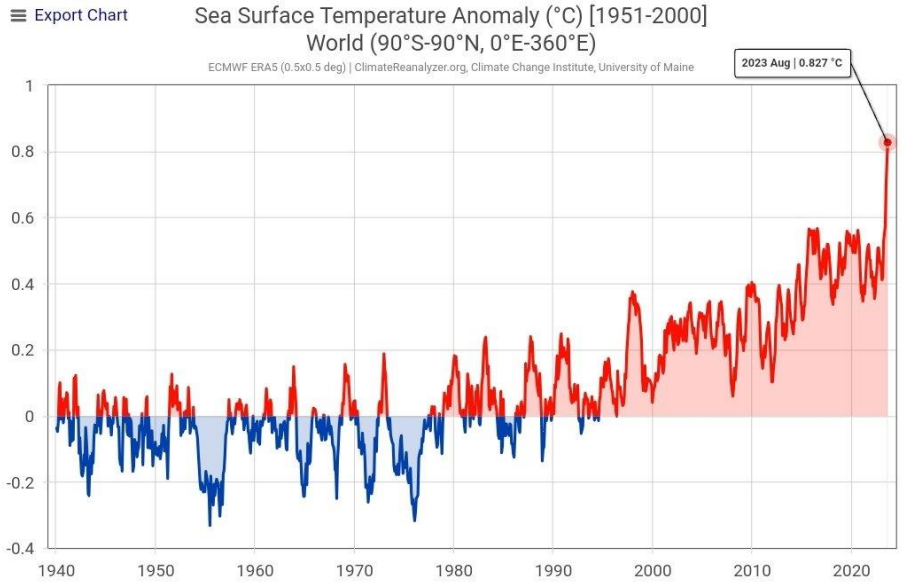
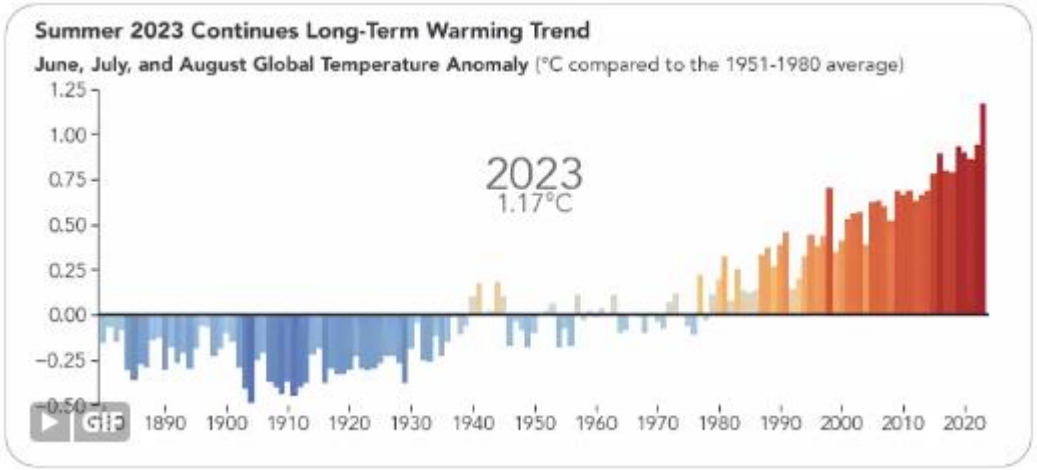
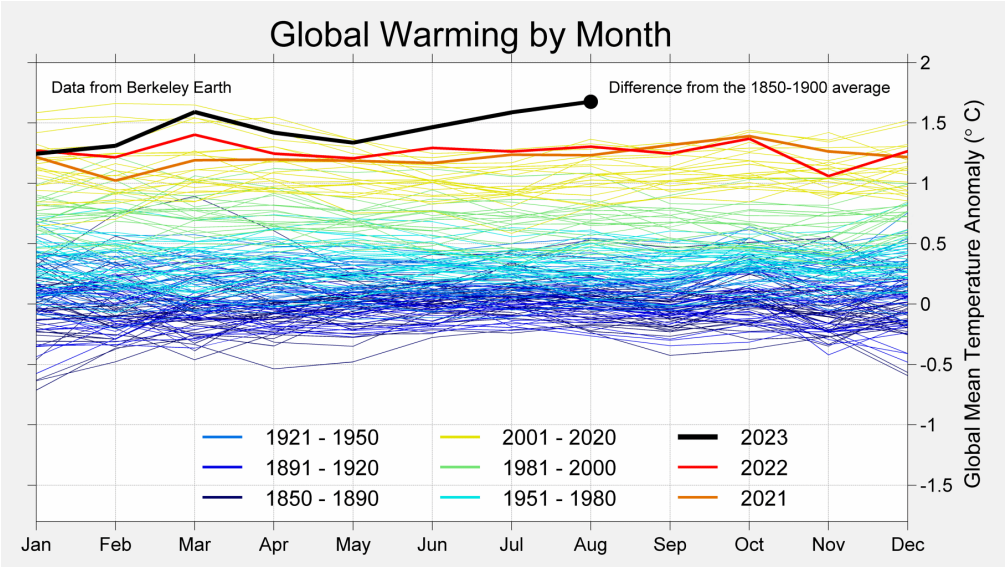
Impacts of climate change on wildfires and their consequences on the forest sector

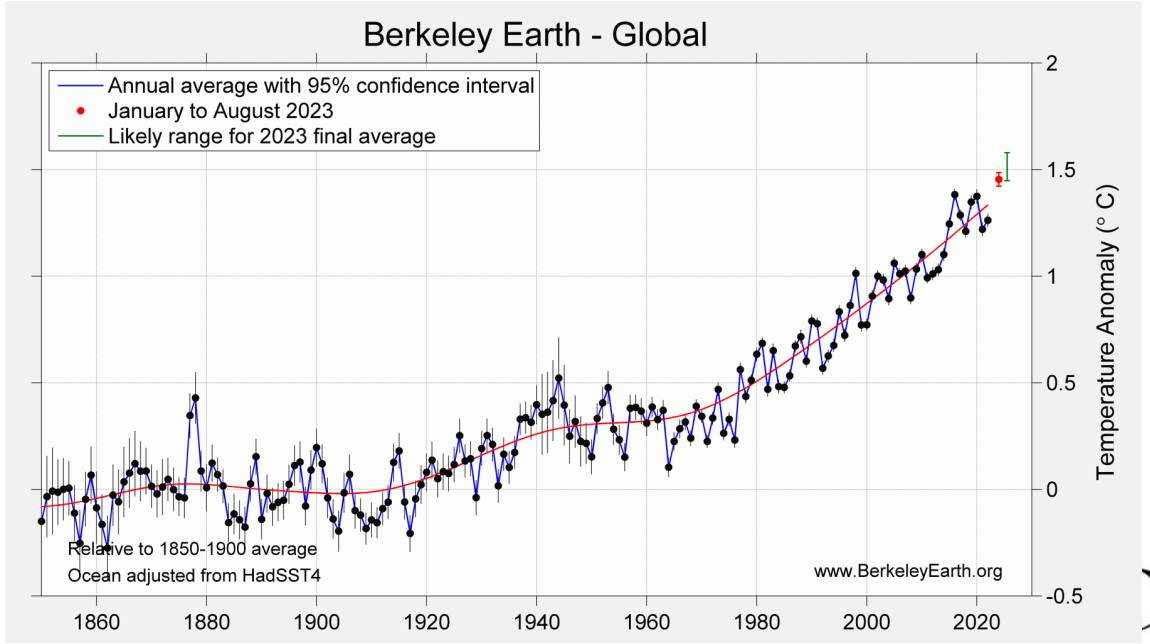
Yan Boulanger
Research scientist Forest ecology
Natural Resources Canada

