

Climate change in the Fort St. James area

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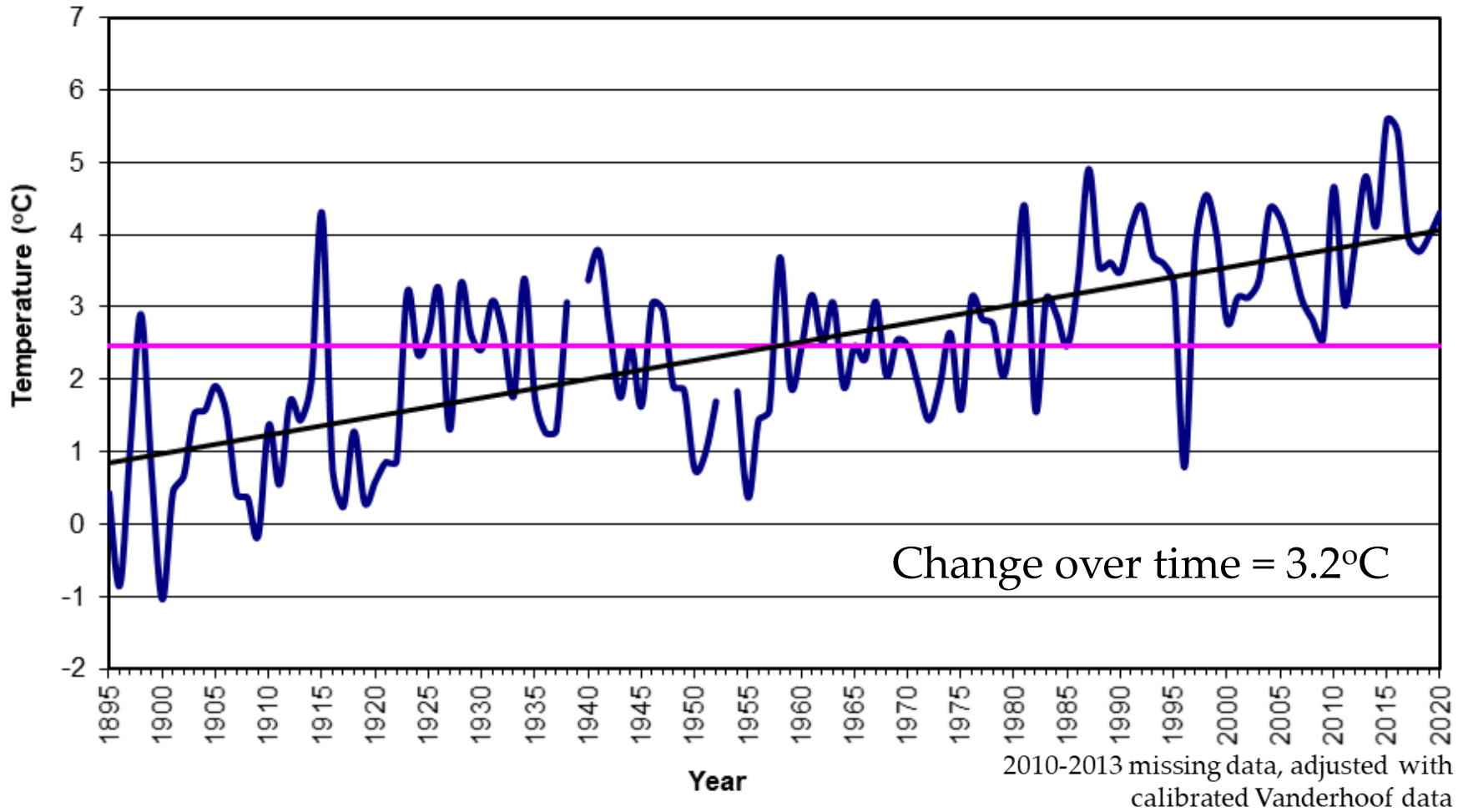
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Jun 2, 2021

Adaptive Silviculture for Climate Change Workshop

Northern BC Climate Change

Annual Mean Temperature Fort St. James 1895-2020



Fort St James

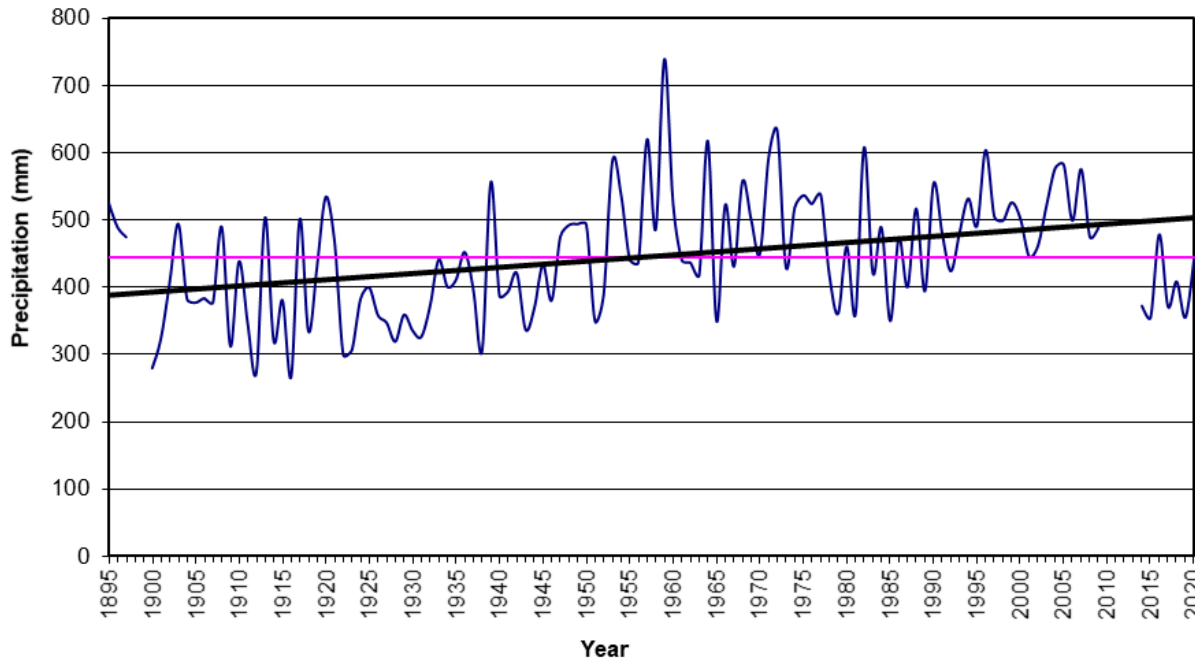
Historical precipitation and temperature change: 1895-2020

Fort St James - change in:	Annual	Winter	Spring	Summer	Fall
Precipitation (%)	25.1	20.8	24.5	28.4	33.4
Mean Temperature (°C)	3.2	3.7	3.1	3.1	2.4
Extr. Max Temperature (°C)	-0.3	1.7	0.6	-0.5	0.9
Extr. Min Temperature (°C)	7.5	7.9	9.3	7.0	7.5

1895-2020

Bold statistically significant $p < 0.05$

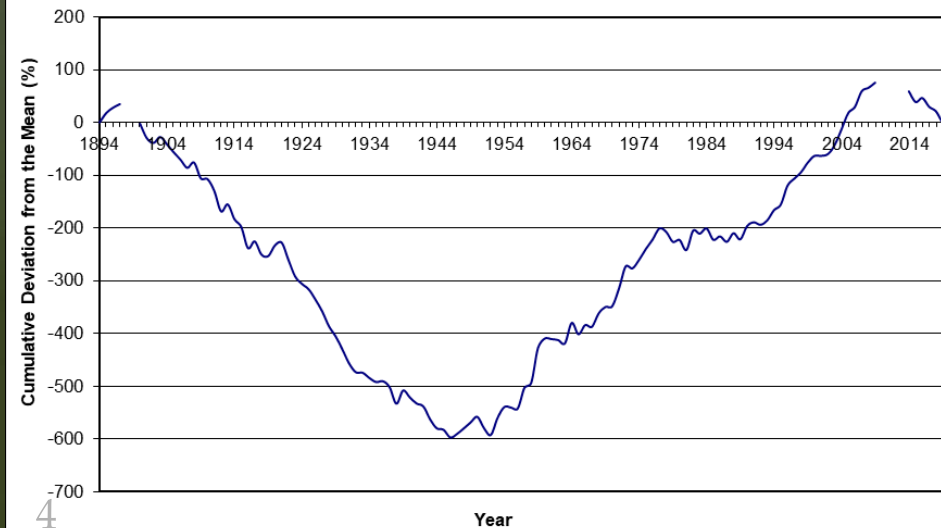
Annual Total Precipitation Fort St. James 1895-2020



