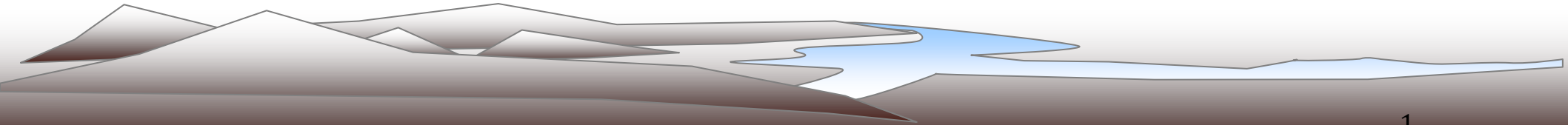


# **The Big Picture**

## **How Prairie Ecosystems Will Change Under a Warmer Climate**

**Richard Schneider**

**May 8, 2024**





# Boreal Forest



# Parkland



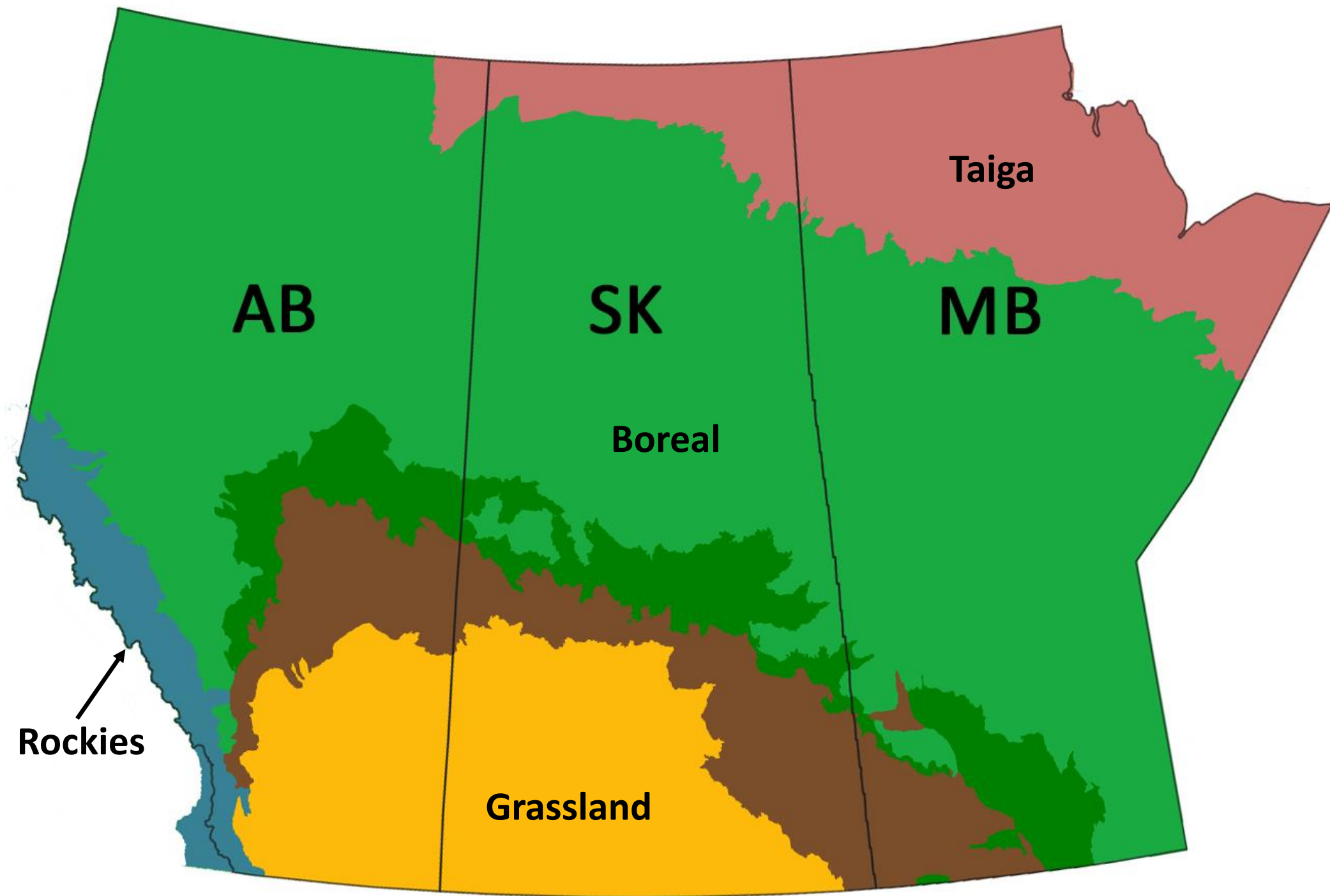
# Rockies

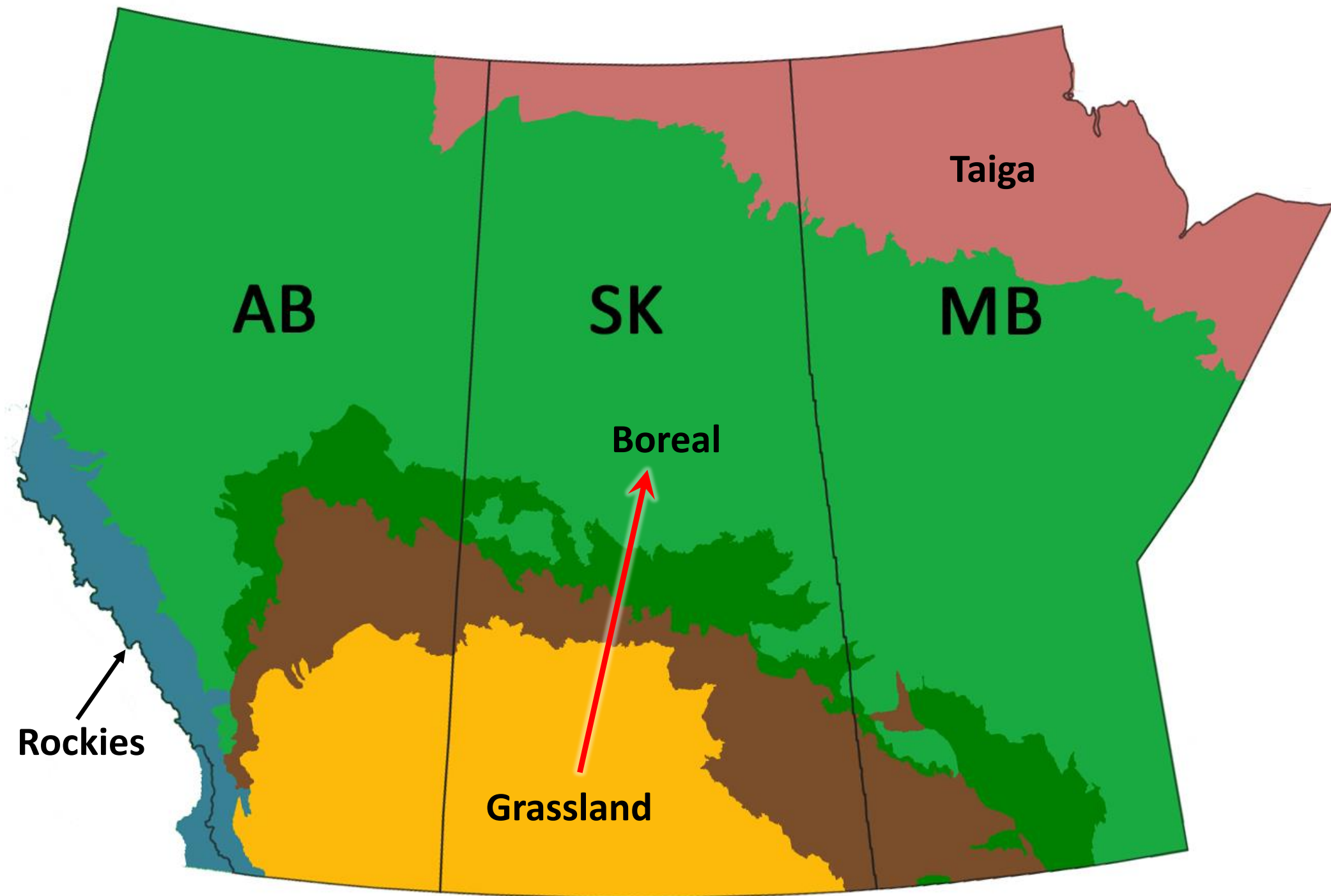


# Grasslands



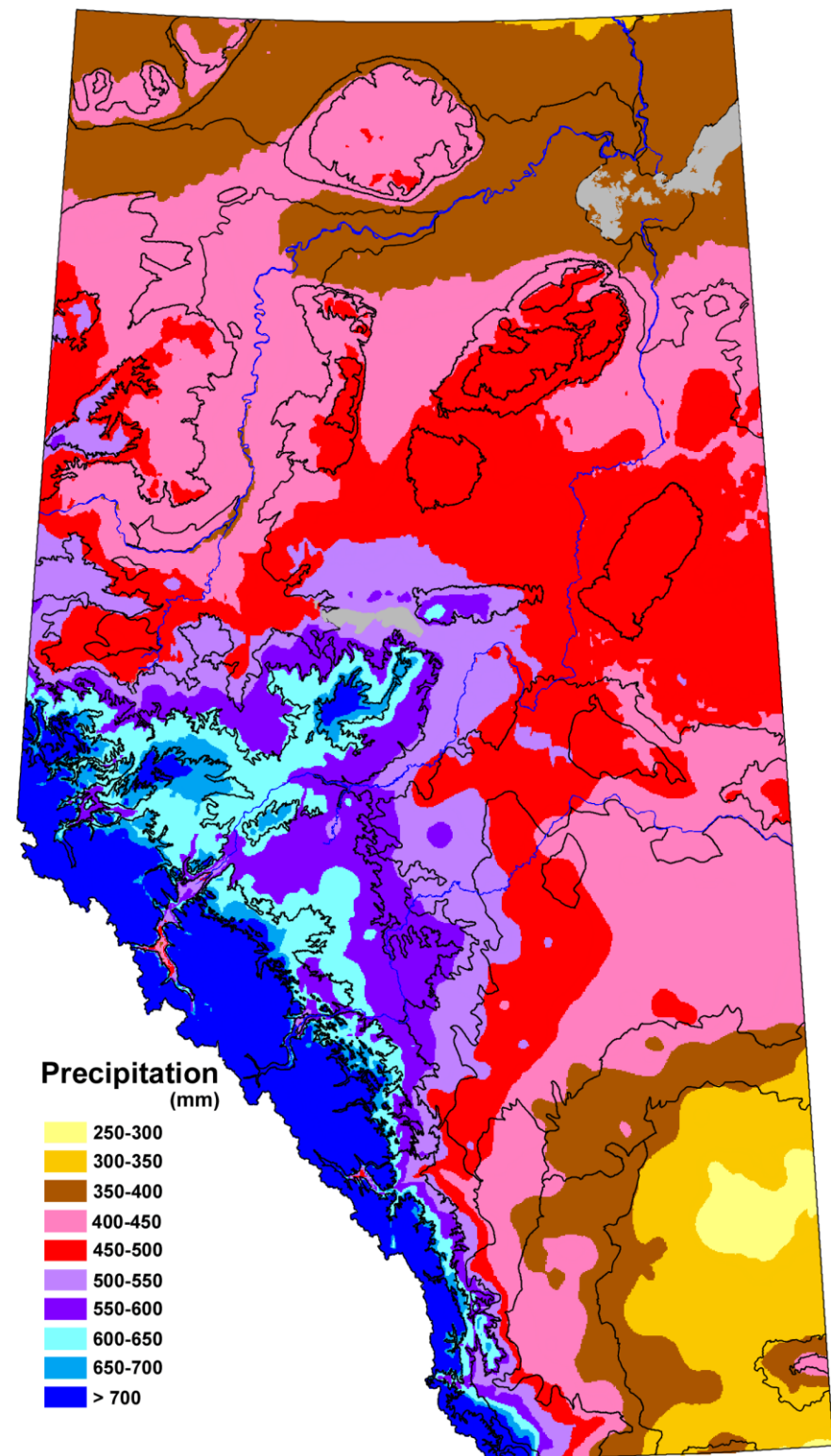








