

## Expected increased risks of wildfires in Canadian wildland-human interface areas

With climate change, current research predicts an increase in forest fires in the **wildland-human interface** or WHI; several inhabited areas will be more at risk in the years to come. Despite this threat, there is currently no available fire risk assessment process for these areas. This study is the first assessment of the current and future wildfire exposure in WHI areas in Canada.

### What is a WHI area?

WHI (wildland-human interface) areas are defined as either residential, industrial, or infrastructure areas in which forest fuels are present. An increasing number of Canadians live in peri-urban areas where the city meets the forest. Many industrial facilities and much infrastructure are also located in or near forested areas.

Currently, 17% of Canada's forested lands are classified as WHI areas. Approximately 12% of Canadians—nearly 4 million people—live in these areas. Indigenous people are over-represented in this group, given that many Indigenous communities are located in WHI areas.

### Billions of dollars up in smoke

Large-scale evacuations, health problems due to smoke, damages to infrastructure, changes to the local economy, loss of timber resources and deterioration of wetlands are just a few examples of the negative effects of forest fires observed in Canada in recent years. The impacts of wildland fires are most significant in the wildland urban interface where wildfires can easily spread from forest fuels to buildings.



Fire and infrastructure. Photo: MFFP

The impact of these fires represents huge costs for residents and insurance companies. The 2016 Fort McMurray fire, for example, is the most expensive natural disaster in Canadian history to date, with \$3.7 billion losses in insurable assets.

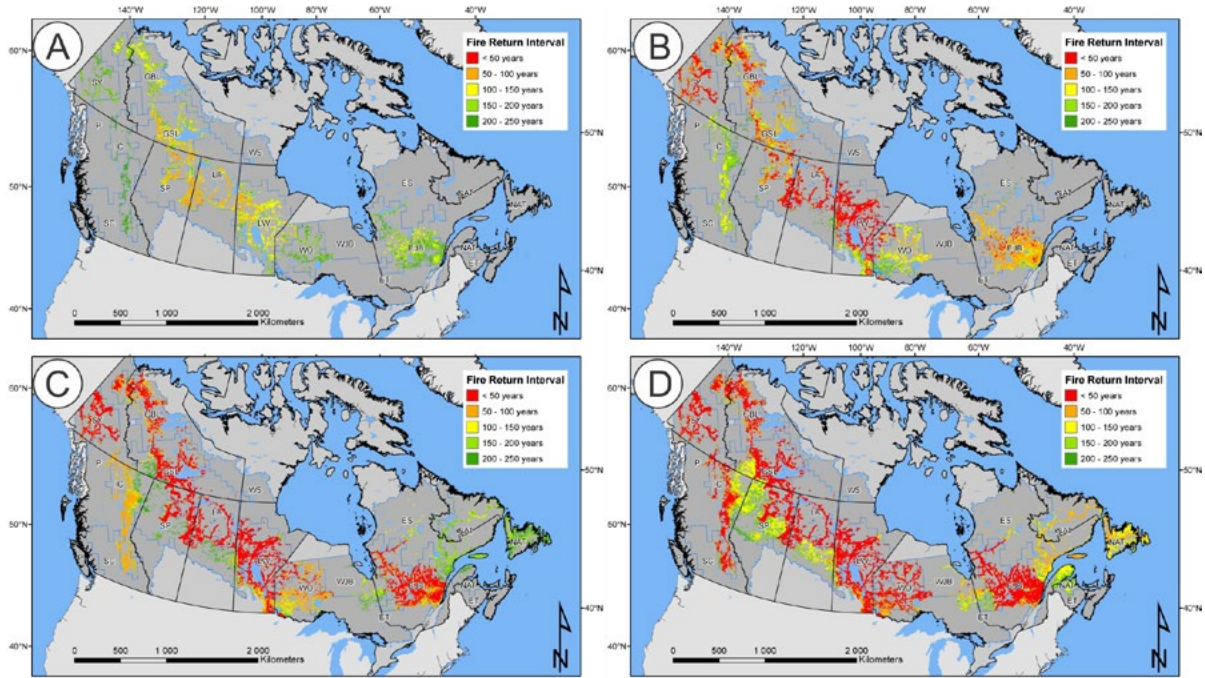
### Short fire return interval and WHI areas

In this study, researchers combined several sources of spatial and demographic information to estimate the current and future proportions of WHI area exposures to fire return intervals (FRI) shorter than 250 years across Canada. This FRI, which is considered short, means that the average interval between two forest fires is 250 years or less in the given areas. One

quarter of Canada's forested lands classified as WHI areas are currently exposed to a short FRI.

### Higher risk for indigenous communities

Approximately 12% of Canadians live in WHI areas, and roughly one third of this population is Indigenous people living on reserves. Currently, about 18% of these Indigenous communities are exposed to FRIs of < 250 years, compared to 5% of the overall Canadian population living in WHI areas.



Location of the wildland-human interface (WHI) to forest fires exposed to fire return intervals  $\leq 250$  years, according to current climatic conditions (A), and future for the periods 2011-2040 (B), 2041- 2070 (C), 2071-2100 (D), under an RCP 8.5 climate scenario.

## Increased impact of climate change

In the coming years, FRI will be affected by climate change. Depending on the climate scenario (slight or significant increase in temperature), the FRI in many regions could be shorter than it is now (shorter than 100 years), with certain regions of Canada being more affected than others. Accordingly, under the worst-case scenario projected for 2100, the risk of exposure to FRIs of shorter than 250 years could reach 39% for indigenous communities and 18% for the overall population.

The negative impact of wildfire is expected to worsen by 2100, especially in the boreal forest. In exposed areas which have undergone more intensive suppression, fires may be more difficult to extinguish due to the increased flammability of fuels. Changes in the type and moisture content of fuels, increased extreme temperatures, a longer fire season and more intense fires all amplify

this negative impact. More fires will also have an adverse effect on fire suppression agencies, such as SOPFEU in Quebec, increasing costs and impacts on the population. These would include material and resource losses as well as evacuations. Furthermore, the results of this study show that northern communities, particularly indigenous communities, will be harder hit by these negative impacts.

## Reducing the risks

In order to reduce the potential effect of fires on WHI areas, preventive measures can be implemented. For instance, regulations could be enacted to impose construction standards that reduce the flammability of buildings, such as the use of non-flammable materials for roofs and walls. Preventive fuel management in WHI areas should also be promoted. This could mean, for example, removing or reducing fuel sources (trees and shrubs) within 30 m around the infrastructure. Similarly, the use of controlled or prescribed burning (where permitted) could be another option in the larger spaces between different infrastructures.

### For more information, please contact:

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