



Niagara Municipalities:

Best practice mitigation of weather and climate – current state

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The background of the slide is a photograph showing a large, white, jagged iceberg on the left side, floating in a body of water. The water is a deep, dark blue, and the surface of the iceberg is highly textured with many small, sharp peaks and valleys. The lighting is bright, creating strong highlights on the white ice and deep shadows in the water.

IPCC warns of irreversible impacts of warming above 1.5°C globally*

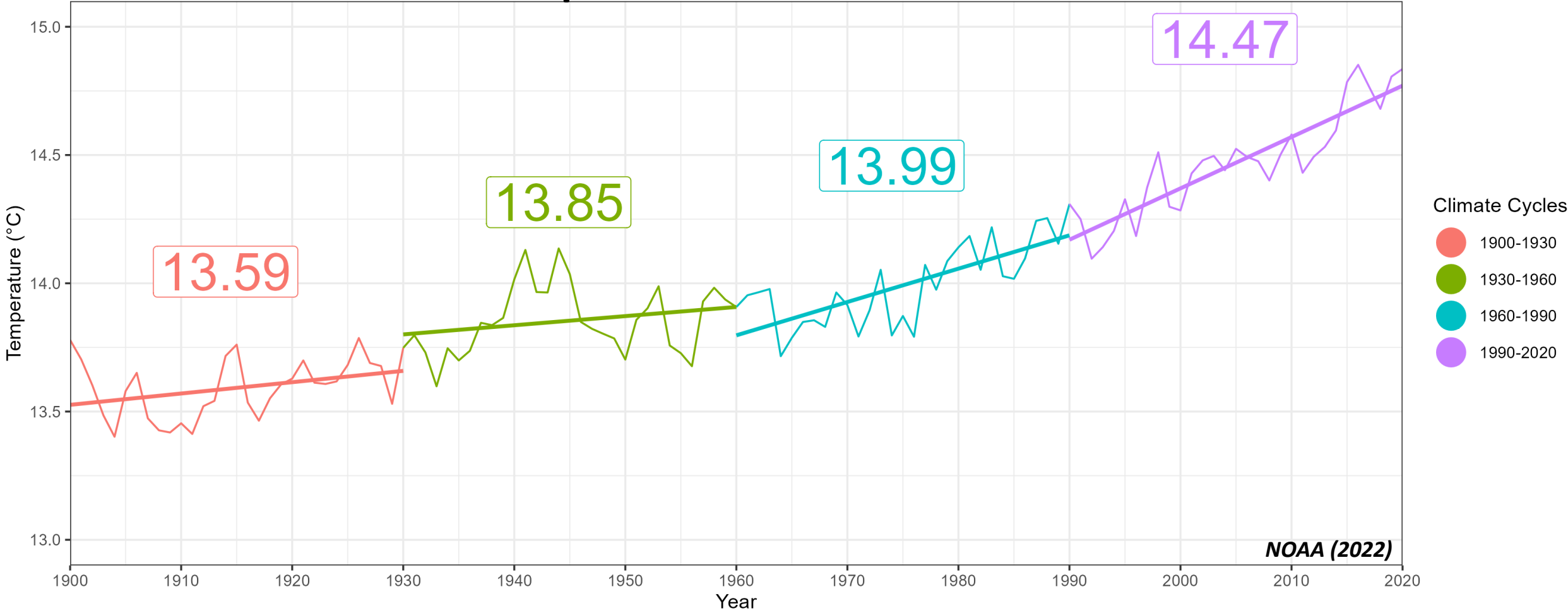
*Global: Land and Ocean

Purpose

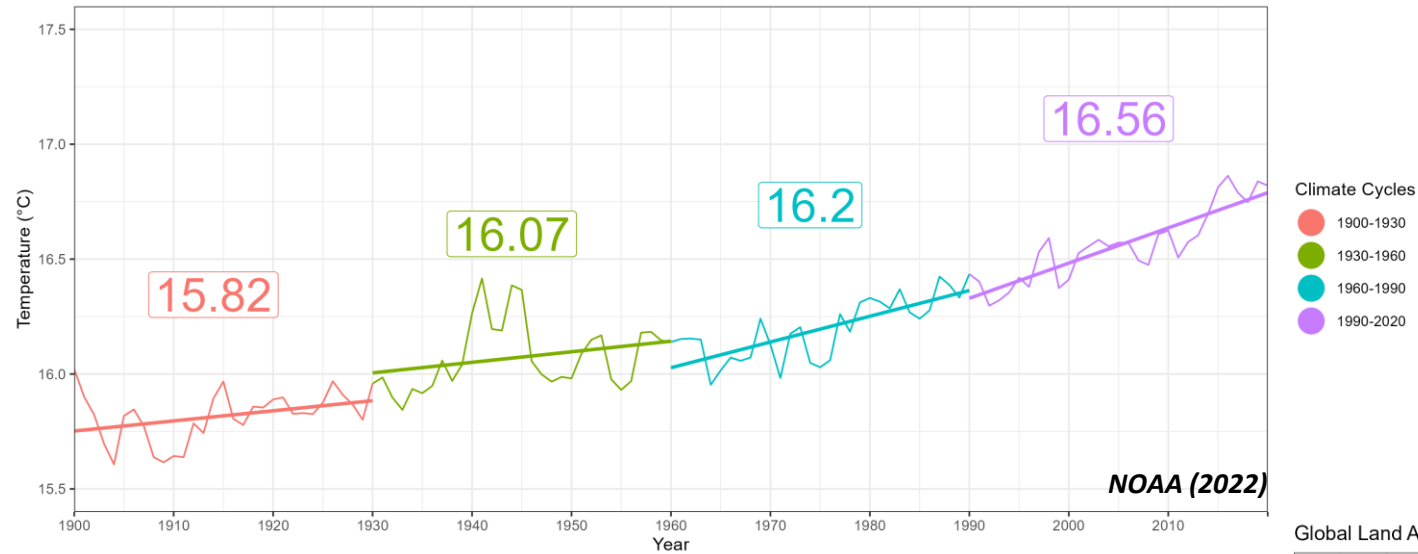
To discuss the effects of weather and climate change at the municipal level

