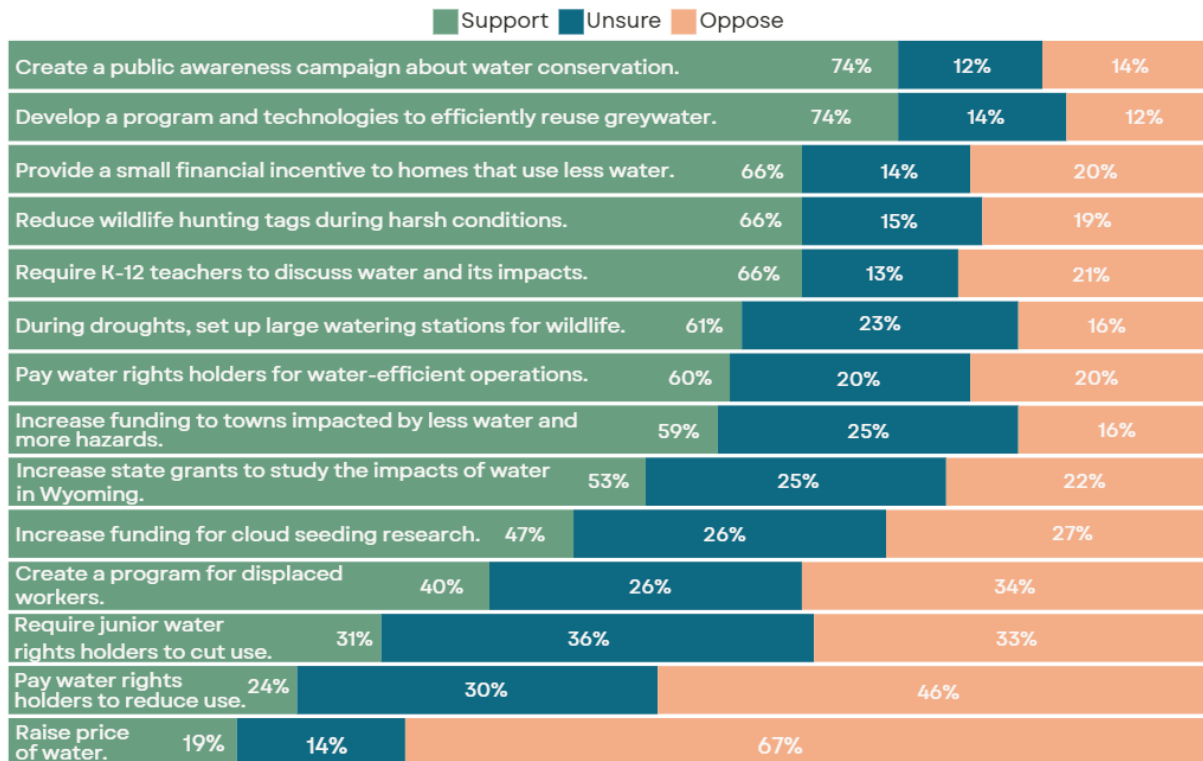


Figure 5. Support levels of different policies addressing Wyoming's changing water resources.

Additionally, respondents were largely aware that policies are needed to address water changes in Wyoming and expressed low levels of policy attitudes that would hinder long-term progress. Finally, half of respondents thought policy costs would be “very” to “extremely” expensive (51.8%) to implement; note that these are *perceptions* of policy costs, not actual policy costs. Even still, 41.9% of respondents thought the costs would be “very much” or “extremely” worth it, with another 31.0% saying the costs would be “moderately” worth it.

4. Adaptation to Water Changes

Optimism outperformed pessimism when respondents were asked about Wyoming’s ability to overcome future challenges due to changing water resources. Additionally, out of eight emotional responses to water changes in Wyoming, **the emotions of ‘worried’ and ‘calm’ yielded the strongest average responses.**

Financial resources, physical resources, and governance/legal resources are the top three resource concerns of respondents among a list of seven resources. Among the lowest resource concerns are emotional and wellbeing support resources and community resources.

Three-quarters of respondents thought it was wise and necessary to adapt to water changes and merely 11% or less of respondents thought it was foolish and unnecessary. Additionally, results show that **respondents largely think their communities should plan for water changes (81.0%)**

because they think water changes are happening (74.9%). **Yet, their perceptions of others' beliefs in water changes are quite different**, with only 37.7% of respondents saying their community believes that water changes are happening and just under half of respondents reporting that people who are important to them believe Wyoming communities should plan for changing water resources. Thus, **there is a misperception of public opinion**.

About 43% of respondents expressed confidence in their ability to work

together with their community to plan and adapt to water changes. **However, people felt much less confident their community had the knowledge and motivation** to plan and adapt. Respondents generally lacked confidence or felt unsure if they could rely on their community to plan and adapt to water changes.

Likewise, respondents were asked many questions about **“community response plans”** (i.e., a generic term with no explanation or details of these plans) to address changing water resources. **Two-thirds of respondents would encourage others to participate** in creating community response plans, and **two-thirds of respondents believe that community response plans can reduce the risks that water changes pose**. Yet, lower numbers of respondents (40%) think the community response plans will be effective. **About half of respondents want to learn more** about how to participate in community response plans. **However, there is generally low self-efficacy** among respondents, such that they do not feel qualified, knowledgeable, or available to participate in creating a community response plan.

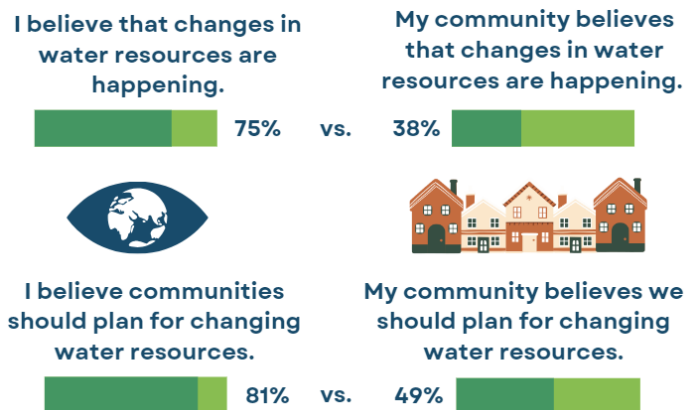


Figure 6. There is more support for creating community response plans than Wyoming residents think.