2023, the year of all records

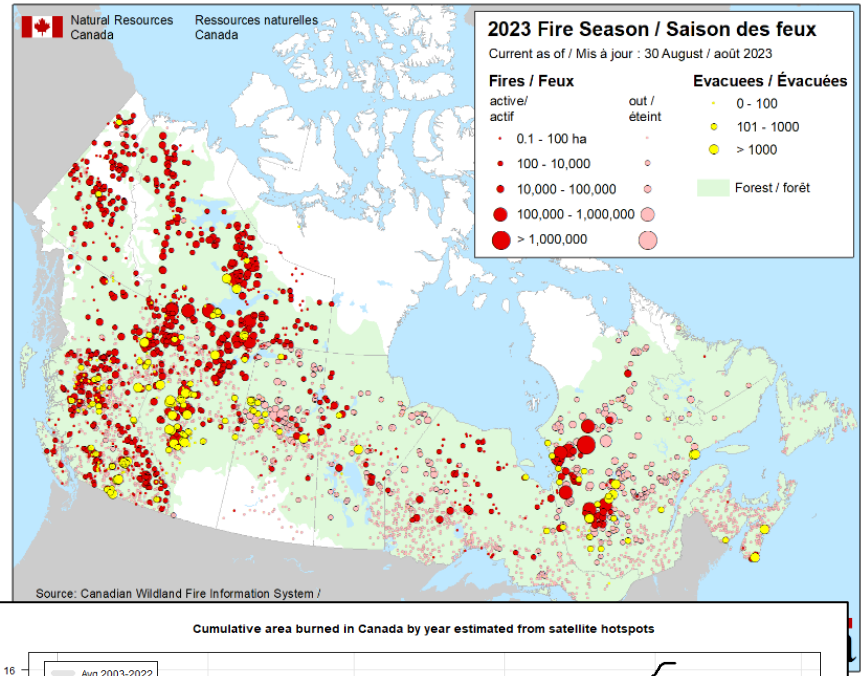


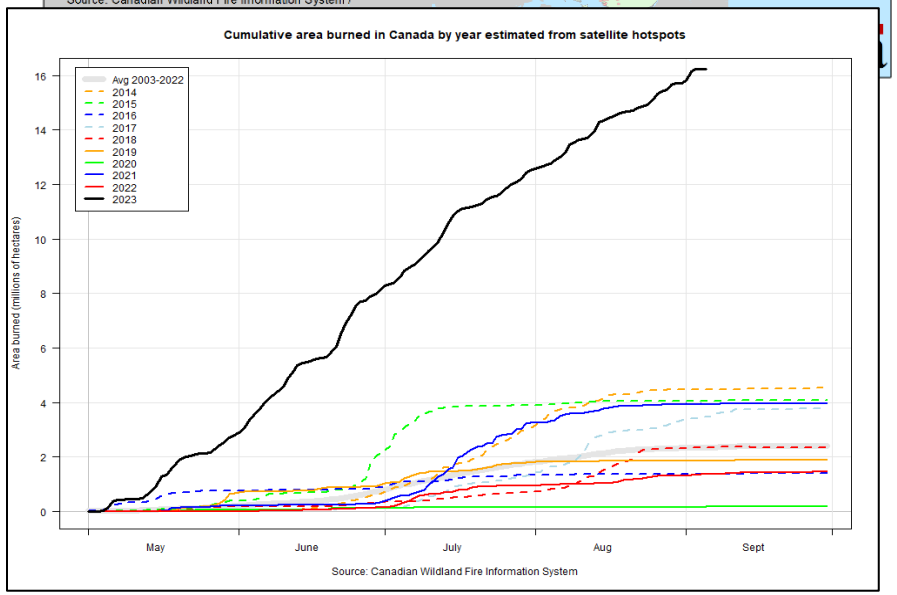


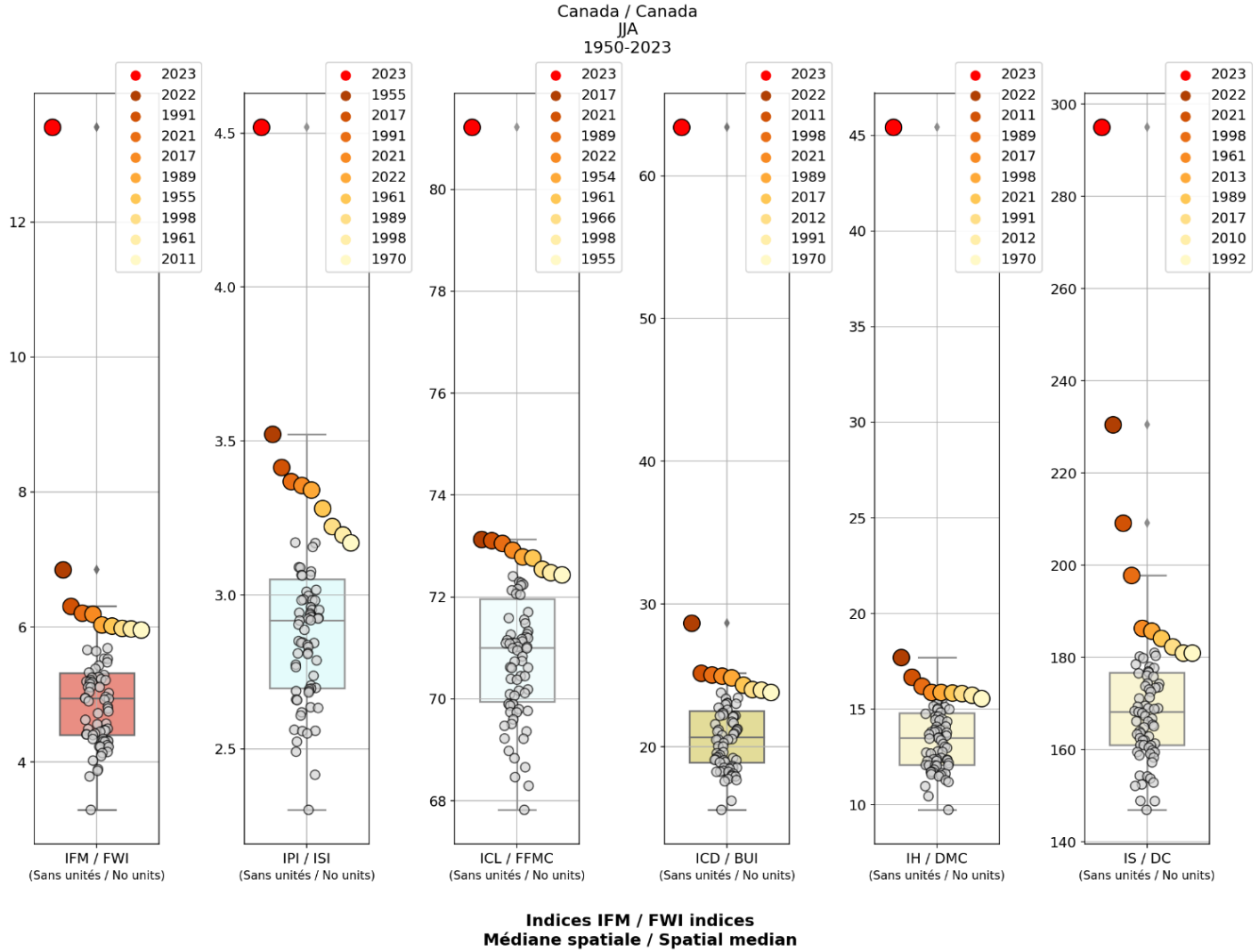




2023, the year of all records…







2023 : marqueur rouge / red marker

Statistique spatiale / Spatial statistic: Médiane / Median
Données / Data: ERA5
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world weather attribution

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On average, wildfires burn about 2.5 million hectares in Canada each year. In 2023, wildfires have already burned nearly 14 million hect

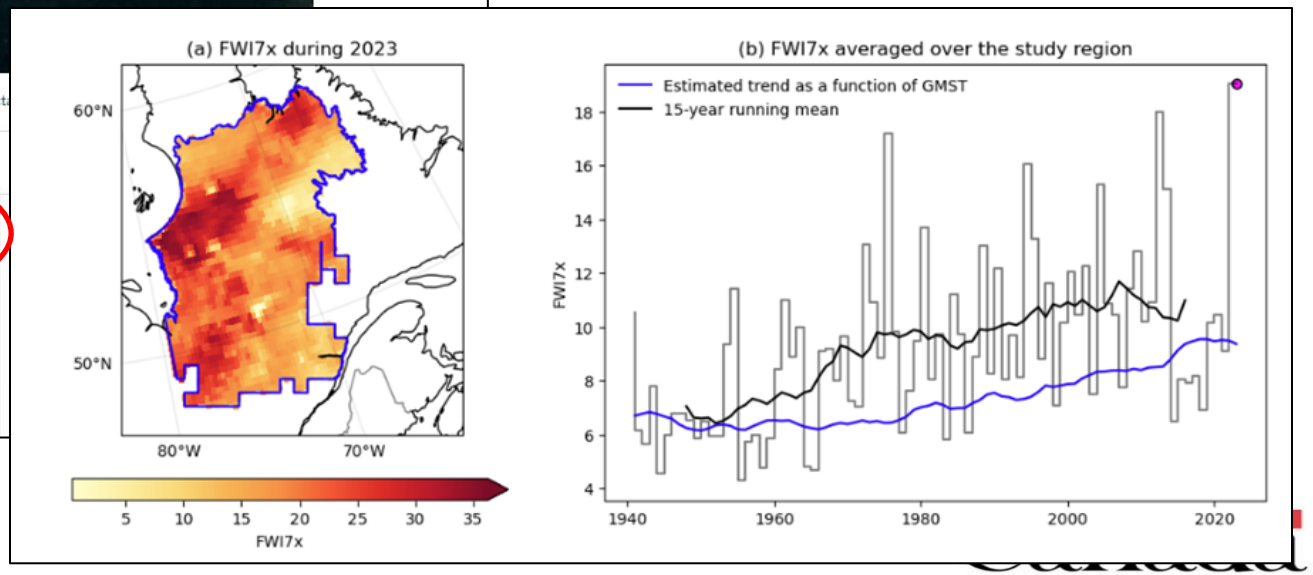
Home > Wildfire > Climate change more than doubled the likelihood of extreme fire weather conditions in Eastern Canada

Climate change more than doubled the likelihood of extreme fire weather conditions in Eastern Canada