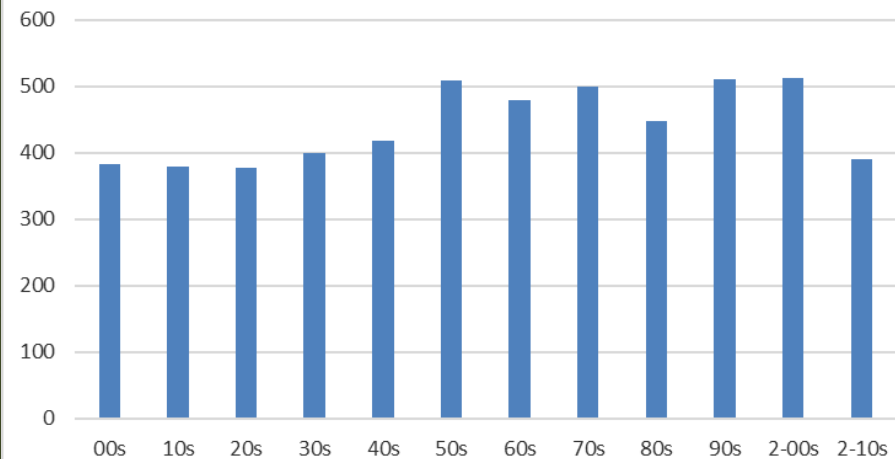
Mean Annual
Precipitation
= 445 mm

- Increasing precipitation
- Recently dry

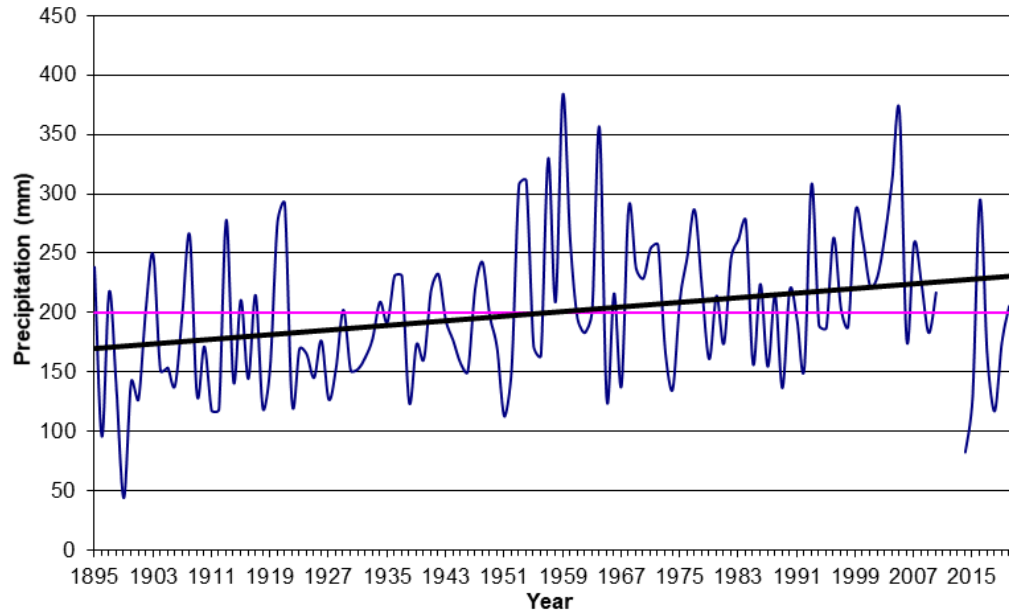
Fort St. James Yearly Precipitation 1895-2020



Fort St James Decadal MAP



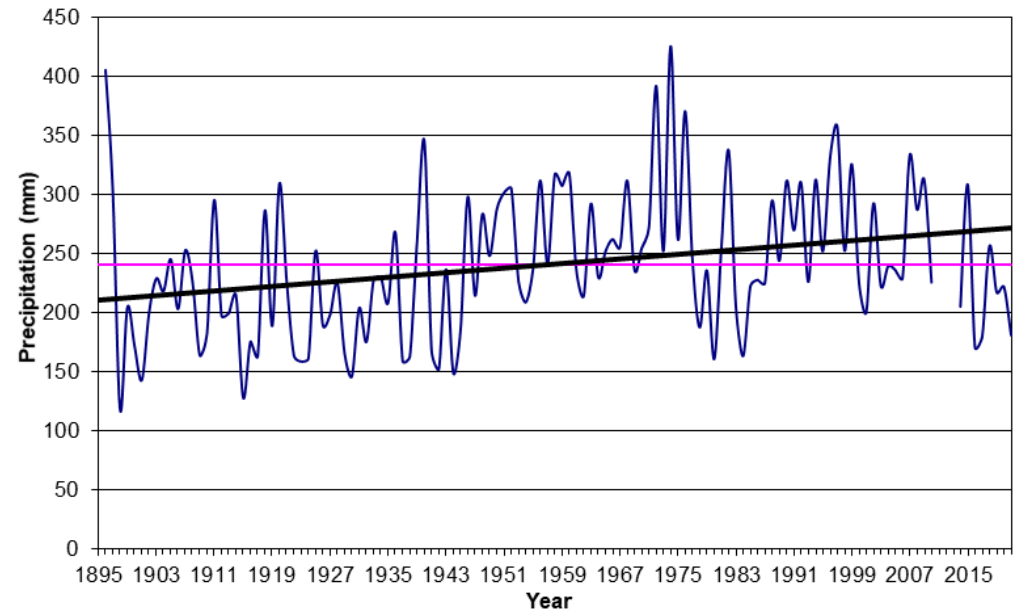
Fort St. James May-Sep Total Precipitation 1895-2020



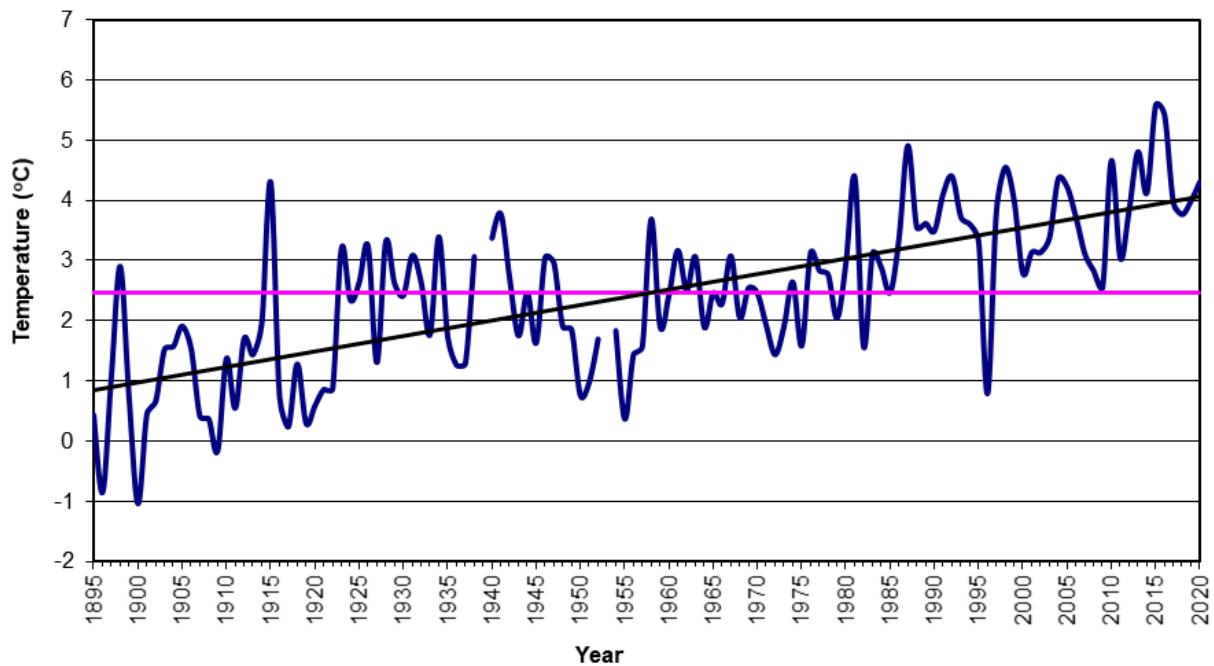
- May-Sep = Growing Season
- 200 mm
- Long term increasing trend
- ~31%

- Oct-Apr = "Winter"
- 241 mm
- Long term increasing trend
- ~27%
- Declining max snow on the ground 1980-2020