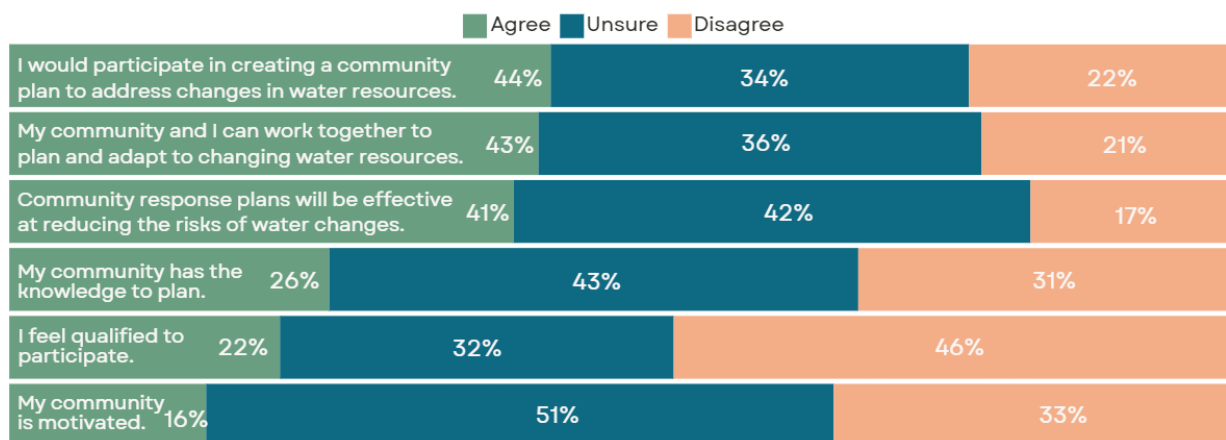


Figure 7. Wyoming residents' responses about community response plans.

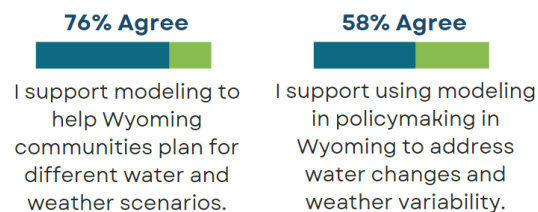


Figure 8. Wyoming residents support modeling for water and weather to help communities adapt.

After reading a short description about scientific modeling for complex water and weather systems, respondents answered questions about their opinions about modeling. **Respondents overwhelmingly think that scientific modeling (of water and weather) can help Wyoming communities adapt** to different water and weather scenarios (78.3%). Nearly two-thirds of respondents want to learn more about modeling from Wyoming

researchers, and **a majority of Wyoming residents support using modeling in policymaking** in Wyoming to address water changes and weather variability. Overall, the results paint a supportive picture of Wyoming residents in terms of using modeling to help plan for adaptation to water and weather changes in Wyoming.

5. Trusted Information Sources and Communication Habits

University of Wyoming scientists and researchers were the most trusted group “to tell

you the truth about changing water resources in Wyoming,” with about 60% of respondents trusting them.

Just more than half of respondents trusted

Wyoming ranchers and farmers and close

interpersonal relationships (family, friends, neighbors). Among the least trusted groups were faith leaders (15.5%), national journalists (11.1%), and large corporations, energy, and mineral industries in Wyoming (6.7%).

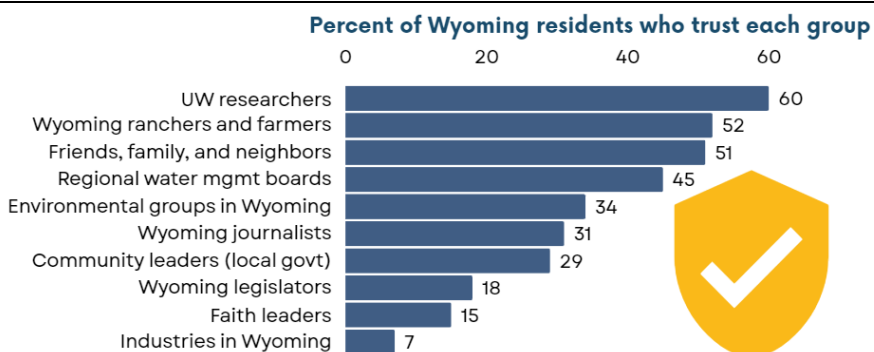


Figure 9. Percent of Wyoming residents who trust each group “to tell them the truth about changing water resources in Wyoming.”

Weather/water apps on phones, interpersonal sources, and Wyoming news media were the top information sources of water and weather information. The most popular Wyoming news media sources were Cowboy State Daily and Wyoming Public Radio.

Talking about Wyoming’s weather and hearing about climate change in the news were the most common communication habits, followed by (3) hearing about water in the news and (4) talking about water-related issues. More than half of respondents (52.1%) talk about climate change “sometimes” or “often,” making it the fifth most common behavior. The least common behaviors were sharing information about climate and water issues.

Survey Methodology

The Wyoming Survey and Analysis Center (WYSAC) recruited 500 respondents from its WyoSpeaks panel for the online survey. The panel was created via probabilistic sampling that comprised a random selection of panel members from a universal frame (as opposed to web opt-in panels, monetary incentive panels, mall intercepts, surveys on a webpage, etc.). As a result of this probability sampling, all Wyoming residents have an equal selection for the panel, and the resulting panel composition is close to the population distribution on basic demographics of county, sex, and age.