To provide a solid foundation for formulating municipal policies.

Global Annual Mean Temperature



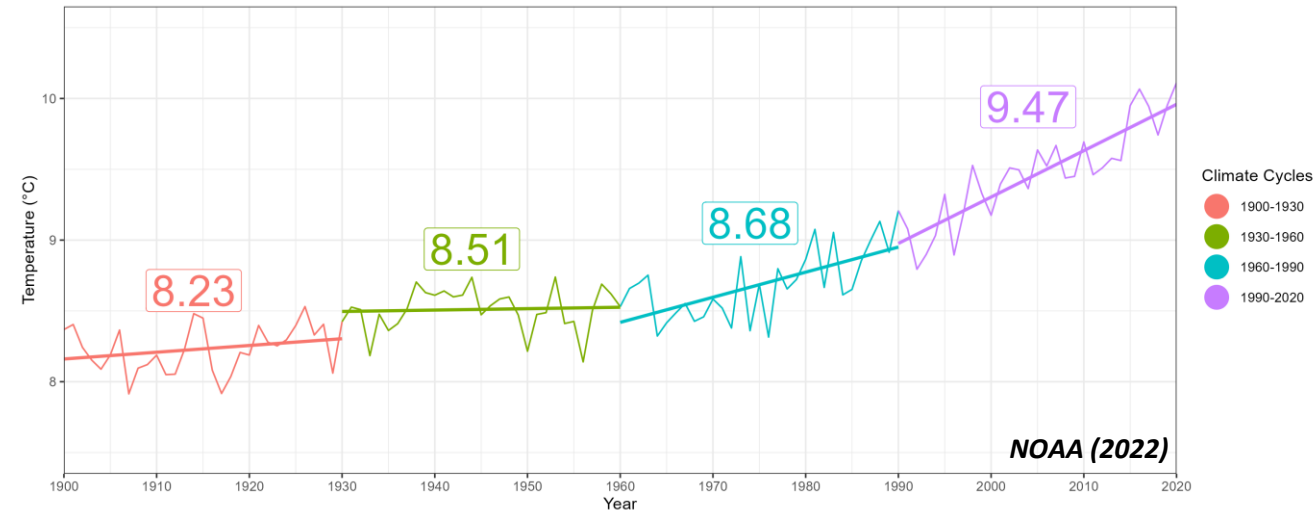
Global Ocean Annual Temperatures



- Land ~ 29%
- Lower thermal capacity
 - Land heats up faster.

- Oceans ~71%
- Higher thermal capacity than land
 - Water heats up slower

Global Land Annual Temperatures



NEW NIAGARA OFFICIAL PLAN

Climate Change Discussion Paper

Niagara Region


November 2019

Canada is warming at twice the global rate


According to *Canada's Changing Climate Report* (2019), Canada is warming at twice the global rate due to local conditions. Canada's loss of snow and sea ice is reducing reflectivity of the surface, which increases the absorption of solar radiation, causing larger surface warming than southern regions.

