How wildfires are threatening Colorado water supplies—and costing a lot of money

July 31 2023, by Elise Schmelzer, The Denver Post

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The Colorado River this spring ran high, fast and so full of sediment pushed downstream from wildfire burn scars that the water treatment plant in Hot Sulphur Springs couldn't keep up.

The sediment repeatedly clogged the town's intake valves, forcing town leaders to issue an emergency order in April and call for residents to voluntarily cut back on water use.

"It was pretty much to the breaking point," said Nick Rardin, water operator with the town.

The 700-person town 30 miles northwest of Winter Park is the most recent Colorado community to deal with impacts to water supplies due to wildfires. As wildfires become larger and more catastrophic across the drying West, water leaders warn communities must prepare for the eventual impact on the critical watersheds that provide the water flowing from Colorado taps.

"We need to figure out what strategies we need to be more resilient in the face of these fires—they're not going to stop happening," said Esther Vincent, director of environmental services for Northern Water.

Wildfires reduce reservoir capacities and make water more difficult to treat—two expensive problems for water utilities and towns that might start manifesting in residents' water bills. Colorado communities continue to deal with water quality problems from the destructive 2020 wildfire season as local, state and federal agencies spend millions of dollars to prepare for the future of wildfire here.

"There is still a lot of watershed to burn," Vincent said.

Charred soil, gritty water

Wildfires alter watersheds and the water that flows through them for years.

In areas that have not burned, soil is more capable of absorbing rain and

snowmelt and vegetation helps hold that soil in place, said Peter Nelson, an associate professor at Colorado State University who studies wildfire effects on water.

But in burn scars, much of that vegetation is gone and the soil is less absorbent. Snow melts faster and less rain is absorbed, leading to higher runoffs and increased flood probability. High volumes of water combined with a lack of vegetation roots to hold soil in place means more sediment and debris travel downstream, Nelson said.

That dirt, rock, ash and debris eventually settles in reservoirs, reducing the amount of space available for water and sometimes clogging systems that take water from the reservoirs for treatment and use.

After fire, water can also carry more nutrients into streams and reservoirs. Increased nutrients can lead to more frequent blooms of algae, some of which are toxic.

Researchers continue to study how wildfires impact water supplies and the best ways to address any harms.

"There's quite a bit in this whole field we would like to know more about," Nelson said. "There's not a shortage of research questions."

High costs

Hot Sulphur Springs was able to provide enough water for its residents through the spring, but it came at a cost.

The city rented more filtration equipment that cost about $20,000 to set up and $1,000 a day to operate, Mayor Ray Tinkum said. Now, town leaders are looking for money to build a permanent, alternative water source to tap when the river water becomes too gritty—a project that

Tinkum expects will cost at least $300,000.

"Pretty soon we're going to have to get an inflow of assistance or we're going to have to reach into the pockets of our community," Tinkum said.

Hot Sulphur Springs is not alone. Silt is the first town on the Colorado River downstream from the 2020 Grizzly Creek Fire, which burned about 46 square miles of land around Glenwood Canyon and created havoc for the small town's water systems.

The city of about 3,500 people spent $100,000 shortly after the fires to replace filters on its water system because it couldn't handle the amount of sediment in the water, said Trey Fonner, the town's public works director. The town had to slow down water treatment to give more time for sediment to settle out of the water, he said.

Now the town is considering building a new $28 million water treatment plant to address the sediment in the water as well as the growing population. Silt residents will see that cost in increased water bills, he said.

The new plant could've waited several years had the fire not happened, Fonner said.

"It's come down to build a new plant or spend the same amount of money to get pre-treatment in front of this plant, but that wouldn't improve capacity that much," he said.

The 2020 East Troublesome Fire in Grand County and Rocky Mountain National Park could also eventually impact water supplies on the Front Range. Northern Water draws water from the reservoirs in Grand County and other water sources west of the Continental Divide and provides it to more than 1 million customers on the Front Range.

It's too early to know exactly what those changes could look like, said Vincent of Northern Water. Although Willow Creek is no longer running black from ash, it continues to dump a significant amount of sediment in Willow Creek Reservoir and is decreasing its capacity.

The nutrients in the water from the fire have also increased algae blooms in Willow Creek Reservoir and Granby Reservoir, which means more treatment is required before the water is used.

Levels of sediment in the Colorado River have dropped back to normal ranges now that runoff is tapering off, Rardin said. But Hot Sulphur Springs leaders estimate sedimentation will remain a problem in their water supply for years, especially during snowmelt and intense rainfall.

"The big thing we're looking at right now is the monsoon rains coming up," Tinkum said.

'The cost of being reactive'

Impacts from wildfires don't dissipate for years—Denver Water is still dealing with the consequences of fires more than 20 years ago.

"Denver Water paid the cost of being reactive," said Christina Burri, a watershed scientist with Denver Water.

The 1996 Buffalo Creek Fire and the 2002 Hayman Fire burned a combined 39 square miles in the South Platte River watershed. Denver Water continues to deal with deposits of sediment from the fire in Strontia Springs Reservoir, where 80% of Denver's water passes through, Burri said. It cost more than $27 million to mitigate the consequences of the fires—most of which was spent on removing sediment from Strontia Springs Reservoir.

"Even 20 years later, we haven't seen a recovery, they are a continual source of sediment," Burri said. "It's more cost-effective to be proactive ahead of the fire instead of reactive."

The costly recovery from the fire prompted a collaboration between Denver Water, the U.S. Forest Service and other agencies to prevent such drastic damage after future fires. The partnership—Forests to Faucets—has facilitated the replanting of vegetation, the placement of mulch over burned areas, prescribed burns and efforts to thin forests.

That preventative work meant that firefighters were able to quickly put out several fires that started in the Strontia Springs Reservoir watershed in 2020, Burri said.

"It would've been really bad and really costly if it had burned really severely," Burri said.

The Colorado Water Conservation Board in January began awarding grant money to communities to develop wildfire-ready action plans so they are planning ahead for fire, said Chris Sturm, watershed program director at the Colorado Water Conservation Board.

"It's difficult to make innovative decisions to address hazards during a disaster," Sturm said.

Grand County received some of that money and is working on a plan, said Katherine Morris, the county's water quality manager. The county and other agencies in the area will consider expanding wetland areas to serve as buffers for water among other fire prevention methods.

When Morris looks at the forests surrounding her community, the number of pine trees killed by beetles is difficult to ignore. It's scary to think about all that fuel for a future fire.

"Aridification of the West is happening and it's happening right before our eyes," she said. "We're going to continue to see fires like this. I know it's a cliche, but it's not 'if' it's 'when.'"