



# Understanding the effect of multiple disturbances and their interaction on understorey plant communities

Sudha Ghimire, Nicole Fenton, Osvaldo Valeria

Forest Research Institute (IRF), University of Quebec at Abitibi-Temiscamingue (UQAT), Rouyn-Noranda, Quebec



## CONTEXT

- ♣ Boreal forest ecosystems – rich in vascular and non-vascular plant communities
- ♣ Bryophytes - principal components of forest floor



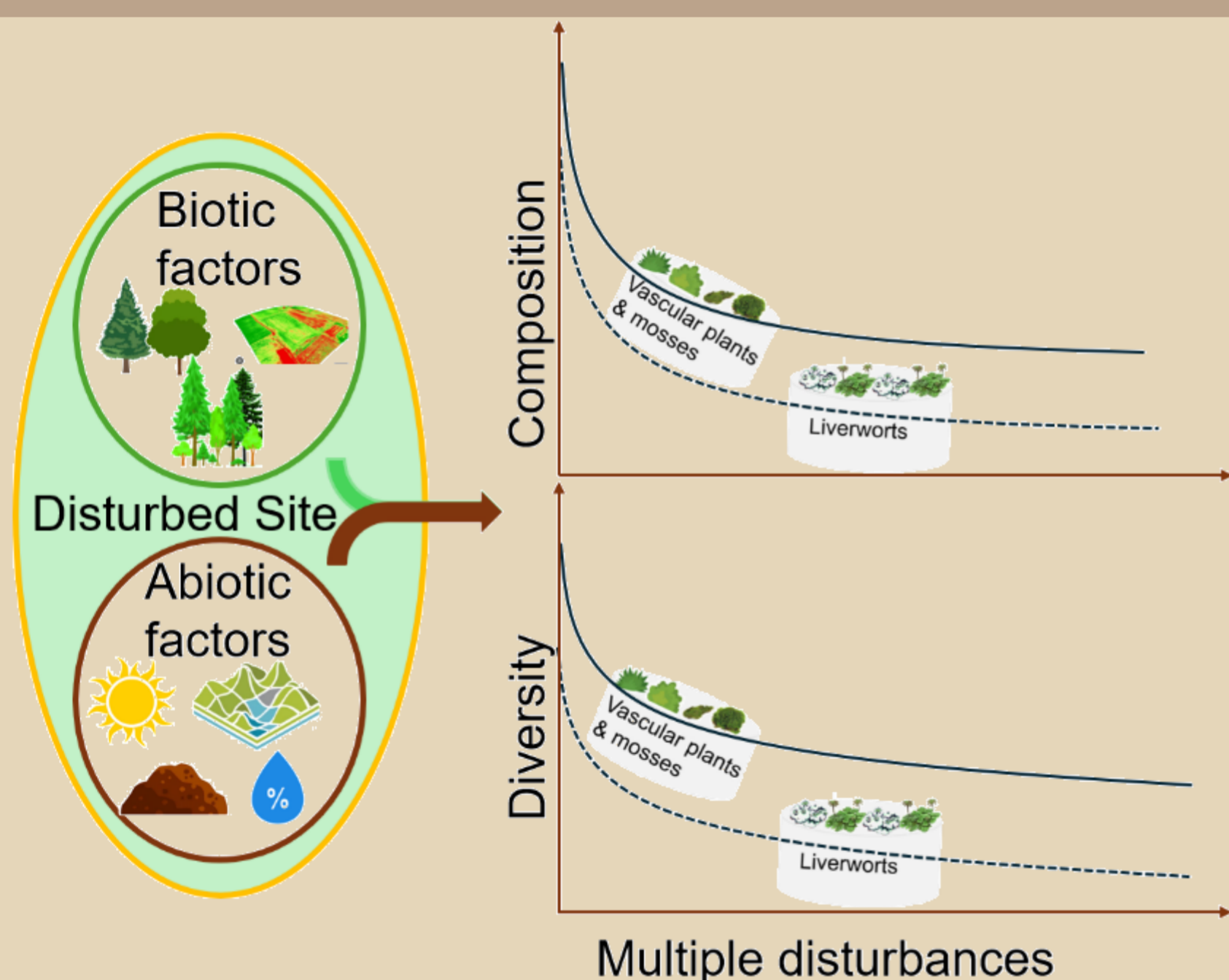
Fig: Factors influencing understorey vegetation in the boreal forest