# Mean Annual Precipitation







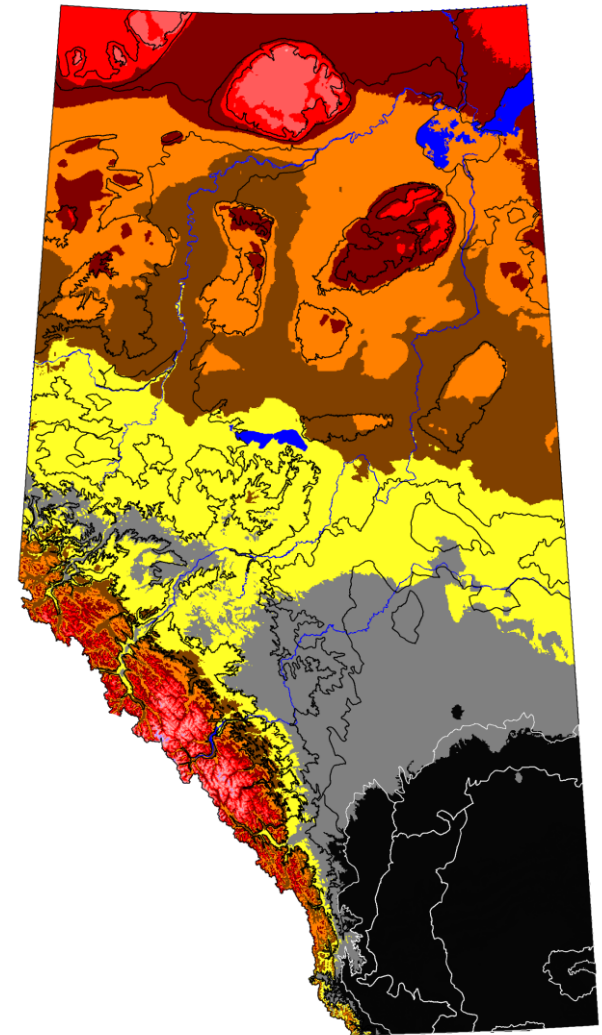
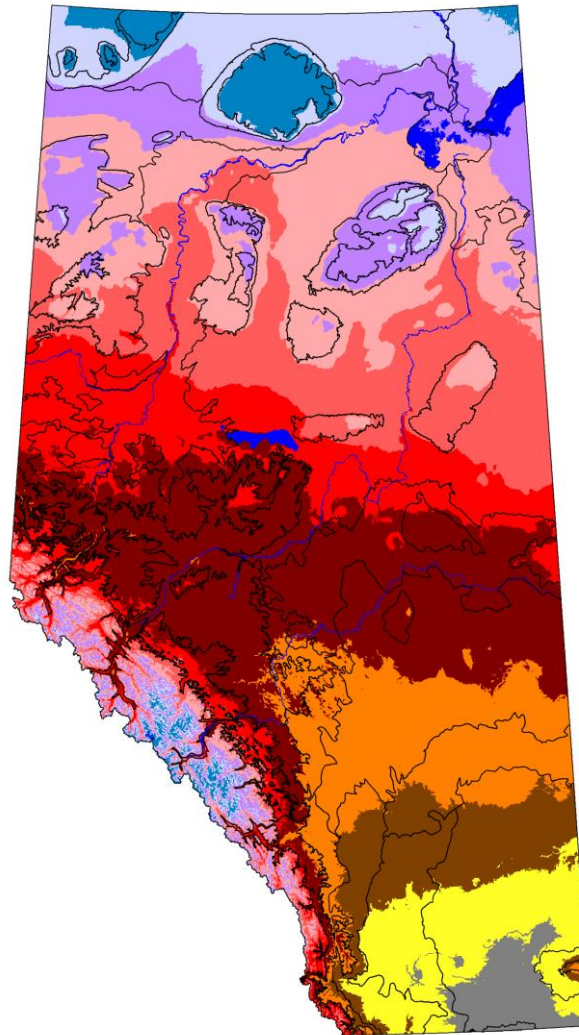
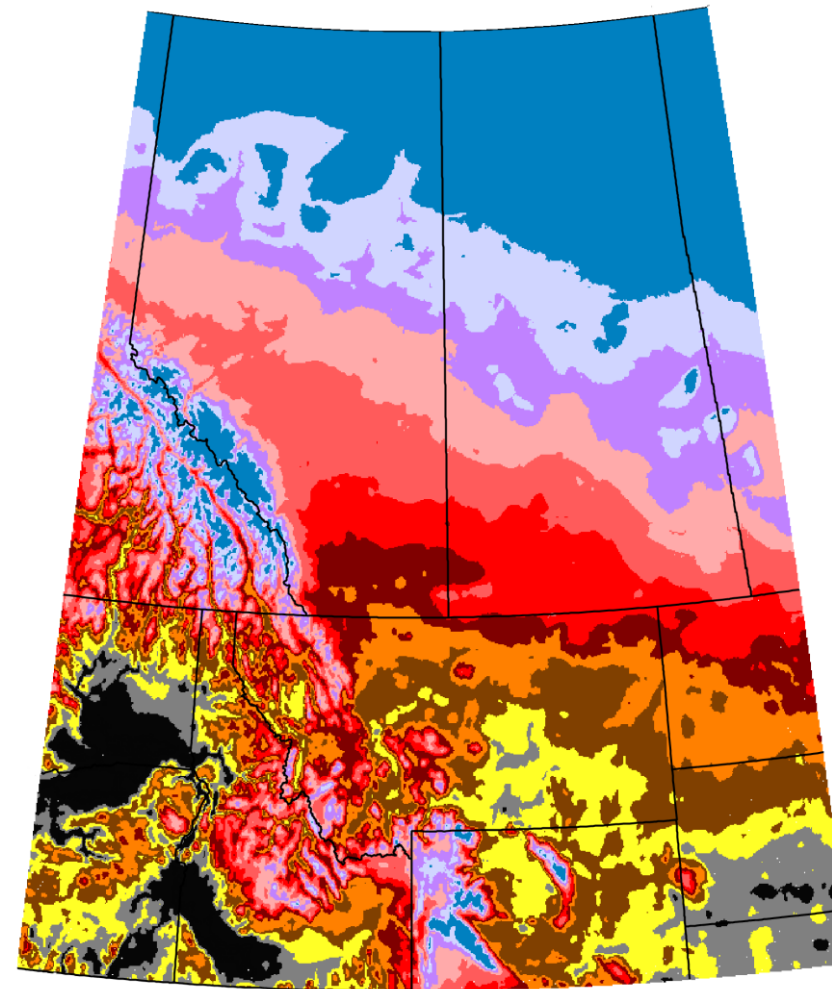