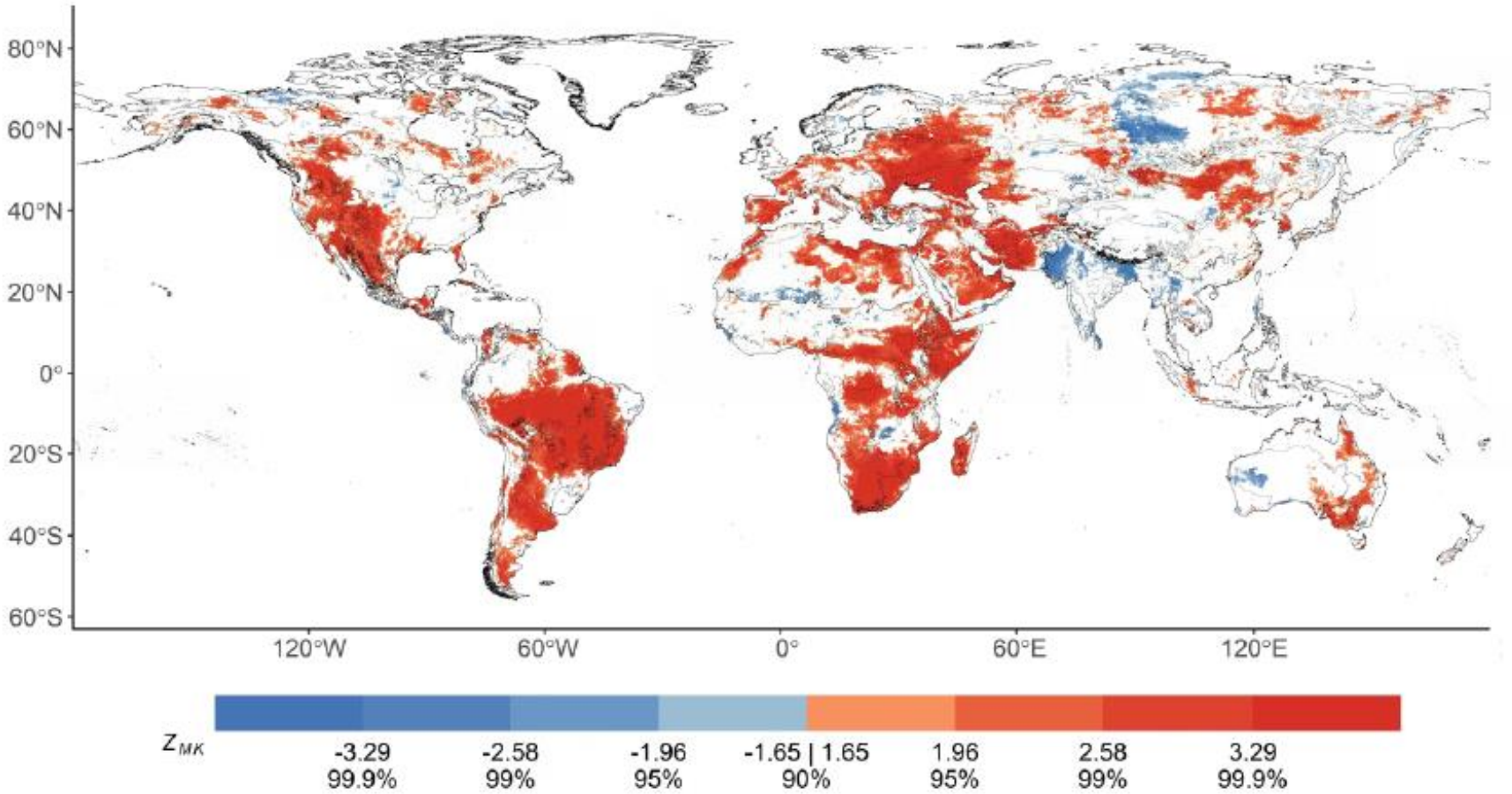
22 August 2023

WILDFIRE
NORTH AMERICA

During May and June 2023 Canada witnessed exceptionally extreme fire-weather conditions, leading to extensive wildfires that burned over 13 million hectares.



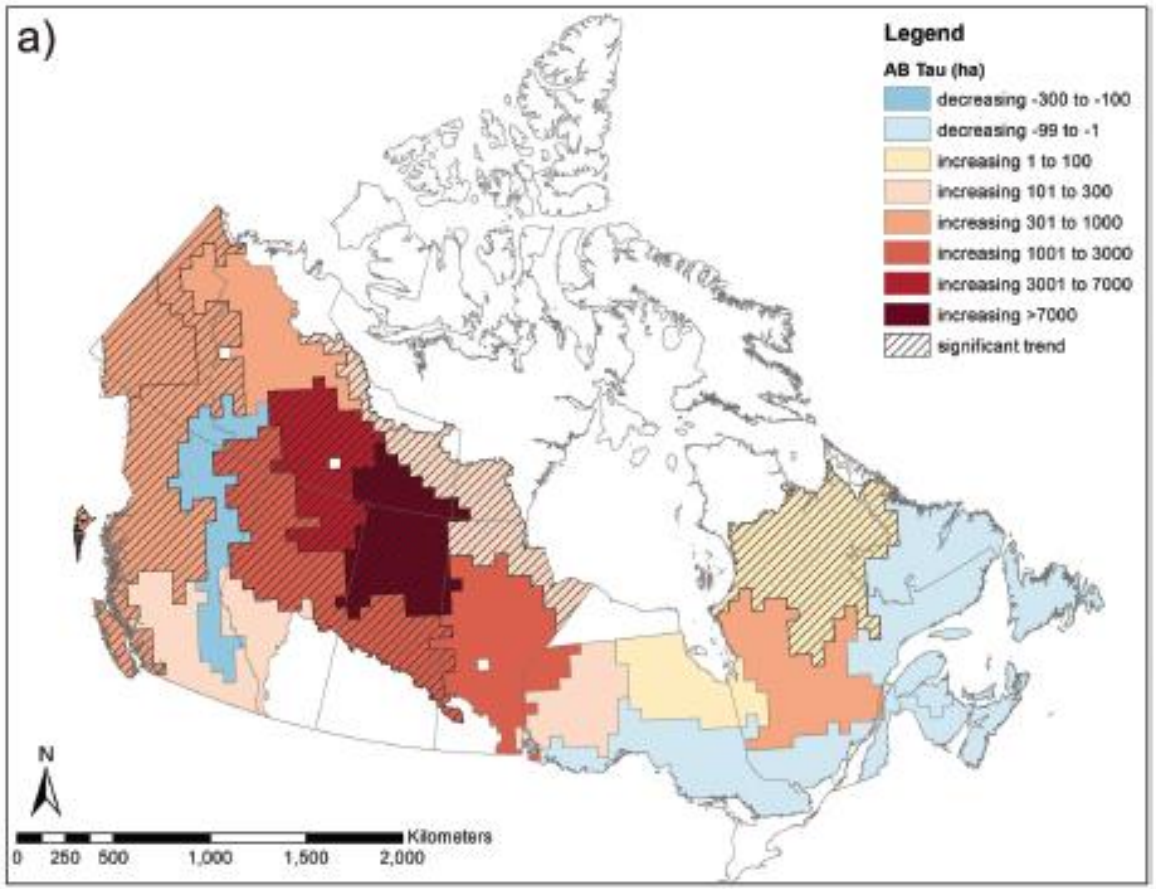
Worldwide, vegetation flammability increases

