

Global Issue, Local Risk

CHI's Health and Climate Index Identifies
Colorado's Most Vulnerable Regions

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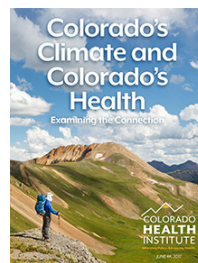
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Index Online

Visit our website for an interactive map showing the full Health and Climate Index:

colo.health/ClimateIndex



For more on health and climate, see CHI's 2017 report: **Colorado's Climate and Colorado's Health.**

bit.ly/2smrRBx

Introduction

A changing climate is likely to bring rising temperatures, dirtier air, extreme drought, and more severe wildfires to Colorado. These changes and others will take a toll on human health. But not all communities or individuals will be affected in the same ways.

In northwestern Colorado, for instance, summertime high temperatures above 90 degrees Fahrenheit are already common. But residents may be better able to withstand the heat than in some other parts of the state because they are relatively healthy, and most are not very old or very young.

In the state's rural southeast, residents tend to be older, and more have health conditions like diabetes and heart disease. Many live in older houses, which often lack air conditioning. High heat days in this region may take a larger toll on the health of residents.

As people, communities, and health organizations plan to address climate change and its effects on human health, they will need to be responsive to unique circumstances and characteristics like these.

The Health and Climate Index, a new tool from the Colorado Health Institute, pulls together data that illustrate climate exposure, demographics, and readiness across the state to build understanding of the link between climate change and health.

The Health and Climate Index suggests that:

- Southeast Colorado had the state's highest rate of exposure to climate change-related environmental factors like high heat days in 2017.
- The southeast also has the highest demographic vulnerability, with high rates of residents with chronic health conditions that may be exacerbated by climate change.
- The Front Range is the state's most vulnerable region in terms of readiness, due in part to large swaths of land in wildland-urban interface risk areas, where human communities face elevated wildfire danger.

Indexing Climate and Health

The Health and Climate Index ranks Colorado regions on a scale of 0 to 10 for 22 variables related to health and climate. Each variable can be measured over time

Key Takeaways

- As Colorado's climate changes, people are likely to suffer adverse health effects from heat, extreme weather, poor air quality, severe drought, and other factors.
- CHI created the Health and Climate Index to examine how different regions' geography, social demographics, and policies influence the health effects of a changing climate.
- Residents on the Eastern Plains are most vulnerable to the health impacts of climate change.

and has been shown to have an effect on human health. The Index is based on data from 2017, the most recent year for which all data points were available.

CHI created this index to analyze what is happening across Colorado. CHI compiled data at a county level and combined multiple counties into seven regions. These regions are based on their geographic location and similarities in demographics. Each region is a composite of several Health Statistics Regions, or HSRs – regions created by the state to plan for health policy. (County-level data is available from CHI upon request.)

The variables are sorted into three categories:

- **Exposure** to climate issues (such as wildfire exposure and extreme heat days);
- **Demographics** that point to increased vulnerability (such as poverty rates and percentage of the population over 65 and under 18); and
- **Readiness** in different regions (such as climate preparedness plans).

Category 1: Exposure

Wildfires, extreme heat, and drought are natural hazards that can cause adverse health effects. This category includes seven climate, weather, and environmental measures.

For a list of sources and acronyms, see Page 19.

1. Number of extreme heat days (above 90 degrees Fahrenheit) from January to December 2017 (PRISM)
2. Rate of emergency department visits for heat related illness per 10,000 people (CDPHE)
3. Rate of acute care hospitalizations for heat related illness per 10,000 people (CDPHE)
4. Percentage of land rated moderate to highest risk for possible loss or harm from a wildfire (CSFS)
5. Percentage of land burned by wildfires in 2017 (CDHSEM)
6. Percentage of surface drinking water importance areas that are at risk for negative impacts from wildfire (CSFS)
7. The number of weeks any percentage of the region's population is in severe, extreme, or exceptional drought (US Drought Monitor)

Category 2: Demographics

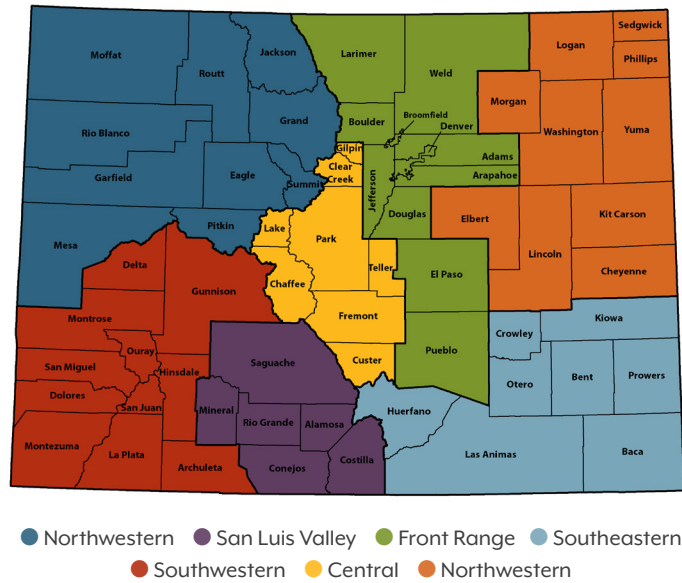
Demographic and social issues influence a community's ability to respond and recover from climate and extreme weather events. This category includes 10 measures.

Social and Built Environment Measures:

Social and economic conditions can affect a person or community's ability to prepare and respond to environmental changes.

1. Percentage of residents living below poverty (ACS)
2. Percentage of residents ages 25+ without a high school degree (ACS)
3. Percentage of residents living in homes built before 1980 (ACS)
4. Percentage of residents who are unemployed and looking for work (CDLE)

Map 1. The Seven Regions in CHI's Index.



Demographic Measures:

Children and older adults are more likely to be affected by a changing climate. Children are more vulnerable to the impacts of climate change because they have a proportionally higher intake of air, immature thermoregulatory systems and immune systems, and a greater ratio of skin surface to body weight. Older adults are more susceptible to climate impacts due to the body's decreased ability to adapt to heat and poor air quality. Older populations tend to experience more social isolation and reduced mobility.

5. Percentage of residents who are under the age of 18. (ACS)
6. Percentage of residents who are age 65 or older (ACS)

Current Health Conditions:

Certain chronic health conditions can be exacerbated by rising temperatures and worsening air quality

7. Percentage of residents who have chronic obstructive pulmonary disease (COPD) (CDPHE)
8. Percentage of residents who have diabetes (CDPHE)
9. Percentage of residents who have asthma (CDPHE)
10. Percentage of residents who have cardiovascular disease (CDPHE)

Category 3: Readiness

Readiness measures include a community's acknowledgement of climate change, percentage of land in wildland-urban interface risk areas, and local public health improvement plans. The category includes five measures.

1. The percentage of residents who believe that global warming is currently happening (Yale Climate Survey)
2. The percentage of residents who believe that the impacts from global warming will harm them personally. (Yale Climate Survey)
3. The percentage of residents who believe that global warming will harm future generations (Yale Climate Survey)
4. The number of local public health priority plans that include environmental health, chronic illness, and obesity, and local public health plans that help prepare and reduce the impacts of climate change in a region (CDPHE)
5. Percentage of land in wildland-urban interface (WUI) risk areas, where human infrastructure intermingles with wildland fuels (CSFS)

Scoring the Index

CHI converted each indicator into a score of 0 to 10, where 0 represents the most severe threats related to climate change and 10 represents no threat. For example, if 75.5 percent of people in a given area believe climate change is happening, this is translated into a score of 7.55 out of 10. The score for each of the three main categories is the average score of all metrics within the category.

