

Bitterroot Valley Climate Resilience Resource Guide

ResilienceMT is a NOAA-funded, University of Montana environmental literacy education project working with Montana communities to build resilience to wildfires, drought, flooding, and extreme heat.

OVERVIEW

Climate change is a global problem that is already affecting western Montana. Understanding climate trends and risks in the Bitterroot Valley will help communities adapt and become more resilient to the changes occurring now and in the future.

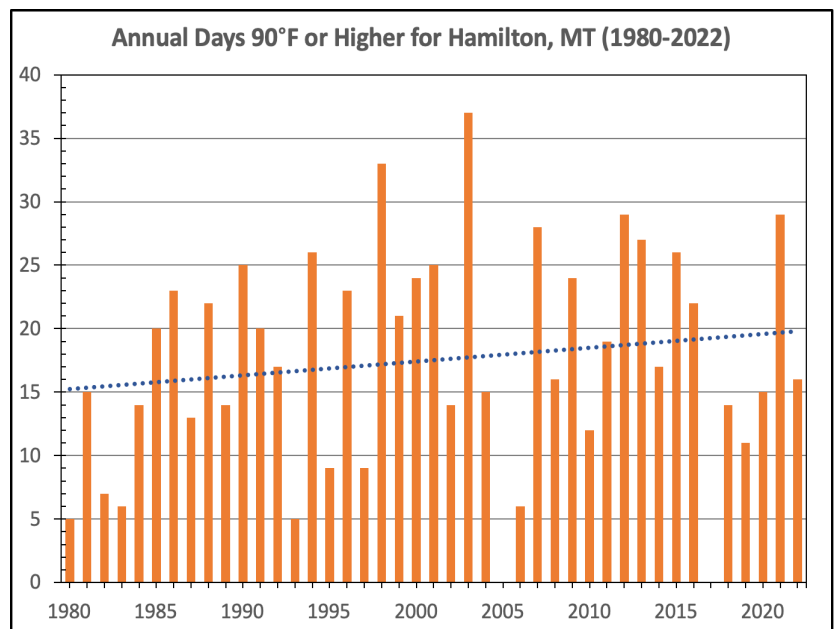
This guide covers climate change trends, impacts, and resilience strategies for the Bitterroot Valley.

Climate Trends

Average annual temperatures in western Montana are increasing. We are seeing more days over 90°F and fewer days below 32°F. For example, in Hamilton, the average number of days $\geq 90^\circ\text{F}$ increased from about 15 days/year in 1980 to 20 days/year 2022, a 33% increase.

Winter precipitation has decreased slightly in Montana in recent decades, which is reflected in the reduced snowpack over time.

In the future, summers are expected to become hotter and drier. Springs are expected to become warmer and wetter. More precipitation will fall as rain rather than snow, even at higher elevations.



Data source: NOAA's National Center for Environmental Information

Climate Impacts

Although wildfire poses one of the most immediate threats, water supplies, recreation, agriculture, and human health are all threatened by climate change as well. In the future, the Bitterroot Valley could experience increasing impacts from extreme heat, drought, and flooding. Developing and implementing climate resilience strategies will help communities prepare!

EXTREME HEAT

In recent years, Montana has seen record-breaking heat in the summer months. Heat waves are projected to become more common and intense in the future. Hotter days and warmer nights cause stress on plants, animals, and people.

Extreme heat – multiple days in a row over 90 degrees – threatens rural communities who have historically lived without air conditioning. People who work outdoors (e.g., landscapers and construction workers), youth, the elderly, and people with certain health conditions are especially vulnerable to heat-related illness.

Heat exhaustion and heatstroke are serious medical conditions. Learn the signs of heat-related illnesses and how to prevent them.

Communities can work together to spread awareness of the dangers of extreme heat and take steps so everybody stays safe, such as promoting ways to help buildings stay cool.

You can also follow local news and weather reports for extreme heat alerts, find cool places during the hottest times of the day, and plan your and your family’s activities to stay cool. Here are some other tips to beat the summer heat:

Limit time outdoors in the sun.

It can be difficult to regulate your body temperature on hot, sunny days.



Stay hydrated.

Drinking lots of water helps your body cool down naturally.



Be mindful of your physical activity

Exercise in extreme heat puts your body at greater risk of a heat-related illness.



Create shade!