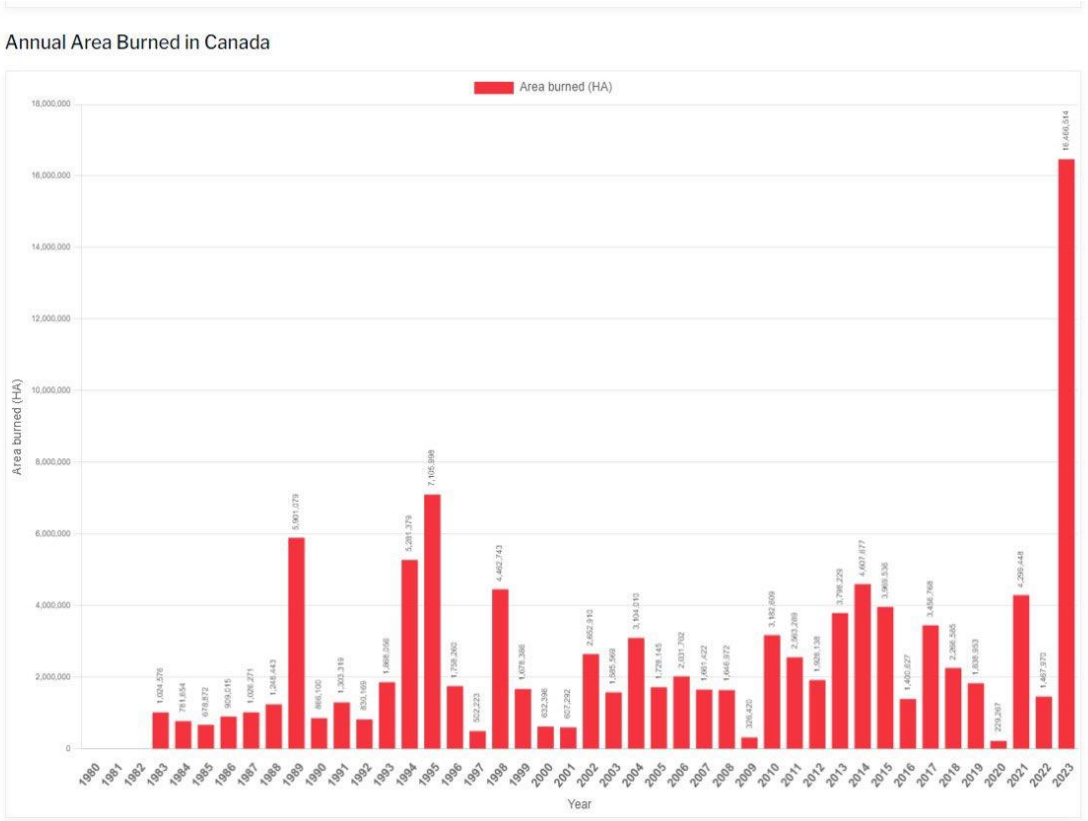


Source : Ellis et al. 2022. GCB

Annual area burned is increasing by 330 000 ha each decade

Superficie brûlée

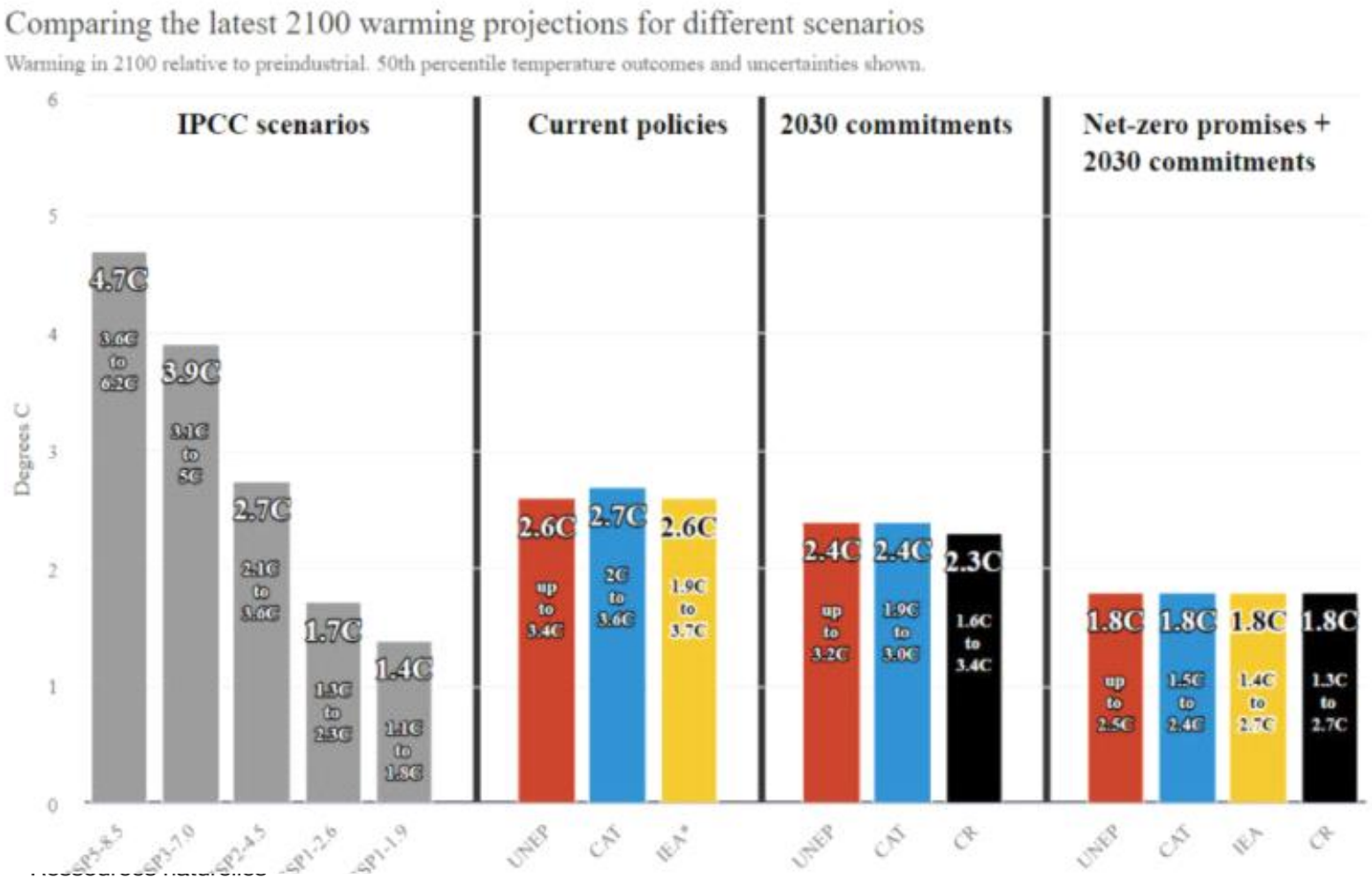




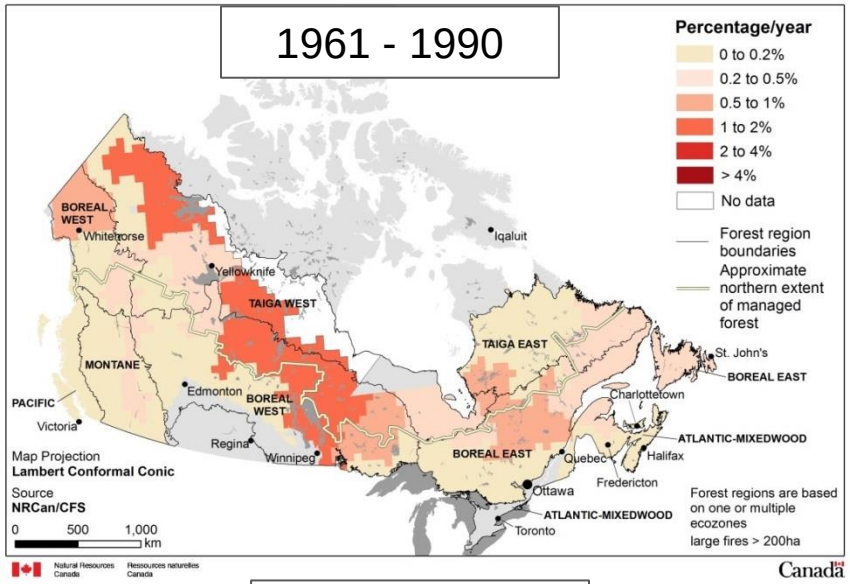
Source : Hanes et al. 2019

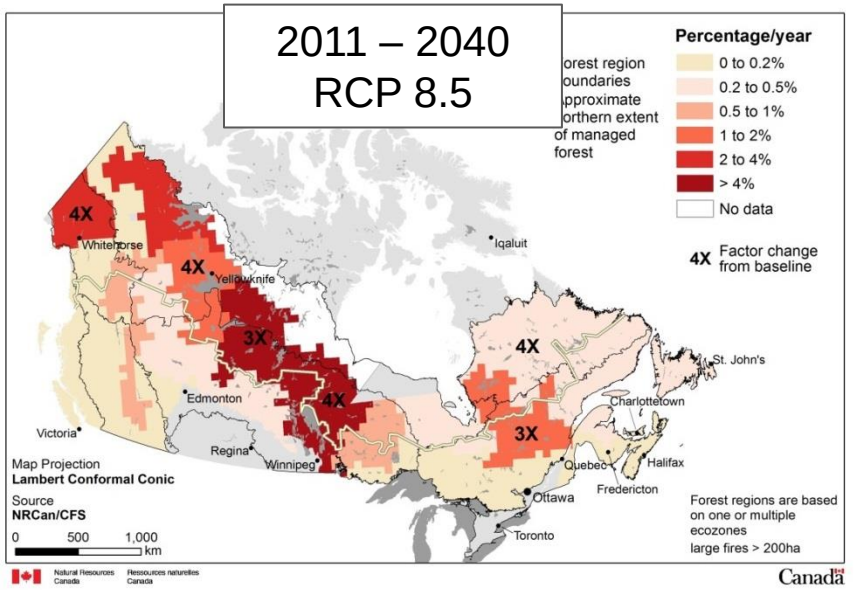
What's in the future?

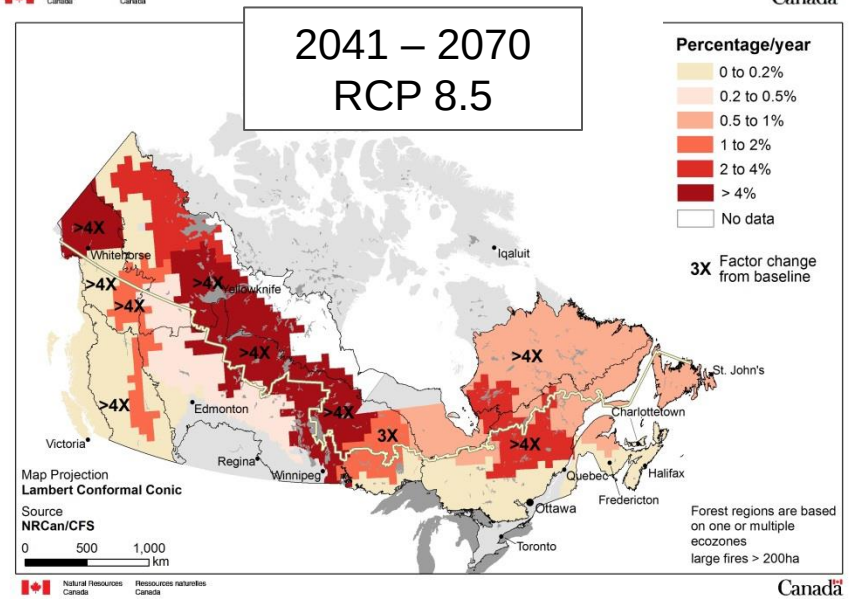
- SSP : Shared Socioeconomic Pathways (W.m-2)