# Temperature in the 2080s

**Current**

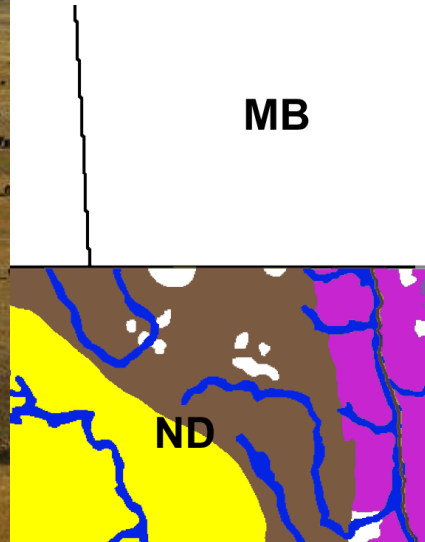
**Min (2 °C)**

**Max (6 °C)**



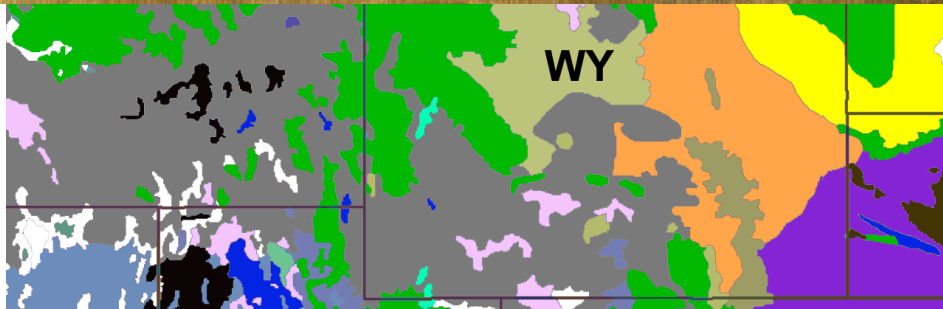


# Parkland/Grassland Transition



