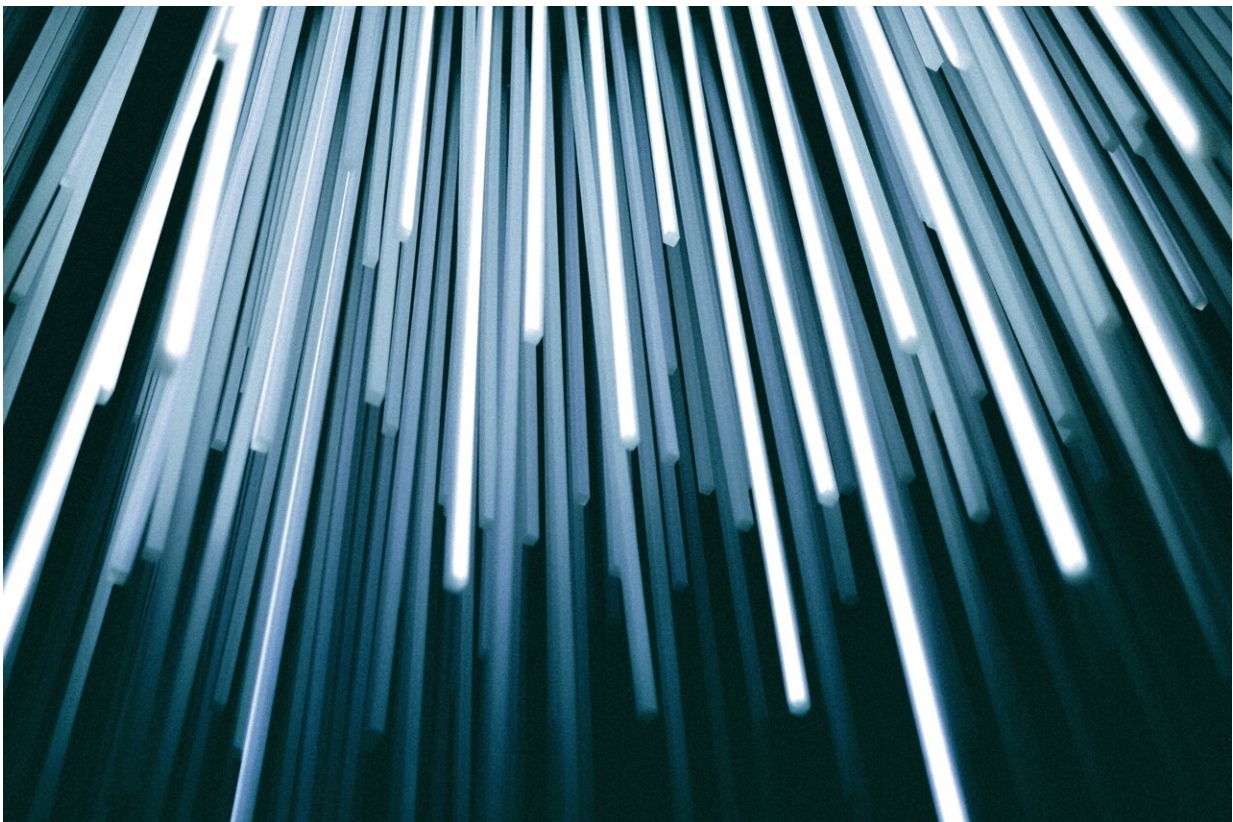


# Canada's flood havoc after summer heatwave shows how climate disasters combine to do extra damage

November 19 2021, by Vikki Thompson

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People living in British Columbia will feel like they have had more than their fair share of climate disasters in 2021. After a record-breaking

heatwave in June, the state in western Canada has been inundated by intense rain storms in November. It's also likely the long-lasting effects of the heatwave made the results of the recent rainfall worse, causing more landslides—which have destroyed highways and railroads—than would otherwise have happened.

In June 2021, temperature records across western North America were shattered. The town of Lytton in British Columbia [registered 49.6°C](#), breaking the previous Canadian national record by 5°C. The unprecedented weather was caused by a high pressure system, a so-called "[heat dome](#)", which sat over the region for several days.

Heat intensified within the dome as the high pressure compressed the air. Dry ground conditions forced temperatures even higher, as there was less water evaporating to cool things down. Although unconfirmed, it's estimated that the heatwave caused [over 400 deaths](#) in British Columbia alone.

The hot and dry weather also sparked wildfires. Just days after recording the hottest national temperature ever, the town of Lytton [burned to the ground](#). The summer's fires and drought left the ground charred and barren, incapable of absorbing water. These conditions make landslides more likely, as damaged tree roots can no longer hold soil in place. It also ensures water flows over the soil quicker, as it cannot soak into the baked ground.

The huge rain storm which lasted from Saturday November 13 to Monday 15 was caused by an atmospheric river—a long, narrow, band of moisture in the atmosphere stretching hundreds of miles. When this band travels over land it can generate extreme rainfall, and it did: in 48 hours, [over 250mm of rain](#) fell in the town of Hope, 100km east of Vancouver.

This much rainfall on its own would probably cause extensive flooding. But combined with the parched soil, the results have been catastrophic. Landslides have destroyed many of the region's transport links, leaving [Vancouver cut off](#) by rail and road. But the [bad news](#) doesn't end there; sediment washed away by these floods could make future floods this winter even worse.

British Columbia is in the grip of what scientists call a compound climate disaster. The effects of one extreme weather event, like a heatwave, amplify the effects of the next one, like a rain storm. Instead of seeing floods and wildfires as discrete events, compound disasters force us to comprehend the cascading crises which are likely to multiply as the planet warms.

## **How to understand compound climate disasters**

The port of Vancouver is the [busiest in Canada](#), moving US\$550 million worth of cargo [every day](#). Because rail links are damaged, ships laden with commodities sit offshore. Canada's mining and farming industries are having to [divert exports](#) through the US. Depending on how quickly the rail links recover, significant economic impacts are possible.

Both the June heatwave and the November rainstorm are unprecedented, record-breaking events, but is their occurrence in the same year just bad luck? A rapid attribution study found that the heatwave was [virtually impossible](#) without climate change. The atmospheric river which brought the deluge is also likely to become [more common and intense](#) in a warming climate.

In British Columbia, future flooding is almost guaranteed to be [more frequent and severe](#). This is life at [1.2°C](#) above the pre-industrial temperature average, yet most politicians don't seem too worried about taking the necessary action to prevent warming beyond [1.5°C](#)—the limit

which countries agreed in 2015 is a threshold beyond which catastrophic climate change becomes more likely.

Western Canada's year of weather extremes did not come from nowhere. [Past trends](#) and [future projections](#) tell us to expect hotter summers and wetter winters in this part of the world, and [record-shattering climate extremes](#) are on the rise.

Worldwide, compound climate disasters are becoming more common as climate change accelerates. [Risk assessments typically](#) measure the impacts of one event at a time, like the damage caused by intense rain storms, without considering how the earlier drought influenced it. This leads to scientists and insurers underestimating the overall damage. With so many combinations of [climate](#) extremes—flooding following wildfires, hurricanes passing as cold spells arrive—we must prepare for every possibility.

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