Fort St. James Oct-Apr Total Precipitation 1895-2020



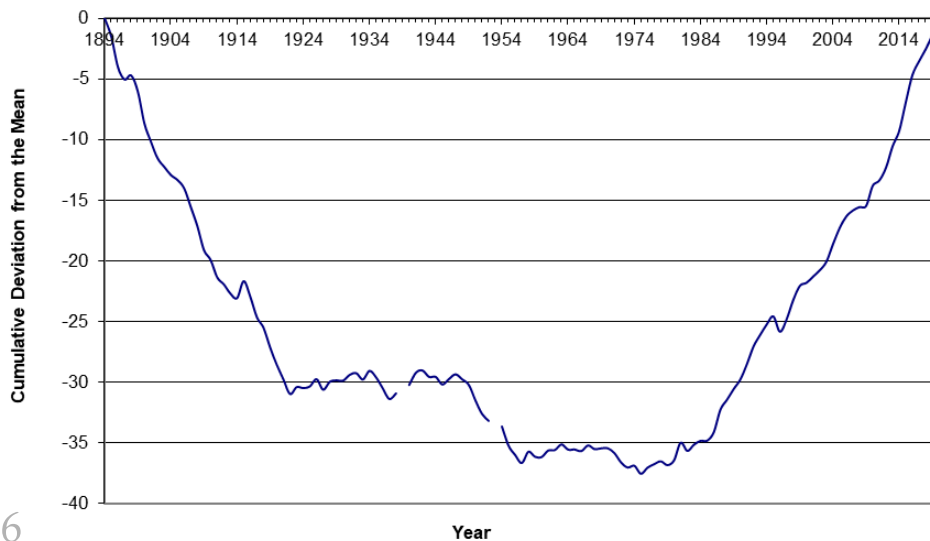
Annual Mean Temperature Fort St. James 1895-2020



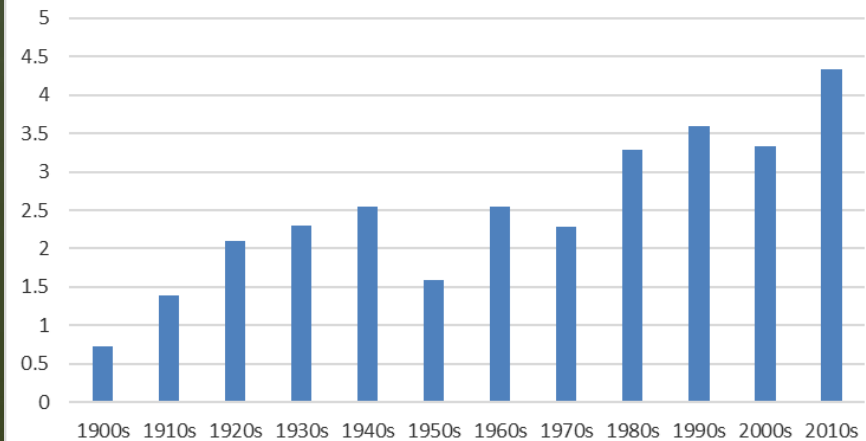
Mean Annual Temperature = 2.5°C

- Warming trend
- Primarily since 1970s

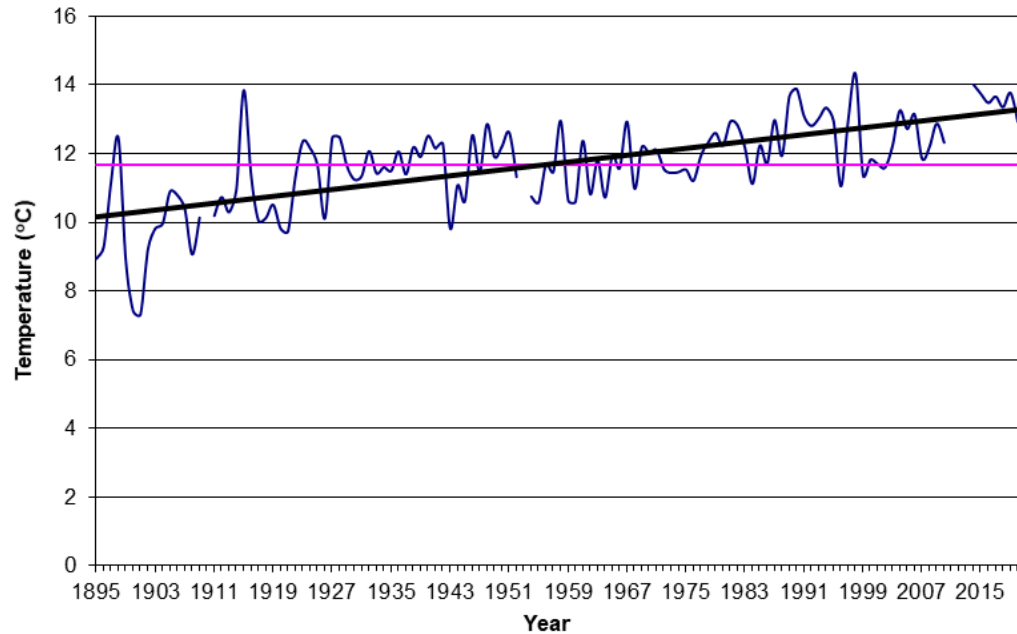
Fort St. James Yearly Temperature 1895-2020



Fort St James Decadal Temperatures



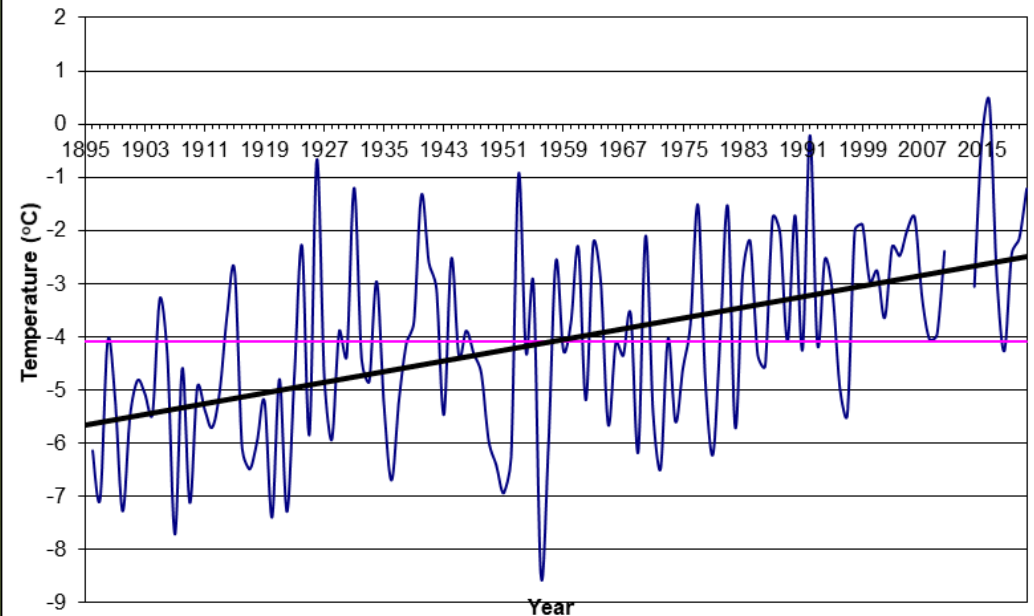
Fort St. James May-Sep Mean Temperature 1895-2020



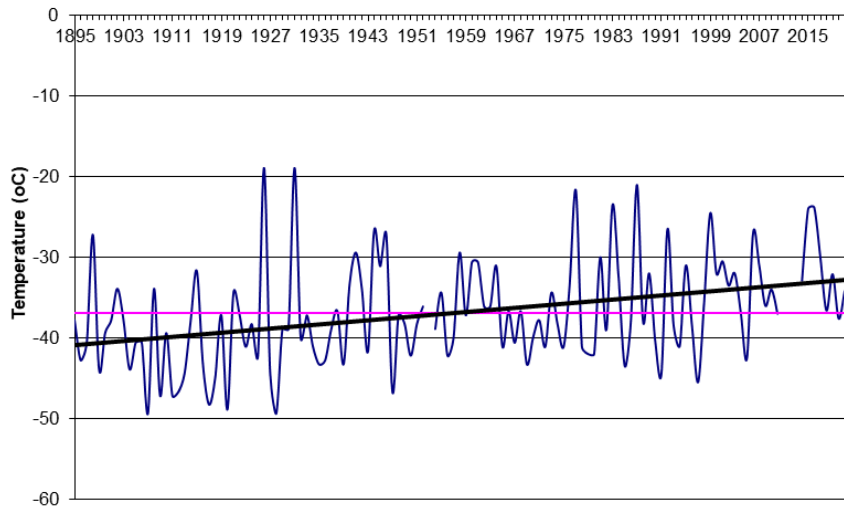
- May-Sep = Growing Season
- 11.7°C
- Long term increasing trend
- ~3.0°C

- Oct-Apr = "Winter"
- -4.1°C
- Long term increasing trend
- ~3.0°C
- Declining max snow on the ground 1980-2020