In order to reduce the impact of response bias on the data, the data was weighted according to county, sex, age, and education. Note that response bias occurs when the characteristics of who actually completes the survey differs from the population characteristics; for example, people who are older, more educated, more civically engaged, and/or more liberal tend to complete more surveys. In summary, because of the probability selection nature of the panel, as well as the weighting, we can be confident that the panel is representative of the Wyoming population.

The margin of error for the survey is plus or minus 4.38 percentage points, with 95% confidence that the true population responses fall within that margin.

Demographics

All 23 Wyoming counties are represented in the survey, and three-quarters of the respondents have lived in Wyoming for more than 20 years ($n = 383$, 77.2%). The average of the respondents was 55 years old (standard deviation or SD = 16.41 years). The split between men and women was even at 49.5% ($n = 244$) each, and there were 12 respondents who did not respond. Respondents could select multiple socially defined racial categories that they identified with, and the vast majority of respondents identified as white ($n = 471$, 94.2%) and only 24 respondents (4.8%) identified as another racial group.

Nearly two-thirds of respondents have earned a four-year college degree ($n = 316$, 63.6%), while just over a third did not ($n = 181$, 36.4%). Few respondents were low-income earners (i.e., earned less than \$50,000) at 18.3% ($n = 87$). Most respondents were middle income earners (earned between \$50,000 and \$100,000 $n = 194$, 40.8%) or high-income earners (earned more than \$100,000, $n = 195$, 41%).

Just more than half of respondents identified with a Christian religion ($n = 252$, 52.3%) and just less than half did not identify with any religion ($n = 227$, 47.1%). In terms of political identification, there were more conservatives ($n = 205$, 42.2%) compared to moderates ($n = 175$, 36%) and liberals ($n = 106$, 21.8%).

Note that the demographics reported above are unweighted. Below is a table that shows the unweighted percent and weighted percent of the survey's demographics, and, for comparison, it also shows the Wyoming Census percent demographics.

	Unweighted %	Weighted %	Census Estimate %
Age			
18-24	2.4	8.9	12.0
25-34	10.2	15.0	16.2
35-44	18.4	17.7	17.2
45-54	13.2	14.7	14.4
55-64	21.0	17.2	16.2
65-74	21.6	16.4	14.9
75+	13.2	10.0	9.1
Sex			
Men	50.2	52.1	51.2
Women	49.8	47.9	48.8
Education			
< HS, HS Grad	6.6	27.2	34.2
Some College, AA	30.0	39.5	36.8
Bachelors Degree	33.6	20.9	18.2
Graduate Degree	29.8	12.5	10.8
County			
Albany	10.4	6.0	7.1
Big Horn	2.6	2.3	2.0
Campbell	4.2	6.5	7.7
Carbon	3.8	2.8	2.5
Converse	2.0	2.5	2.3
Crook	1.0	1.4	1.2
Fremont	5.4	6.8	6.6
Goshen	2.4	2.5	2.2
Hot Springs	0.8	0.9	0.8
Johnson	2.2	1.8	1.5
Laramie	17.6	18.0	17.3
Lincoln	3.2	3.6	3.4
Natrona	10.8	12.2	13.5
Niobrara	0.8	0.5	0.4
Park	6.8	5.9	5.4
Platte	1.4	1.7	1.5
Sheridan	6.2	6.2	5.6
Sublette	2.6	1.8	1.5
Sweetwater	5.6	6.6	6.9
Teton	3.4	3.8	4.3
Uinta	2.2	3.1	3.4
Washakie	2.4	1.6	1.4
Weston	2.2	1.4	1.2

Complete Survey Results

Section 1. Climate Change Beliefs, Risk Perceptions of Water Changes, and Approaches to Water

1.1 Climate Change Belief

Respondents were asked to select one climate change statement that best described their opinion about climate change. Respondents overwhelmingly believed that climate change is happening (86.0%), but they were generally split on the causes of climate change, with 46.8% of respondents saying that natural fluctuations in Earth's temperatures are the cause and 39.2% of respondents saying that humans are largely the cause.

Climate Change Belief	Percent of Respondents
I don't think climate change is happening.	10.7
I have no idea whether climate change is happening.	3.3
I think climate change is happening, but it is caused by natural fluctuations in Earth's temperatures that are not caused by humans.	46.8
I think climate change is happening, and I think it is largely caused by humans.	39.2

1.2 Global Warming's Six Americas

Respondents were asked to respond to four questions that measure their beliefs about global warming. These questions are from Yale Program on Climate Change Communication's ["Six America's Quiz."](#)

Statement	Not at all (1)	Not too (2)	Somewhat (3)	Very (4)	Extremely (5)	Mean SD
How important is the issue of global warming to you personally?	23.8%	17.9%	24.7%	14.5%	19.1%	2.87 1.42

Statement	Not at all (1)	Not very (2)	Somewhat (3)	Very (4)	Mean SD
How worried are you about global warming?	31.2%	20.2%	26.9%	21.7%	2.39 1.14

Statement	Not at all (1)	Only a little (2)	A moderate amount (3)	A great deal (4)	Mean SD
How much do you think global warming will harm you personally?	33.3%	23.9%	28.3%	14.6%	2.24 1.07
How much do you think global warming will harm	23.8%	15.5%	18.1%	42.6%	2.80 1.22

future generations of people?					
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Respondent Segmentation of Global Warming's Six Americas

The four questions above are then used to categorize respondents into six groups that describe their climate change beliefs. These six groups are called the “Global Warming’s Six Americas” by the Yale Program on Climate Change Communication. Results show that Wyoming residents are most often Alarmed (30.7%), followed by Dismissive (23.9%), Cautious (20.2%), Concerned (16.1%), and Doubtful (9.2%).