The scores are based on county-level data that were rolled into regional averages. For context, CHI also calculated a state average value across all Colorado counties. This average does not represent the value for the state of Colorado, but a simple average across counties. It does not matter that Denver County is larger than Mineral County, as both are counted the same here. Equal weight was given to all 22 variables.

San Luis Valley: A Snapshot, Not a Prediction

According to the Health and Climate Index, in 2017, the San Luis Valley was the state's least vulnerable region. It had some of the state's lowest wildfire risk and a low percentage of homes built near wildland areas. It also had a high rate of regional health plans that considered climate-related factors. Yet in 2018, the San Luis Valley was the site of the Spring Creek Fire, the third-largest fire recorded in the state, which scorched more than 108,000 acres and damaged over 100 buildings in Costilla and Huerfano counties.¹

This example is a reminder that this Index is a snapshot of data from a given year rather than a prediction of future climate events. The San Luis Valley's score on the Index's Exposure measure is likely to look different in 2018.

Policymakers and community members can still use the Index and its data as a tool to explore areas of vulnerability at a local level. In the San Luis Valley, for instance, the region's high rates of certain health conditions might point to populations that need attention.

As the Index compiles more years of data, trends in variables will offer a more comprehensive look at different regions' vulnerability.

In 2017, the state's average score on the Health and Climate Index was 6.4 on a scale of 0 to 10, with 10 being least vulnerable to health risks and 0 being most. The state's average exposure score in 2017 was 7.2. The state's average demographic score in 2017 was 5.9. The average readiness score was 6.2.

All three factors are likely to change over time. The exposure variables, which cover factors like wildfires and heat exposure, are most likely to change significantly from year to year. But readiness scores, which include human-determined factors like plans addressing climate change, also will change as communities change. And demographic scores will evolve with migration, aging, and other trends.

The Health and Climate Index is not intended to predict future changes in variables. It serves instead as a snapshot of current climate factors in Colorado.

Index Results and Analysis

Exposure

Exposure scores measure a region's vulnerability to health impacts of weather and environmental issues related to climate change.

Average Regional Score: 7.2

Southeastern Colorado is most vulnerable

The region with the greatest vulnerability to exposure in 2017 was the southeast region. It scored 6.2 out of 10. This region, which includes Kiowa, Crowley, Otero, Bent, Prowers, Huerfano, Las Animas, and Baca counties, had 60 days above 90 degrees in 2017. The southeast also had also a high rate of

hospitalizations due to heat illnesses.

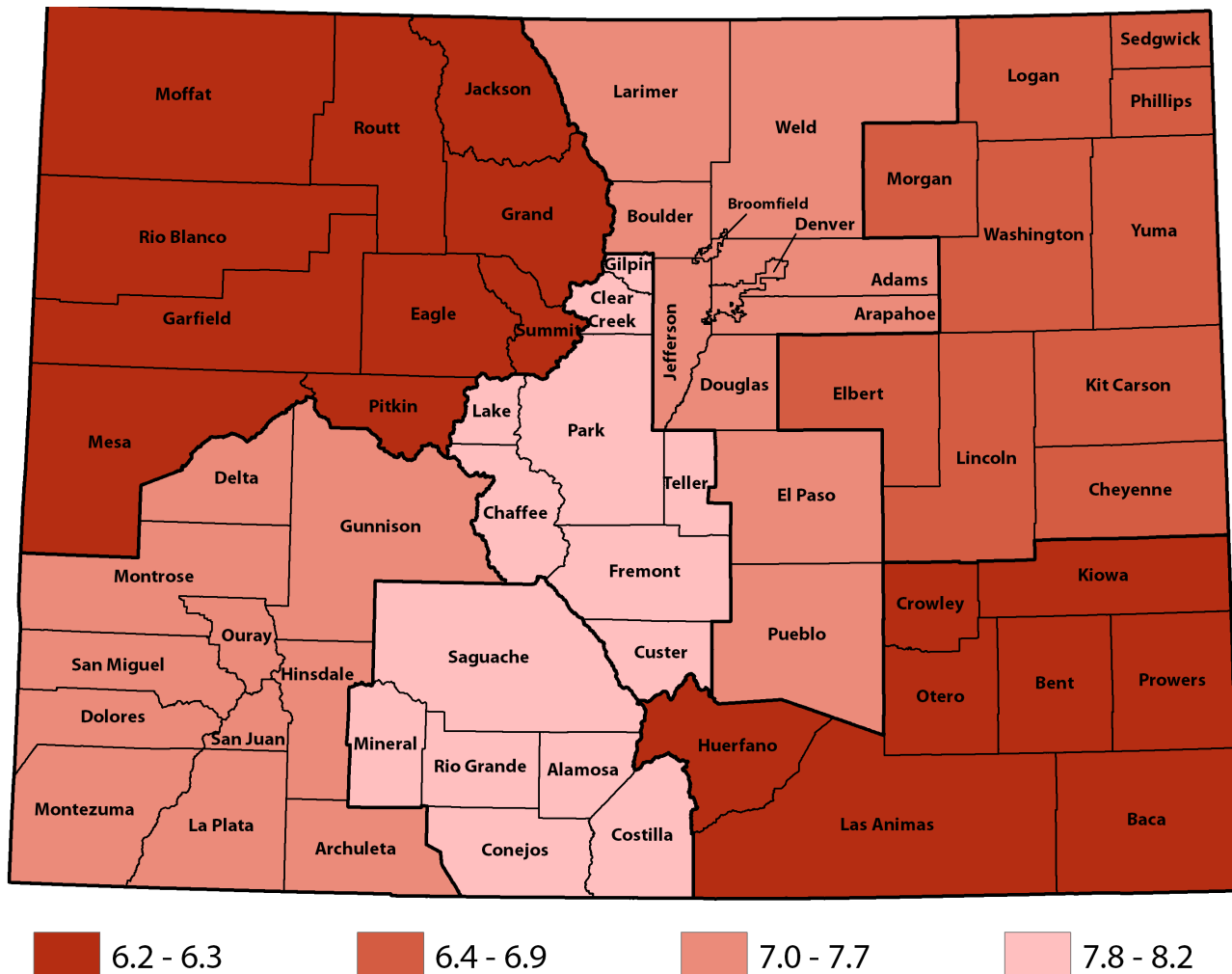
It also stands out for having a particularly high number of weeks spent in a drought in 2017 and having a significant portion of its water vulnerable to wildfires.