Fort St. James Oct-Apr Mean Temperature 1895-2020



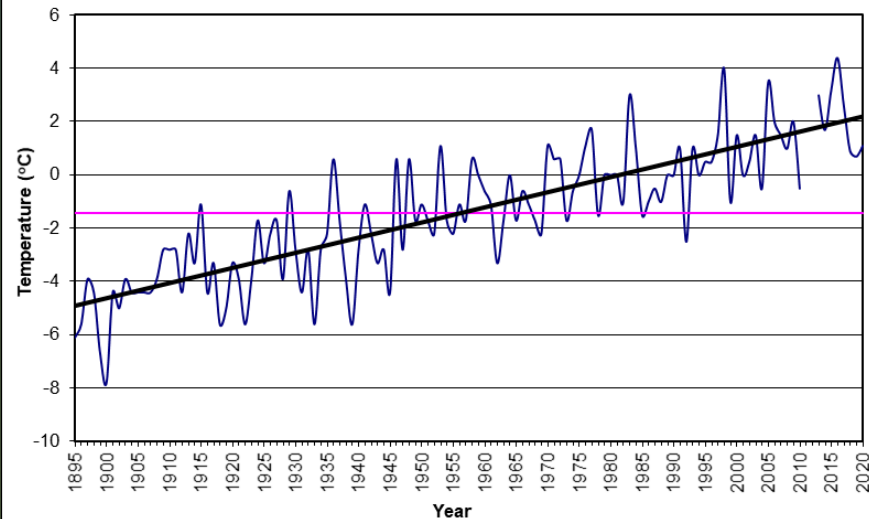
Fort St. James Winter Min Temperature 1895-2021



Winter Minimums:

- Average -37°C
- Used to be common $<40^{\circ}\text{C}$
- Once in last two decades
- Trend = $+8^{\circ}\text{C}$

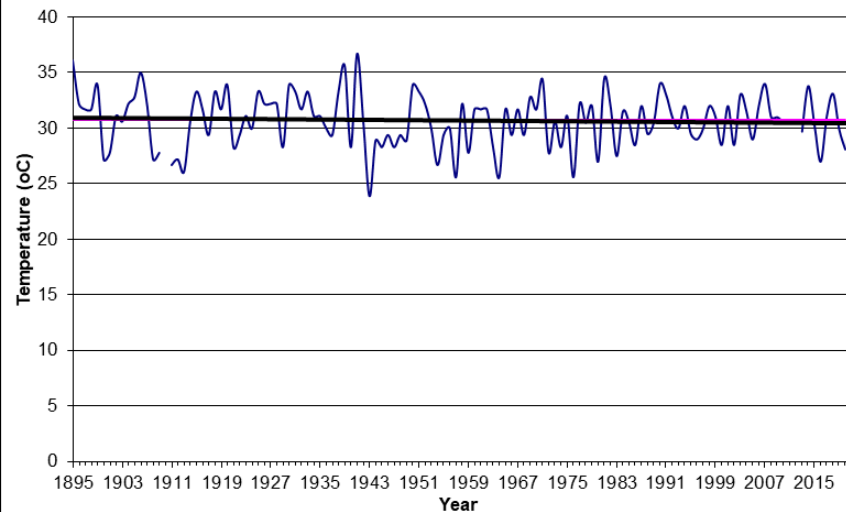
Fort St. James Summer Min Temperature 1895-2020



Summer Minimums:

- Average -1.4°C
- Frost, extreme frost less frequent
- Trend = $+7^{\circ}\text{C}$

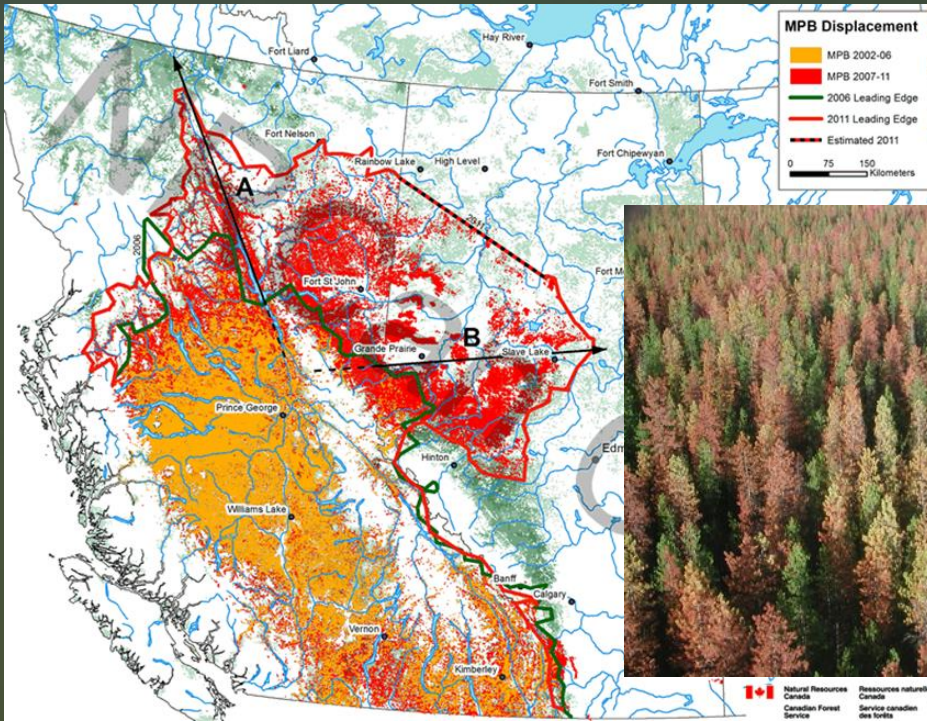
Fort St. James Summer Max Temperature 1895-2020



Summer Maximums:

- Average 31°C

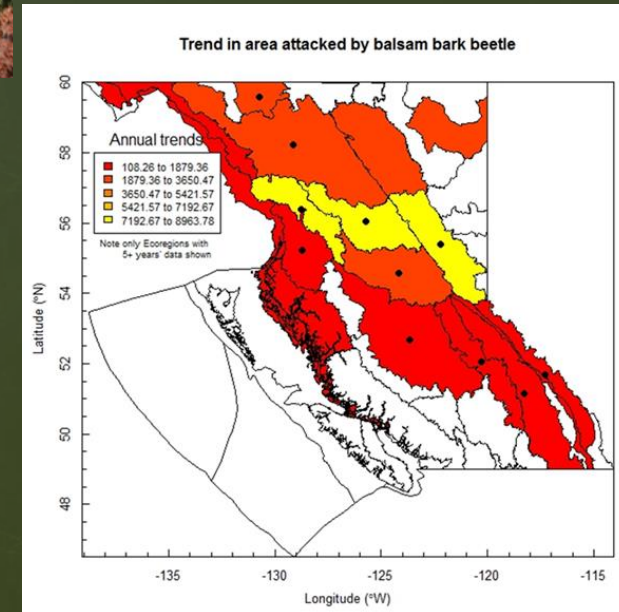
Climate Change and Forest Health



Mountain Pine Beetle



Rusts of Lodgepole pine

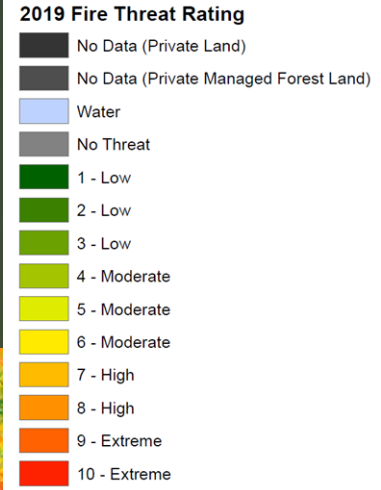
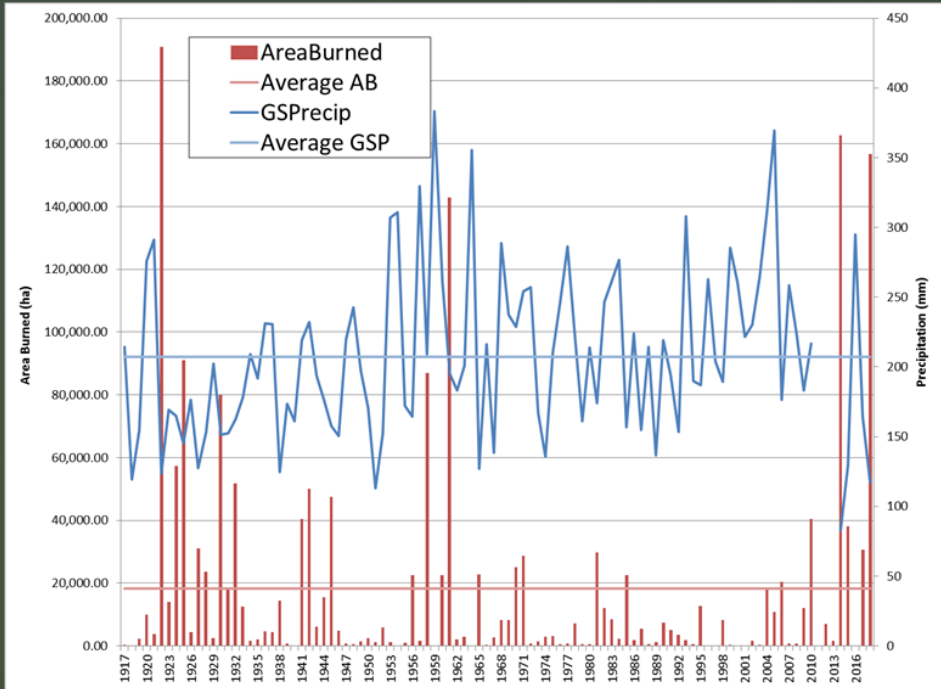