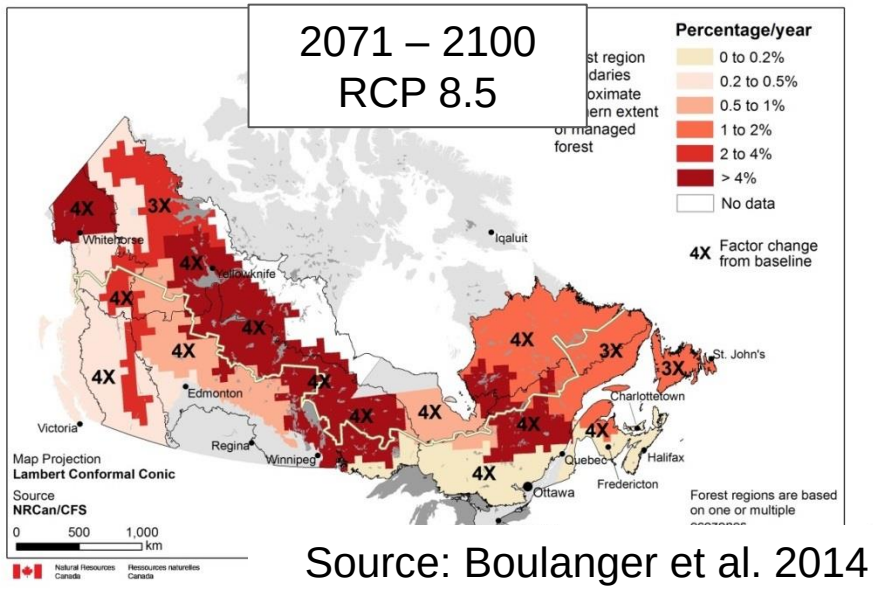


Annual area burned will greatly increase







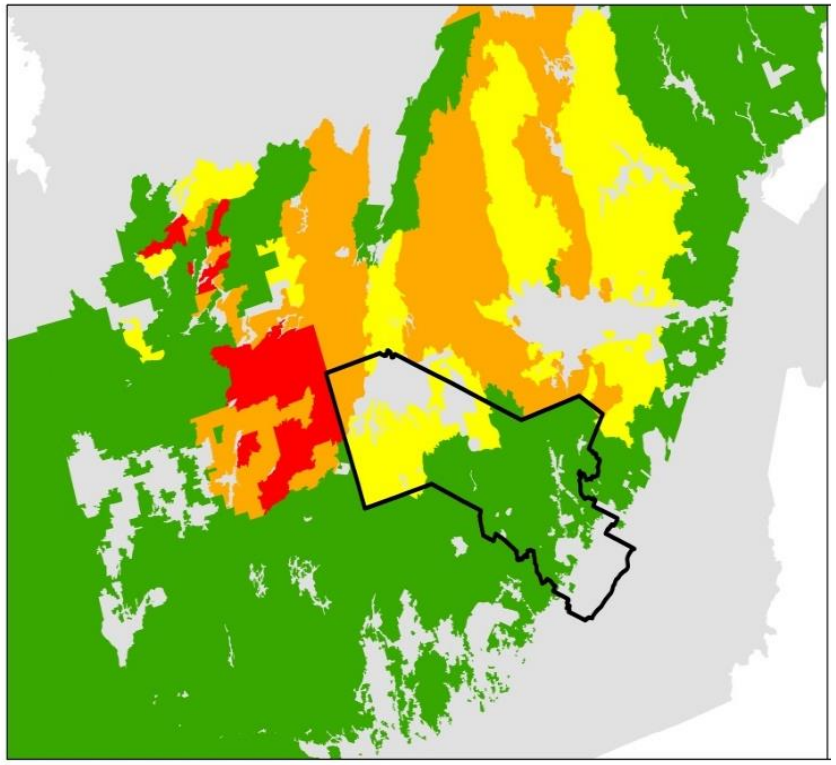


Source: Boulanger et al. 2014

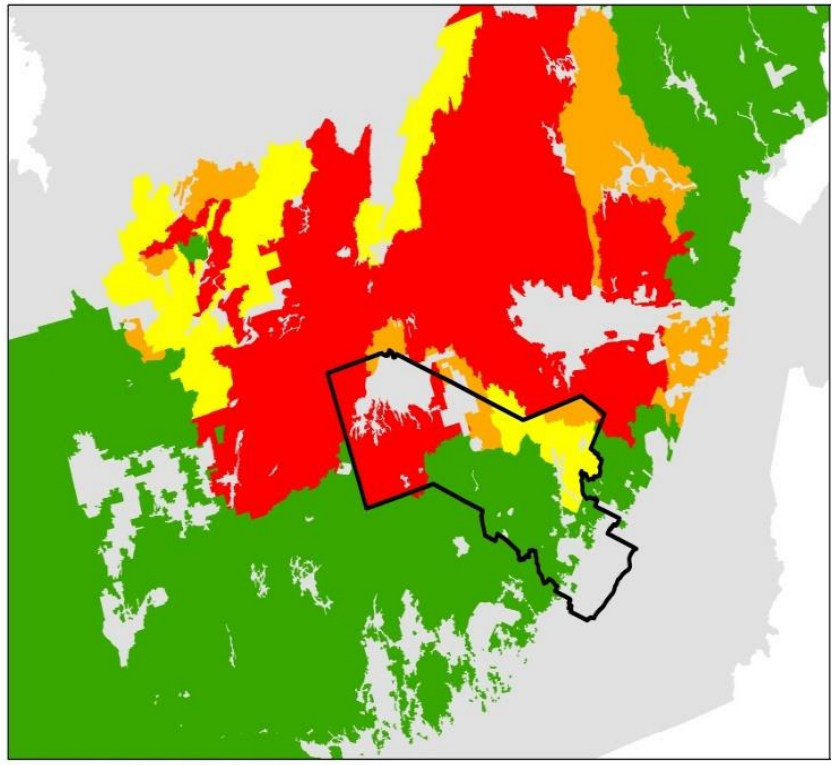
Such increases will affect our ability to conduct sustainable forest management