The San Luis Valley is least vulnerable

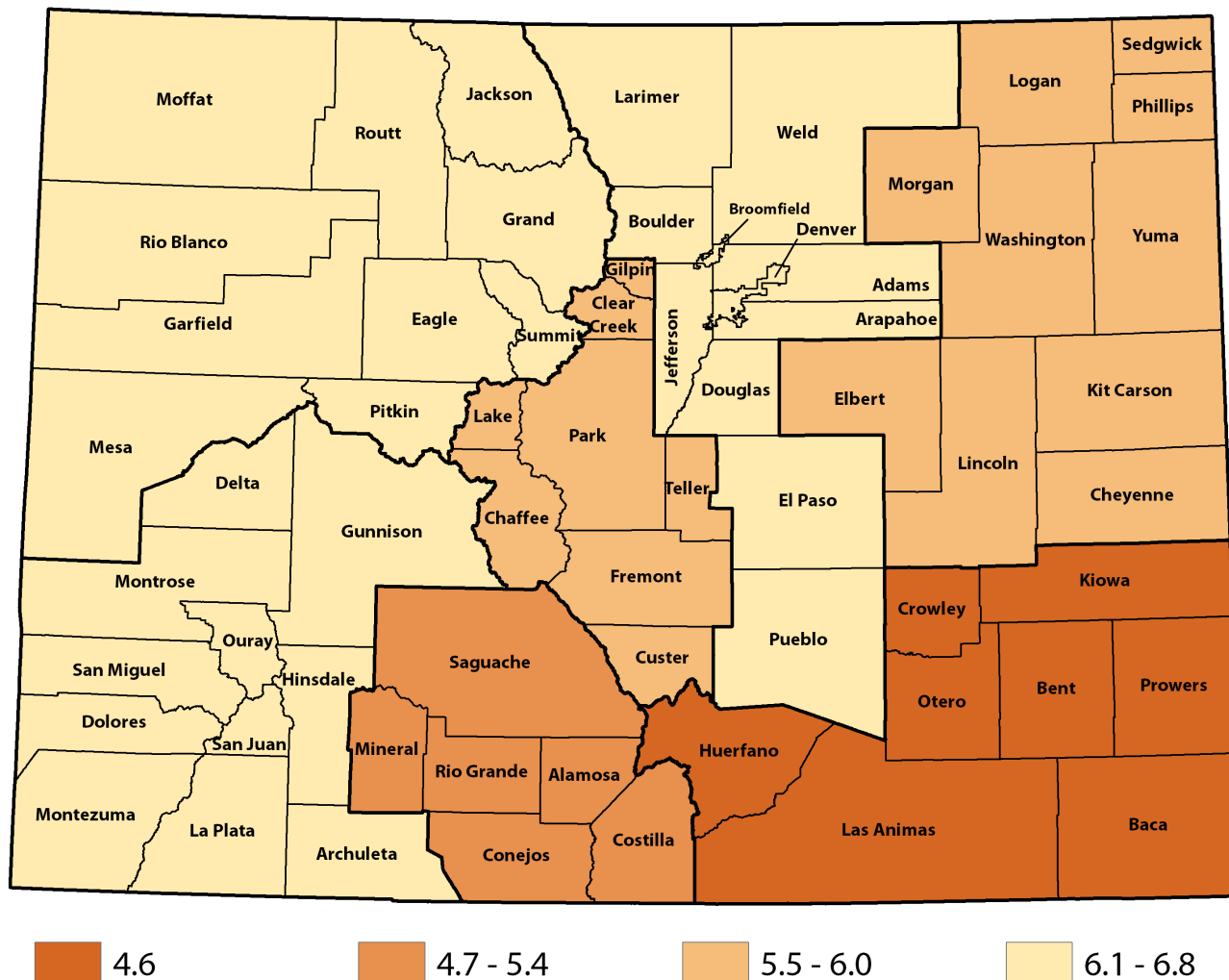
The region that experienced the least vulnerability to the health impacts of exposure was the San Luis Valley, with a score of 8.2.

This region, which includes Saguache, Mineral, Rio Grande, Alamosa, Conejos, and Costilla counties, had no recorded extreme heat days in 2017. This region also had no hospitalizations for heat-related illnesses in 2017, compared with the state average of 0.8 per 10,000 residents.

Map 2. Southeastern, Northwestern Colorado Have Worst Exposure Scores.



Map 3. Southeastern Colorado Has Worst Demographics Score.



Demographics

Demographic scores capture social and demographic conditions that affect an individual or communities' health or the ability to respond to climate-related issues.

Average Regional Score: 5.9

Southeastern Colorado is most vulnerable

The southeast region was most vulnerable on the 2017 Index, with a score of 4.6.

Kiowa, Crowley, Otero, Bent, Prowers, Huerfano, Las Animas, and Baca counties had higher-than-average percentages of residents with chronic health issues, residents ages 65 and older, and residents

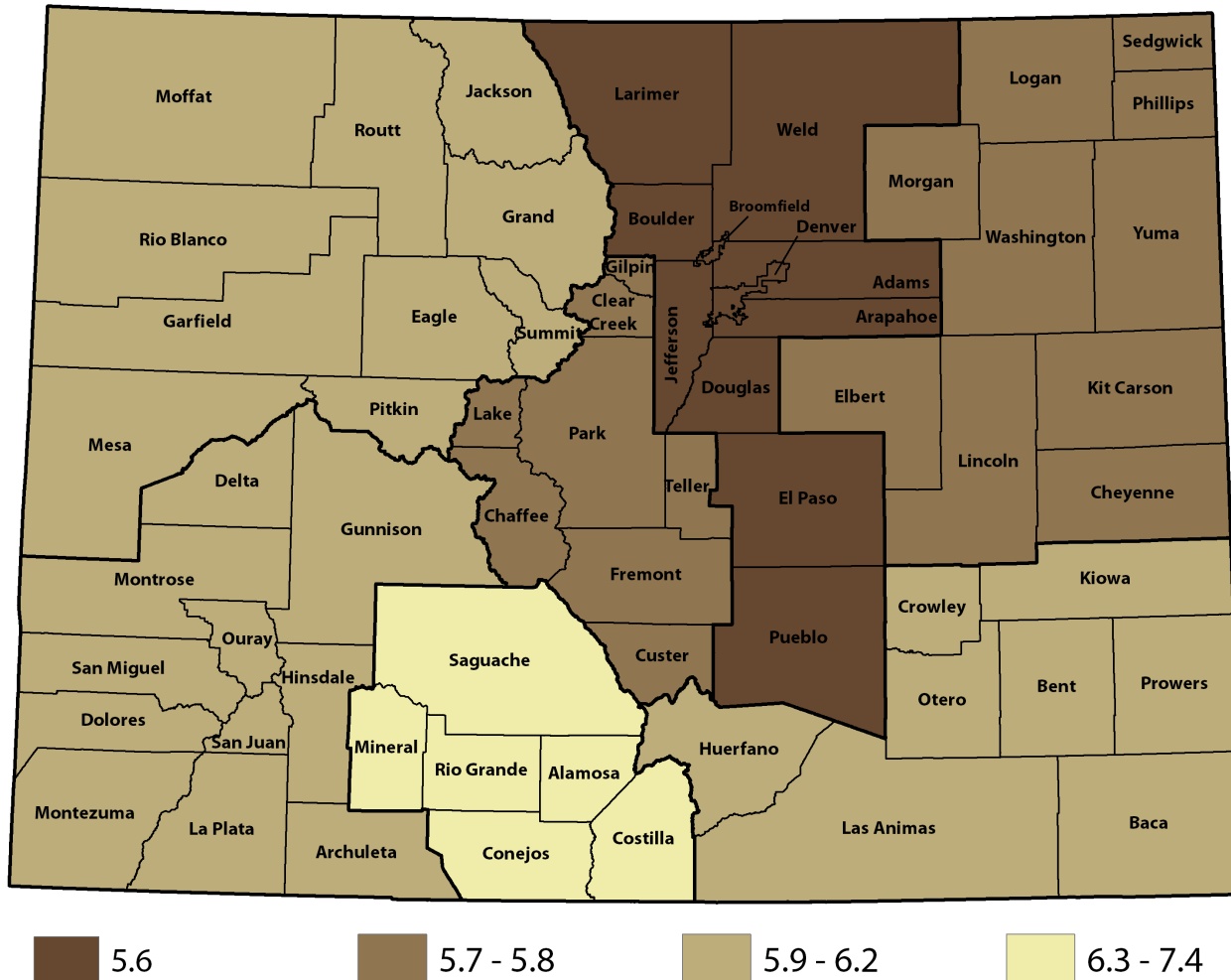
experiencing poverty. It also had higher-than-average unemployment and adult residents without a high school diploma. For instance, more than 8 percent of residents have COPD, many more than the state average (5.7 percent). Meanwhile, almost three-fourths (72 percent) of all homes in the region were built before 1980, which means they are less likely to have house cooling systems like air conditioning. This is higher than the state average of 52 percent.