Defoliators: e.g. Aspen Leaf Miner

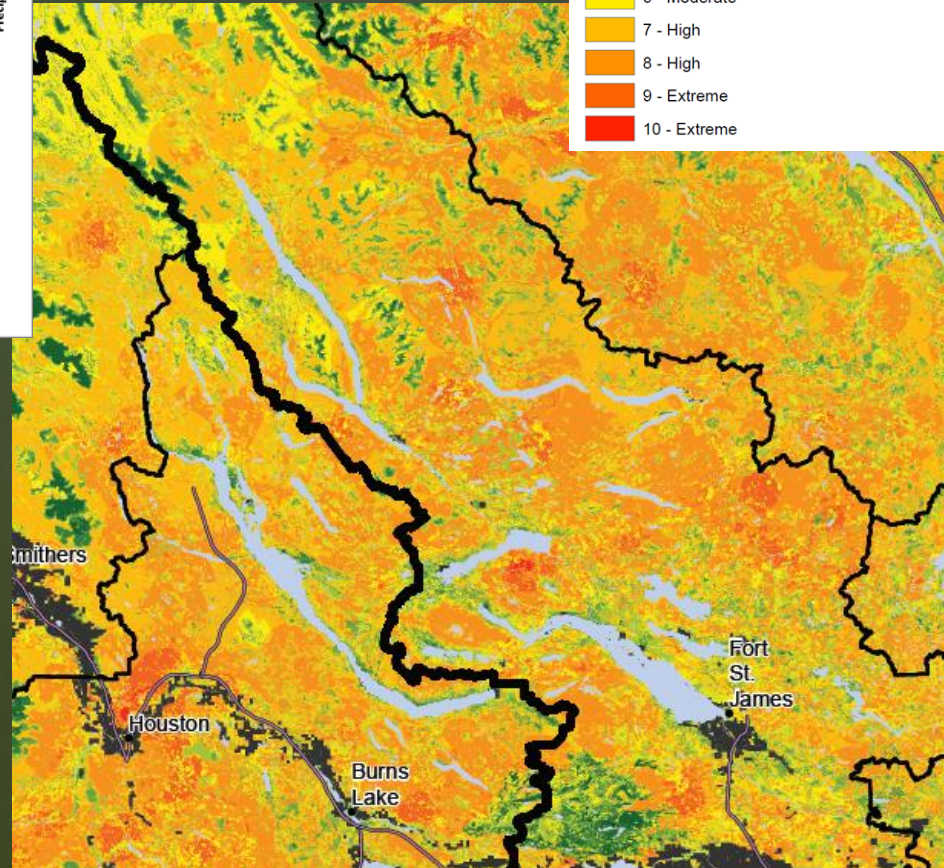


Spruce Beetle

Climate Change and Forest Fire

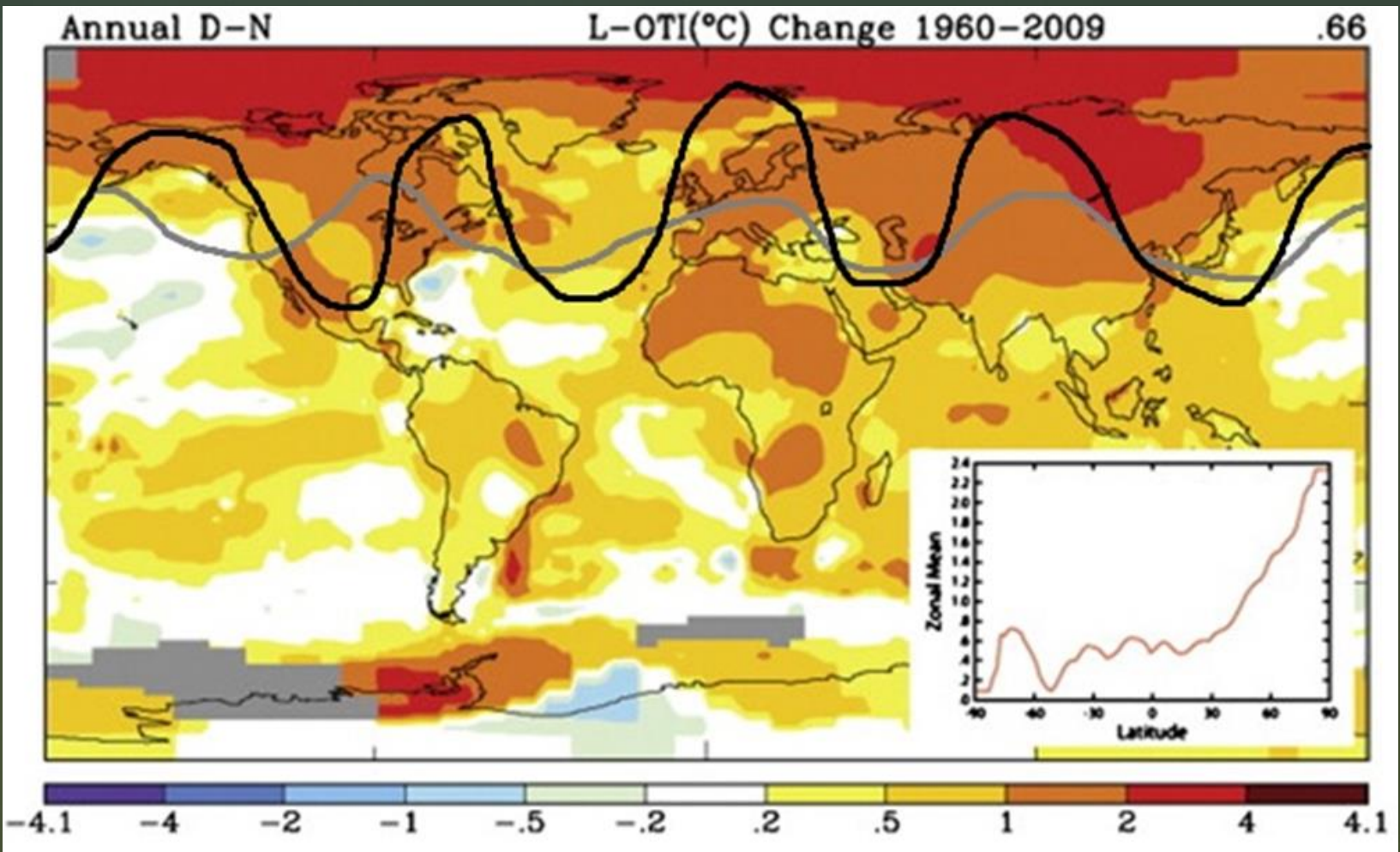


Wildfire Risk Mapping = 90th percentile weather



Omineca Region Wildfire Area Burned and Growing Season Precipitation

- BCWS: “over 90% of fire suppression is weather”



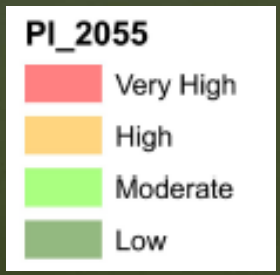
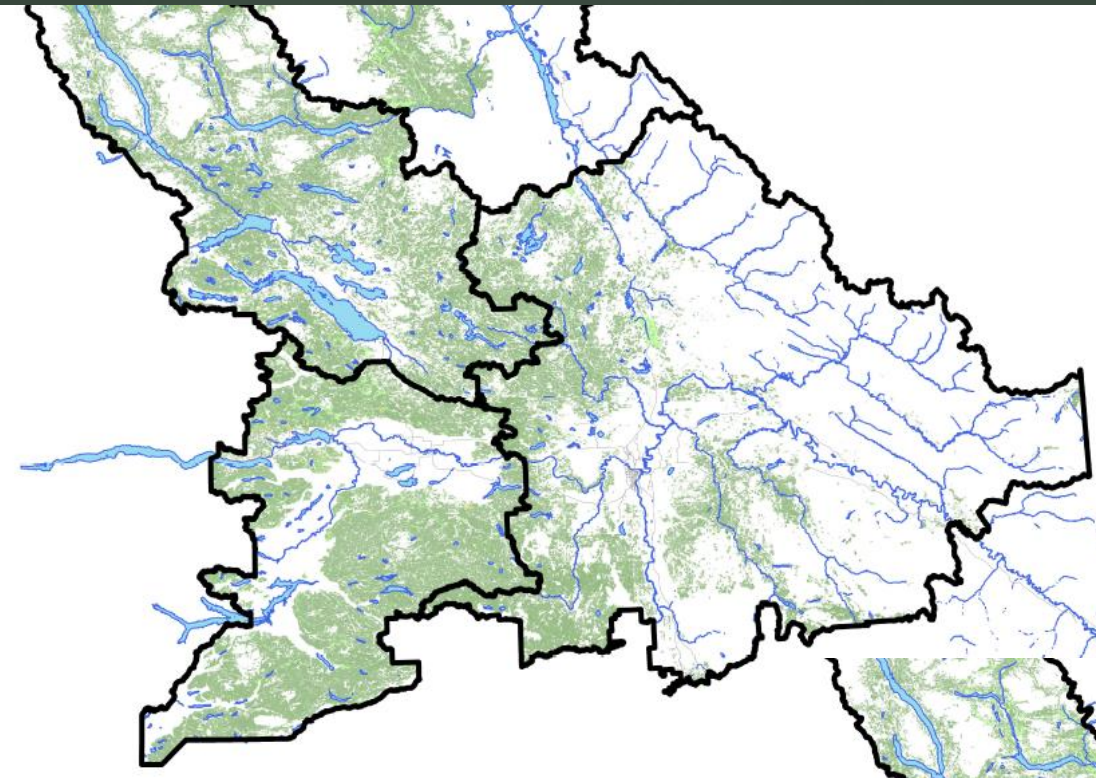
Arctic Amplification of global warming

