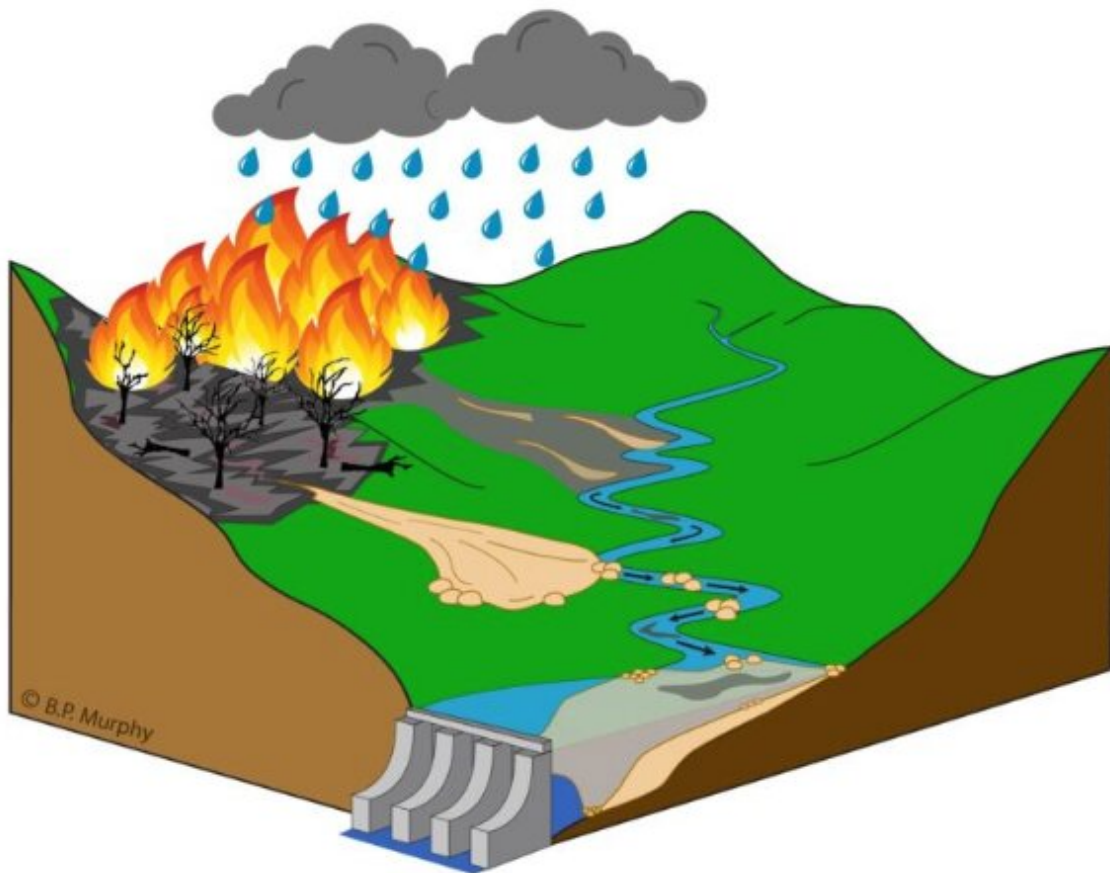


Wildfire can pose risks to reservoirs

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Wildfires can facilitate post-fire debris flows, depositing sediment into rivers. Over time, rivers can carry this sediment downstream, eventually reducing water storage in reservoirs. Credit: Brendan Murphy

Over the past 30 years, wildfires have gotten bigger, stronger, and

occurred more often. As climates continue to warm, this trend will likely continue, causing disruption to landscapes and water systems alike.

Wildfires are destructive to ecosystems, but they can also set the stage for future issues. "After a wildfire, particularly a high-severity wildfire, you have significant impacts to the soil that affects the infiltration of [water](#)," says Brendan Murphy, a research associate at Utah State University.

The inability of water soaking into the ground can trigger flooding and erosion, says Murphy, eventually leading to something called a runoff-generated debris flows. As the water flows along the land surface, it can pick up and carry [sediment](#) and rocks. "If you [pick up] enough," he says, "You can get these big debris flows that can carry really large, coarse sediment downstream."

Murphy says in the western U.S. these debris flows generally happen in smaller basins. "Some of that sediment will go into the river; some of it may actually stay stored in the valley for decades, if not thousands of years," says Murphy.

"What we're trying to do is start thinking about what happens to that sediment after the wildfire," he says. Specifically, the researchers want to know how much sediment will be carried downstream, eventually making its way to a [reservoir](#).

In the western U.S., reservoirs provide long-term storage of water for tens of millions of people. The researchers used modeling to understand the locations and severity post-wildfire erosion could pose to downstream reservoirs.

Murphy and his colleagues are investigating what effects wildfires might have on downstream reservoirs. Murphy will give an invited talk about

their research at the GSA Annual Meeting in Phoenix on Sunday morning.

In previous work, scientists have developed models for estimating the risk of wildfires based on what sort of fuels were available, or models of potential debris flow areas after a wildfire. But Murphy says these models are stand-alone tools—understanding how the fires, debris flows, and sediment transfer are linked is especially important when estimating risks.

"What we're trying to do is create new linked models where we can take the predictions of post-wildfire erosion, network-scale sediment routing models, and actually predict how much of that sediment can make it downstream," he says. Murphy adds that the team is particularly interested in how much sediment might move downstream into a reservoir, and when that might occur.

They are initially testing their new modeling on six reservoirs around Salt Lake City, Utah, but have plans to expand across the entire state. Murphy says the team is hoping their new modeling will help bring researchers together in predicting the risks from post-[wildfire](#) sediment at a landscape scale. The team has been meeting with state and federal forest agencies as well as landowners and water managers to discuss risks and mitigation.

"Fire is not something we can avoid," says Murphy, adding that people need to become more accustomed to seeing fire on the landscape and dealing with the outcomes. Murphy says, "If we want to do a better job of managing our water resources moving forward, we need to do a better job of managing fire."

More information: [gsa.confex.com/gsa/2019AM/meet ...
app.cgi/Paper/338078](https://gsa.confex.com/gsa/2019AM/meet...app.cgi/Paper/338078)

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