FACT SHEET

Wildfire and Water Supplies

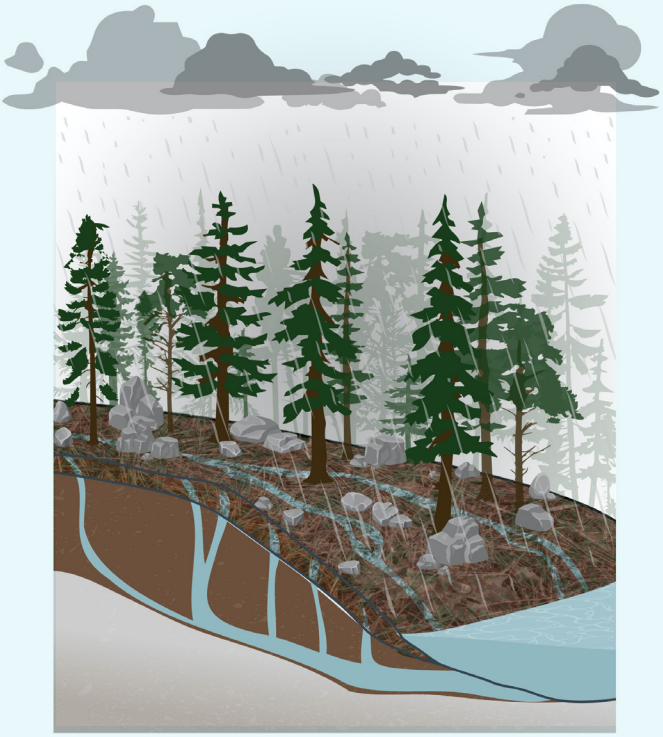
There's a close link between forest health and clean water in Colorado. About 80% of Colorado's population relies on forested watersheds to deliver municipal water supplies — the threat of wildland fire and its negative impacts on water affects many people across the state. According to the U.S. Forest Service, which manages more than 14.5 million acres of national forest lands in Colorado, 90 percent of those lands are located in watersheds that contribute to public water supplies.

In a forest, as snowpack melts, runoff eventually collects in small streams that drain toward rivers, creating watersheds and river basins. As water flows down mountain slopes, the forests stabilize soil and prevent erosion, filter contaminants, enhance soil moisture storage and groundwater recharge, and reduce the likelihood of flooding. Water slowly percolates through the soil or runs off forested watersheds typically with low nutrient and sediment concentrations. As forest soils and vegetation absorb water, they buffer against strong storms and minimize flooding. Fire changes that, sometimes for years.

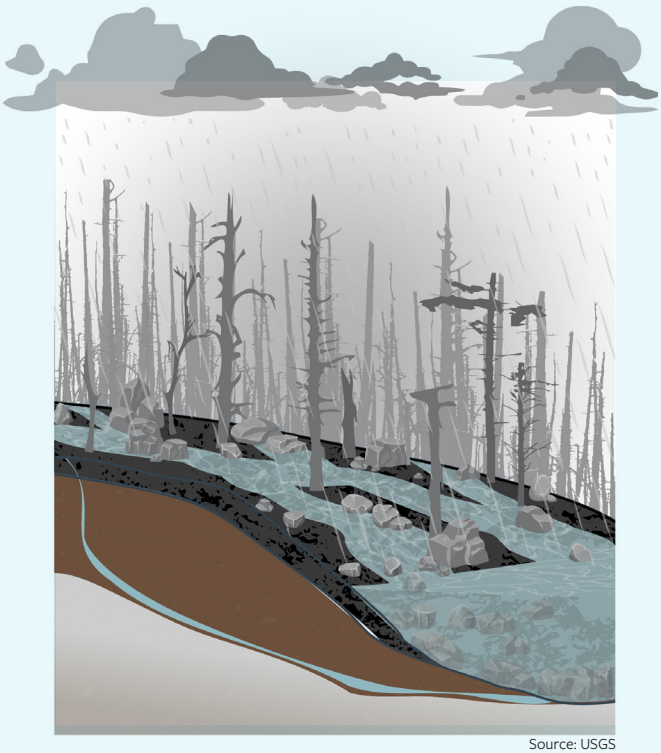
During a fire, ash, firefighting chemicals, and other contaminants settle on streams and reservoirs as trees and vegetation burn. When a fire is severe and slow moving and the right variables are present — the types of burning vegetation and the right soil temperature, texture and moisture, among others — the burn can result in water-repellent or "hydrophobic" soils.