- Faster warmer in the Arctic affects the mid-latitude jet stream
 - becomes slower, greater peaks (north) and lower valleys (south)
- Similar weather patterns become more frequent or get stuck
 - can mean prolonged drying conditions (any time) or prolonged heat

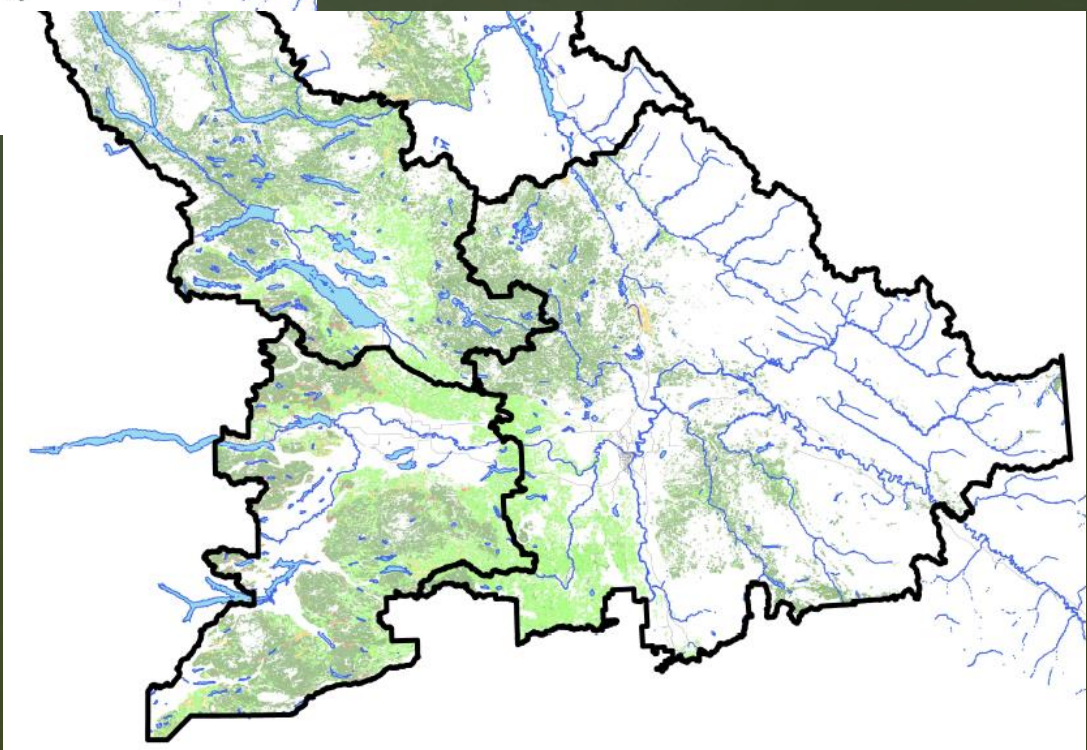
