



– Fire Regime Changes in Canada

A Wildfire Resilience Consortium of Canada Research Brief

Wildfires in Canada are changing: More area is burning with fewer fires

In 2019, a landmark study (Hanes et al., 2019) examined how wildfires in Canada have changed over the last half century, using data from 1959-2015. The same researchers have recently published an update (Hanes et al., 2025), adding nine more years of data, an updated area burned database and new analyses. Together, these studies reveal how the wildfire regime in Canada is changing:

Annual number of fires is in decline



- › Nationally, the annual number of fires has been declining since 1988.

Annual average area burned is increasing

- › In the 1959-2024 period, the average area burned was 2.08 million hectares per year.
- › No region in Canada has a decreasing trend in average annual area burned from 1959-2024 (Unlike in the 1959-2015 period).

Lightning and human-caused fires are both burning more area

- › From 1980-2024:

55% of fires in Canada were caused by lightning

- › Lightning-caused fires burn the most area nationally with 92% of the area burned from 1980-2024 started by lightning. The number of large (>200 ha) lightning-caused fires increased from 1980-2024.

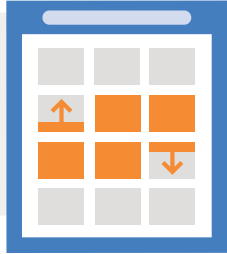
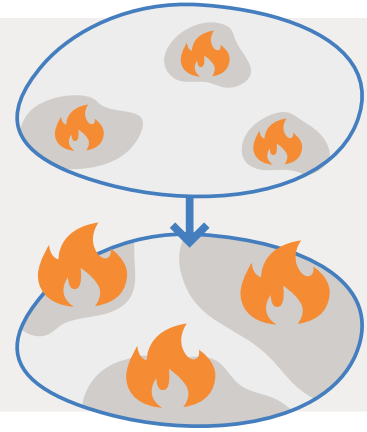
45% of fires in Canada were caused by humans

- › Average annual area burned by human-caused fires was declining in Canada from 1980-2005 but has been increasing in the last 19 years.

Large fires are getting larger and more frequent

The number of large fires (≥ 200 ha) have increased on average by 3 fires per year since 1959.

- › A few large fires (5% of all fires from 1959–2024) are responsible for 98% of the land that has burned in Canada.
- › Large fires are getting larger in Canada — there are now more individual fires that burn $>20\,000$ ha than there were in the past.



Fire season is growing longer. Long-term trends show:

- › Earlier start by 9 days and later end by 7 days.
- › Overall increase of over two weeks in fire season length.

Suppression is not as effective on intense large fires; therefore, proactive interventions remain important in a changing climate

This study finds that wildfires in Canada have been getting larger over the past 66 years. The authors expect that this trend will continue as weather becomes hotter and drier in future years. As fires become larger and more intense, full suppression in managed areas may not always be possible due to a lack of safety for fire personnel and/or a lack of effectiveness of suppression interventions. For some large and intense fires, only a change in weather or fuels will change the fire behaviour.