After the fire, burned debris and vulnerable soils pose a long-term risk to nearby waterways. Rainstorms and other precipitation flush ash, sediment, debris, nutrients and other contaminants into streams and reservoirs. Without vegetation and root systems to hold sediment in place, massive erosion and flooding can occur, which is worsened by hydrophobic soils. Water rushes down the landscape, rather than slowly percolating into the ground. When contaminants are flushed into streams and reservoirs, they can impact water quality, aquatic habitat and fish spawning grounds, sometimes resulting in fish kills. Ash and debris that enters reservoirs and pipes can have long-term drinking water impacts, sometimes to the point where the water or infrastructure becomes unusable. Increased runoff, high stream temperature, nitrogen, turbidity levels and other impacts may remain for years after a burn.

Pre-fire Forest



Post-fire Forest



Source: USGS

After a Burn

After a wildland fire, erosion control methods slow runoff and debris flows. On federal lands, a Burned Area Emergency Response (BAER) team makes treatment recommendations, but on private property, landowners can work with local coalitions or entities such as the Natural Resources Conservation Service to assess and treat their landscape.

BAER recommendations begin with determining the most urgent threats, including the extent of water-repellent soils, soil cover, flood- and debris-prone areas, channel stability, potential for increased erosion and water quality deterioration, barriers to water flow, hazardous material contamination, and more. Then work begins to stabilize the area, reduce erosion, slow streamflows, and trap sediment and other contaminants through land treatments and stream channel treatments.

Providing Water After a Burn

After a burn, a community's water supply or infrastructure may be affected or become unusable, leaving limited options to get water to the people who need it. Water providers often continue to deliver water by finding a way to treat contaminated water, using other water sources, and limiting water consumption.

During the 2020 Grizzly Creek Fire, the City of Glenwood Springs, which typically draws its water from No Name Creek right in the fire's path, switched to its emergency water source: the Roaring Fork River. In the aftermath of the fire, the city is building new pipelines so it can more easily draw water from the Roaring Fork in an emergency or mix it with its other water sources to improve quality. Glenwood Springs also updated its pretreatment plant and intake pipe to filter out debris, heavy metals, and other contaminants that run off of burn scars.

Fort Collins and Greeley rely on the Cache la Poudre River, which was impacted by the 2020 Cameron Peak and East Troublesome wildfires, for a portion of their water supplies. The two communities had to close water intakes off the Poudre and rely on alternative water sources. Now, the cities are working, along with Larimer County, to stabilize burned hillsides, but they expect that ash, debris, sediment and other contaminants could make the Poudre River unusable in summer 2021. Fort Collins has asked customers to voluntarily reduce their water use as it prepares to rely primarily on stored reservoir water.

Source Water Protection

To protect public drinking water supplies, the Colorado Department of Public Health and Environment (CDPHE) runs a non-regulatory Source Water Assessment and Protection (SWAP) program. The program stems from the U.S. Environmental Protection Agency's Safe Drinking Water Act, which was established in 1974 to protect public health by regulating drinking water supplies. In 1996, U.S. Congress amended the law and required all states to develop a Source Water Assessment program.

Colorado's plan includes two phases: one to assess public drinking water systems and potential contaminants and a second to develop and implement source water protection plans by reducing pollutant risks, including risks from wildfire, through management. The development of those SWAPs is voluntary and done locally, though some state grants are available to assist with the development or implementation of SWAPs. According to CDPHE's Source Water Protection Plan Data Viewer, updated in April 2020, there are 33 completed and publicly accessible SWAPs in Colorado, but more than 100 completed plans that are not public.

BY THE NUMBERS

80%

of Coloradans rely on forested watersheds for clean drinking water

$64 million

Invested, as of 2021, in forest management through the Forests to Faucets Program to protect Denver's water supply

NEED TO KNOW

Burned forests impact water quantity, not just quality. A 2018 study in the journal Nature Communications found that wildland fires enhanced annual river flow in the semi-arid West. Data indicates that a fire that burns 15% of a watershed can enhance flows for five years or more.

Wildfire risk is the likelihood of fire occurring, intensity of a burn, and the effects of the fire. A 2021 report, "A Cost-Benefit Analysis of Denver's Forests to Faucets Program" found that the program's economic impact could improve by prioritizing work in the highest risk areas.

RESOURCES

Forest Management to Protect Colorado Water Resources: tinyurl.com/swnz5ffx

2020 Colorado Forest Action Plan: tinyurl.com/nmvcd4nz

Burned Area Emergency Response: tinyurl.com/wcvfhbha

Colorado Post-Fire Recovery Playbook: tinyurl.com/bvwtvtt3

Colorado Source Water Protection Plan Data Viewer: tinyurl.com/379esz7b

After the Flames: tinyurl.com/ffwt7yts

FRESH WATER NEWS

WATER EDUCATION COLORADO

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