Alarmed	Concerned	Cautious	Disengaged	Doubtful	Dismissive
30.7%	16.1%	20.2%	0%	9.2%	23.9%

The following paragraph is from [Global Warming's Six Americas - Yale Program on Climate Change Communication](#). “The Alarmed are convinced global warming is happening, human-caused, an urgent threat, and they strongly support climate policies. Most, however, do not know what they or others can do to solve the problem. The Concerned think human-caused global warming is happening, is a serious threat, and support climate policies. However, they tend to believe that climate impacts are still distant in time and space, thus climate change remains a lower priority issue. The Cautious haven’t not yet made up their minds: Is global warming happening? Is it human-caused? Is it serious? The Disengaged know little about global warming. They rarely or never hear about it in the media. The Doubtful do not think global warming is happening or they believe it is just a natural cycle. They do not think much about the issue or consider it a serious risk. The Dismissive believe global warming is not happening, human-caused, or a threat, and most endorse conspiracy theories (e.g., “global warming is a hoax”). Want to know which of the Six Americas you are in? Take the short Six Americas Quiz on the Yale Program on Climate Change Communication website at <http://climatecommunication.yale.edu/visualizations-data/sassy/>”

The question scoring is based on a statistical model by Chryst et al. (2018). The Six Americas are described in detail in Maibach et al. (2011).

1.3 Risk Perception

Respondents were asked eight questions about their risk perceptions of changing water resources in Wyoming. Four questions were geared toward respondents’ perceptions of risk susceptibility (or likelihood of the risk occurring), and four questions were geared toward respondents’ perceptions of risk severity (or magnitude of the risk occurring). Overall, a large majority of respondents believed that Wyoming as a whole (82.2%) and their local area in Wyoming (68.4%) is susceptible to and likely to be affected by changing water resources. Turning to severity perceptions, two-thirds (66.5%) of respondents thought there were dire consequences of changing water resources in Wyoming. However, only 44.9% of respondents thought their local area in Wyoming is feeling the effects of changing water resources. This shows a time disconnect, whereas respondents may see changing water resources as a future problem rather than a “now problem.”

Risk Perception	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
Wyoming is susceptible to changing water resources.	82.2	11.9	5.9	2.76 0.55
My local area in Wyoming is likely to be affected by changing water resources.	68.4	20.5	11.2	2.57 0.68
There are dire consequences of changing water resources in Wyoming.	66.5	20.9	12.6	2.54 0.71
Water changes are likely to have a big impact on people like me	63.8	23.5	12.7	2.51 0.71
The risk of water changes in Wyoming is high.	60.6	24.9	14.5	2.46 0.73
The threat of changing water resources in Wyoming is severe.	60.2	22.3	17.5	2.43 0.77
My local area in Wyoming is feeling the effects of changing water resources.	44.9	31.0	24.1	2.21 0.80
Researchers are certain that water changes will have harmful impacts for Wyoming in the future.	42.0	46.5	11.6	2.30 0.67

1.4 Approaches to Water

Respondents were asked seven questions that inquired about their approach to thinking about water. Approaching water as a socio-ecological system was the most popular response (85.1%), followed closely by an economic approach (84.5%) and wellness/leisure approach (68.3%). The least common approaches to water were a dominion approach (28.0%) and trust in God approach (25.7%).

Approach to Water	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
Human-water ecosystem: I have a responsibility to care for water/nature because I'm a part of the human-environment system and my actions impact the system.	85.1	11.0	3.9	2.81 0.48
Economic: Water is an economic asset.	84.5	8.1	7.4	2.77 0.57
Pleasure: Water is a resource for leisure activities, and I care about it because it contributes to my wellness and pleasure.	68.3	18.2	13.6	2.55 0.72
Spiritual: Water has spiritual value outside of religious institutions.	39.3	35.4	25.3	2.14 0.79
Private property: Water is a private property right.	31.3	32.1	36.6	1.95 0.82
Dominion: God gives humanity the right to control water.	28.0	37.0	35.0	1.93 0.79

God in control: I am not worried about future water conditions because I trust that God has a plan.	25.7	27.0	47.3	1.78 0.83
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Section 2. Knowledge and Experiences of Changing Water and Weather in Wyoming

2.1 Knowledge About Water and Weather Variability

Respondents were asked to reflect on three aspects of Wyoming's water and weather: (1) warm weather, (2) water availability, and (3) unpredictable and irregular weather. They were asked to compare today to the past 50 years, and they were asked to look ahead to the next 50 years. These were true or false questions, but respondents could report "I don't know". Results showed that just over half of respondents reported Wyoming's weather has gotten warmer compared to the past, and 41.8% of respondents reported Wyoming's weather will get warmer in the future. In terms of water availability, 47.4% of respondents reported Wyoming's water resources have declined compared to the past and half of respondents (50.2%) reported they expect Wyoming's future water resources will decline. Finally, for unpredictable weather, 47.3% of respondents reported more unpredictable Wyoming weather in the past 50 years and 40.2% expect more unpredictable weather in the future. It is important to note that large percentages of respondents reported "I don't know" to many of these questions (i.e., IDK ranged from 20.7% to 41.0%, with larger IDK responses in the future-focused questions).

Statement	Percent of Respondents	
Past-Comparison Warmer: In general, Wyoming's weather patterns have gotten warmer compared to the past.	True:	53.2
	False:	26.1
	I don't know:	20.7
Future Warmer: Looking ahead to the next 50 years, Wyoming's weather patterns will get warmer.	True:	41.8
	False:	18.5
	I don't know:	39.7
Past-Comparison Less Water: Compared to the past, Wyoming's water resources have declined.	True:	47.4
	False:	19.1
	I don't know:	33.5
Future Less Water: In the future, Wyoming's water resources will decline.	True:	50.2
	False:	11.5
	I don't know:	38.3
Past-Comparison Unpredictable Weather: During the last 50 years, the weather in Wyoming has become more unpredictable and irregular.	True:	47.3
	False:	28.9
	I don't know:	23.8
Future Unpredictable Weather: Over time, the weather in Wyoming will become more unpredictable and irregular.	True:	40.2
	False:	18.8
	I don't know:	41.0

2.2 Experience with Water-Related Natural Hazards

Respondents were asked about their experience with drought, heat waves warmer than 90 degrees Fahrenheit, wildfire, and flood in the past 10 years. Six out of ten respondents have experienced drought and heat waves. Almost half of respondents have experienced wildfire. Just over a third of respondents have experienced flooding. 22.5% of respondents have experienced all four hazards.