Northwestern Colorado is least vulnerable

Northwestern Colorado, which includes Moffat, Routt, Jackson, Rio Blanco, Grand, Garfield, Eagle, Summit, Pitkin, and Mesa counties, was the least vulnerable, with a score of 6.8.

This region had a lower-than-average percentage of residents over age 65. It also has the lowest

Map 4. The Front Range Has Colorado's Worst Readiness Score.



proportion of houses built before than 1980 (39 percent) and some of the lowest rates of residents with chronic health conditions such as cardiovascular disease and diabetes.

The southwestern and Front Range regions were also less vulnerable than the state as a whole.

Readiness

Scores in this category measure a region's ability to adapt to and mitigate climate-related impacts. Variables in this section reflect how prepared communities are in each region based on residents' beliefs about global warming, where the population lives, and whether local public health agencies prioritize climate-related factors.

Average Regional Score: 6.2

The Front Range is most vulnerable

The Front Range region, which stretches from Larimer and Weld counties south to Pueblo County, scored the lowest with a 5.6. Nearly 17 percent of this region's land is in WUI risk areas. The Front Range also has the lowest number of local public health plans that prioritize clean air, clean water, obesity, and chronic illness relative to population.

The San Luis Valley is least vulnerable

The San Luis Valley, comprised of Alamosa, Conejos, Costilla, Saguache, Rio Grande, and Mineral counties, was the least vulnerable in the state, with a score of 7.4. A large proportion of its population lives in counties with local public health priority plans focusing on clean air, clean water, and addressing obesity and chronic illnesses. The region also is home to the highest percentage of residents who

recognize the impacts of climate change: 73 percent, compared to the state average of 70 percent, believe that climate change is real. This region has created a Regional Environmental Health group to address local environmental issues.²

Statewide Trends

Looking at health and climate in these three categories allows us to see patterns of vulnerability. The Eastern Plains — the southeast and northeast regions in this analysis — are most vulnerable overall. The regions' overall scores, 5.7 and 6.2, were lower than the state's average score of 6.4.

The lower scores reflect higher climate exposure, such as extreme heat days and higher rates of emergency room and hospital visits due to heat illness. They also reflect low scores in most of the demographic variables, such as higher rates of chronic illnesses and higher percentage of older houses.

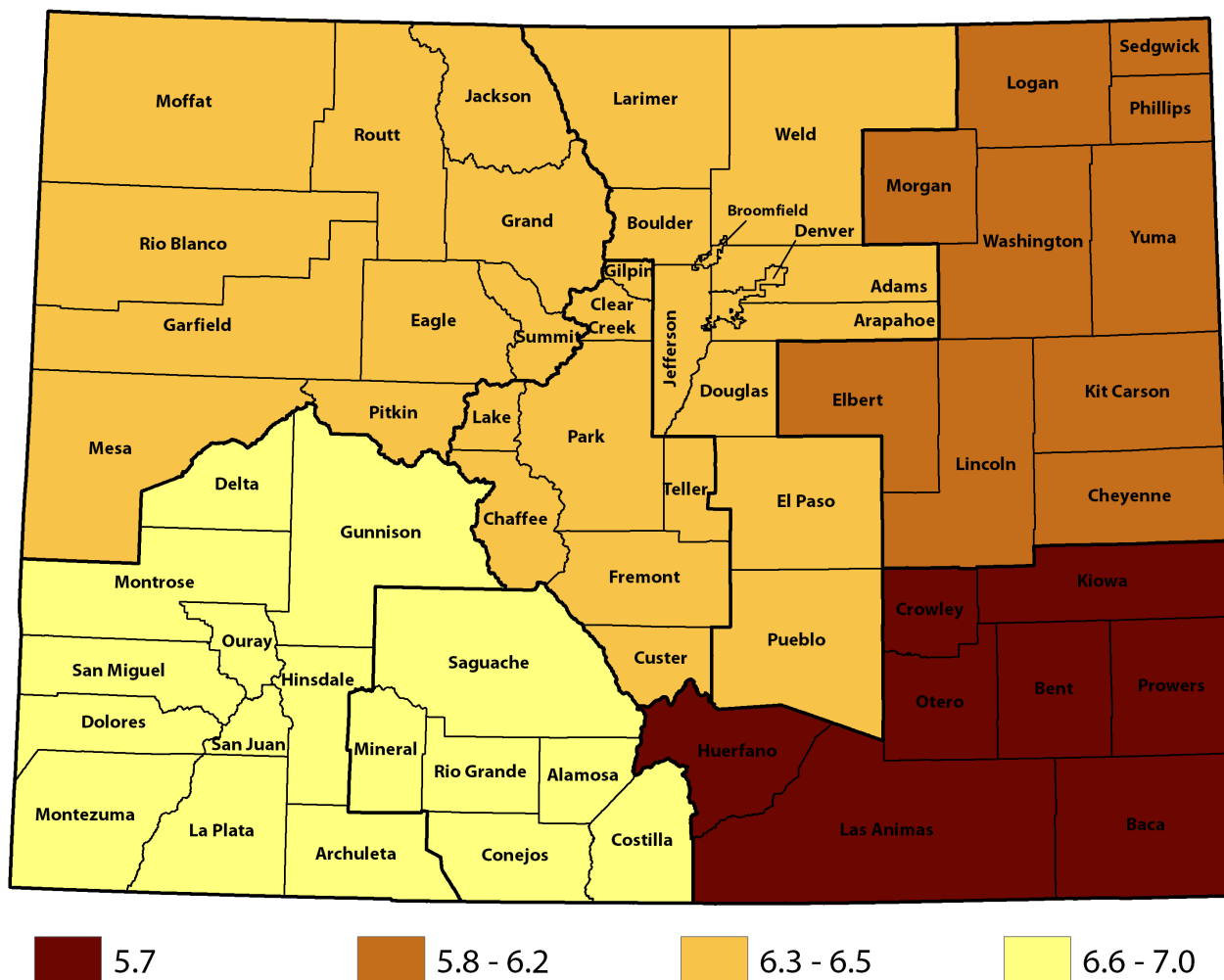
The region experiencing the least vulnerability overall is the San Luis Valley. In 2017, the San Luis Valley had fewer extreme heat days and fewer residents hospitalized for heat-related illnesses. It also has a high readiness score, with many local public health plans prioritizing issues related to climate change and a lower percentage of land in a WUI risk areas.

The state's central and southwestern regions score well or above average in the three main categories, but they still have notable climate-related risks.

The southwestern region, which has the second highest overall score of 6.8, has almost 10 percent of its land in moderate to highest wildfire risk areas. Wildfires can be particularly harmful in this region because over 7 percent of land is designated as a WUI risk area and over 90 percent of its surface water sources can be damaged by fire.

The central region, which also has a score above

Map 5. Southwestern Colorado and the San Luis Valley Have the Best Overall Scores.



the state's average overall, has several social and demographic measures that put it at risk if exposure to heat and wildfire increases in the area. Almost 20 percent of the population is over 65, and in this mountainous region, mobility and social isolation can be particular challenges. Ten percent of this region's residents have asthma, which could be a major health risk if wildfire smoke lingers in the area.

The Front Range scored above the state average overall, but sees particular vulnerability when it comes to preparedness. The region contains the metropolitan areas ranked as the 11th and 15th most ozone-polluted cities in America in 2017.³ However, the region had no local public health priority plans prioritizing clean air.⁴

Diverse Factors, Diverse Responses

The Health and Climate Index scores offer a look at how Colorado and its diverse regions are likely to be affected by a changing climate.

But what can we do about these scores, especially given the scope and challenges of a changing climate? The steps will likely vary based on a region's scores and areas of concern.

