

Climate change supercharged 'fire weather' behind Canada blazes

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A fire burns in Quebec province of Canada in late July; Canada is experiencing its most devastating fire season ever, with nearly 15.3 million hectares (37.8 million acres) already burned - more than double the previous 1989 record.

Months of hot and dry weather created the tinderbox-like conditions behind this year's record-breaking wildfires in Canada, leading scientists to point the finger at climate change.

An in-depth [scientific analysis](#) published Tuesday now bears this out, finding fire seasons of this severity are at least seven times more likely to occur as a result of humanity burning fossil fuels.

The [study](#) by the World Weather Attribution group also found that over the year, fire-prone conditions were 50 percent more intense as a result of global warming.

"As we continue to warm the planet, these kinds of events are going to get more frequent and they're going to get more intense," first author Clair Barnes, an environmental statistician at Imperial College London, told AFP.

Canada is experiencing its most devastating fire season ever, a result of record high temperatures, low humidity and early thaw of snow melt. Nearly 15.3 million hectares (37.8 million acres) have burned: an area larger than Greece, and more than double the previous 1989 record.

Some 200,000 people have been evacuated, at least four have died, and smoke from the burning forests has led to dangerous air pollution spreading across much of Canada and the United States to the south—driving spikes in emergency department visits and even school closures.

As of late July, the [forest fires](#) had directly emitted more than a billion tons of carbon dioxide into the atmosphere as well as methane and [nitrous oxide](#) that had a combined greenhouse effect equivalent of a further 110 million tons of carbon dioxide, according to recent research.

For the current study, scientists examined the eastern province of Quebec, honing in on zones that are similar in climate and vegetation. The region saw an exceptionally high number of fires in May and June, when national temperature records were smashed by 0.8 degrees Celsius

(1.4 degrees Fahrenheit).

Because wildfires are highly complex and not driven solely by climate, the researchers focused instead on conditions conducive to blazes, using a metric called the Fire Weather Index (FWI).

This combines temperature, wind speed, humidity and precipitation. The team accumulated this data from January to July to derive a measure of severity of fire [weather](#) over the entire season.

While Quebec's fires were unprecedented, analysis of the recent climate record indicated the seasonal conditions causing the blazes are no longer rare, occurring once every 25 years. This means they now have a four percent chance of happening every year.

To understand the contribution of man-made global warming, they used computer model simulations to compare the climate as it is today, after about 1.2C (2.2F) of global warming since the late 1800s, with the climate of the past.

This showed [climate](#) change had made seasons of this severity at least seven times more likely to occur compared to pre-industrial times. Barnes stressed, however, that this was a lower-bound estimate, with the researchers choosing to be conservative in the face of statistical uncertainty.

Indigenous communities hit hardest

Yan Boulanger, an ecologist with the Canadian Forest Service and the report's second author, told AFP the cumulative impact of circumstances favorable to fire was key. "It's because those fire weather conditions lasted so long that those fires could grow so big."

The team also identified the seven-day-stretch when fire weather conditions were at their highest, and found such peak conditions were more than twice as likely to occur than in the past, as a result of [climate change](#).

If the world continues burning fossil fuels at high rates, the likelihood and intensity of severe fire weather conditions will only increase, the analysis showed.

These fires imperil the future of the forestry sector, Boulanger warned, with a question mark over whether regeneration efforts can keep up with losses.

The most impacted communities meanwhile are remote and have relatively few resources, including Indigenous peoples, who made up 75 percent of those evacuated in July.

"This increasing severity of extreme events and likelihood of extreme events is not going to stop until we reach net zero and stop adding extra greenhouse gases into the atmosphere," said Barnes, adding it's "not too late" to lobby political leaders to change course.

World Weather Attribution is an [international collaboration](#) that has now completed more than 50 studies of extreme weather events, with the results later reviewed in peer-reviewed journals.

More information: Barnes et al, Climate change more than doubled the likelihood of extreme fire weather conditions in Eastern Canada, (2023). [DOI: 10.25561/105981](https://doi.org/10.25561/105981)

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