## Vegetation Type

- Bluestem Prairie
- Desert
- Floodplain
- Foothills Prairie
- Forest



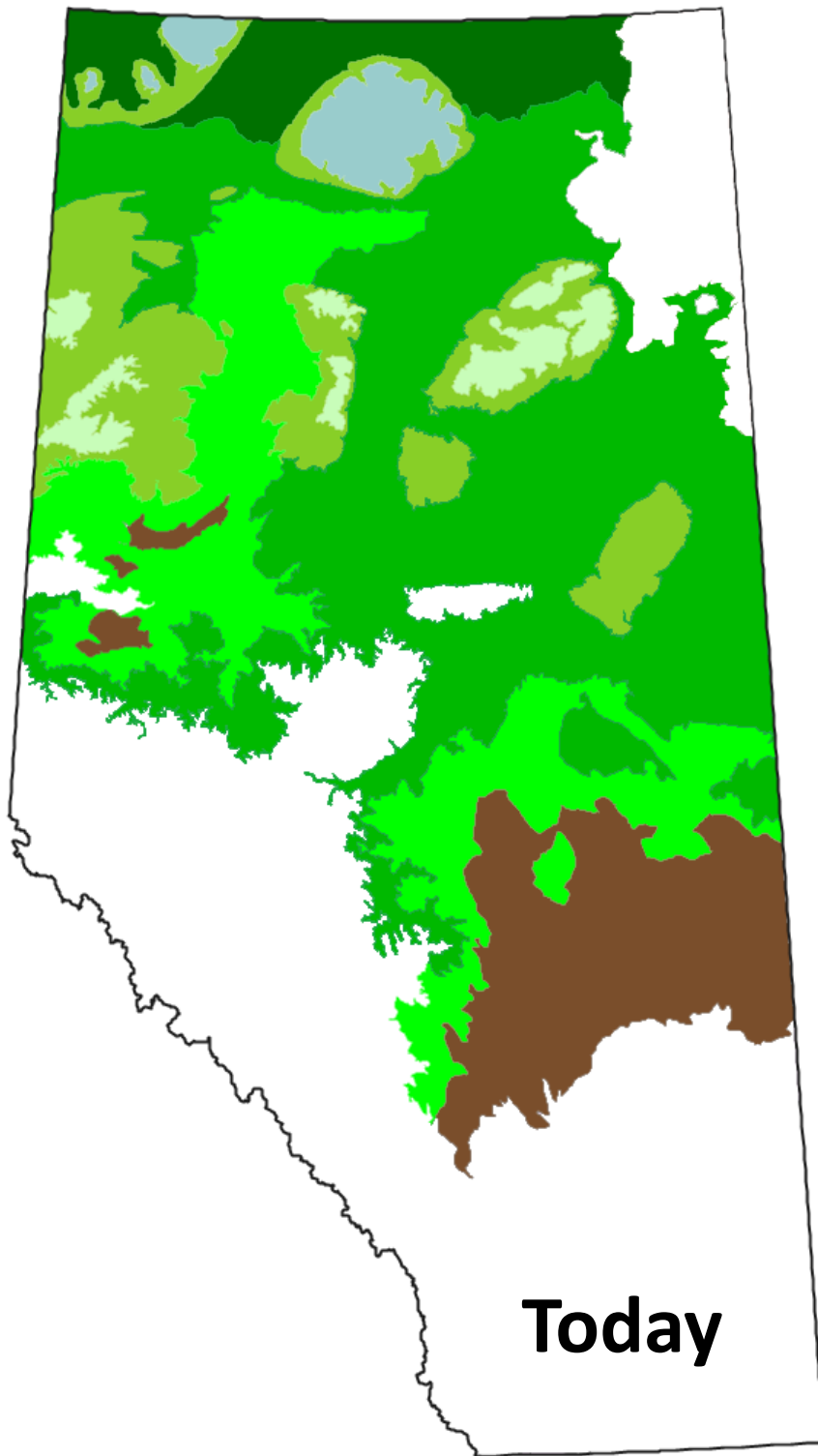


# Parkland/Grassland Transition



# Boreal Transitions

Parkland = moisture  