- **A region with a high exposure score may determine that it needs to prepare for more high heat days or wildfires.** It might encourage homeowners near natural areas to create fire breaks or take measures to protect watersheds. Individuals, communities, or health care organizations may decide they want to take steps to reduce greenhouse gas emissions to lessen their contributions to climate change.
- **An awareness of demographic factors can inform local governments and organizations about how they prepare for a changing climate.** Health care organizations in a region where many people already have asthma might send out ozone alerts or provide information about how a changing climate connects to air quality awareness.
- **Policymakers and public health officials may promote readiness to mitigate the health impacts of climate change.** Organizations or governments in regions where many people

who already believe that climate change is happening may run different campaigns or take different steps than those in places where fewer people believe climate change is happening.

Some situations that may develop with a changing climate are not included in this Index, including changes in Colorado's economy as outdoor recreation options shift or water shortages that could require changes in development patterns. These changes will certainly affect the health of communities and individuals. Access to health care can also play a role in preparing for and adapting to climate impacts.

And some communities within a county or region that may be more vulnerable are not captured by the Index. Communities of color, for instance, have been shown to be more at risk from climate impacts due to their greater likelihood of living close to polluted areas. Specific communities within counties with high numbers of elderly people or people with illnesses likely to be affected by a changing climate may also require more attention.

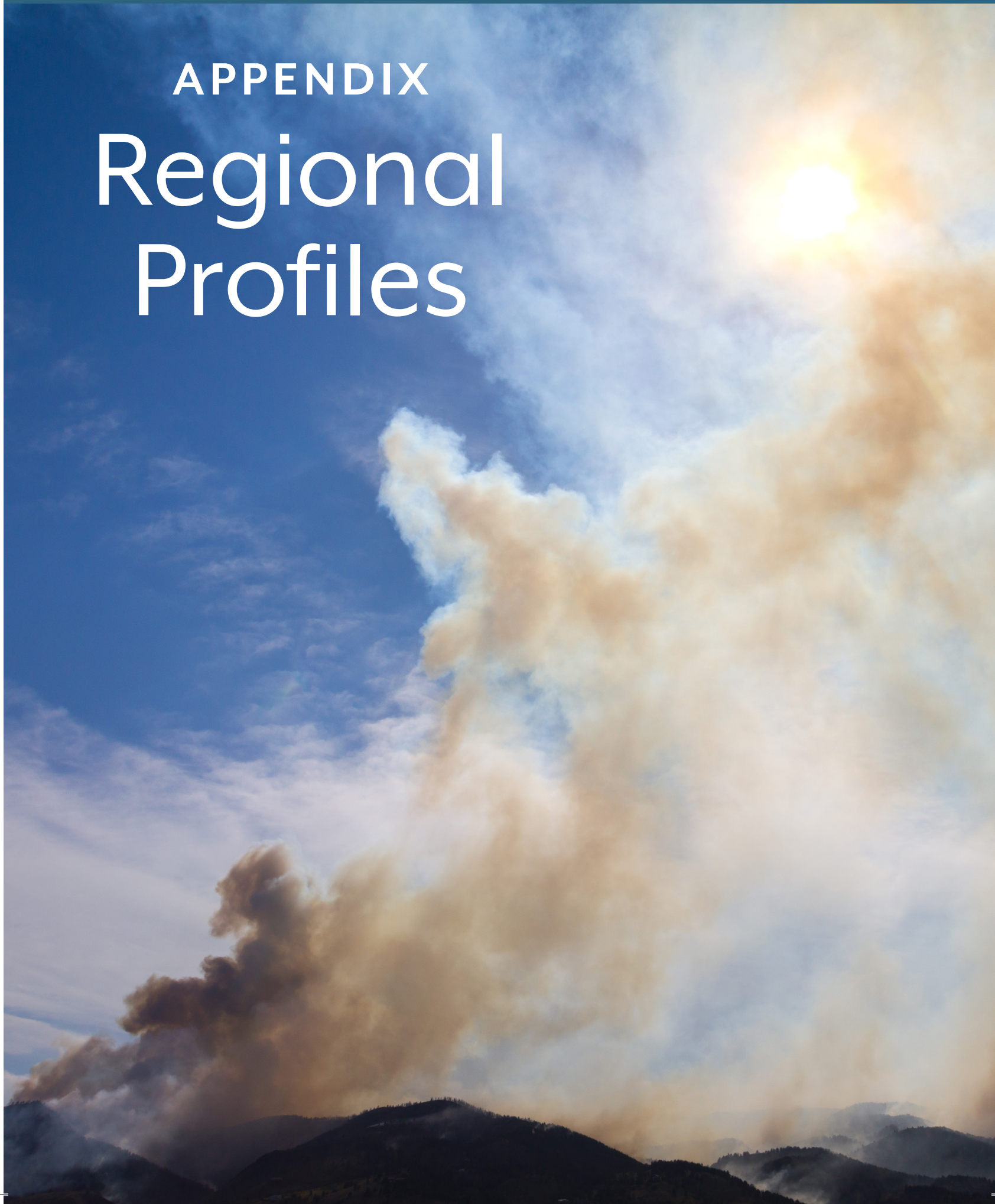
Still, the Health and Climate Index can be used as a tool to point people towards areas of concern and to gain a clearer understanding of some of the ways climate change may directly affect them, their regions, and the state of Colorado.

Conclusion

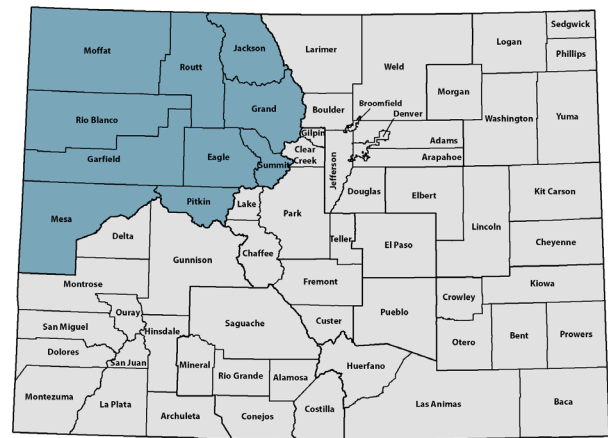
Changes to Colorado's climate have a direct effect on human health. Those human effects are often felt most deeply in areas where climate change isn't always a prominent issue in the news. Scientists have studied the effects of climate change on mountain ecology in detail. But a changing climate poses more risk to human health in Colorado's lower elevations, where summer days are hotter, more people have health issues that are exacerbated by heat, and more homes are in wildfire-prone areas.

The Health and Climate Index provides data to focus attention on human vulnerability to climate. It can help indicate where these impacts are the worst, where more vulnerable populations live, and how ready communities are to address climate change.

APPENDIX
Regional
Profiles



Northwestern Colorado



	Overall	Exposure	Demographics	Readiness
Index Score	6.4	6.3	6.8	6.2
State Avg.	6.4	7.2	5.9	6.2

Exposure

	Heat: Extreme heat days (90 degrees F or above)	Heat: Rate of heat-related emergency department visits per 10,000 residents	Heat: Rate of heat-related hospitalizations per 10,000 residents	Wildfire: Percent of acres burned in 2017	Wildfire: Wildfire risk moderate to highest in 2017	Wildfire: Percent of drinking water areas at risk	Drought: Percent weeks in severe, extreme, or exceptional drought
Index	8.0	6.8	0.0	10.0	8.5	0.6	10.0
Measure	72 Days	13.3	1.6	0.4%	15%	94%	0%

Demographics

	Percent total population in poverty	Unemployed rate	No high school diploma (Age 25+)	Living in housing built before 1980	Percent age: under 18	Percent age: 65+	Percent of residents with cardiovascular disease	Percent of residents with asthma	Percent of residents with diabetes	Percent of residents with COPD
Index	8.7	9.7	9.4	6.1	7.8	8.7	3.2	2.8	6.4	5.5
Rate	12.7%	3.2%	5.8%	38.5%	22%	13%	6.4%	7.8%	5.1%	3.8%

Readiness

	Beliefs and Opinions: Answered Yes to "Is global warming happening?"	Beliefs and Opinions: Answered Yes to "Will global warming harm you personally?"	Beliefs and Opinions: Yes to "Will global warming harm future generations?"	Number of Local Public Health Priority Plans addressing climate issues (Weighted Average of Region's Counties)	Percent of land in a WUI risk area
Index	7.0	3.8	6.9	3.5	9.5
Measure	69.7%	38.2%	69.4%	1.42	5%

Summary

The northwest region, comprised of Moffat, Routt, Jackson, Rio Blanco, Grand, Garfield, Eagle, Summit, Pitkin, and Mesa counties, has an overall Health and Climate Index score of 6.4, the same as the state average.