- ♣ Exposed to **multiple co-occurring disturbances**
- ♣ Changes in resource availability and microhabitat condition
- ♣ Impact on diversity and composition

## OBJECTIVES

- ♣ To identify how the diversity and composition of understorey plants change due to disturbances
- ♣ To detect the major factors that cause the change in understorey plant communities

## HYPOTHESIS



## METHODOLOGY

### Study area

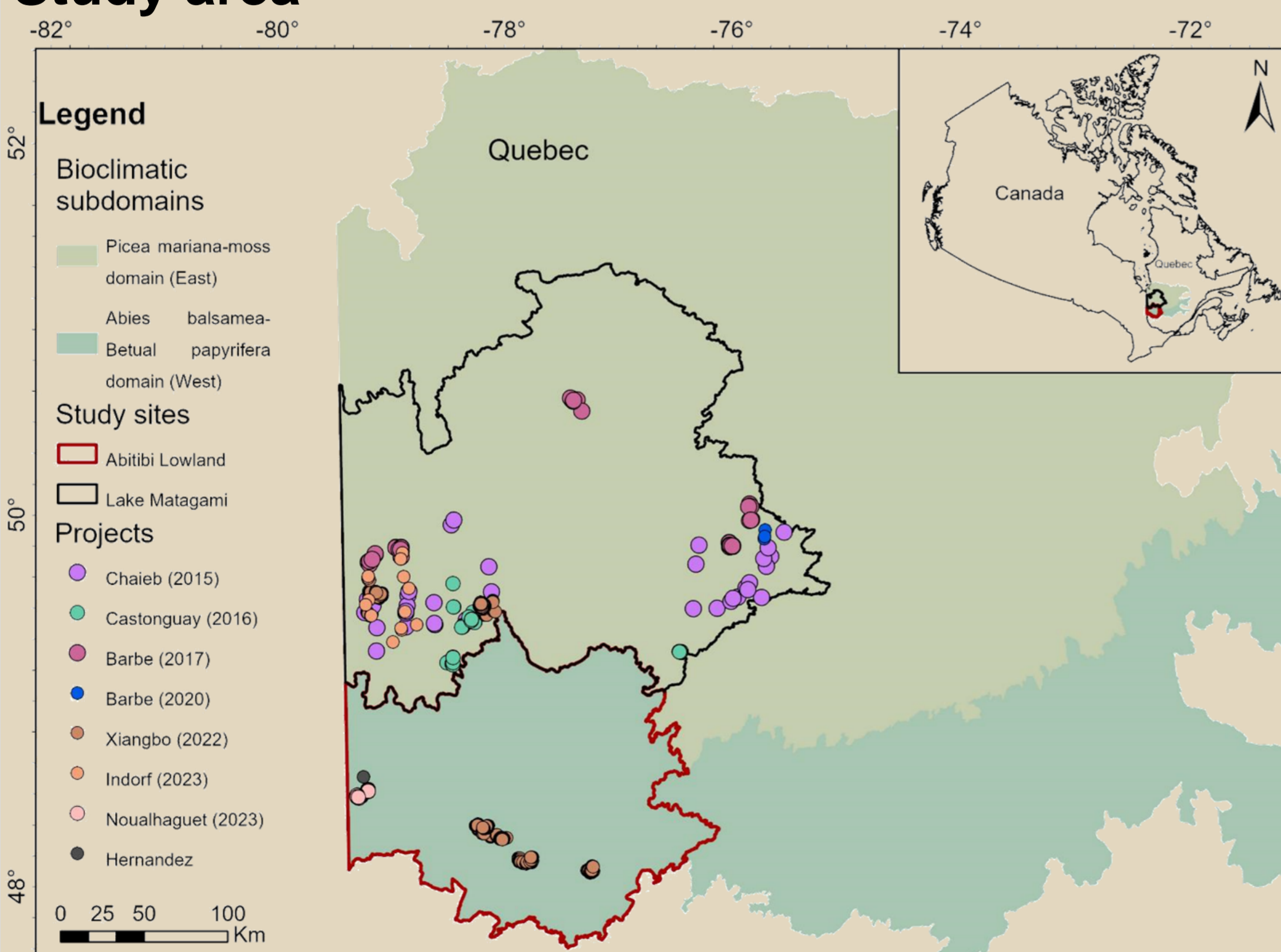


Fig: Sampling locations within different bioclimatic domains of Quebec

## Disturbance map

- ♣ Extracted map for major disturbances (wildfire, insect outbreaks, harvesting, mine sites, road construction, and power transmission lines)