Water-Related Natural Hazard	Percent of Respondents
Drought	66.4
Heat Waves > 90°F	66.3
Wildfire	49.3
Flood	35.6

Section 3. Policy and Action on Water Changes in Wyoming

3.1 Responsibility and Action

Respondents were asked about who should be doing more or doing less when it comes to water changes in Wyoming. Respondents rated various levels of government, private industry, and environmental groups. Overall, a majority of respondents think most groups should be doing more. The highest-ranking groups that respondents want more action from were large corporations, energy, and mineral industries in Wyoming (75.9%), local and state government officials (74.4% and 72.4%, respectively), Wyoming Gov. Mark Gordon (66.9%), and regional water management boards (66.6%). In terms of what groups are doing the right amount, 52.9% of respondents thought small businesses were doing the right amount, followed by Wyoming ranchers and farmers (45.3%), conservation and environmental organizations in Wyoming (40.8%), and University of Wyoming researchers (39.7%).

Responsible Party	Should be doing more (3)	Currently doing the right amount (2)	Should be doing less (1)
Large corporations, energy, and mineral industries in Wyoming	75.9%	21.0%	3.1%
Local town and county community officials	74.4%	23.5%	2.1%
Wyoming state legislators	72.4%	21.5%	6.1%
Wyoming governor (Mark Gordon)	66.9%	25.6%	7.5%
Regional water management boards (e.g., Upper Colorado River Commission, Colorado River Working Group, Bureau of Reclamation)	66.6%	24.0%	9.3%
Residents of Wyoming	60.6%	37.2%	2.2%
U.S. Congress	60.5%	14.5%	25.0%
U.S. President (Joe Biden)	55.9%	17.1%	27.0%
Wyoming ranchers and farmers	49.9%	45.3%	4.8%

University of Wyoming researchers	48.2%	39.7%	12.1%
Small businesses in Wyoming	43.6%	52.9%	3.5%
Conservation and environmental organizations in Wyoming	39.9%	40.8%	19.4%

3.2 Policy Options

Respondents were presented with 15 different policy options to address changing water resources in Wyoming and were asked to rate their agreement with each policy. Nine of the 15 policies had support greater than 50% of respondents. The policies with the most support were a public information campaign about water conservation (74.4%) and a state program to more efficiently use greywater (73.5%). The other seven policies that had greater than 50% of support dealt with wildlife management policies, K-12 education efforts, and increased funding for Wyoming water rights holders, communities, and researchers. Policies that did not receive much support were mandated water reductions of Wyoming water rights holders (30.6%), as well as increasing the cost of water to individuals and businesses (19.4%) and funding to water-dependent businesses when they are struggling due to water changes (24.4%).

Policy	Support % (3)	Unsure % (2)	Oppose % (1)	Mean SD
1. Create a public information campaign aimed at informing Wyoming residents about ways we can reduce and conserve water in our homes and land	74.4	12.1	13.5	2.61 0.71
2. Develop a state program and technologies to more efficiently use the relatively clean water that was previously used in households' showers, sinks, washing machines, and other kitchen appliances	73.5	14.4	12.1	2.61 0.69
3. Reduce the number of wildlife hunting tags to avoid hunting wildlife that have reduced numbers due to harsh weather conditions (like prolonged drought or harsh winter storms)	66.1	15.0	18.9	2.47 0.79
4. Provide a small financial incentive to households that use less water than a specific target	66.1	14.0	20.0	2.46 0.80
5. Require K-12 teachers to teach units on water in Wyoming and how water impacts their communities	65.5	13.2	21.3	2.44 0.82
6. During droughts and water shortages, set up large watering stations for wildlife (similar to the elk feeding stations)	61.0	23.3	15.7	2.45 0.75

7. Pay Wyoming water rights holders to invest in more water-efficient operations	59.2	20.4	20.4	2.39 0.80
8. Increase funding to Wyoming communities who are disproportionately impacted by decreased water and increased hazards	58.7	25.0	16.3	2.42 0.75
9. Increase the amount of state grants available to Wyoming researchers who study the impacts of water of Wyoming communities, businesses, and people	52.8	25.2	22.0	2.31 0.81
10. Increase funding for more scientific research into cloud seeding programs at University of Wyoming, which may enhance snowfall under the right conditions	47.2	25.8	27.0	2.20 0.84
11. Pay Wyoming water rights holders to voluntarily reduce water usage to lessen drought conditions	40.0	26.3	33.8	2.06 0.86
12. Develop a state program for Wyoming workers, who were laid off due to water-related causes (e.g., a prolonged drought that forces a fishing guide company to close), to find employment elsewhere or get training for another career	39.9	25.8	34.3	2.06 0.86
13. Require more junior water rights holders to reduce water usage	30.6	36.4	33.0	1.98 0.80
14. Provide funding to tourism and recreation businesses in Wyoming when they are financially struggling due to changing water resources	24.4	29.6	46.0	1.78 0.81
15. To encourage water conservation, increase the price of water to individual customers and businesses in Wyoming	19.4	14.0	66.5	1.53 0.80

Maladaptive Policy Reactions

Maladaptive policy reactions refer to policy views that hinder progress and can lead to negative outcomes over time. Respondents were asked to rate their agreement to four statements that represented maladaptive policy reactions to water changes in Wyoming. On average, less than 15% of respondents expressed maladaptive policy reactions and about 27% to 30% of respondents were unsure about maladaptive policy beliefs. Thus, respondents were largely aware that policies are needed to address water changes in Wyoming.