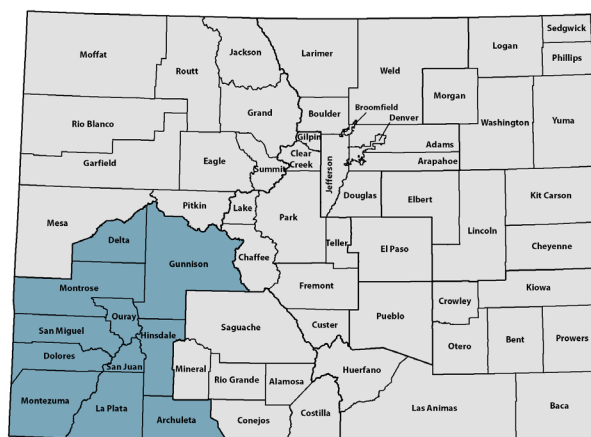
This region has among the highest rates of exposure in the state. Its overall score was a 6.3, compared to the state's 7.2. The region had 72

extreme heat days in 2017 — more than any other region — and high use of medical services due to heat-related illness. It also has a higher percentage of land with elevated wildfire risk.

In the demographics category, on the other hand, the region had the state's least vulnerable population: A lower share of its population is 65 or older or living with cardiovascular disease, diabetes, and COPD living in the .

In the readiness category, the northwest scored 6.2, the same as the state average. It has one of the state's lowest percentages of land in a WUI risk area.

Southwestern Colorado



	Overall	Exposure	Demographics	Readiness
Region	6.8	7.7	6.5	6.2
State Avg.	6.4	7.2	5.9	6.2

Exposure

	Heat: Extreme heat days (90 degrees F or above)	Heat: Rate of heat-related emergency department visits per 10,000 residents	Heat: Rate of heat-related hospitalizations per 10,000 residents	Wildfire: Percent of acres burned in 2017	Wildfire: Wildfire risk moderate to highest in 2017	Wildfire: Percent of drinking water areas at risk	Drought: Percent weeks in severe, extreme, or exceptional drought
Index	8.9	7.8	7.2	10.0	9.2	0.8	10.0
Measure	39 Days	8.8	0.5	0.0%	8.2%	92.0%	0.0%

Demographics

	Percent total population in poverty	Unemployed rate	No high school diploma (Age 25+)	Living in housing built before 1980	Percent age: under 18	Percent age: 65+	Percent of residents with cardiovascular disease	Percent of residents with asthma	Percent of residents with diabetes	Percent of residents with COPD
Index	8.5	9.7	9.5	6.0	8.0	8.2	3.6	1.5	5.0	5.2
Measure	14.9%	3.1%	5.3%	39.9%	20%	18%	6.0%	9.2%	7.1%	4.1%

Readiness

	Beliefs and Opinions: Answered Yes to "Is global warming happening?"	Beliefs and Opinions: Answered Yes to "Will global warming harm you personally?"	Beliefs and Opinions: Yes to "Will global warming harm future generations?"	Number of Local Public Health Priority Plans addressing climate issues (Weighted Average of Region's Counties)	Percent of land in a WUI risk area
Index	7.0	3.8	7.0	3.8	9.3
Measure	70.2%	38.4%	70.4%	1.51	7.2%

Summary

The southwest region, comprised of Delta, Gunnison, Montrose, Ouray, San Miguel, Hinsdale, Dolores, San Juan, Montezuma, La Plata, and Archuleta counties, has the second highest overall score: 6.8. That means it's one of the state's less vulnerable regions.

In the exposure category, the region had the third highest score. Fewer residents here used medical services due to heat-related illnesses in 2017. The region also had no weeks where any percentage of the population was living in severe to exceptional drought.

Southwestern Colorado scored a 6.5 for demographics, which means its residents are some of the state's less vulnerable demographically. The region has a lower proportion of adult residents without a high school degree and living in housing older than 1980. It also had a lower percentage of residents with chronic health conditions such as cardiovascular disease, diabetes and COPD.

The region scored a 6.2 in the readiness category, the same as the state average. Compared to other regions in the state, southwestern Colorado has a lower percentage of land in a WUI risk area and slightly more people who believe global warming is real and will harm them personally and future generations.

San Luis Valley



	Overall	Exposure	Demographics	Readiness
Region	7.0	8.2	5.4	7.4
State Avg.	6.4	7.2	5.9	6.2

Exposure

	Heat: Extreme heat days (90 degrees F or above)	Heat: Rate of heat-related emergency department visits per 10,000 residents	Heat: Rate of heat-related hospitalizations per 10,000 residents	Wildfire: Percent of acres burned in 2017	Wildfire: Wildfire risk moderate to highest in 2017	Wildfire: Percent of drinking water areas at risk	Drought: Percent weeks in severe, extreme, or exceptional drought
Index	10.0	6.4	10.0	10.0	9.8	1.0	10.0
Measure	0 Days	14.6	0.0	0.00%	2.5%	90.0%	0.0%

Demographics

	Percent total population in poverty	Unemployed rate	No high school diploma (Age 25+)	Living in housing built before 1980	Percent age: under 18	Percent age: 65+	Percent of residents with cardiovascular disease	Percent of residents with asthma	Percent of residents with diabetes	Percent of residents with COPD
Index	7.5	9.6	9.2	4.3	7.6	8.3	1.4	2.2	3.1	0.7
Measure	25.1%	3.9%	8.0%	56.7%	24%	17%	8.1%	8.4%	9.8%	7.9%

Readiness

	Beliefs and Opinions: Answered Yes to "Is global warming happening?"	Beliefs and Opinions: Answered Yes to "Will global warming harm you personally?"	Beliefs and Opinions: Answered Yes to "Will global warming harm future generations?"	Number of Local Public Health Priority Plans addressing climate issues (Weighted Average of Region's Counties)	Percent of land in a WUI risk area
Index	7.3	4.4	7.3	8.7	9.5
Measure	72.8%	44.2%	72.7%	3.49	5.5%

Summary

The San Luis Valley, comprised of Saguache, Mineral, Rio Grande, Alamosa, Conejos, and Costilla counties, has the highest overall score of 7.0. This means that the region experienced the least vulnerability to health risks from climate impacts in 2017. The region also has the smallest population of the seven, with just under 47,000 residents.

This may be counterintuitive, as the San Luis Valley has some of the state's more vulnerable demographics. But the score was largely driven by the region's low levels of exposure in 2017 and high scores in readiness.

