SOME ACTIONS ALREADY TAKEN

- The state’s Multi-Hazard Mitigation Plan, technical assistance programs, disaster response plans, emergency communications materials, and sector-specific programs are helping Montana address its current risks.
- The Governor’s Report on the Potential for Drought and Flooding in Montana discusses how future drought, extreme heat, and wildfire risks could affect water supply.
- The Montana State Water Plan discusses how climate change could affect water supply, and proposes adaptation measures to reduce these impacts.

WEAKNESSES

- No evidence of detailed statewide climate change vulnerability assessments across the sectors examined.
- No evidence of official state funding, policies, or guidelines to improve resilience against climate change-related extreme heat, drought, or wildfire.
- No evidence of action to incorporate climate change projections associated with extreme heat, drought, or wildfire into state-level programs, investments, and activities.
- Extreme heat is not covered in the State Multi-Hazard Mitigation Plan.
- Limited evidence that the State Water Plan’s recommendations are currently being implemented.
Montana has the second lowest extreme heat preparedness score in the nation and earns an F for its far below average level of preparedness in the face of a below average overall threat. Because Montana is so sparsely populated, its heat wave threat to vulnerable populations is below average among the lower 48 states. While most states have taken strong action to address their current heat risks, Montana has taken only a fair amount of action to address its current heat risks. The Department of Public Health and Human Services (DPHHS) does have some initiatives on the health impacts of extreme heat events, but the Montana State Multi-Hazard Mitigation Plan does not cover extreme heat events. Montana’s heat wave threat is projected to more than quadruple by 2050, but due partly to the state’s sparse population, remain at a below average threat level. Despite this substantial increase, Montana has taken almost no action to understand its future heat risks, whereas the majority of states have taken at least limited action. Montana has also taken no action to plan for or implement adaptation measures for its future heat risks.

**KEY FINDINGS:**

**EXTREME HEAT THREAT**

<table>
<thead>
<tr>
<th>Extreme Heat Threat to Vulnerable Populations</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank (among states)</td>
<td>35th</td>
<td>38th</td>
<td>39th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>2030</td>
<td>2050</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 1 Average number of heat wave days per year times total vulnerable population. A score of 1 represents 1 vulnerable person exposed to 1 heat wave day. 

**Average annual number of heat wave days: Average number of days each year on which the maximum temperature exceeds the 95th percentile of daily maximum temperature in the baseline period (1991-2010) for at least three consecutive days.**

**DID YOU KNOW?**

- Currently, Montana averages 5 days a year classified as dangerous or extremely dangerous, according to the NWS Heat Index. By 2050, it faces three times as many such days, nearly 15 a year.
- By 2050, the typical number of heat wave days in Montana is projected to quadruple from 10 to nearly 40 days a year.
- Montana has more than 26,000 people 65 and older, or under 5 years old, living below the poverty line, which is below average among the lower 48 states. These groups are considered to be especially vulnerable to extreme heat.
EXAMPLE CRITERIA
A subset of the criteria used to develop Montana’s extreme heat preparedness grade.

<table>
<thead>
<tr>
<th></th>
<th>Transportation</th>
<th>Energy</th>
<th>Water</th>
<th>Health</th>
<th>Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADDRESSING CURRENT RISKS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the State Hazard Mitigation Plan cover extreme heat?</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Does the state have an extreme heat emergency response plan that is updated routinely?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>n/a</td>
</tr>
<tr>
<td>Does the state provide extreme heat emergency communication materials for citizens?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>CONDUCTING VULNERABILITY ASSESSMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the state published information on how the frequency or severity of extreme heat events may change in the future?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Has the state conducted extreme heat vulnerability assessments for each sector?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Is the state tracking extreme heat impacts?</td>
<td>NO</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>PLANNING FOR ADAPTATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a statewide climate change adaptation plan covering extreme heat?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Is there a statewide implementation plan for climate change adaptation?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Does the state have sector-specific extreme heat adaptation plans?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>IMPLEMENTING RESILIENCE ACTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there optional state guidelines for resilient activities (e.g., construction)?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Are there state requirements for resilient activities (e.g., construction)?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Is there evidence that the state is implementing extreme heat adaptation policy/guidelines?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
</tbody>
</table>

“n/a” indicates that the sector is either insensitive to the threat or the state does not have a significant role.

MONTANA
Montana has one of the worst drought preparedness scores and earns an F for its below average level of preparedness in the face of a far above average overall widespread summer drought threat. Currently, Montana is among the worst affected states of the 36 states assessed for drought, but it has taken only a fair amount of action to address its current drought risks (most states have taken strong or extensive action). By 2050, Montana is projected to remain in the top five worst affected states yet it has taken only limited action to understand, plan for, and implement adaptation measures for future drought risks.

MONTANA COMPARED TO OTHER STATES:

The preparedness grade represents how well a state is preparing for its threat level, relative to all states evaluated for that threat. It compares a state’s position in the distribution of threat levels to its position in the distribution of preparedness scores. Thus two states with the same absolute preparedness score might receive different grades, depending on their levels of threat—a state with a higher threat level would receive a lower grade. For details, see the methodology.

KEY FINDINGS:

Severity of widespread summer drought: Sum of soil moisture deficit (standard score) in the summer months for model grid cells where the standard score is less than -1, when at least 30% of grid cells in a state meet this criterion.
EXAMPLE CRITERIA
A subset of the criteria used to develop Montana’s drought preparedness grade.