RCP 8.5

2025

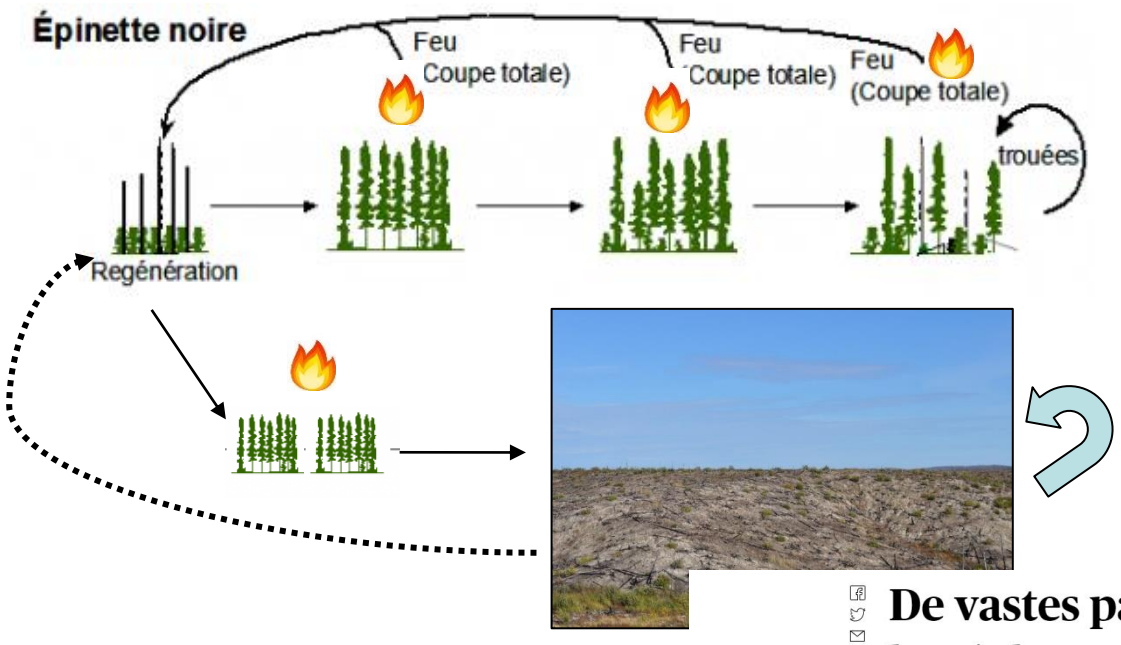


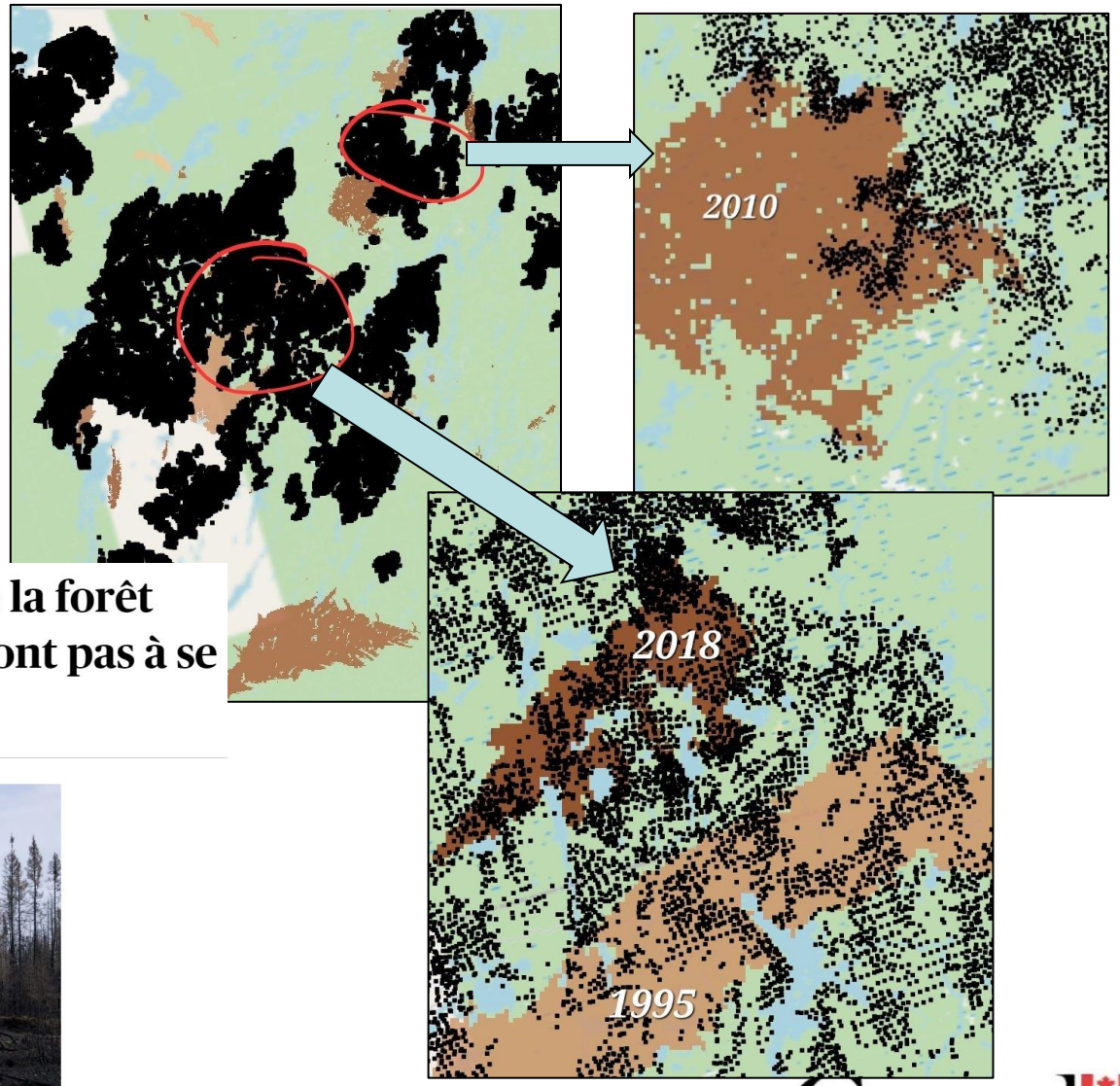
2085



Gauthier et al. 2015

Regeneration failures

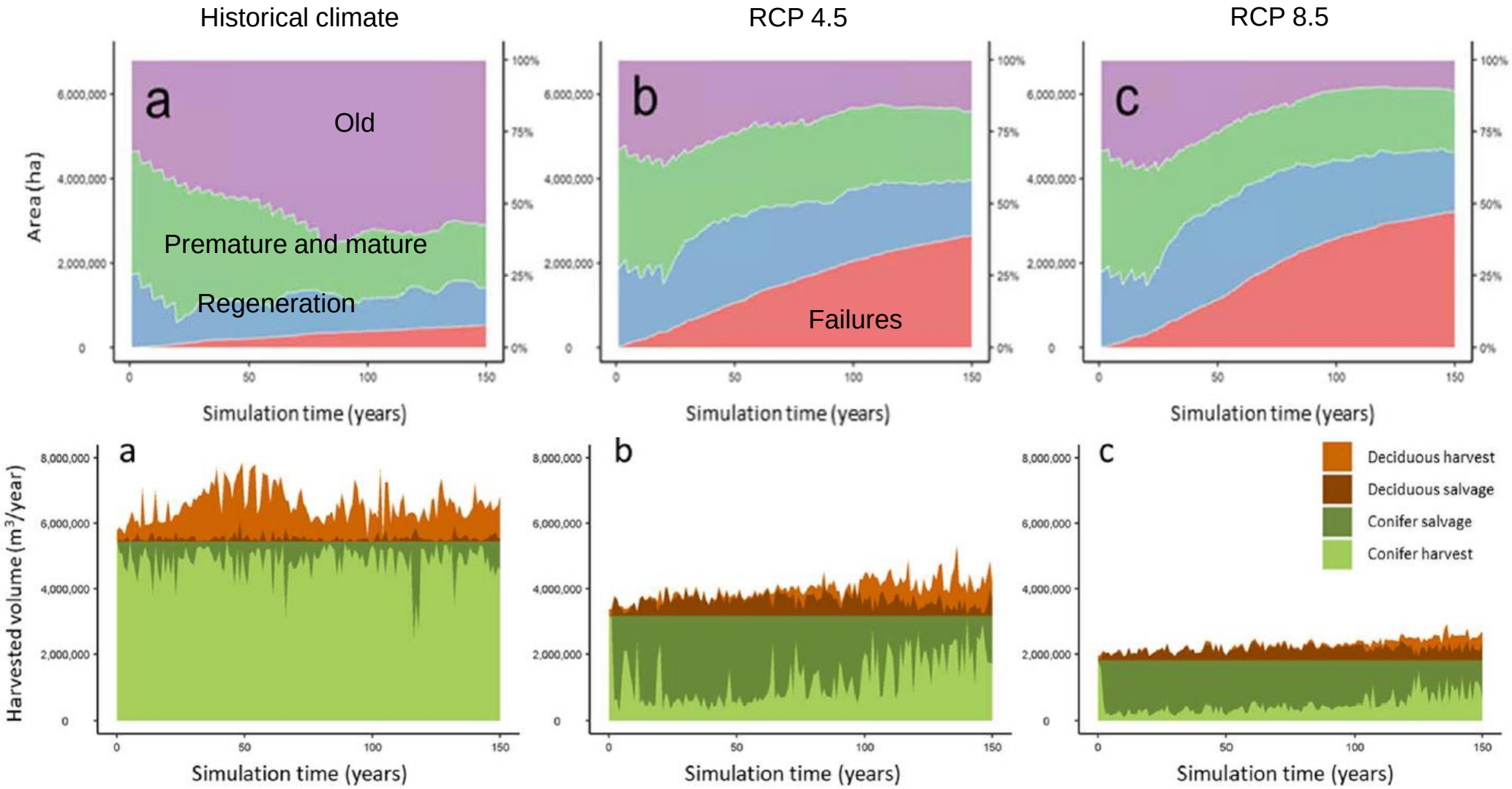


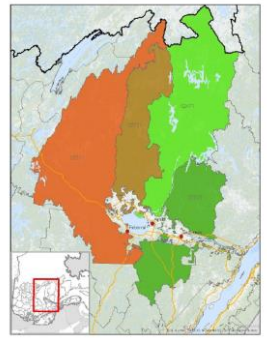


De vastes pans de la forêt boréale n'arriveront pas à se régénérer

[Accueil] / [Environnement]