tipping point between  
grassland and forest





# Parkland





# Boreal Dry Mixedwood

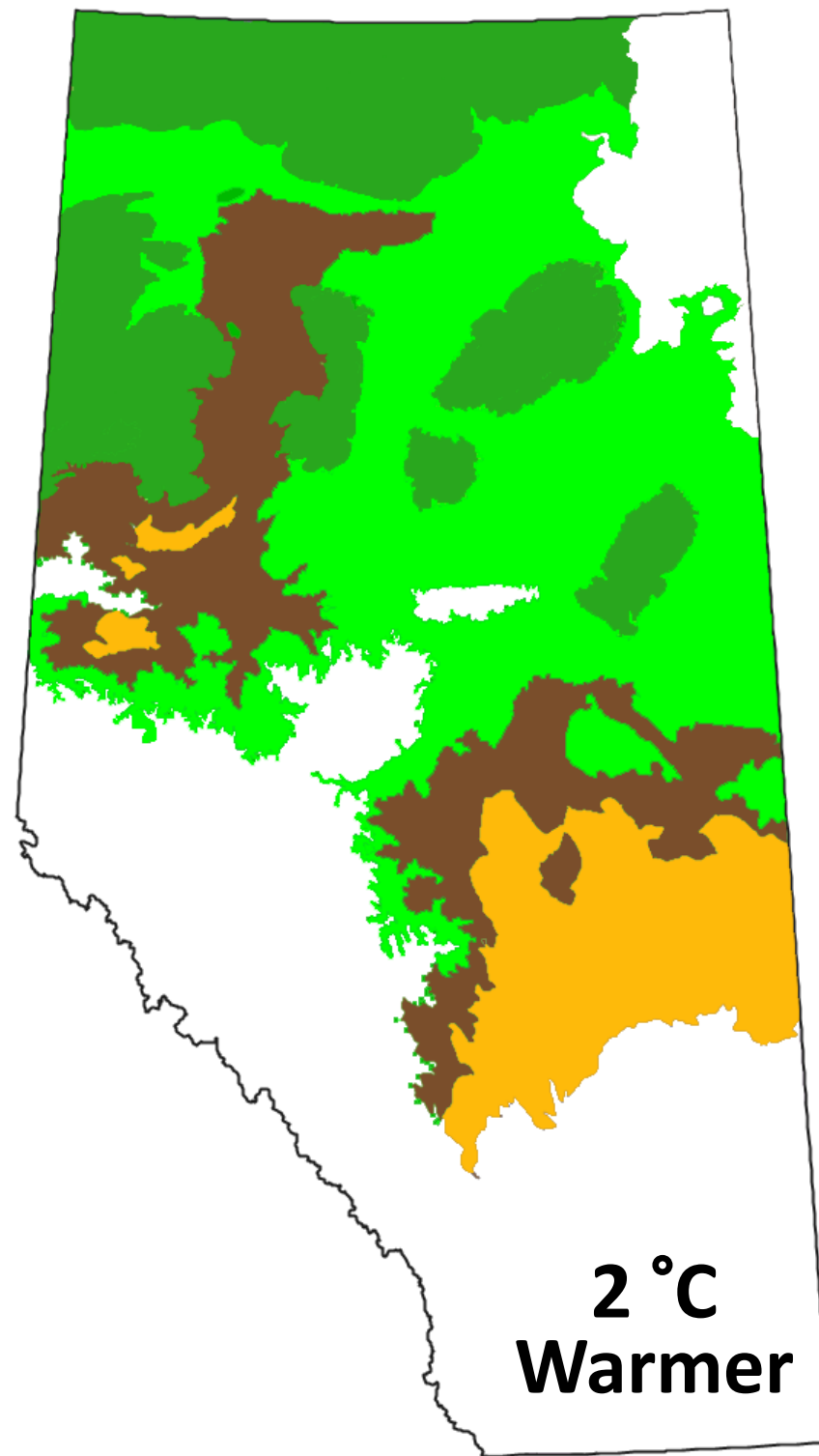
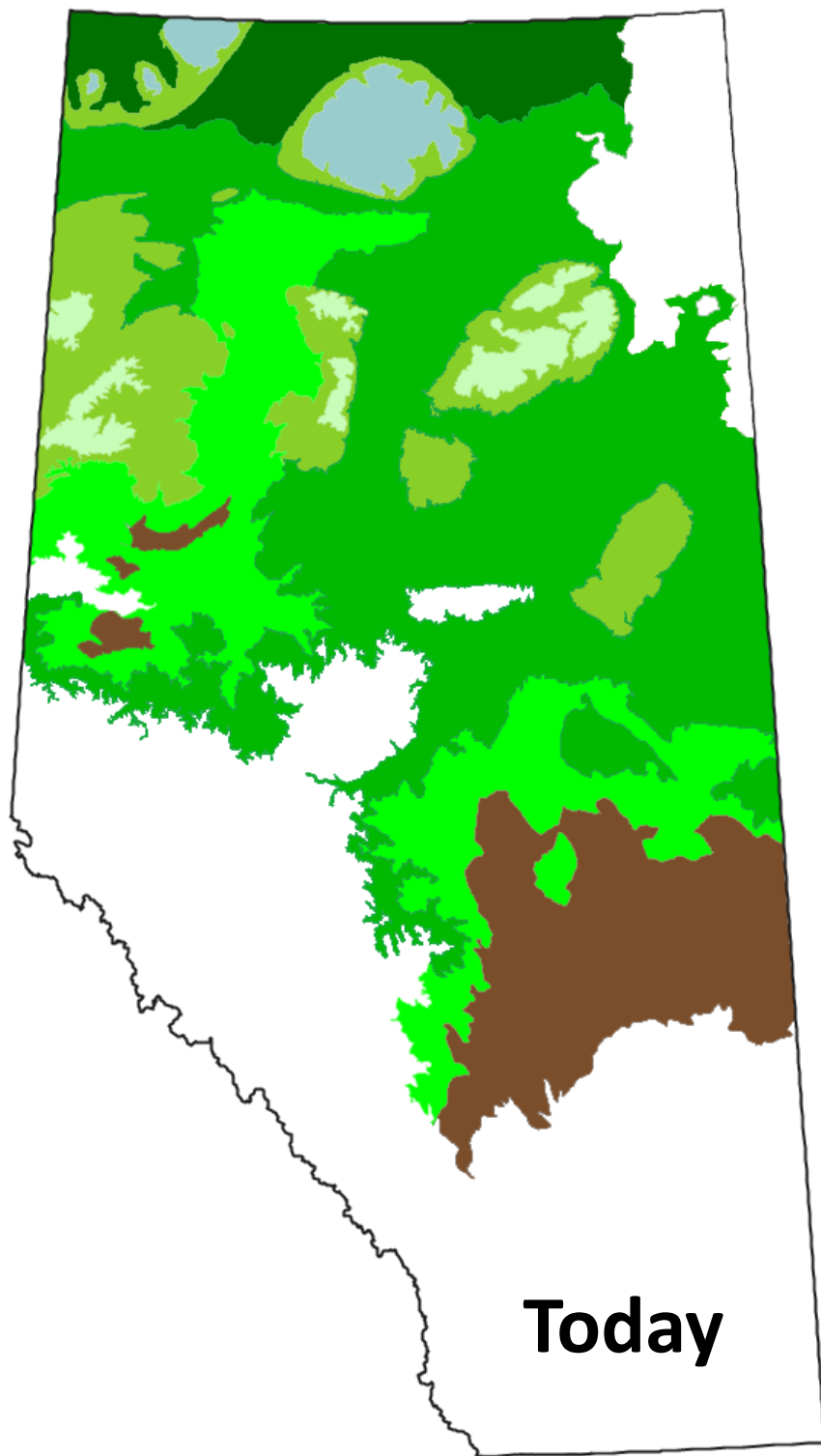