<table>
<thead>
<tr>
<th></th>
<th>Transportation</th>
<th>Energy</th>
<th>Water</th>
<th>Health</th>
<th>Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADDRESSING CURRENT RISKS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the State Hazard Mitigation Plan cover drought?</td>
<td>n/a</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>n/a</td>
</tr>
<tr>
<td>Does the state have a drought emergency response plan that is updated routinely?</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Does the state provide drought emergency communication materials for citizens?</td>
<td>n/a</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>CONDUCTING VULNERABILITY ASSESSMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the state published information on how the frequency or severity of drought may change in the future?</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Has the state conducted drought vulnerability assessments for each sector?</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Is the state tracking drought impacts?</td>
<td>n/a</td>
<td>n/a</td>
<td>✓</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>PLANNING FOR ADAPTATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a statewide climate change adaptation plan covering drought?</td>
<td>n/a</td>
<td>NO</td>
<td>✓</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Is there a statewide implementation plan for climate change adaptation?</td>
<td>n/a</td>
<td>NO</td>
<td>✓</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Does the state have sector-specific drought adaptation plans?</td>
<td>n/a</td>
<td>NO</td>
<td>✓</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>IMPLEMENTING RESILIENCE ACTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there optional state guidelines for resilient activities (e.g., construction)?</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Are there state requirements for resilient activities (e.g., construction)?</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
<tr>
<td>Is there evidence that the state is implementing drought adaptation policy/guidelines?</td>
<td>n/a</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>n/a</td>
</tr>
</tbody>
</table>

“n/a” indicates that the sector is either insensitive to the threat or the state does not have a significant role.
Montana earns a C for its average level of preparedness in the face of a below average overall wildfire threat. Currently, Montana’s threat is below average among the 24 states assessed for wildfire, largely because Montana has a small population living in the wildland-urban interface. Like the majority of states, Montana has taken strong action to prepare for its current wildfire risks through the State Multi-Hazard Mitigation Plan. The state’s Energy Assurance Plan also includes strategies to reduce wildfire risks, and the Department of Natural Resources and Conservation (DNRC) has a fire suppression program. While Montana is projected to have a large percent increase in threat level by 2050, it is projected to continue to face a below average threat. Montana has taken limited action to understand its future wildfire risks, but there is no evidence that the state is planning for or implementing measures to address its future wildfire risks.

MONTANA COMPARED TO OTHER STATES:

THREAT LEVEL:

PREPAREDNESS LEVEL:

The preparedness grade represents how well a state is preparing for its threat level, relative to all states evaluated for that threat. It compares a state’s position in the distribution of threat levels to its position in the distribution of preparedness scores. Thus two states with the same absolute preparedness score might receive different grades, depending on their levels of threat—a state with a higher threat level would receive a lower grade. For details, see the methodology.

KEY FINDINGS:

<table>
<thead>
<tr>
<th>WILDFIRE THREAT</th>
<th>2000</th>
<th>2030</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Days With High Wildfire Potential</td>
<td>10</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Rank (among states)</td>
<td>24th</td>
<td>24th</td>
<td>24th</td>
</tr>
</tbody>
</table>

Average Annual Number of Days with High Wildfire Potential: Average number of days each year with Keetch-Byram Drought Index values exceeding 600.

DID YOU KNOW?

- Montana has only 600,000 people (below average) living within the wildland-urban interface, where developed land and wild lands converge and intersperse, and vulnerability to wildfire is elevated. However, this equates to about 60 percent of Montana’s total population, which is above average among the 24 states assessed for wildfire.
- Currently, the number of days per year with high wildfire potential, weighted by its vulnerable population, is below average, the lowest among the 24 states assessed.
- By 2050, Montana’s average number of days with high wildfire potential is projected to increase from less than 1 to more than 5 days a year.
EXAMPLE CRITERIA
A subset of the criteria used to develop Montana’s wildfire preparedness grade.

<table>
<thead>
<tr>
<th></th>
<th>Transportation</th>
<th>Energy</th>
<th>Water</th>
<th>Health</th>
<th>Communities</th>
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</thead>
<tbody>
<tr>
<td><strong>ADDRESSING CURRENT RISKS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the State Hazard Mitigation Plan cover wildfire?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Does the state have a wildfire emergency response plan that is updated routinely?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Does the state provide wildfire emergency communication materials for citizens?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>CONDUCTING VULNERABILITY ASSESSMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the state published information on how the frequency or severity of wildfires may change in the future?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Has the state conducted wildfire vulnerability assessments for each sector?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Is the state tracking wildfire impacts?</td>
<td>✓</td>
<td>n/a</td>
<td>NO</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>PLANNING FOR ADAPTATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a statewide climate change adaptation plan covering wildfire?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Is there a statewide implementation plan for climate change adaptation?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Does the state have sector-specific wildfire adaptation plans?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td><strong>IMPLEMENTING RESILIENCE ACTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there optional state guidelines for resilient activities (e.g., construction)?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Are there state requirements for resilient activities (e.g., construction)?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Is there evidence that the state is implementing wildfire adaptation policy/guidelines?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

“n/a” indicates that the sector is either insensitive to the threat or the state does not have a significant role.