Maladaptive Policy Reactions	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
The science surrounding changing water resources in Wyoming is unreliable, so policies are not needed.	14.3	29.8	55.9	1.58 0.73
New policies to address changing water resources are unnecessary because they will cause harm in Wyoming.	13.0	30.3	56.7	1.56 0.71
There is no point for Wyoming to create new policies, as these actions will not make any difference for Wyoming.	12.1	29.5	58.4	1.54 0.70
Water changes in Wyoming are not a big challenge for us to face and do not require new policies to address them.	11.8	27.1	61.2	1.50 0.70

Perceived Policy Cost and Return on Investment

Respondents were asked how expensive they thought it would be to implement policies to respond to changing water resources in Wyoming. They were also asked if the costs are worth the investment. Half of respondents thought policy costs would be “very” to “extremely” expensive (51.8%) to implement; note that these are *perceptions* of policy costs, not actual policy costs. Even still, 41.9% of respondents thought the costs would be “very much” or “extremely” worth it, with another 31.0% saying the costs would be “moderately” worth it.

Policy Cost and ROI	Response Options	Percent of Respondents	Mean SD
In general, how expensive do you think it will be for Wyoming to develop and implement policies to respond to changing water resources.	Not at all expensive	1.2	3.57 0.88
	Slightly expensive	7.5	
	Moderately expensive	39.6	
	Very expensive	36.5	
	Extremely expensive	15.3	
In general, do you think that the costs for Wyoming to implement policies to respond to changing water resources are worth the investment?	Not at all worth it	12.6	3.13 1.17
	Slightly worth it	14.6	
	Moderately worth it	31.0	
	Very much worth it	31.0	
	Extremely worth it	10.9	

Section 4. Adaptation to Water Changes

4.1 Adaptation Optimism and Pessimism

Respondents were asked to consider how optimistic vs. pessimistic they were that Wyoming can overcome future challenges due to decreased water availability and increased water-related hazards (wildfire, flood, drought). They listed two percentages that were required to total 100% to

represent their optimism vs. pessimism. Results show respondents are more likely to express higher optimism (55.8%) than pessimism (44.2%).

	Mean %	SD %	Mode	Median	Range
Optimistic	55.8	22.4	50	50	0-100
Pessimistic	44.2	22.4	50	50	0-100

4.2 Concerns About Community Resources

Respondents were asked to rank their community's resources to adapt to water changes and hazards by their level of concern. They were told, "Some Wyoming residents are concerned that their community does not have the resources needed to plan and adapt to decreased water and increased water-related hazards. Please rank the following resources according to your level of concern. If you're most concerned about the financial resources needed for your community to plan and adapt to decreased water, then rank that as #1 concern. If you're least concerned about cultural resources, then rank that as #7 concern."

The most common first choice ranking of concern was financial resources. Physical resources (infrastructure, technology, equipment) and governance/legal resources (policy knowledge, legal support) showed the second and third highest mean (or, average) concern ranking, respectively. The mode ranking shows the most common ranking choice for each of the resources; for example, the most common ranking choice for cultural resources out of 1 to 7 was a 3.

Resource Concern	1st	2nd	3rd	4th	5th	6th	7th	Mode Rank	Mean SD
Financial resources (money and funding)	38.3%	22.1%	12.8%	11.0%	6.0%	4.5%	5.3%	1	2.59 1.79
Physical resources (technology, equipment, infrastructure)	13.3%	28.1%	19.5%	14.1%	12.4%	10.3%	2.2%	2	3.24 1.64
Governance and legal resources (policy knowledge, legal support)	13.1%	15.4%	15.6%	26.3%	15.8%	6.2%	7.6%	4	3.65 1.71
Cultural resources (wisdom, place-based scientific knowledge)	15.8%	14.0%	19.0%	13.0%	17.0%	16.3%	4.8%	3	3.70 1.83
Information and tools resources (management decision support tools, data to make informed decisions)	14.1%	10.0%	18.8%	14.5%	15.0%	8.6%	18.9%	7	4.08 2.01

Community resources (social networks, volunteers, community groups)	2.6%	6.9%	7.6%	13.4%	20.3%	35.2%	14.0%	6	5.04 1.55
Emotional and wellbeing resources (religious or spiritual groups, counseling services)	2.8%	3.6%	6.7%	7.6%	13.4%	19.0%	47.0%	7	5.70 1.64

4.3 Beliefs About Water Changes and Perception of Others' Beliefs

The next set of questions compares respondents' own beliefs about water changes in Wyoming to their perceptions of what others think. Results show that respondents largely think their communities should plan for water changes (81.0%) because they think water changes are happening (74.9%). Yet, their perceptions of others' beliefs in water changes are distorted, with only 37.7% of respondents saying their community believes that water changes are happening and just under half of respondents reporting that people who are important to them believe Wyoming communities should plan for changing water resources.

Normative Beliefs	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
Self-belief - I think my community should plan for changing water resources.	81.0	12.8	6.2	2.75 0.56
Self-belief - I believe that changes in water resources are happening.	74.9	13.4	11.7	2.63 0.68
Normative Belief - People who are important to me think Wyoming communities should plan for changing water resources.	49.2	37.8	13.0	2.36 0.70
Normative Belief - My community believes that changes in water resources are happening.	37.7	42.0	20.3	2.17 0.74

4.4 Confidence in Community Adaptation

Respondents were asked five questions about their confidence in their Wyoming communities to address changing water resources. About 43% of respondents expressed confidence in their ability to work together with their community to plan and adapt to water changes. However, 36.0% of respondents were unsure about working together with their community.

When respondents were asked if they thought their community had the knowledge to plan and adapt to water changes, just over a quarter of respondents felt confident. Many respondents were unsure or not confident in their community's knowledge and resources. Likewise, just over 20% of respondents felt they could rely on their community to plan and adapt to water changes, with

38.4% of respondents being unsure and another 40.7% being unconfident. Finally, respondents have a serious lack of confidence (i.e., only 16.3% confident) in their community's motivation to plan and adapt to changing water resources; however, half of respondents are unsure.