Drought Risk

Lodgepole Pine

Historical

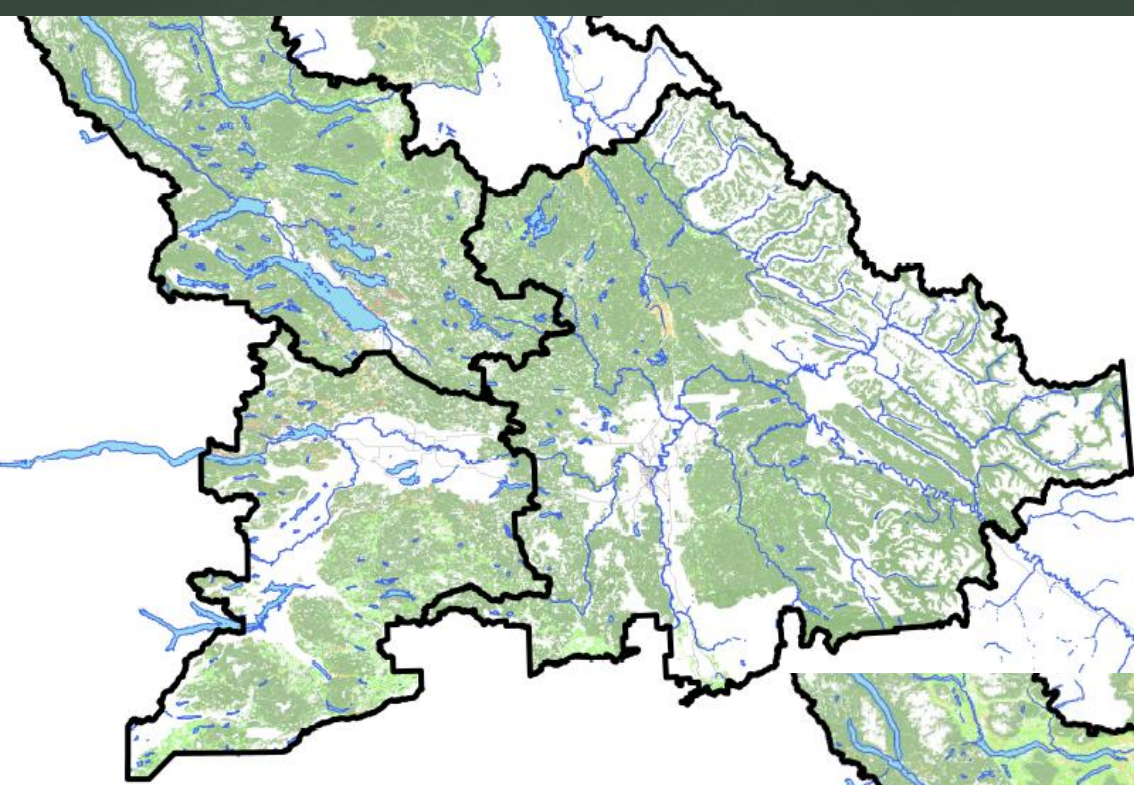


2041-2070

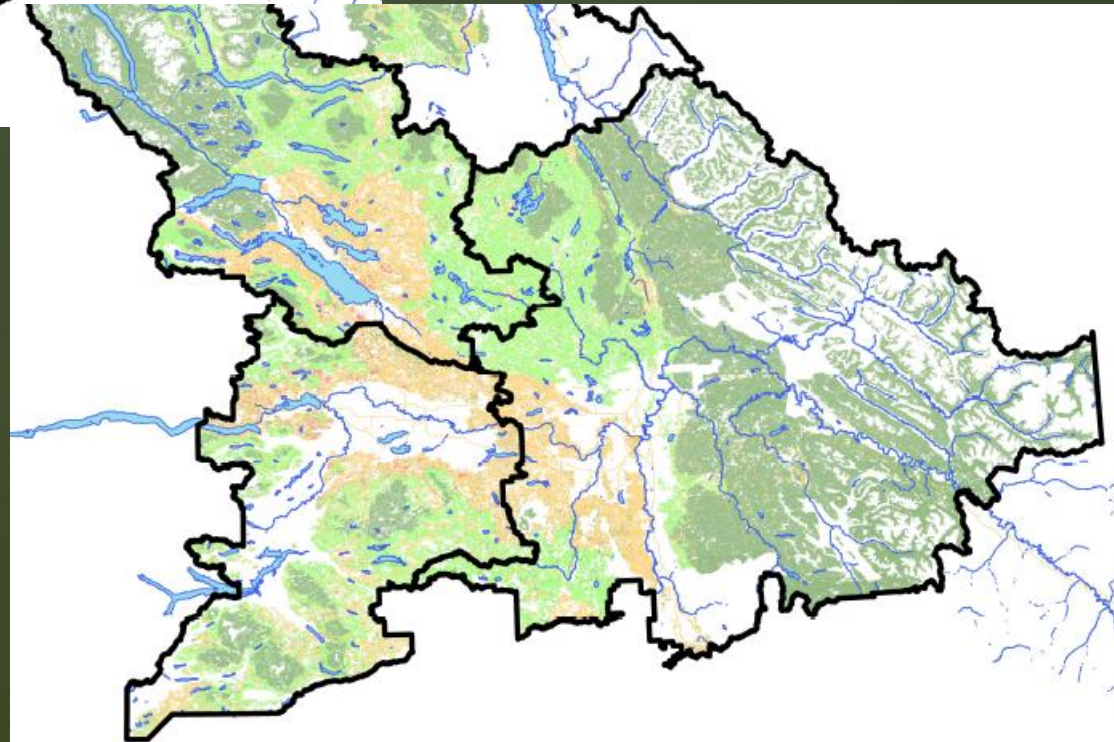


Drought Risk

Hybrid Spruce



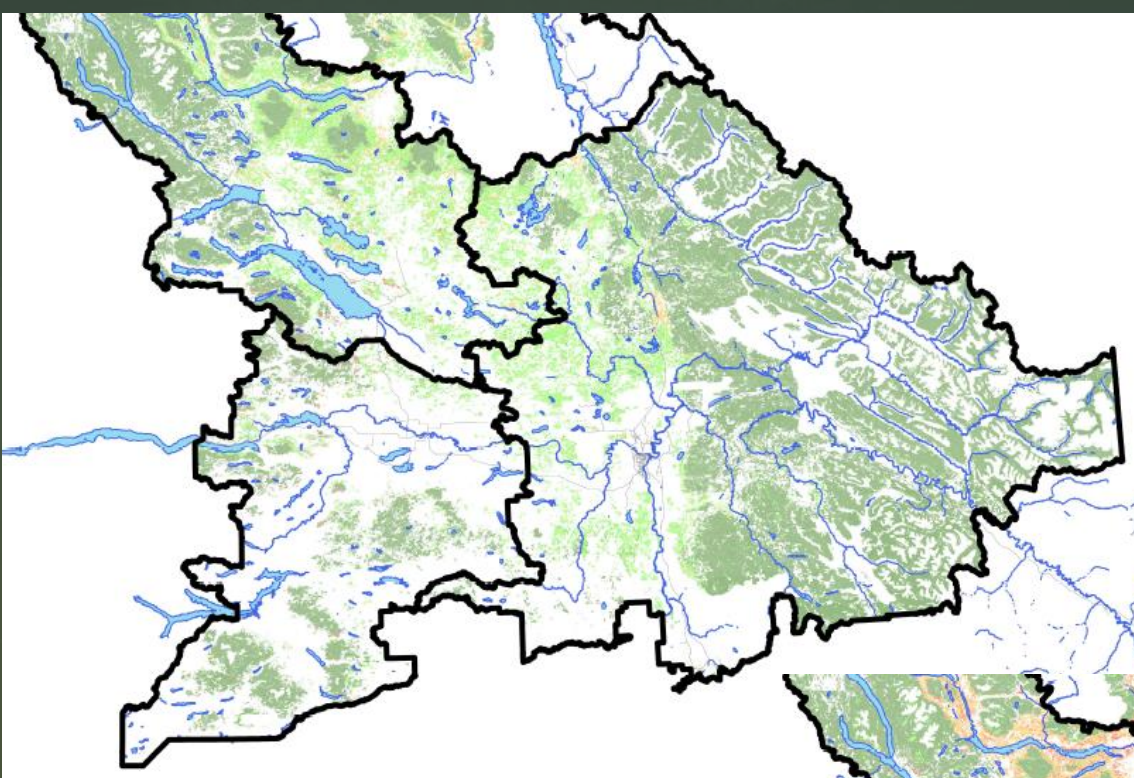
Historical



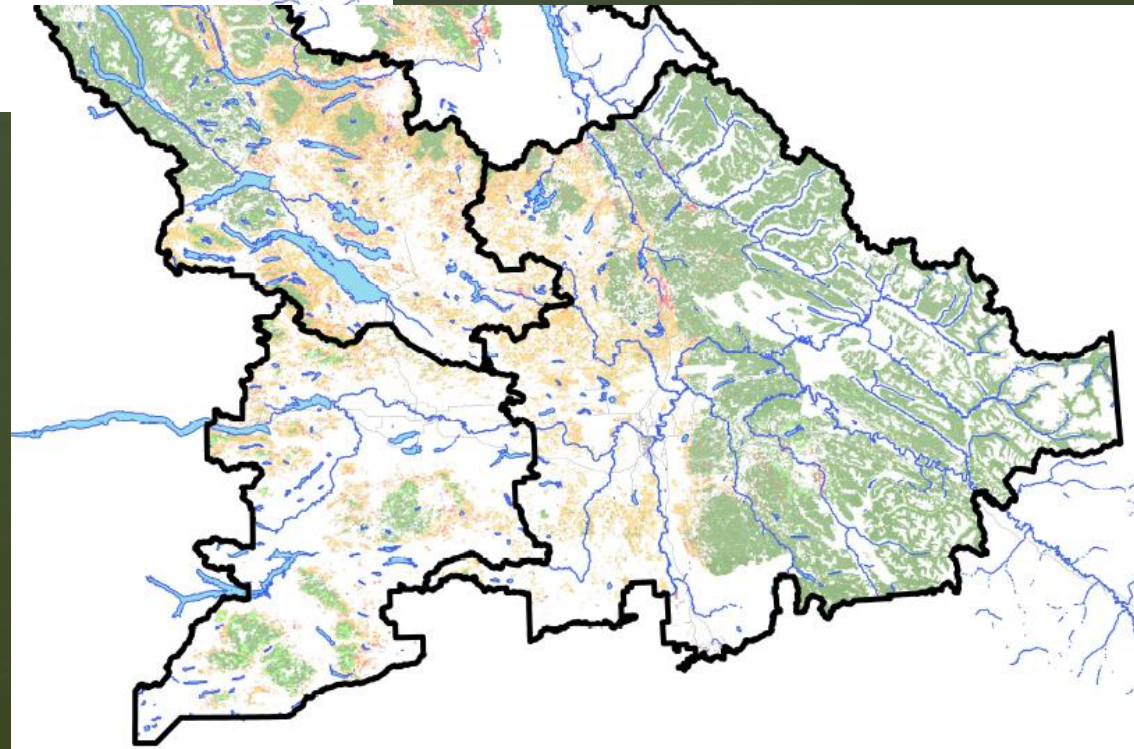
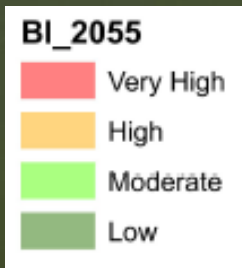
2041-2070