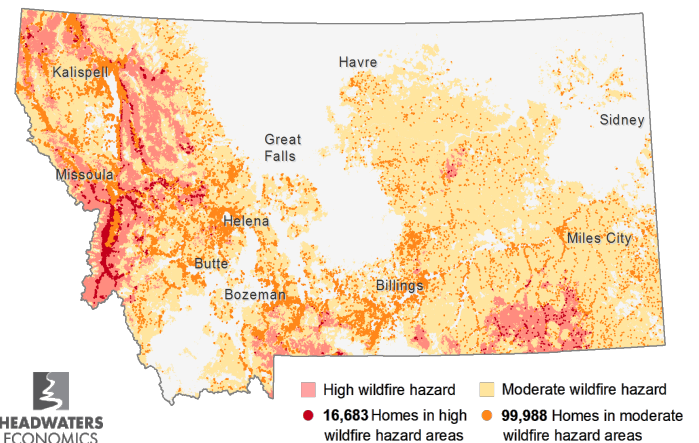
Growing trees and building shade structures around homes and in urban areas can help keep us cool.



WILDFIRE

Hotter, drier summers are increasing wildfire hazards. So too is building in the Wildland Urban Interface (WUI), which is the zone where developed areas with houses and other human-built structures meet undeveloped wildlands including forests and grasslands.

According to Headwaters Economics, Ravalli County had by far the most homes built in wildfire hazard areas from 1980 to 2018. Along with more buildings in the path of wildfires within the WUI comes a growing need to fight wildfires that threaten those buildings.



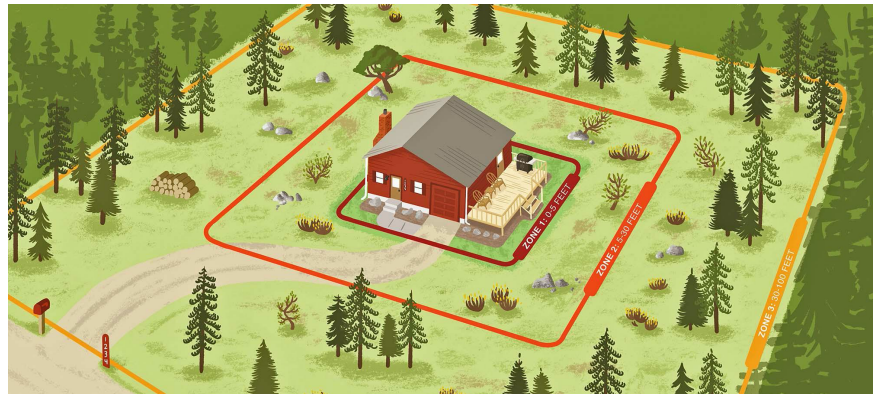
Wildfire hazard areas and homes in wildfire hazard areas

HEAT EXHAUSTION	OR	HEAT STROKE
Faint or dizzy		Throbbing headache
Excessive sweating		No sweating
Cool, pale, clammy skin		Body temperature above 103° Red, hot, dry skin
Nausea or vomiting		Nausea or vomiting
Rapid, weak pulse		Rapid, strong pulse
Muscle cramps		May lose consciousness
<ul style="list-style-type: none"> • Get to a cooler, air conditioned place • Drink water if fully conscious • Take a cool shower or use cold compresses 		<h2>CALL 9-1-1</h2> <ul style="list-style-type: none"> • Take immediate action to cool the person until help arrives

Symptoms & responses to heat-related illness

Fire season in Montana is expected to get longer in the future, and fire danger is expected to increase. In Ravalli County, homebuilding in wildfire hazard areas is putting people and property in harm's way and increasing the need to make houses and yards more resilient to fire. If your house is in a fire-prone area, there are some simple actions you can take to reduce risks. Fire in the Root recommends the following:

- Create a defensible space in the *immediate zone* (within 5 ft. of your home) by clearing trees, shrubs, dead leaves, and debris.
- In the *intermediate zone* (5-30 ft. from your home), create an additional fuel break by removing vegetation, especially under trees.
- In the *extended zone* (from 30 to 100 ft.) thin shrubs and small conifers between mature trees and remove low dead branches or “ladder fuels.”