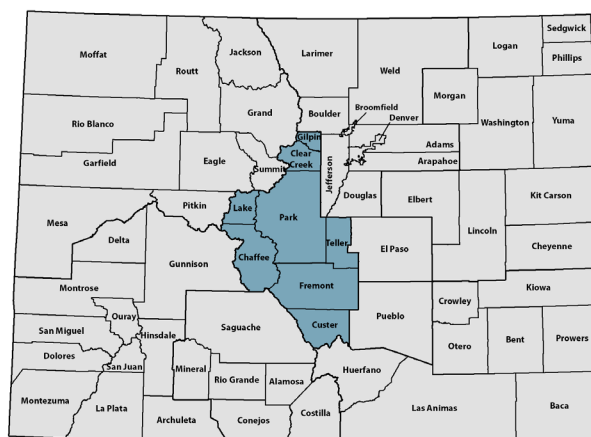
The San Luis Valley had the state's best exposure score: 8.2. This high score is driven by having no extreme heat days in 2017 as well as having a low percentage of land at elevated risk for wildfire. The region also had the

lowest rate of hospitalizations due to heat illness.

On the other hand, the valley had the second lowest score for demographic risk. This low score is due to the region's overall low socioeconomic status and higher prevalence of chronic illnesses. One in four people the San Luis Valley is living in poverty and 8 percent of the adult population doesn't have a high school degree. It is the youngest region in the state, with almost one in four residents under age 18. It also has some of the state's highest rates of cardiovascular disease, asthma, and COPD.

The San Luis Valley has the highest readiness score: 7.4. Residents are more likely to believe that global warming is currently happening and will harm them personally as well as future generations. The region has the most local public health plans concerning environmental health and chronic illnesses relative to its population.

Central Colorado



	Overall	Exposure	Demographics	Readiness
Region	6.5	7.9	5.8	5.7
State Avg.	6.4	7.2	5.9	6.2

Exposure

	Heat: Extreme heat days (90 degrees F or above)	Heat: Rate of heat-related emergency department visits per 10,000 residents	Heat: Rate of heat-related hospitalizations per 10,000 residents	Wildfire: Percent of acres burned in 2017	Wildfire: Wildfire risk moderate to highest in 2017	Wildfire: Percent of drinking water areas at risk	Drought: Percent weeks in severe, extreme, or exceptional drought
Index	9.8	8.6	7.4	10.0	9.1	0.6	10.0
Measure	6 Days	5.6	0.4	0.02%	9.0%	93.9%	0.0%

Demographics

	Percent total population in poverty	Unemployed rate	No high school diploma (Age 25+)	Living in housing built before 1980	Percent age: under 18	Percent age: 65+	Percent of residents with cardiovascular disease	Percent of residents with asthma	Percent of residents with diabetes	Percent of residents with COPD
Index	8.9	9.7	9.4	5.4	8.3	8.1	0.4	0.5	4.2	2.8
Measure	11.3%	3.2%	5.7%	46.1%	17%	19%	9.0%	10.2%	8.3%	6.1%

Readiness

	Beliefs and Opinions: Answered yes to "Is global warming happening?"	Beliefs and Opinions: Answered yes to "Will global warming harm you personally?"	Beliefs and Opinions: Answered yes to "Will global warming harm future generations?"	Number of Local Public Health Priority Plans addressing climate issues (weighted average of region's counties)	Percent of land in a WUI risk area
Index	6.9	3.7	6.9	2.6	8.5
Measure	68.8%	37.0%	68.6%	1.04	14.5%

Summary

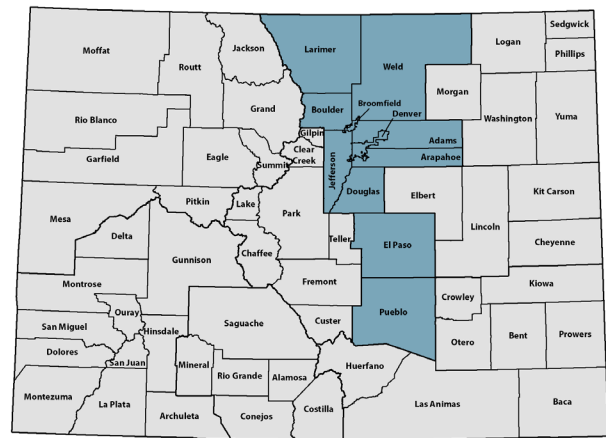
The central region, comprised of Gilpin, Clear Creek, Lake, Park, Chaffee, Teller, Fremont, and Custer counties, has an overall score of 6.5, above the state average.

The central region has the second highest exposure score: 7.9. This score is driven by a low number of extreme heat days as well as low rates of hospitalizations and emergency room visits for heat-related illness.

The region scored below the state average for the demographics category with a score of 5.8. The population is older than in many regions, with 19 percent above age 65. The region has above average rates of cardiovascular disease and asthma.

The region has the second lowest readiness score: 5.7. Residents were less likely to believe that global warming will harm them personally or harm future generations. The region has a low number of public health plans that can better prepare communities for the impacts of climate change by focusing on environmental health and chronic illnesses. The region also has one of the highest percentages of land in WUI risk areas.

Front Range



	Overall	Exposure	Demographics	Readiness
Region	6.5	7.5	6.5	5.6
State Avg.	6.4	7.2	5.9	6.2

Exposure

	Heat: Extreme heat days (90 degrees F or above)	Heat: Rate of heat-related emergency department visits per 10,000 residents	Heat: Rate of heat-related hospitalizations per 10,000 residents	Wildfire: Percent of acres burned in 2017	Wildfire: Wildfire risk moderate to highest in 2017	Wildfire: Percent of drinking water areas at risk	Drought: Percent weeks in severe, extreme, or exceptional drought
Index	8.5	7.3	6.4	10.0	9.5	2.1	8.7
Rate	56 Days	11.0	0.6	0.01%	5.0%	78.7%	13.2%

Demographics

	Percent total population in poverty	Unemployed rate	No high school diploma (Age 25+)	Living in housing built before 1980	Percent age: under 18	Percent age: 65+	Percent of residents with cardiovascular disease	Percent of residents with asthma	Percent of residents with diabetes	Percent of residents with COPD
Index	8.9	9.7	9.5	5.4	7.6	8.8	2.9	1.8	5.3	5.2
Rate	10.9%	2.8%	5.2%	46.5%	23.7%	12%	6.7%	8.9%	6.7%	4.0%

Readiness

	Beliefs and Opinions: Answered Yes to "Is global warming happening?"	Beliefs and Opinions: Answered Yes to "Will global warming harm you personally?"	Beliefs and Opinions: Answered Yes to "Will global warming harm future generations?"	Number of Local Public Health Priority Plans addressing climate issues (Weighted Average of Region's Counties)	Percent of land in a WUI risk area
Index	7.2	4.0	7.2	1.5	8.3
Rate	72.1%	39.8%	71.6%	0.61	16.9%

Summary

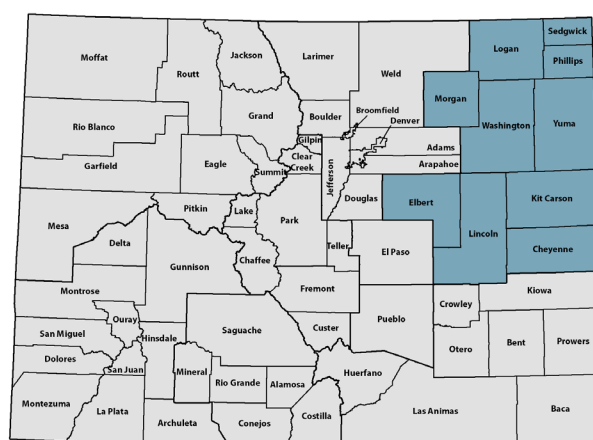
The Front Range, comprised of Larimer, Weld, Boulder, Broomfield, Denver, Jefferson, Adams, Arapahoe, Douglas, El Paso, and Pueblo counties, had an above average overall score of 6.5. That means this region, which is home to 83 percent of Colorado's population, is slightly less vulnerable than other parts of the state.

The region had a better-than-average exposure score of 7.5, even though 2017 saw almost seven weeks when the population was living in severe to exceptional drought. The region also saw 56 days above 90 degrees but didn't report high rates of hospitalization due to heat-related illness.