Drought Risk

Sub-alpine Fir



Historical



2041-2070

Drought Risk

Douglas Fir

Historical

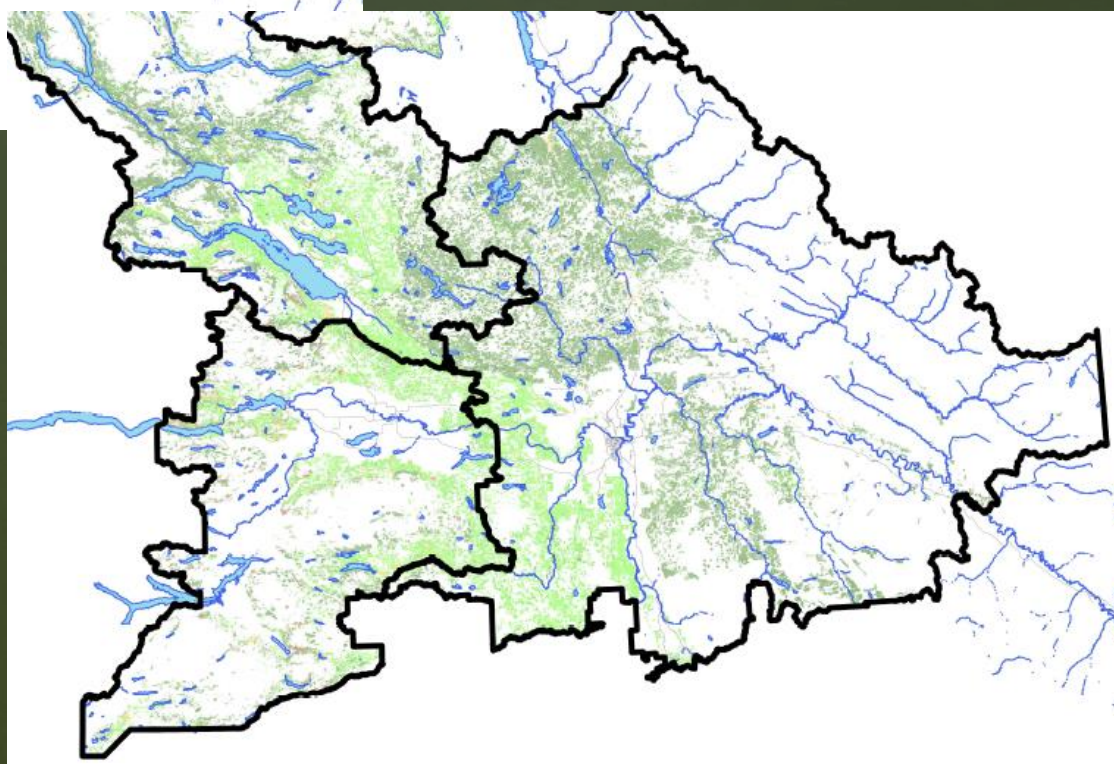
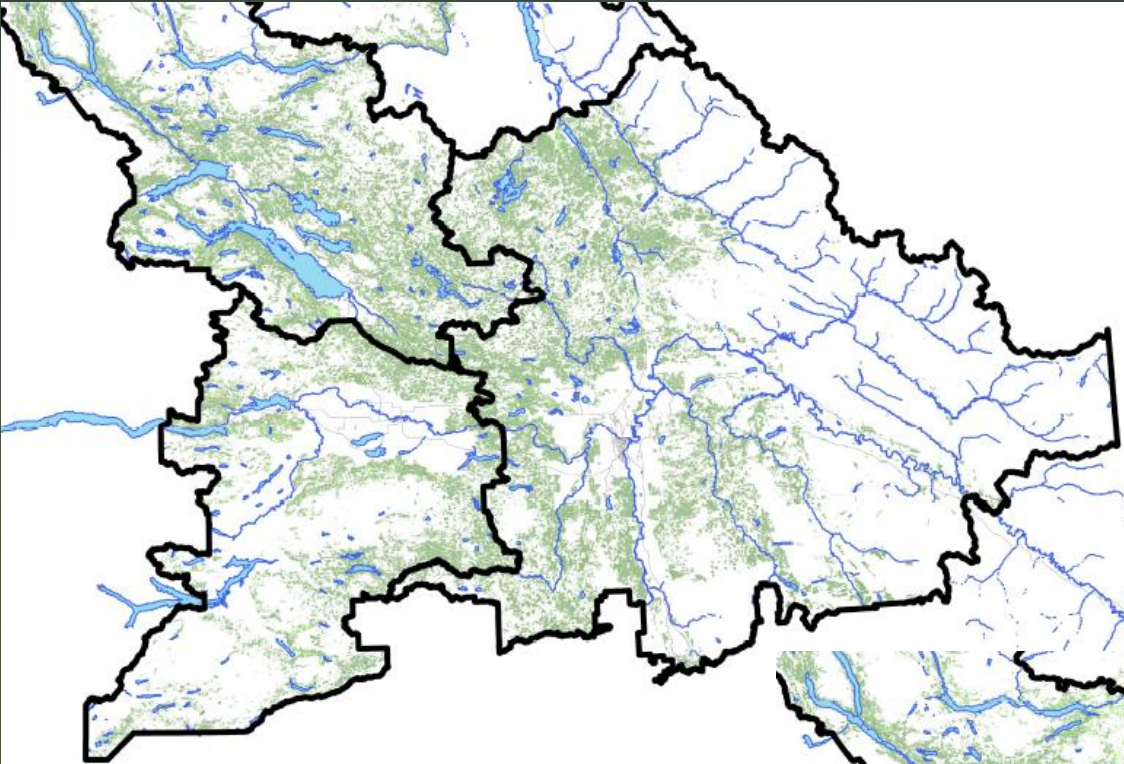
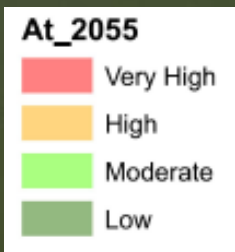


2041-2070

Drought Risk

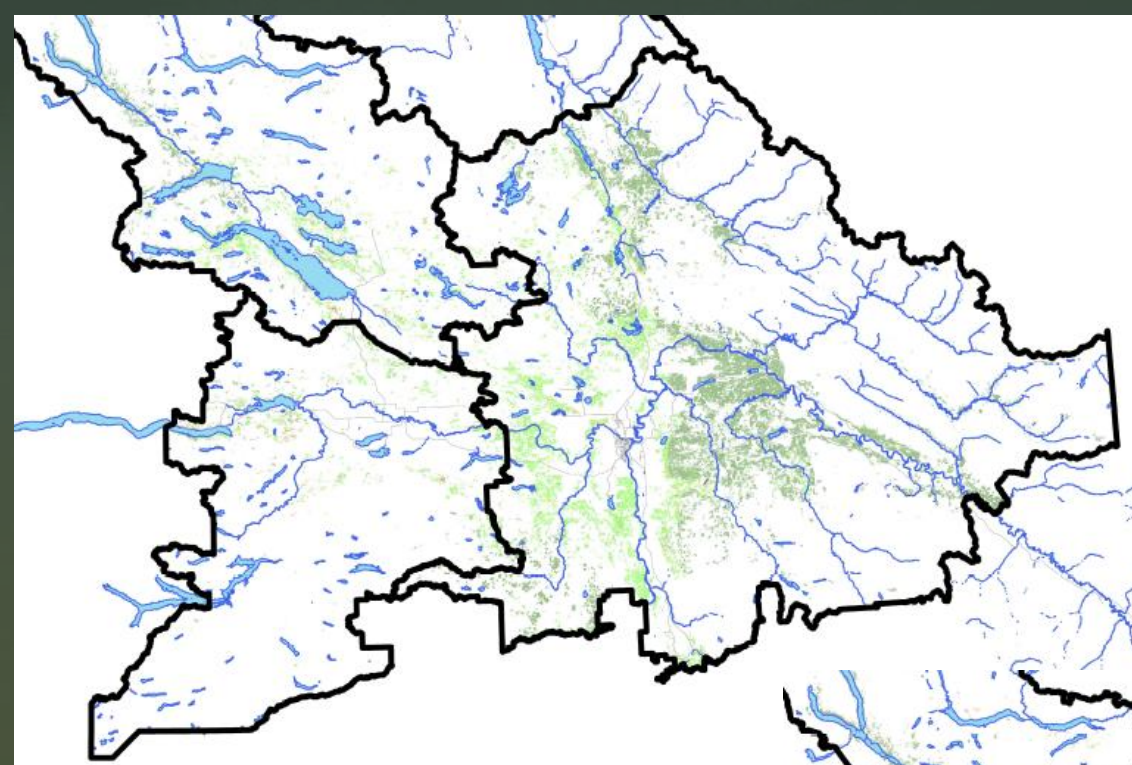
Aspen

Historical

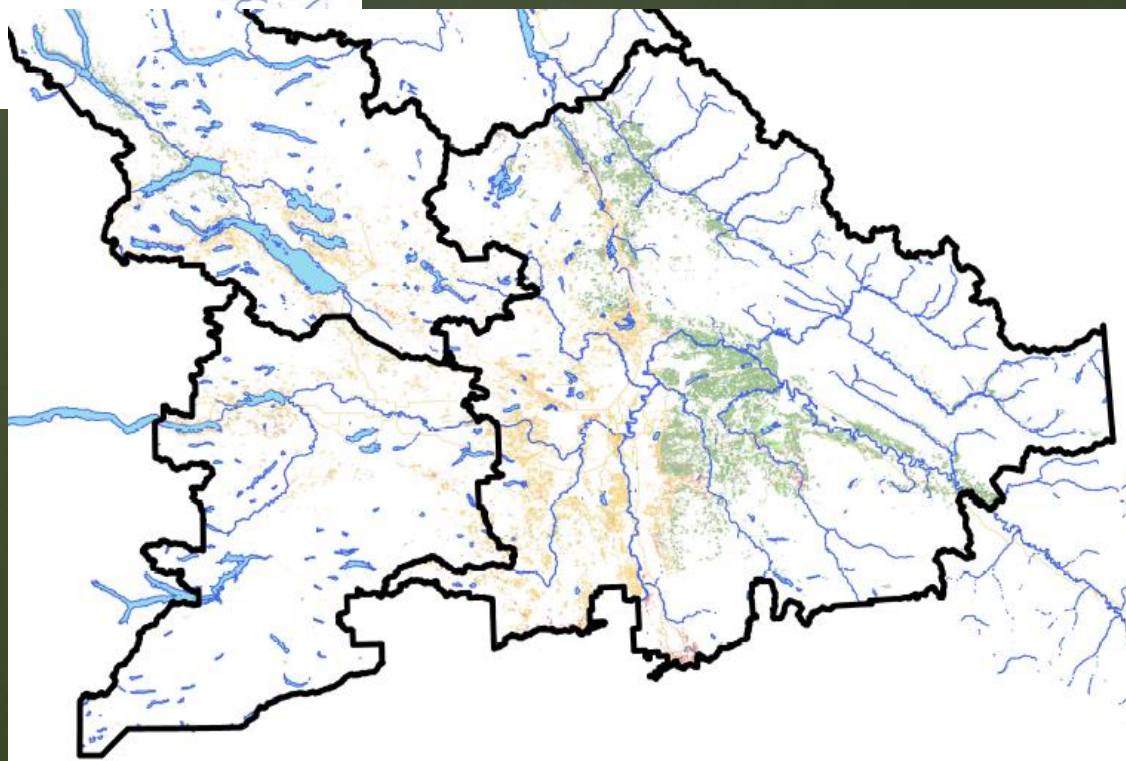
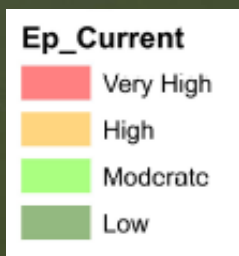


Drought Risk

Birch



Historical



2041-2070

Questions?

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