Community Efficacy	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
My community and I can work together to plan and adapt to changing water resources.	43.2	36.0	20.8	2.22 0.77
My community has the knowledge to plan and adapt to changing water resources.	25.6	43.1	31.3	1.94 0.75
I am confident that my community has the resources needed to plan and adapt to water changes.	27.4	30.5	42.2	1.85 0.82
My community is motivated to plan and adapt to changing water resources.	16.3	51.2	32.5	1.84 0.68
I can rely on my community to plan and adapt to water changes.	20.9	38.4	40.7	1.80 0.76

4.5 Beliefs and Behavioral Intentions with Community Response Plans

Respondents were asked many questions about “community response plans” (i.e., a generic term with no explanation or details of these plans) to address changing water resources. Two-thirds of respondents would encourage others to participate in creating community response plans. Likewise, two-thirds of respondents believe that community response plans can reduce the risks that water changes pose, but lower amounts of respondents think the community response plans will be effective (40.7%). About half of respondents want to learn more about how to participate in community response plans. However, there is generally low self-efficacy among respondents, such that they do not feel qualified (22.1%), knowledgeable (19.4%), or available (21.0%) to participate in creating a community response plan.

Community Response Plan Beliefs and Behaviors	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
My community can reduce the risks that water changes pose to our community by creating a response plan.	67.7	26.1	6.2	2.61 0.60
I would encourage others to participate in creating a community plan to address changing water resources.	67.7	23.6	8.8	2.59 0.65
I am interested in learning more about how to participate in a community plan to address water changes.	48.4	33.9	17.7	2.31 0.75
Community response plans that address water changes will be effective at reducing the risks of changing water resources.	40.7	42.5	16.7	2.24 0.72
I would participate in creating a community plan to address changes in water resources.	44.1	33.5	22.4	2.22 0.79

I feel qualified to participate in creating a community plan to address water changes.	22.1	31.7	46.2	1.76 0.79
I have the time and availability needed to participate in creating a community plan to adapt to water changes.	21.0	33.6	45.4	1.76 0.78
I have the knowledge to participate in creating a community plan to adapt to changing water resources.	19.4	29.0	51.7	1.68 0.78
Water changes in my community are not a big challenge for us to face and do not require community plans to address them.	11.2	27.1	61.7	1.49 0.69

4.6 Adaptation Attitudes and Emotions

Adaptation Attitudes

Respondents were asked about their attitudes toward adapting to changing water resources in Wyoming using four adjectives: necessary, foolish, wise, and unnecessary. Three-quarters of respondents thought it was wise and necessary to adapt to water changes and very low numbers of respondents thought it was foolish (11.4%) and unnecessary (8.2%).

I think adapting to changes in water resources in Wyoming is...	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
Wise	76.9	16.0	7.1	2.70 0.59
Necessary	75.3	14.9	9.8	2.66 0.65
Foolish	11.4	16.6	72.0	1.39 0.68
Unnecessary	8.2	19.4	72.4	1.36 0.63

Adaptation Emotions

Respondents were asked to rate the intensity of eight emotions they may feel about changing water resources in Wyoming. In general, results show Wyoming residents do not feel strong emotions related to changing water resources, which can be observed with the majority of respondents reporting emotions at the moderately, slightly, or not at all levels. In looking at the mean (or average) response to the emotions, being “worried” and “calm” ranked at the top two feelings and “sad” and “guilt” ranked at the bottom two feelings.

Emotion	A lot or extremely % (3)	Slightly or moderately % (2)	Not at all % (1)	Mean SD
Worried	20.5	69.3	10.2	2.10 0.55
Calm	23.6	62.6	13.8	2.10 0.60
Hopeful	17.9	66.4	15.7	2.02

				0.58
Confident	8.7	72.2	19.1	1.90 0.52
Frustrated	22.5	44.0	33.4	1.89 0.74
At ease	11.5	62.8	25.7	1.86 0.59
Sad	18.0	43.6	38.4	1.80 0.72
Guilty	3.7	26.5	69.8	1.34 0.55

4.7 The Use of Modeling in Adaptation to Changes in Water and Climate

Respondents read a brief description about modeling, and then answered questions about modeling. In terms of attitudes of modeling, respondents overwhelmingly think that modeling can help Wyoming communities adapt to different water and weather scenarios (78.3%). Nearly two-thirds of respondents want to learn more about modeling from Wyoming researchers, and 57.8% of Wyoming residents support using modeling in policymaking in Wyoming to address water changes and weather variability. Just under half of respondents (45.1%) trust researchers who conduct modeling, with many uncertain about trust opinions and merely 13% distrusting researchers. Even still, there is some skepticism about modeling, with 27.1% of respondents expressing skepticism and 26.2% reporting there is too much room for interpretation with modeling for it to be useful. Yet only 13.3% of respondents agreed that there was too much uncertainty in modeling for the results to be useful. Overall, the results paint a supportive picture of Wyoming residents in terms of using modeling to help plan for adaptation to water and weather changes in Wyoming.