The Front Range tied with the Southwest for the second-highest demographics score: 6.5. The region has a high rate of adult residents with a high school degree, and unemployment is low. The region has high rates of chronic disease, especially asthma and cardiovascular disease.

The region has the state's lowest readiness score: 5.6. This low score is driven by a high percentage (17 percent) of land in a WUI risk area. This means more residents are at risk from wildfires and there is a higher need for emergency preparedness plans and resources. The region has a low rate of local public health plans that address environmental health issues relative to the population.

Northeastern Colorado



	Overall	Exposure	Demographics	Readiness
Region	6.2	6.9	6.0	5.8
State Avg.	6.4	7.2	5.9	6.2

Exposure

	Heat: Extreme heat days (90 degrees F or above)	Heat: Rate of heat-related emergency department visits per 10,000 residents	Heat: Rate of heat-related hospitalizations per 10,000 residents	Wildfire: Percent of acres burned in 2017	Wildfire: Wildfire risk moderate to highest in 2017	Wildfire: Percent of drinking water areas at risk	Drought: Percent weeks in severe, extreme, or exceptional drought
Index	8.4	6.5	2.5	10.0	10.0	3.4	7.5
Measure	58 Days	14.3	1.2	0.29%	0.0%	65.8%	24.5%

Demographics

	Percent total population in poverty	Unemployed rate	No high school diploma (Age 25+)	Living in housing built before 1980	Percent age: under 18	Percent age: 65+	Percent of residents with cardiovascular disease	Percent of residents with asthma	Percent of residents with diabetes	Percent of residents with COPD
Index	8.7	9.8	9.4	3.9	7.7	8.4	2.1	3.5	2.8	3.6
Measure	13.0%	2.2%	6.0%	61.3%	23.4%	16.1%	7.4%	7.0%	10.2%	5.4%

Readiness

	Beliefs and Opinions: Answered Yes to "Is global warming happening?"	Beliefs and Opinions: Answered Yes to "Will global warming harm you personally?"	Beliefs and Opinions: Answered Yes to "Will global warming harm future generations?"	Number of Local Public Health Priority Plans addressing climate issues (Weighted Average of Region's Counties)	Percent of land in a WUI risk area
Index	6.5	3.6	6.6	2.7	9.5
Measure	64.6%	36.3%	65.7%	1.07	5.4%

Summary

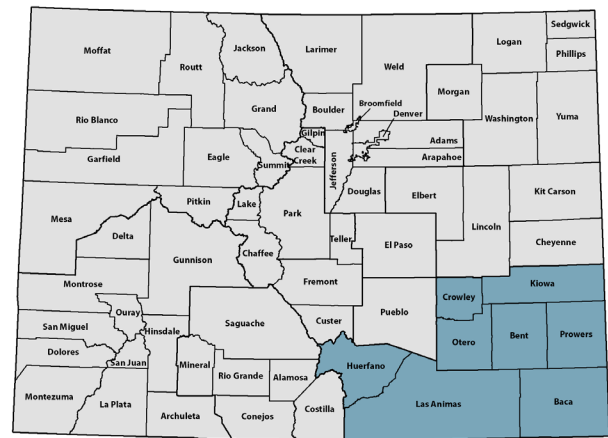
Northeastern Colorado, comprised of Logan, Sedgwick, Phillips, Washington, Yuma, Elbert, Lincoln, Kit Carson, and Cheyenne counties, had the second lowest overall score: 6.2.

The region had a below-average exposure score of 6.9. In 2017, it endured a high number of extreme heat days (58 days) and had a high rate of residents using medical services for heat-related illnesses.

The region scored below average in demographics, with a 6.0. The region ranked low for older housing, with over 60 percent of homes built before 1980. It is also home to a higher percentage of residents under the age of 18. Northeastern Colorado has a very low unemployment rate: 2.2 percent.

The region has a low readiness score: 5.8. This lower score is driven by its residents' beliefs about global warming. Compared to the other six regions, fewer people in northeastern Colorado believe global warming is occurring (64 percent), that it will harm them personally (36 percent) or that it will harm future generations (66 percent).

Southeastern Colorado



	Overall	Exposure	Demographics	Readiness
Region	5.7	6.2	4.6	6.2
State Avg.	6.4	7.2	5.9	6.2

Exposure

	Heat: Extreme heat days (90 degrees F or above)	Heat: Rate of heat-related emergency department visits per 10,000 residents	Heat: Rate of heat-related hospitalizations per 10,000 residents	Wildfire: Percent of acres burned in 2017	Wildfire: Wildfire risk moderate to highest in 2017	Wildfire: Percent of drinking water areas at risk	Drought: Percent weeks in severe, extreme, or exceptional drought
Index	8.4	0.0	6.3	10.0	9.9	1.6	7.2
Measure	60 Days	40.9	0.6	0.03%	0.7%	84.5%	28.3%

Demographics

	Percent total population in poverty	Unemployed rate	No high school diploma (Age 25+)	Living in housing built before 1980	Percent age: under 18	Percent age: 65+	Percent of residents with cardiovascular disease	Percent of residents with asthma	Percent of residents with diabetes	Percent of residents with COPD
Index	7.9	9.6	9.2	2.8	7.9	8.0	0.0	0.0	0.0	0.0
Measure	20.7%	3.6%	8.1%	71.6%	21%	20%	9.4%	10.8%	14.2%	8.4%

Readiness

	Beliefs and Opinions: Answered Yes to "Is global warming happening?"	Beliefs and Opinions: Answered Yes to "Will global warming harm you personally?"	Beliefs and Opinions: Yes to "Will global warming harm future generations?"	Number of Local Public Health Priority Plans addressing climate issues (Weighted Average of Region's Counties)	Percent of land in a WUI risk area
Index	6.9	4.1	6.9	3.4	9.7
Measure	69.3%	41.0%	69.2%	1.38	3.5%

Summary

Southeastern Colorado, comprised of Kiowa, Crowley, Otero, Bent, Prowers, Huerfano, Las Animas, and Baca counties, has the lowest overall score: 5.7. This region, known for its grasslands, experiences significant climate-related exposure and has a particularly vulnerable population.

This region had the state's highest rates of emergency department visits due to heat-related illnesses in 2017. Southeastern Colorado also had high number of extreme heat days (60 days).

The region had the lowest demographic score in the state. The drivers of this low score are high rates of cardiovascular disease, asthma, diabetes, and COPD. The region's rates for these illnesses is almost double the state average. Its residents were also more likely to not have a high school diploma and to live in poverty.

The region scored a 6.2 for readiness, which is the same as the state average. It has the lowest percentage of land in a WUI risk area and a higher than average percentage of residents who believe that global warming will harm them personally.

Endnotes

¹ Incident Information System, InciWeb, Available at: <https://inciweb.nwcg.gov/incident/5875/>

² Colorado Department of Public Health and Environment, Regional Environmental Health, Available at: <https://www.colorado.gov/pacific/alamosacounty/regional-environmental-health>

³ State of the Air Report, 2017, Available at: <https://www.lung.org/assets/documents/healthy-air/state-of-the-air/state-of-the-air-2017.pdf>

⁴ Colorado Department of Public Health and Environment (CDPHE), Local Public Health Priority Plans, Available at: https://www.colorado.gov/pacific/sites/default/files/LPHA_Clean-Air-Map.pdf

Data Sources and Acronyms

PRISM: Parameter-elevation Regressions on Independent Slopes Model

CDPHE: Colorado Department of Public Health and Environment

CSFS: Colorado State Forest Service

CDHSEM: Colorado Division of Homeland Security and Emergency Management

ACS: American Community Survey

CDLE: Colorado Department of Labor and Employment



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