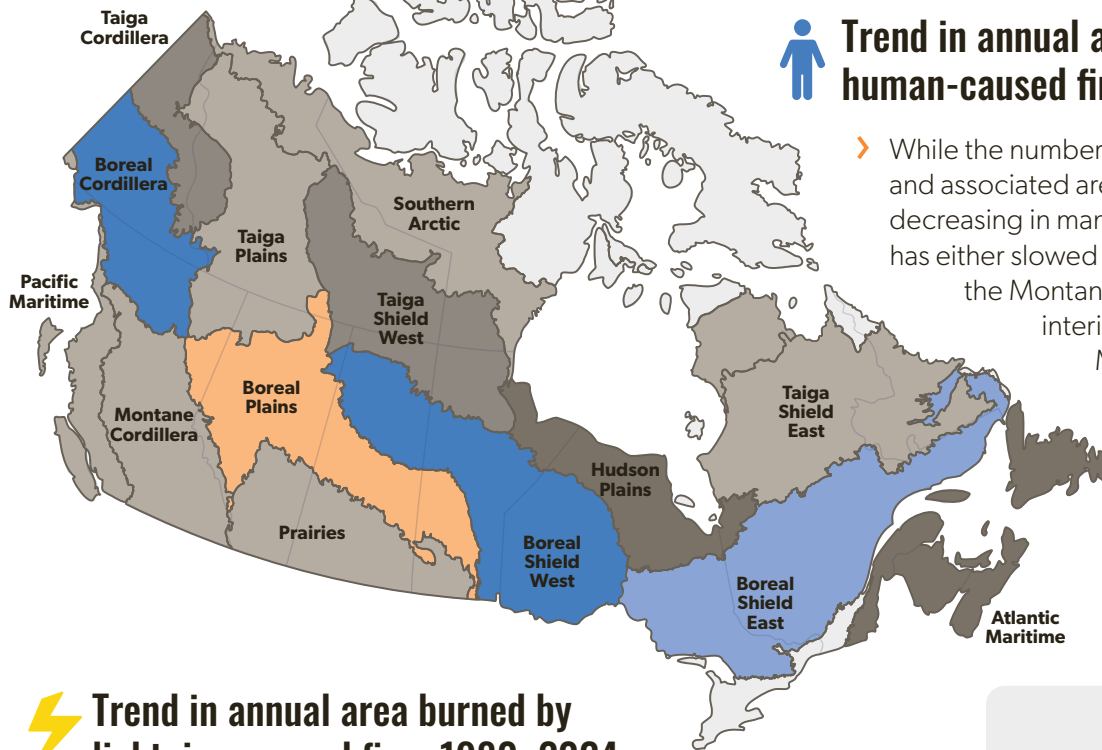




Trend in annual area burned by human-caused fires 1980–2024

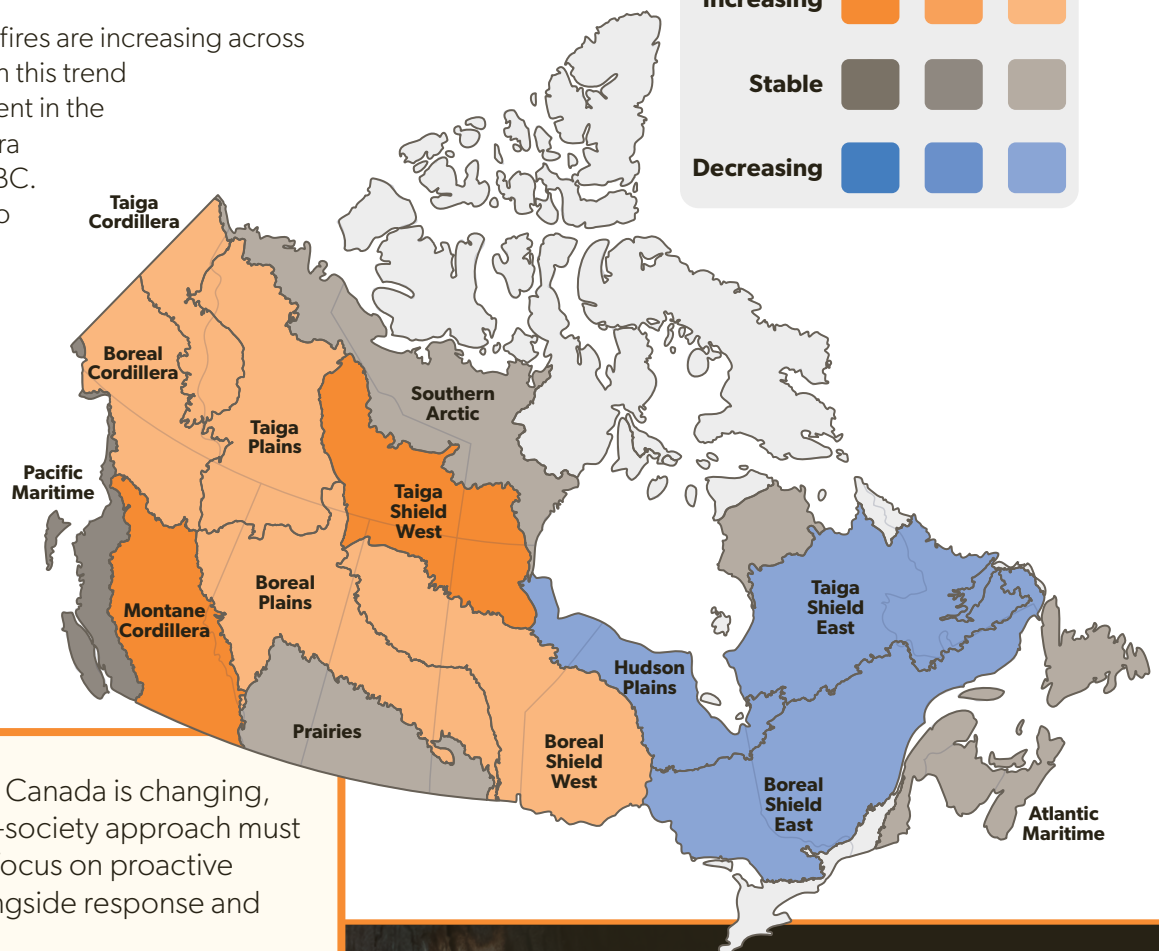
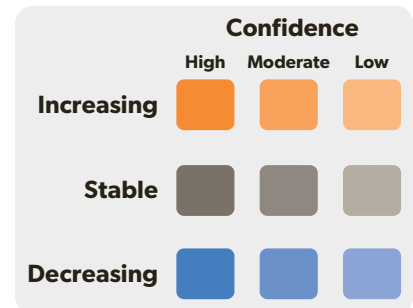
- While the number of human-caused fires and associated area burned have been decreasing in many regions, this trend has either slowed or gone flat (such as in the Montane Cordillera region of interior BC or the Atlantic Maritime region).

This is likely due to regional changes in weather that produce dryer fine fuels.



⚡ Trend in annual area burned by lightning-caused fires 1980–2024

- Lightning-caused fires are increasing across many regions, with this trend particularly apparent in the Montane Cordillera region of interior BC. This may be due to a combination of increased lightning strikes and drier fuels.



The fire regime in Canada is changing, and our whole-of-society approach must also change to a focus on proactive interventions alongside response and recovery.

Learn more from Hanes et al. 2025.
[doi/10.1139/cjfr-2025-0209](https://doi.org/10.1139/cjfr-2025-0209)