# Boreal Wet Mixedwood









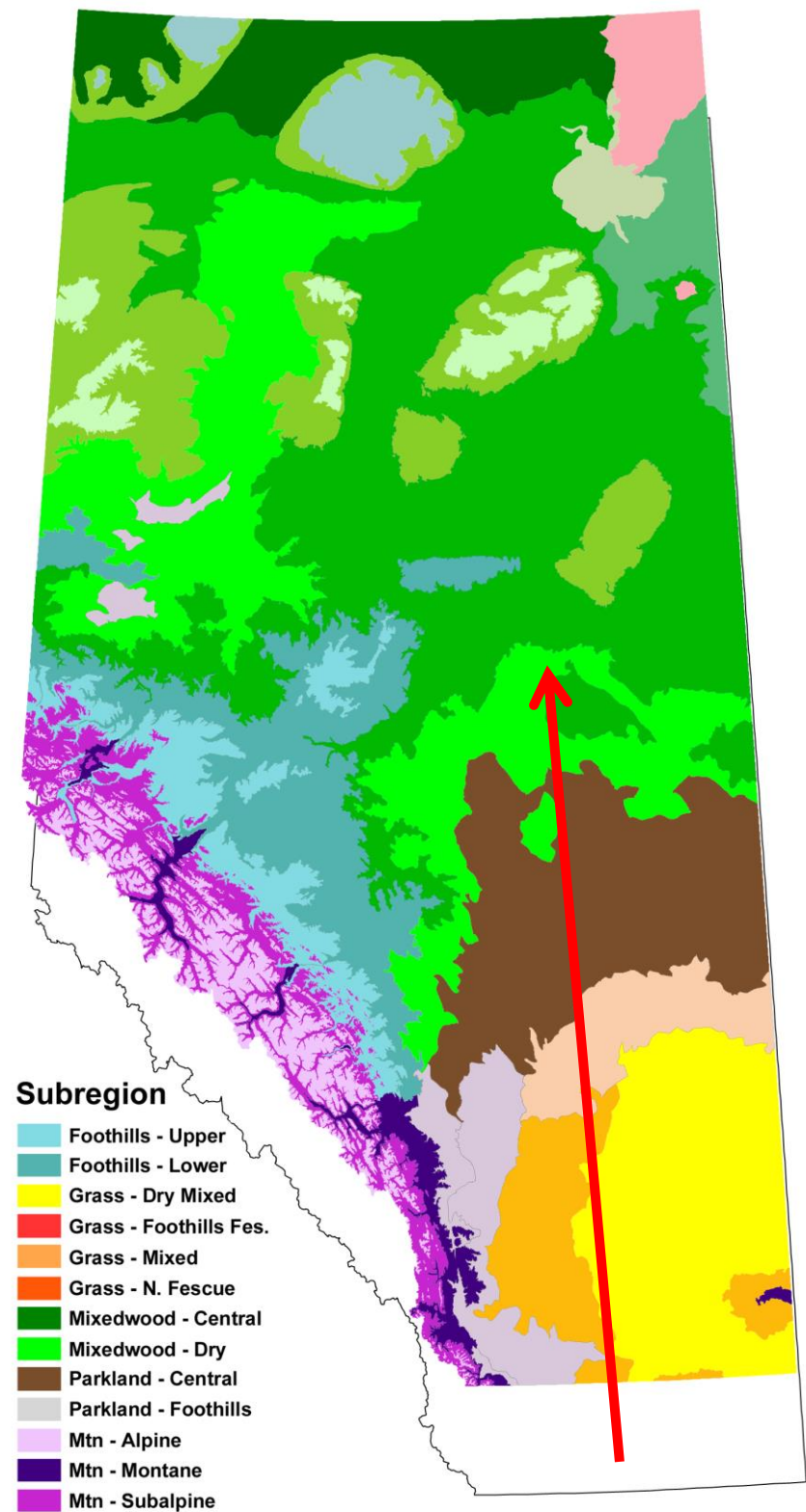
# Forest Transitions Will Take Decades





# Is Global Warming a Threat to Biodiversity?

**Change  $\neq$  Loss**





# Canadian Species are Survivors of Past Episodes of Climate Change









# Some Species Have Low Resilience





# Barriers to Movement Now Exist





# **Rate of Change is Faster than Past Episodes of Climatic Change**

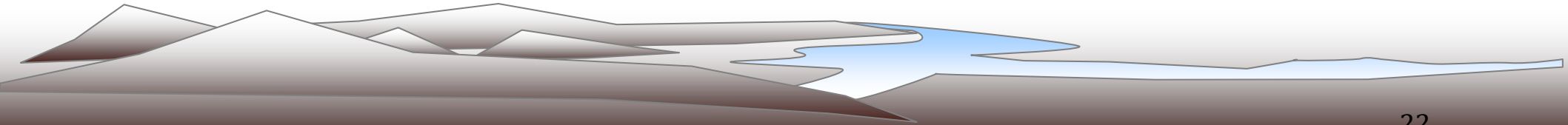
- Some species may not be able to keep up**





# Summary

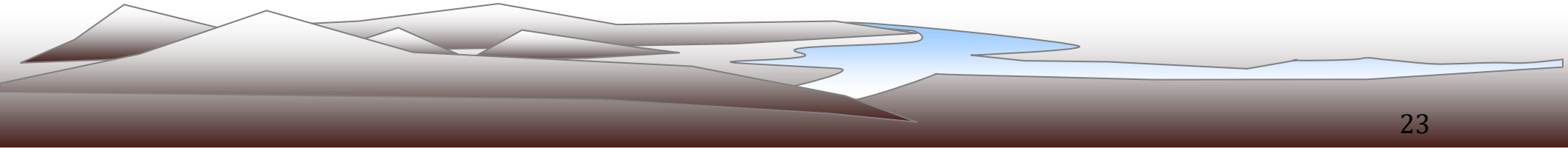
- Warmer temperatures = increased evaporation and reduced ground moisture