This means less and different kind of volume harvested





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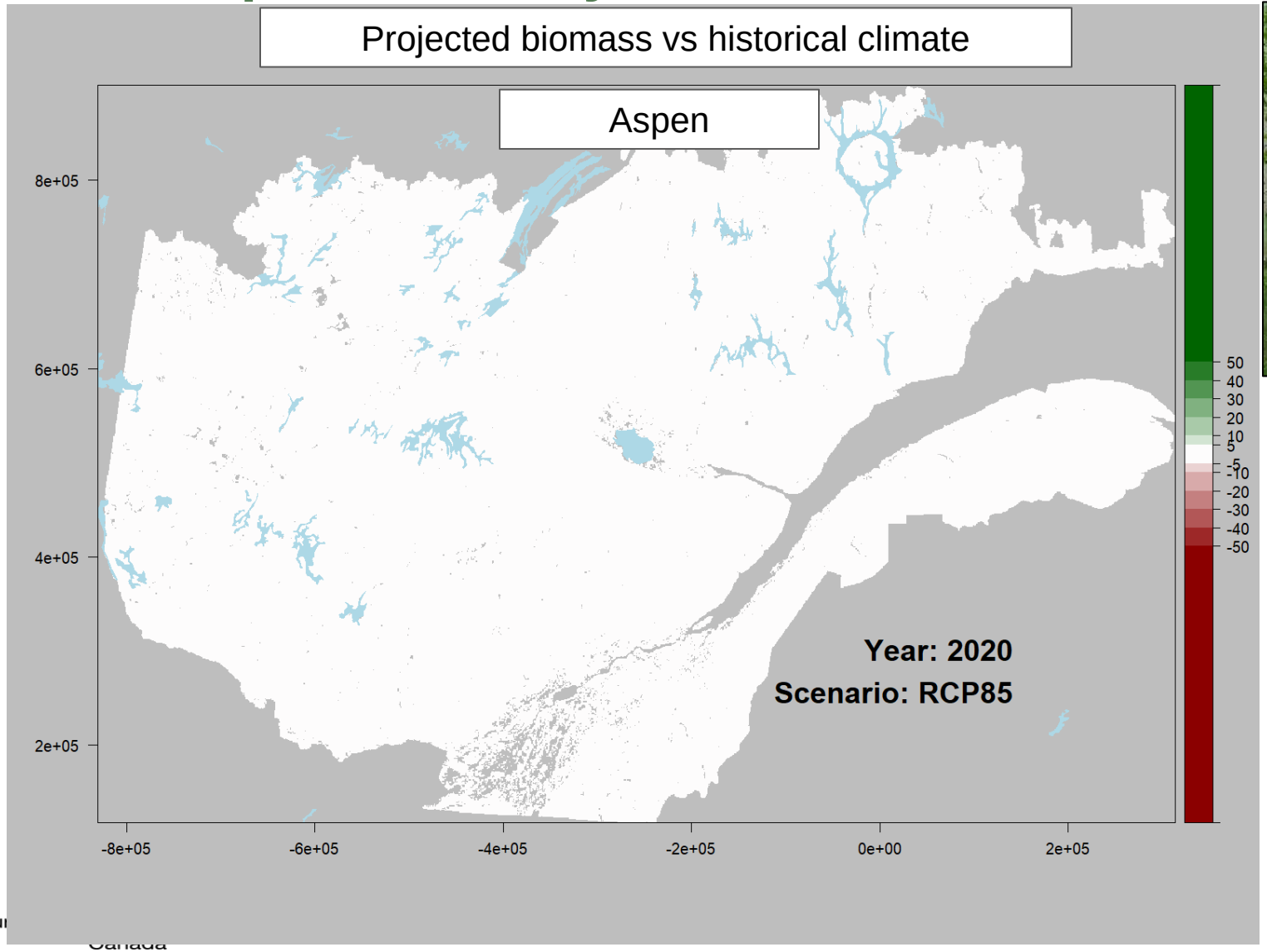
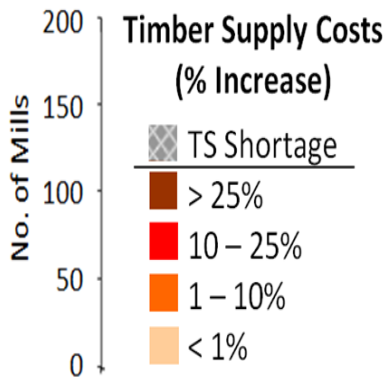
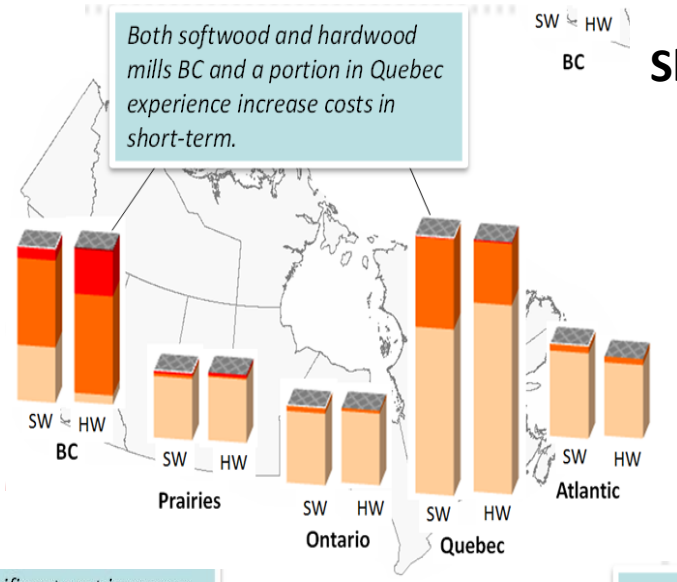
Canada

Increases in fire activity will promote the expansion of pioneer species, many of which are deciduous



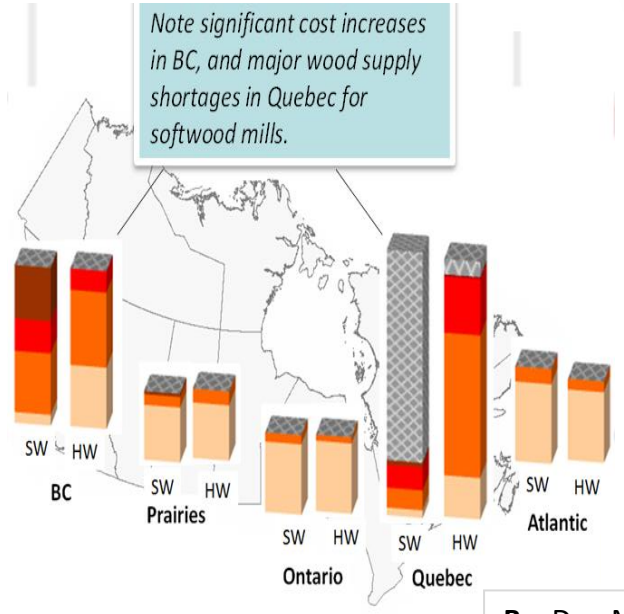
Higher costs and timber shortages, especially for softwood



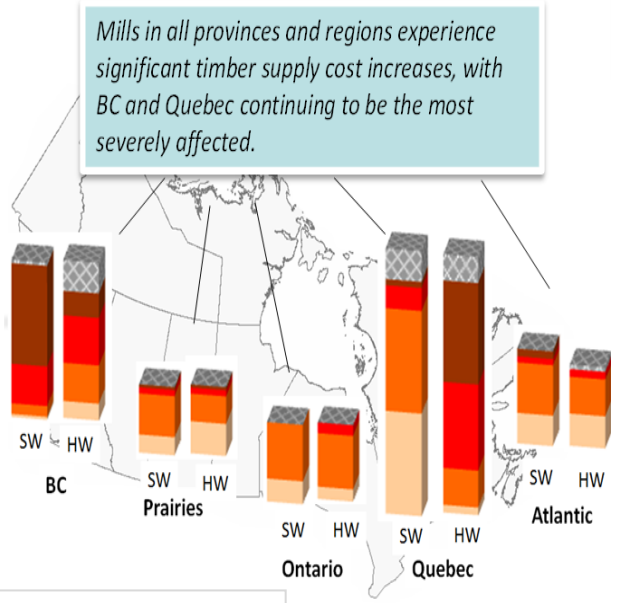


Short term| 2011-2040

Mid term| 2041-2070



Long term | 2071-2100



By: Dan McKenney, John Pedlar, Denys Yemshanov, Anne-Hélène Mathey

Solution 1) Having a precautionary reserve over a larger proportion of the territory

