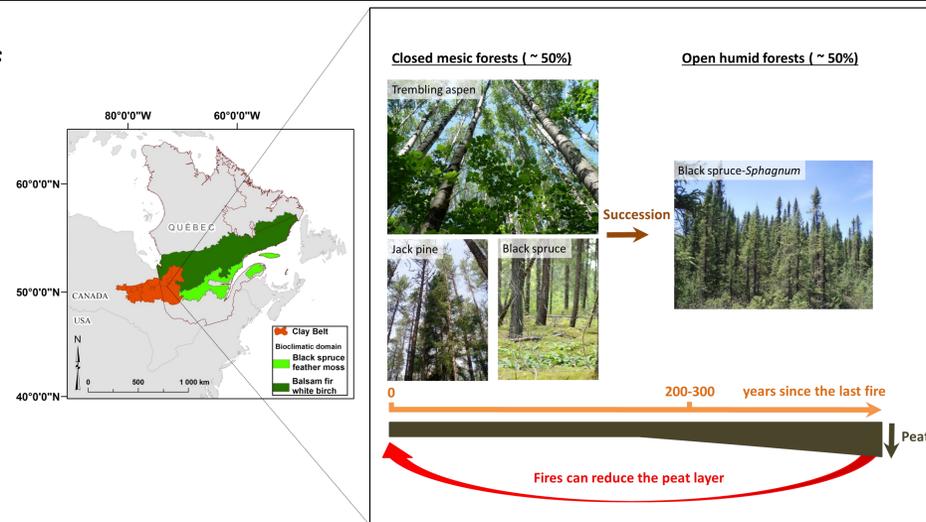


1. Context

- In the Clay Belt Boreal forest (eastern Canada) a **decrease of fire frequency** during the **past 3 millennia** contributed to an **acceleration of peat accumulation (=paludification)**.
- Forests tend to converge to **open humid spruce-Sphagnum forests** regardless of the initial species composition in the **prolonged absence of fire**.
- The anticipated **increase in drought frequency** with the climate change could lead to a **shift in forest structure and composition**, and to a subsequent **peat reduction** via increased fire disturbance.

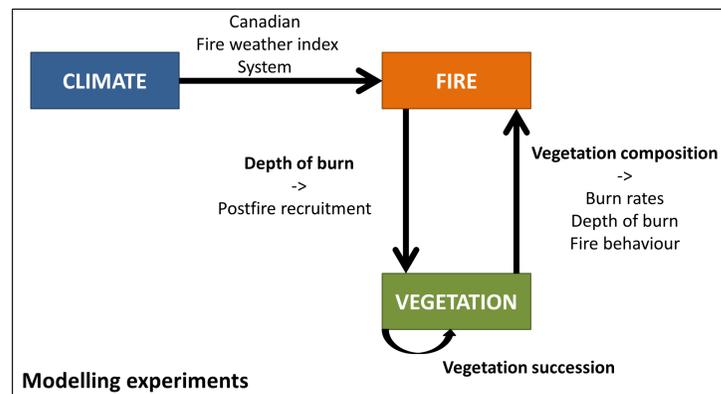


2. Objectives

We projected the impacts of climate change on fire activity (fire occurrence, burn rates, and depth of burn) and on vegetation composition, and addressed these two questions:

- Will fire occurrence, burn rates and depth of burn increase in response to climate change?
- Will the Clay Belt boreal landscapes shift into closed forests in response to the projected increases of fire frequency?

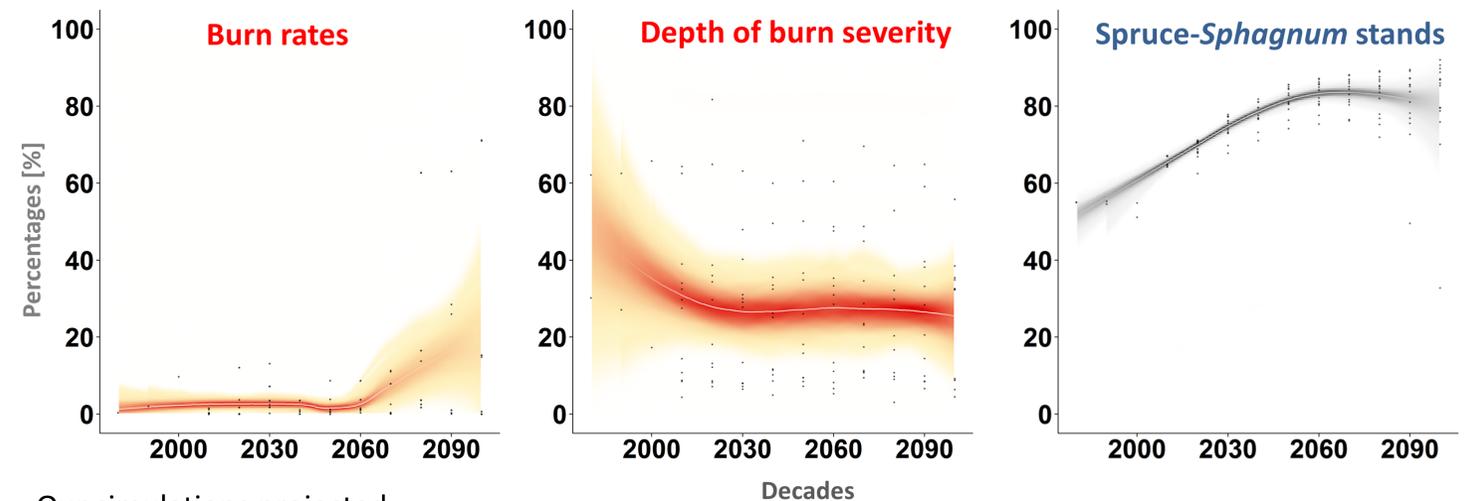
3. Methods



The impacts of a changing climate on fire regime characteristics and vegetation dynamics was investigated using the **Canadian Fire Effects Model (CanFIRE)**.

- New:** vegetation feedbacks on fire activity and depth of burn influence forests postfire recruitment.
- Simulation period: 1971-2100; time step: 10 years; simulations at the stand scale.

4. Results



Our simulations projected :

- An **increase of burn rates** from 2061-2100 and a **decrease of depth of burn severity** from 1971 to 2030.
- An **increase of humid Spruce-Sphagnum stands** that will **protect forests from severe depth of burn**

5. Conclusions

- The **legacy of past fire activity** implies a **rapid succession of closed forests into open black spruce forest** in upcoming decades.
- Moist conditions** of these forests will provide a **resistance** to increasing fire activity.
- Future shifts** in landscape composition and structure are **unlikely to offset increasing area burned** in response to continued warming in the Clay Belt boreal forest.

Thanks

A. Belleau, L. Dumas, A. Leduc, C. Leroy, D. Lessieur, P. Grondin, M. Paquette, M. Desrochers, R. St Amant, S. Kembel, M. Garneau, P. Bernier, J.