- Drier southern prairies. Northward shift in grasslands at the expense of the boreal forest
- Ecosystem transitions will lag behind climate
- Extent of change will depend on the amount of warming that actually occurs
- Many species will decline; some will benefit





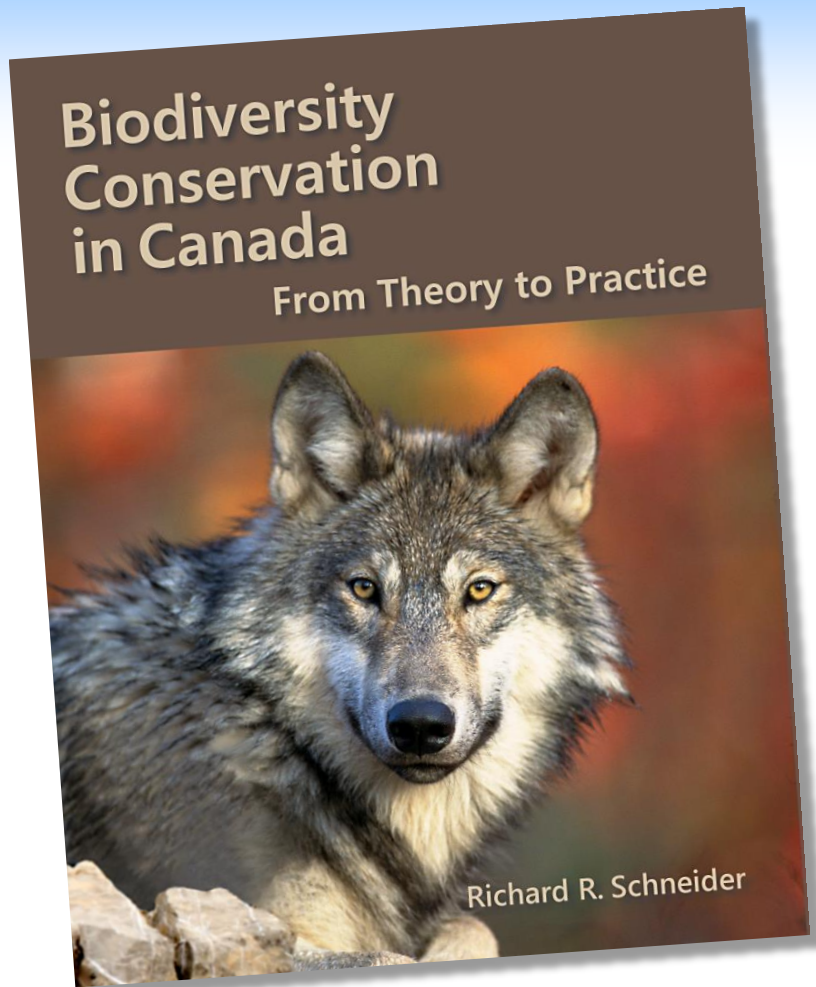
# What About People?

- Rural population most affected: major changes in agriculture and forestry coming (and decline of the oil and gas sector)
- Urban population: climate “tax” from cost of adaptation measures, higher prices for goods, decline in economy





# More Information



## Chapter 9: Climate Change

[openeducationalberta.ca/  
schneider/](http://openeducationalberta.ca/schneider/)