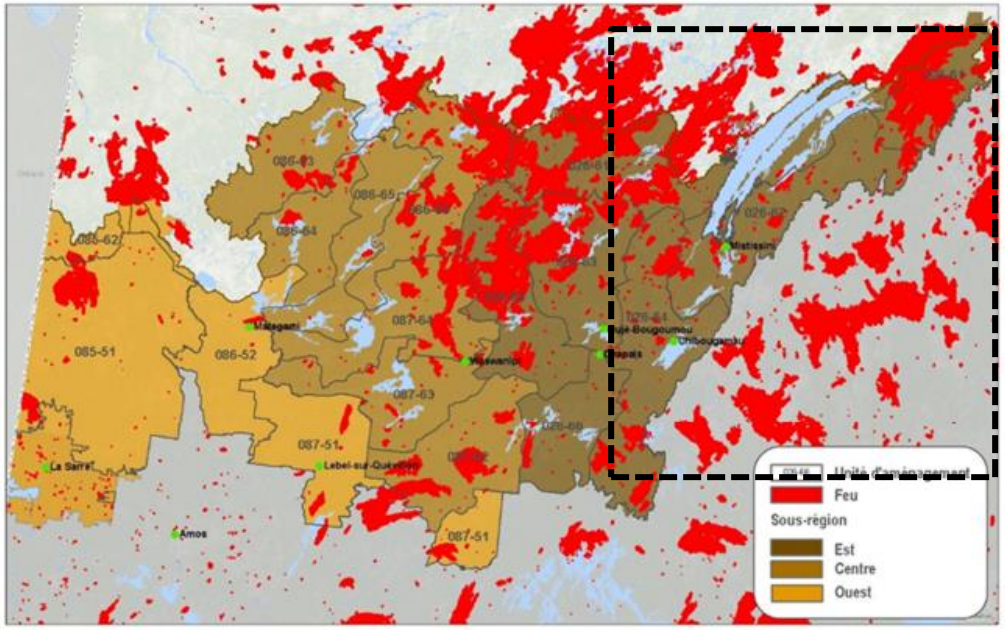
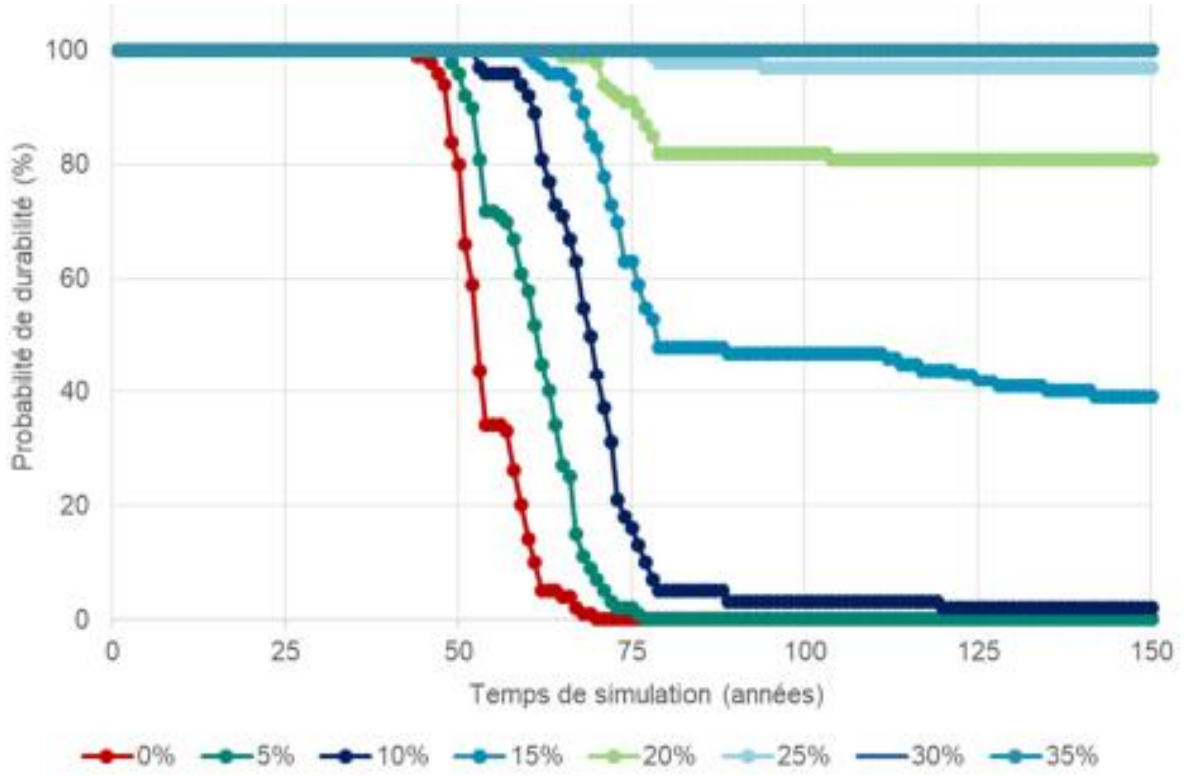
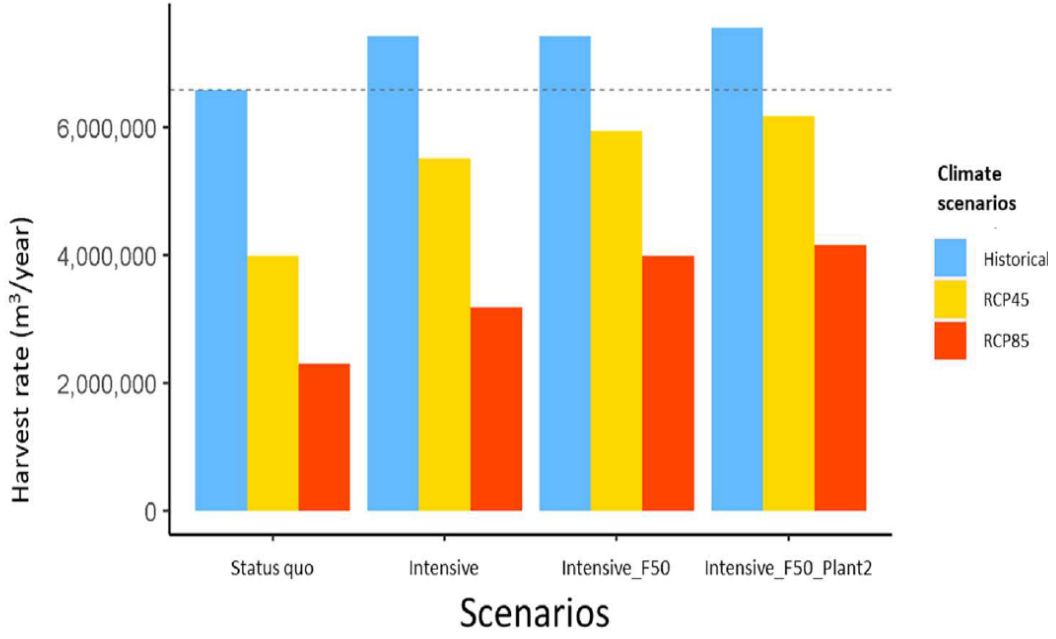


Figure 1. Les unités d'aménagement, les feux de 1976 à 2019 (en rouge) et les trois sous-régions (Ouest, Centre et Est, en tons de brun) de l'aire d'étude dans la région Nord-du-Québec



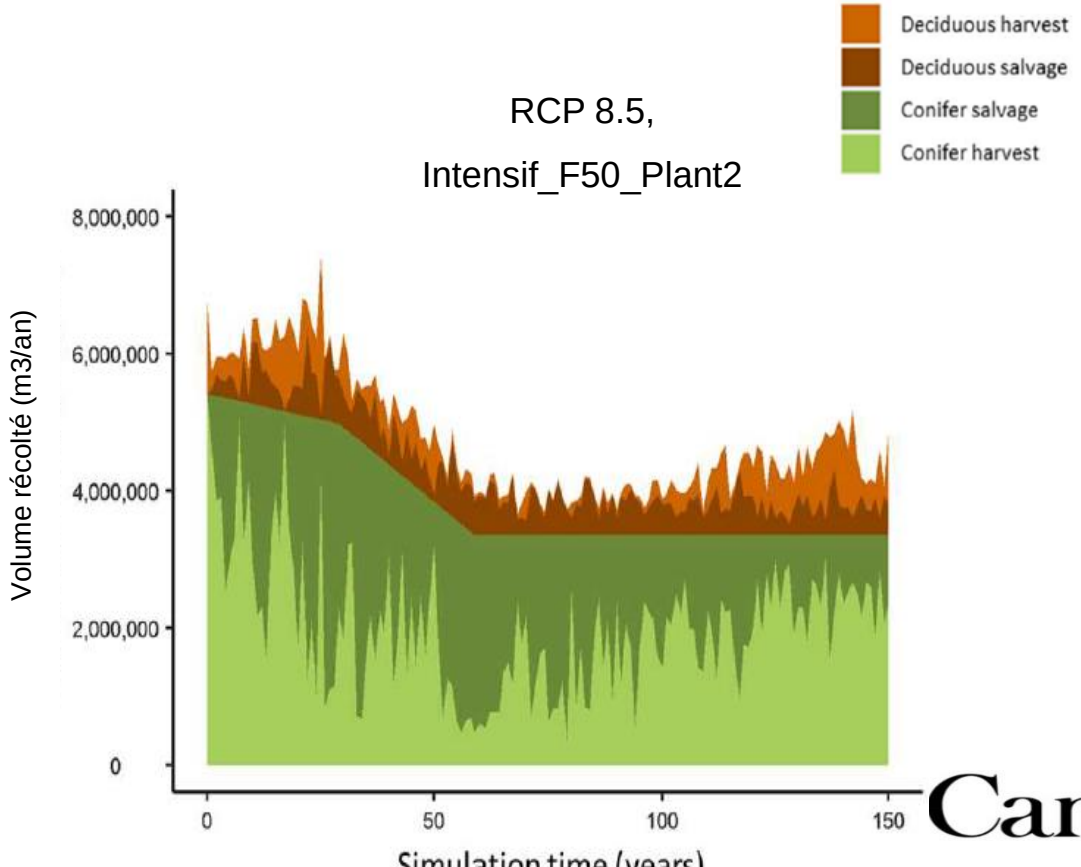
BFEC 2022

Solution 2) Make our forest landscapes more fire resistant



RCP 8.5,

Intensif_F50_Plant2

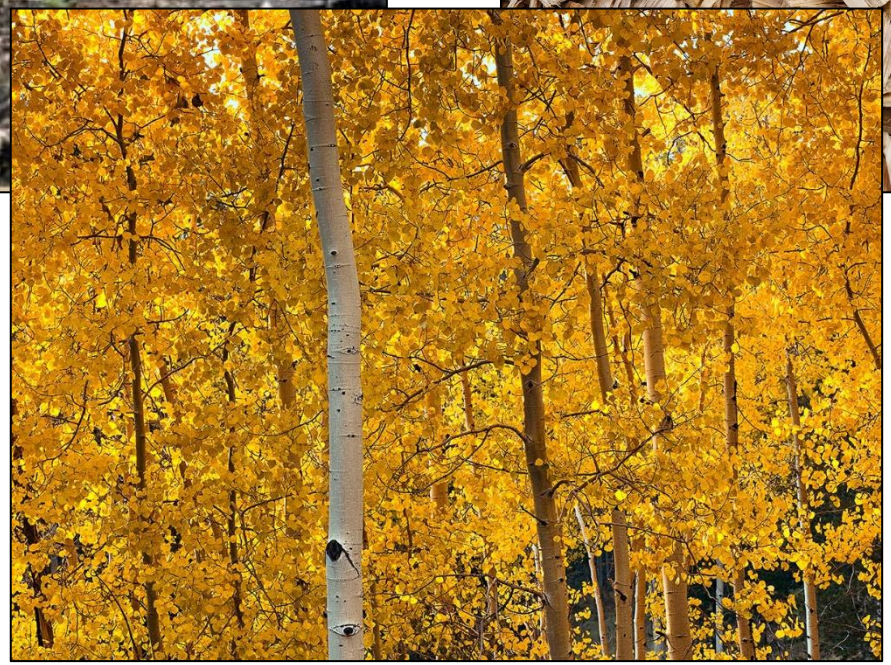


Solution 3) Make our forest landscapes more fire resilient

E.g. : variable retention

E.g. : favor fire resilient species

Solution 4) Make the forest sector and the industrial structure more resilient



A vast undertaking for the future!

- What are the costs of doing nothing vs doing adaptation?
- Capacity to managed landscape is limited per year
- Harmonized with other strategies (e.g. : wood production + proecting communities)
- Wood is one thing. All about other issues (wildlife, carbon, etc…)?
- Build win-win strategies
- Having regional strategies