Modeling Attitude	Agree % (3)	Unsure % (2)	Disagree % (1)	Mean SD
Modeling can help Wyoming communities adapt to different water and weather scenarios.	78.3	13.1	8.6	2.70 0.62
I support using modeling to help Wyoming communities plan for different water and weather scenarios.	75.6	14.9	9.6	2.66 0.64
I am interested in learning more about modeling from the Wyoming researchers who conduct modeling research.	62.7	23.7	13.6	2.49 0.72
I support using modeling in policymaking in Wyoming to address water changes and weather variability.	57.8	27.3	14.8	2.43 0.74
I want more information about modeling before I can offer my support.	49.4	26.2	24.4	2.25 0.82
The description of modeling was very objective.	48.4	40.9	10.6	2.38 0.67
I trust the researchers who conduct modeling.	45.1	41.8	13.1	2.32

				0.69
I am hesitant to base decisions and policy on modeling.	32.0	34.6	33.4	1.99 0.80
I felt like the description of modeling was trying to persuade me.	28.5	33.8	37.7	1.91 0.81
I am skeptical about models.	27.1	30.7	42.1	1.85 0.82
There is too much room for interpretation of the results for modeling to be useful.	26.2	33.2	40.6	1.86 0.80
I have heard other people criticize the effectiveness of modeling.	23.9	30.7	45.3	1.79 0.80
We should deal with water and weather changes as they arise rather than use modeling.	16.5	24.3	59.2	1.57 0.76
There is too much uncertainty in modeling for the results to be useful.	13.3	34.2	52.5	1.61 0.71

Section 5. Trusted Information Sources and Communication Habits

5.1 Trusted Groups

Respondents were asked to select all the groups of people “that you trust to tell you the truth about changing water resources in Wyoming.” The most trusted group was University of Wyoming scientists and researchers at 60%. Just more than half of respondents trusted Wyoming ranchers and farmers and close interpersonal relationships (family, friends, neighbors). Among the least trusted groups were faith leaders (15.5%), national journalists (11.1%), and large corporations, energy, and mineral industries in Wyoming (6.7%).

Trusted Group	Percent of Respondents
University of Wyoming scientists and researchers	60.3
Wyoming ranchers and farmers	52.4
Friends, family, neighbors, acquaintances	51.3
Regional water management boards (e.g., Upper Colorado River Commission, Colorado River Working Group, Bureau of Reclamation)	45.2
National researchers	33.8
Conservation and environmental organizations in Wyoming	33.8
Wyoming-based journalists	30.8
Community leaders (local government)	28.8
Small businesses in Wyoming	27.0
Wyoming governor (Mark Gordon)	19.4
Wyoming legislators	18.0
Faith leaders	15.5
Journalists from national media outlets	11.1
U.S. President (Joe Biden)	6.7
Large corporations, energy, and mineral industries in Wyoming	6.7

5.2 Current Information Sources About Water/Weather

Respondents were asked to select all the sources where they come across information about water and weather. They were asked to select sources that they “purposefully seek out information” and sources that they “may happen to see information.” Below is a ranking of the most common sources to the least common sources. The top sources were water and weather-related apps on their phones, interpersonal sources (friends, family, neighbors, acquaintances), and news media sources. The most popular news media source was Cowboy State Daily, followed by Wyoming Public Radio and national/international newspapers (print or digital).

Source	Percent of Respondents
1. Specific water and weather-related apps on my phone	46.0
2. Friends, family, neighbors, acquaintances	46.0
3. Cowboy State Daily	35.3
4. Wyoming Public Radio	28.3
5. Social media	27.7
6. National or international newspapers (print or digital)	26.3
7. Other local radio stations	22.2
8. Local TV	22.1
9. WyoFile	21.1
10. Other Wyoming newspapers (print or digital)	21.1
Casper Star Tribune	
Wyoming Tribune Eagle	
Sheridan Press	
Oil City News	
Powell Tribune	
Laramie Boomerang	
Torrington Telegram	
Sweetwater Now	
Jackson Hole News&Guide	
Wyo4News	
Pinedale Roundup	
Cody Enterprise	
Riverton Ranger	
County10.com	
Buffalo Bulletin	
Lusk Herald	
Douglas Budget	
Gillette News Record	
Greybull Standard	
Republican Rustler	
Northern Wyoming News	
NSW	
Star Valley Independent	

Uinta County Herald	
WyoToday	
11. National TV	18.4
12. University of Wyoming Extension	17.8
13. Scholarly articles	17.5
14. Professional or trade organizations (e.g., Wyoming Stockgrowers Association)	17.5
15. Other sources	10.0
Government (specifics below)	
National Weather Service (including High Plains Regional Climate Center)	
Snotel (snowpack data)	
Irrigation districts	
Bureau of Reclamation	
State Engineer's Office	
FEMA	
Western Area Power Administration	
Cheyenne Board of Public Utilities	
NOAA	
USGS	
Local conservation districts	
Lusk, Wyoming, library	
Niobrara County	
USBR charts	
Iowa State University (wind data)	
Personal experience and observations	
Inflammatory, aggressive, or demeaning comment	
Private weather forecasting	
Online research when looking at properties in out lying areas with land	
Denver Botanic Gardens	
Science-based research	
TED talks	
US Alumni media	
Personal weather station	
16. YouTube	9.0

5.3 Communication Habits About Water and Weather

Respondents were asked how often they engaged in various communication behaviors surrounding weather, water, and climate. The most common communication behaviors were (1) talking about Wyoming's weather and (2) hearing about climate change in the news, followed by (3) hearing about water in the news and (4) talking about water-related issues. More than half of respondents (51.2%) talk about climate change "sometimes" or "often," making it the fifth most common behavior. The least common behaviors were sharing information about climate and water issues.

Communication Behavior	Never % (1)	Rarely % (2)	Sometimes % (3)	Often % (4)	Mean SD
Talk weather: Discuss Wyoming's weather	1.3	13.0	38.6	47.2	3.32 0.74
Talk water: Discuss water-related issues in Wyoming (e.g., drought, flood, wildfire, impacts of water on ag and ranching)	14.3	22.4	48.6	14.7	2.64 0.90
Talk Climate: Discuss climate change	17.9	30.9	36.2	15.0	2.48 0.95
Hear Climate: Hear about climate change in the news	5.0	11.4	30.9	52.6	3.31 0.86
Hear Water: Hear about water-related issues in the news	9.3	27.1	49.2	14.4	2.69 0.83
Share Climate: Share information about climate issues	24.1	31.2	31.5	13.2	2.34 0.98
Share Water: Share information about water issues	23.8	34.7	31.9	9.6	2.27 0.93



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