

Fire and rain: West to get more one-two extreme climate hits

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The one-two punch of nasty wildfires followed by heavy downpours, triggering flooding and mudslides, will strike the U.S. West far more often in a warming-hopped world, becoming a frequent occurrence, a new study said.

That [fire](#)-flood combination, with [extreme drenchings](#) hitting a spot that burned within a year, could increase as much as eight-fold in the Pacific

Northwest, double in California and jump about 50% in Colorado by the year 2100 in a worst-case climate change scenario of increasing [greenhouse gas emissions](#), according to a study in Friday's *Science Advances*.

The study said that as human-caused [climate change](#) intensifies, 90% of extreme fire events will be followed by at least three extraordinary downpours in the same location within five years.

Study authors said it's because even though the West is [getting drier overall](#)—making wildfire season longer—concentrated bursts of intense rain are increasing and coming earlier so areas can get hurt by both extremes.

"One disaster is bad. Two disasters in rapid succession is even worse because you're already reeling from the first one," said study co-author Samantha Stevenson, a [climate scientist](#) at the University of California Santa Barbara. "But in the particular case of wildfire plus extreme rain, the wildfire is setting you up for worse consequences because you're losing your vegetation, you're changing soil properties and making that landscape more conducive to destructive flooding."

Stevenson knows because the Thomas Fire, which started in late 2017 and was followed a month later by a downpour of half an inch (13 millimeters) of rain in just five minutes, caused mudslides in Montecito that killed 23 people.

"Oh yeah, it was crazy," Stevenson said. "Like the entire highway was blocked off with like a wall of mud. There were boulders in people's living rooms."

For study co-author Daniel Swain, a western weather expert at UCLA who lives in Colorado, it hit even closer to home. Last week, he had to

evacuate his Boulder home because of a fire. Today is the start of flash flood season.

Especially in the Pacific Northwest, fire and flood seasons keep getting longer and closer to each other. While both are get likely to get worse, extreme rainfall should increase more, Swain said.

"That's another sort of a double whammy, a situation where you have the candle burning at both ends," Swain said. "It's entirely foreseeable that some of these places will literally still have fires burning when the first extreme rainfall event extinguishes them."

The report looked at 11 Western U.S. states, concentrating on four of them where the projected increase in fires followed by downpours was most noticeable.

Study authors acknowledged that the worst-case warming scenario they studied, using dozens of large-scale climate model simulations, is becoming increasingly less likely because many but not all countries, including the United States and Europe, have been cutting emissions of heat-trapping gases.

They said they were unable at the time to use simulations of more likely scenarios with some moderate emission reductions. But in the more likely scenarios the Pacific Northwest would probably still see a four-fold increase in fire-and-flooding, said study lead author Danielle Touma, a National Center for Atmospheric Research climate scientist.

The simulations were of fire weather, not fires themselves, and downpour conditions. University of California at Merced [climate](#) scientist LeRoy Westerling, who wasn't part of the study, said he worries about the accuracy of global computer model simulations being able to work on such a small scale. Still, he said, the results make sense.

More information: Danielle Touma, Climate change increases risk of extreme rainfall following wildfire in the western United States, *Science Advances* (2022). DOI: [10.1126/sciadv.abm0320](https://doi.org/10.1126/sciadv.abm0320).
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