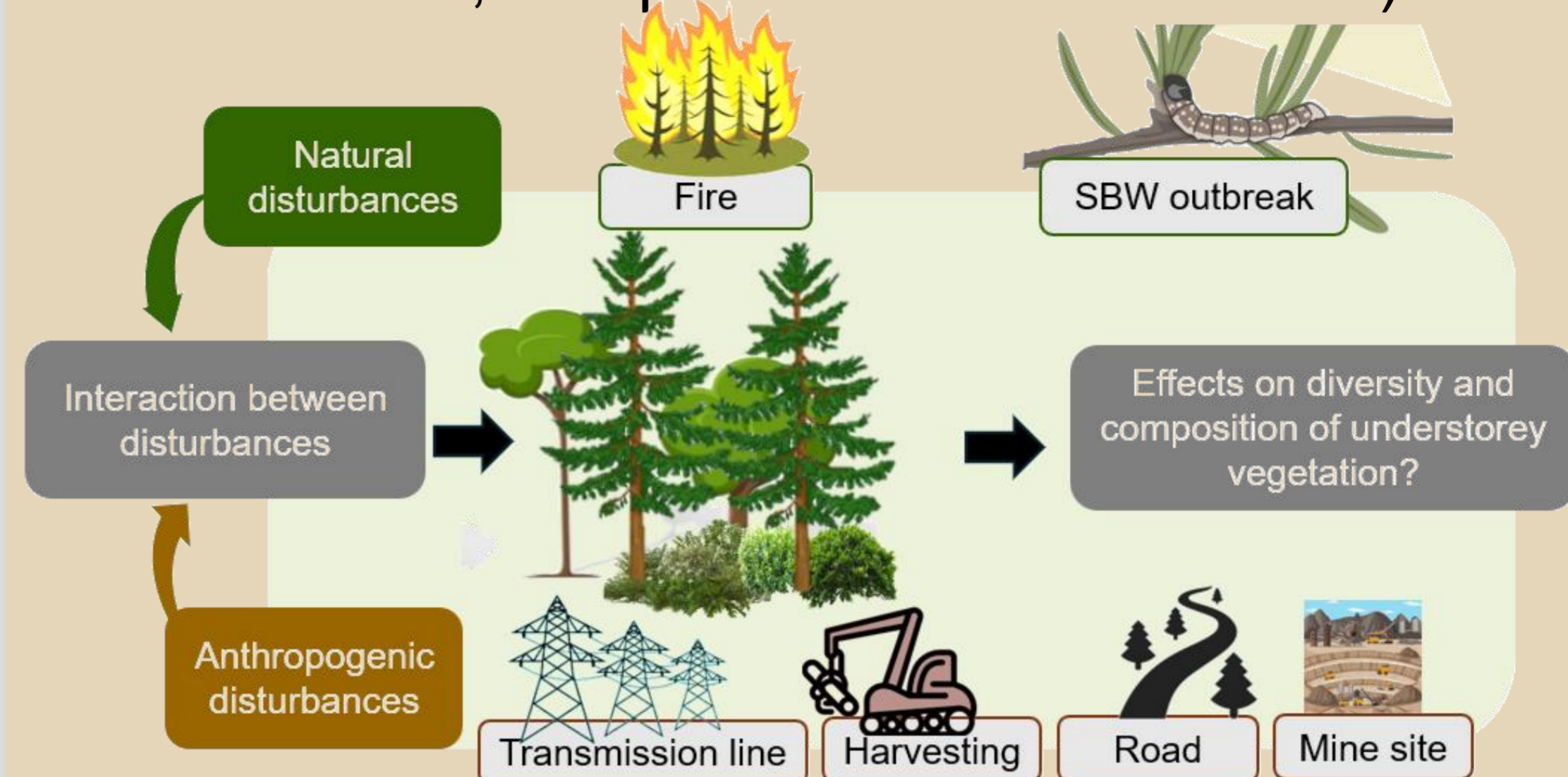


Fig: Effects of multiple disturbances in forest ecosystems

- ♣ Compiled data from pre-existing projects
- ♣ Applied disturbance-specific buffer distances to filter plots from different ecosystem types and multiple disturbances
- ♣ Identified 747 disturbed and 95 undisturbed (control) plots

