



# Climate change more than doubled the intensity of extreme wildfire weather in Quebec, Canada, in Summer 2023

## About extreme event attribution

- Thanks to significant and ongoing advances in the field of climate science, it is now possible to determine the role played by human-induced climate change in the manifestation of past extreme weather events as well as the future of these types of events in a warming world.
- The World Weather Attribution (WWA) initiative is an international coalition of scientists and practitioners who collaborate in the aftermath of weather-related disasters to assess the role of climate change in the event and its likelihood of recurrence.
- Led by a core team of experts from Imperial College London, the Royal Netherlands Meteorological Institute (KNMI) and the Red Cross Red Crescent Climate Centre, the WWA has carried out more than 30 studies of this type using a peer-reviewed and publicly accessible methodology. It also regularly contributes to the growing conversation about the changing trends in extreme weather and the need for adaptation to this disaster risk.

**The 2023 wildfire season in Canada was the most devastating ever recorded in the country, with over 18 million hectares burned – more than double the previous 1989 record of 7.6 million hectares. At least four fatalities were linked directly to the fires that saw over 200,000 people evacuated from their homes over the summer and dangerous air quality across much of Canada and the United States.**

## Climate change increased the magnitude and extent of the unprecedented 2023 Canadian wildfire season

Climate scientists have found that the weather conditions that drove the wildfires in the province of Quebec in May to July 2023 were at least twice as likely and 20–50 per cent more intense because of human-induced climate change. In today's climate, these types of conditions are expected to occur once every 25 years or with a 4 per cent chance every year. The sheer scale of the wildfires along with the changing risks that they highlighted raised significant concerns about the vulnerability and exposure of Canadian communities to extreme events, and posed questions about the adaptation required to be prepared for future seasons.

## Ecology and forest management plus legislation and emergency management were identified as key drivers of vulnerability and exposure

Wildfire is a common and natural occurrence in the Canadian boreal forest – part of the ecological zone's natural cycle of burning and regeneration. When it does not affect lives and livelihoods, an individual wildfire in an unpopulated and/or unexploited area can be – and often is – left to burn out on its own. However, the extent and intensity of this wildfire season posed significant threats to people and communities across the region.

## Positive impacts on the communities

1. The wildfires occurred primarily in the Canadian boreal forest where wildfires are part of natural ecological processes that are necessary for forest regeneration. *In this type of forest, a variety of forest management techniques are currently used to manage wildfire risk under different jurisdictions.*

# Recommendations

*A balance of management techniques will be required to meet the challenge of increased fire risk in the future.*

2. Canada has an extensive legislation and policy landscape around wildfire management. *Wildfire management falls at all levels of jurisdiction, from national level wildfire fighting to municipal bylaws for wildfire prevention and everything in between at municipal, provincial, territorial and federal levels. Civil protection and disaster laws apply specifically to wildfires in inhabited areas and every province and territory has developed bespoke legislation to prevent, detect and manage wildfires.*
3. The number, extent and intensity of wildfires in Canada this season required a focus on saving lives and protecting communities from direct impacts, rather than total fire suppression. *Early detection and warning systems are tools that greatly help to reduce the impacts of extreme weather events by providing exposed communities with information about risks and behaviours to adopt to protect themselves and their communities. During the summer, the national preparedness level was also set at level 5 for a significant*
4. Many of the communities that were directly exposed to these wildfires were among the most remote in the country and highly vulnerable because of this geography. *Fly-in communities – those which are accessible only by air for most of the year – were highly exposed and vulnerable. In particular, a large proportion of those affected were Indigenous peoples; previous studies have shown that Indigenous peoples in Canada face a 30 per cent higher probability of being displaced by and experiencing the adverse impacts of wildfires.*
5. The wildfires had significant 'relocated impacts' on air quality across Canada and the United States, proving that extreme weather and climate change do not recognize regional or national borders. *Local jurisdictions in neighbouring countries activated response actions such as warning messages, mask distribution and promoting self-protection actions among their particularly vulnerable populations.*

The study shows that fire weather risks due to climate change are increasing. As climate change intensifies the probability and intensity of fire weather, we may also expect to see more incidents of transboundary impacts in the future. Knowing this, both mitigation and adaptation strategies will be required to reduce the drivers of risk and decrease its impacts on people's lives and livelihoods.

Adaptation actions will be critical to helping communities and response systems to recover and prepare for the season, year and decade ahead, informed by after-action

reviews and research into this unprecedented wildfire event.

## Future research

In-depth research into this event alongside the development of adaptation options will be important to ensure that people and systems are better prepared for future wildfire seasons. Key questions for consideration include:

- What resources are needed to be better prepared for changing wildfire regimes?
- What strategies, techniques and tools could decrease the risks of wildfire ignitions and spread?

- In what ways could affected communities build back better to be more resilient to wildfires in the future?
- How should wildfires be managed across national and sub-national borders?

And many more.

You can read more about the World Weather Attribution initiative and the involvement of the Red Cross Red Crescent Climate Centre at <https://www.worldweatherattribution.org/>