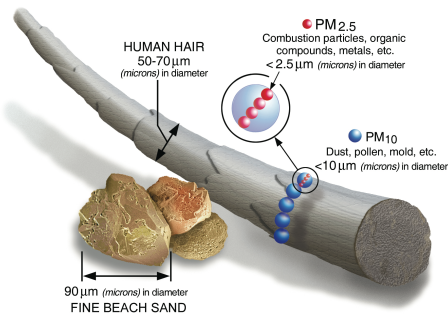


A properly treated Home Ignition Zone (HIZ)

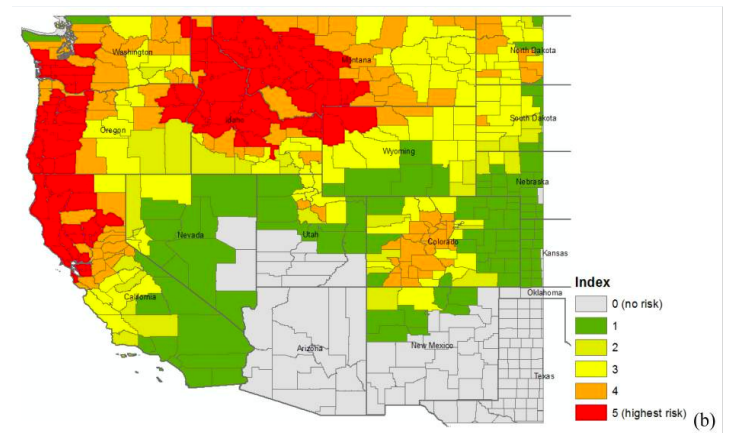
Community leaders can adopt building codes, plans, and policies to reduce community wildfire hazards.

SMOKE

Bitterroot Valley residents are very familiar with wildfire smoke. “Smoke waves,” defined as two or more days of unhealthy air, are likely to be longer, more intense, and more frequent in the coming decades.



Wildfire smoke includes very fine particulate matter (PM), less than 2.5 micrometers wide (PM2.5), or 30 times smaller than the width of a human hair!



Map showing wildfire smoke risk by mid-century

PM2.5 can get past the lung’s natural defenses. It is especially dangerous to vulnerable populations such as children, the elderly, and persons with respiratory or heart conditions. Among counties in Montana, Ravalli County had the most days of unhealthy air in the state in recent years. Poor air quality during wildfire season has caused schools to cancel sport practices and games. It is important to be aware of the local Air Quality Index (AQI) levels to guide your and your family’s outdoor activities during wildfire season!

AQI Level	Condition	Health Risk
0–50	Good	Little or no risk
51-100	Moderate	Very sensitive people may be affected
101-150	Unhealthy for Sensitive Individuals	Sensitive people may be affected
151-200	Unhealthy	General public may experience health effects
201-300	Very Unhealthy	Health Alert: Risk increased for everyone
>300	Hazardous	Health Warning: Everyone may be affected

To help their neighbors, the Bitterroot Climate Action Group (BCAG), with a grant from the Dept. of Natural Resources and Conservation and Fire in the Root, had a HEPA Filter Project to distribute portable air filtration units to financially strained residents who are susceptible to wildfire smoke.

DROUGHT

Climate change is associated with an increase in extreme weather events, including more severe and longer periods of drought. Recreation industries that draw tourists, support small businesses, and provide jobs in the Bitterroot Valley will be affected.

With hotter, drier summers, drought is a growing concern in the Bitterroot Valley. Streamside and wetland wildlife habitat will be under increasing stress. Fishery closures due to warming waters and lower stream flows will become more common too.

With warming winters, Montana is expected to experience “snow droughts” in the coming years, which will negatively impact winter recreation.

Agriculture in Ravalli County, which generated \$42 million in revenue in 2017, will also need to adapt to climate change, especially dryland farming. Water overallocation and stream dewatering that is already occurring highlight the need to plan for a hotter, drier future.



Lost Trail Ski Resort, Sula, MT

FLOODING

Warmer air can hold more moisture – and release it quickly! As we saw with the Yellowstone River floods in 2022, flooding can devastate communities. Across the state, precipitation is projected to increase in the spring in the future.

Rain-on-snow events cause rapid run-off that can quickly raise stream levels to flood levels. The Bitterroot River has seen flooding or flood advisories the last three springs. Such events are expected to be more frequent and severe in the future with more extreme weather events.



Flooding on the Bitterroot River in 2022

Wildfire can also increase flood risk by leaving fine ash layers that can repel water, leading to more runoff. Thus, Bitterroot communities need to prepare for and work on mitigating flooding risk.

RESOURCES TO LEARN MORE

Check out the Resilience Links at tinyurl.com/ResilienceMT or use this QR Code →



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