## Sampling design

- ♣ Allocation of 40 additional sampling sites based on ecosystem types and road accessibility

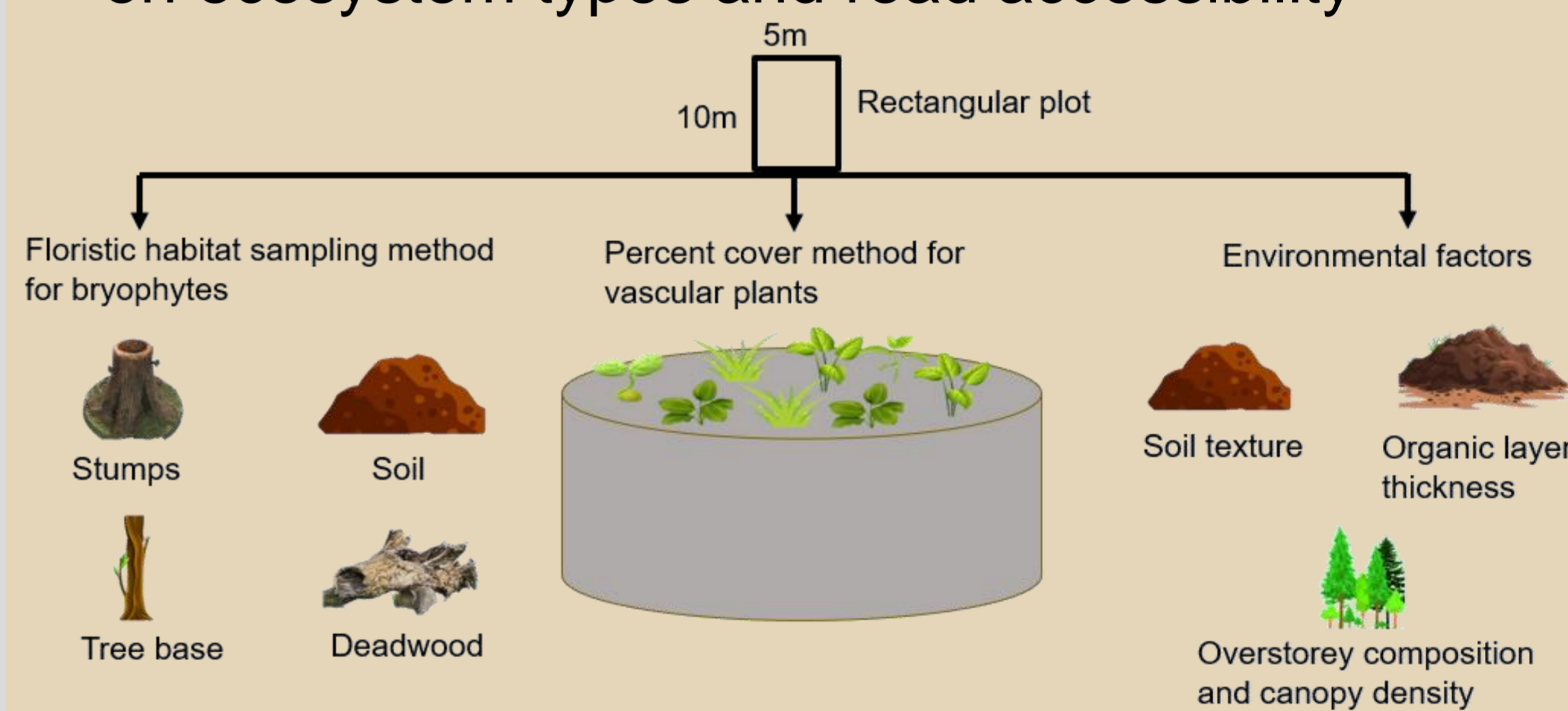


Fig: Sampling design for the vegetation data collection

## Environmental factors

- ♣ Extraction of topographical factors (slope, elevation, aspect, topographic position index, water flow direction, & flow accumulation) using DEM
- ♣ NDVI will be used for calculating additional vegetation factors

## CONTRIBUTIONS

- ♣ Help identify species and habitats vulnerable to multiple disturbances at a landscape level
- ♣ Elucidate the cumulative disturbance effect on understorey plant communities

## References



## LinkedIn



Sudha.Ghimire@uqat.ca