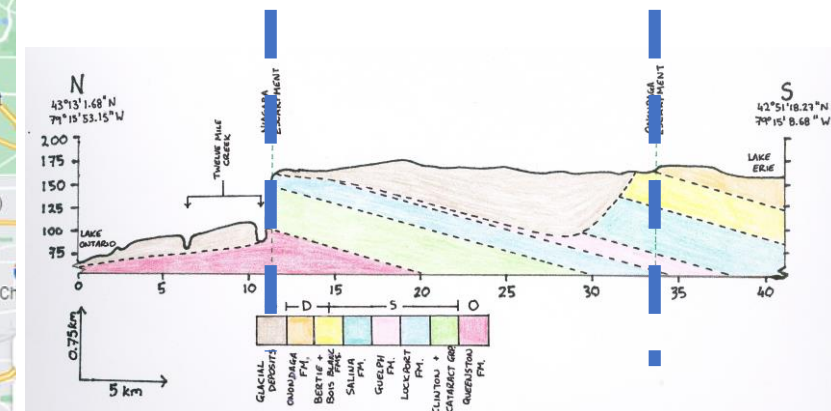
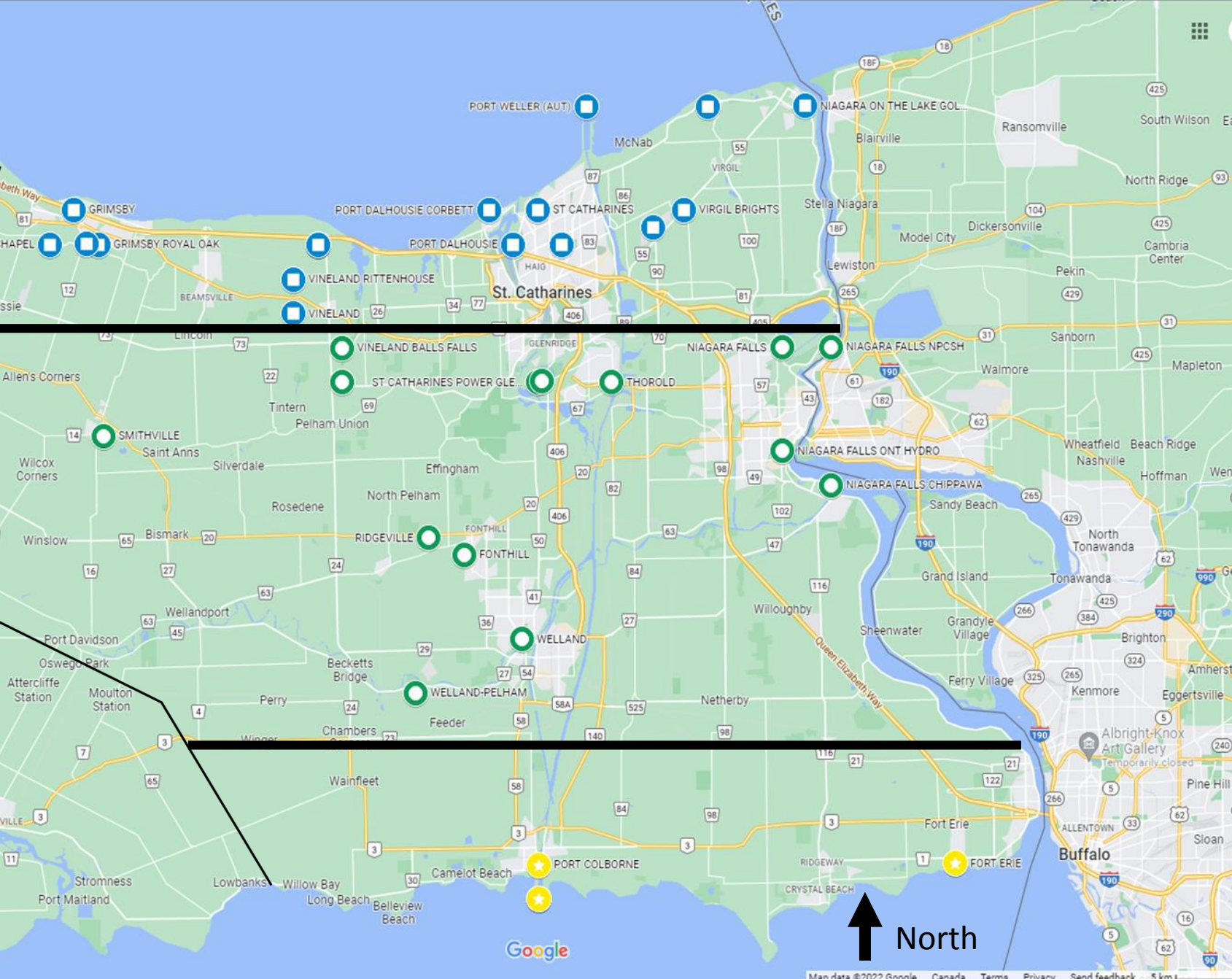
Map of the Niagara Region

- All weather stations used are shown separated by tier (north, central, and south)

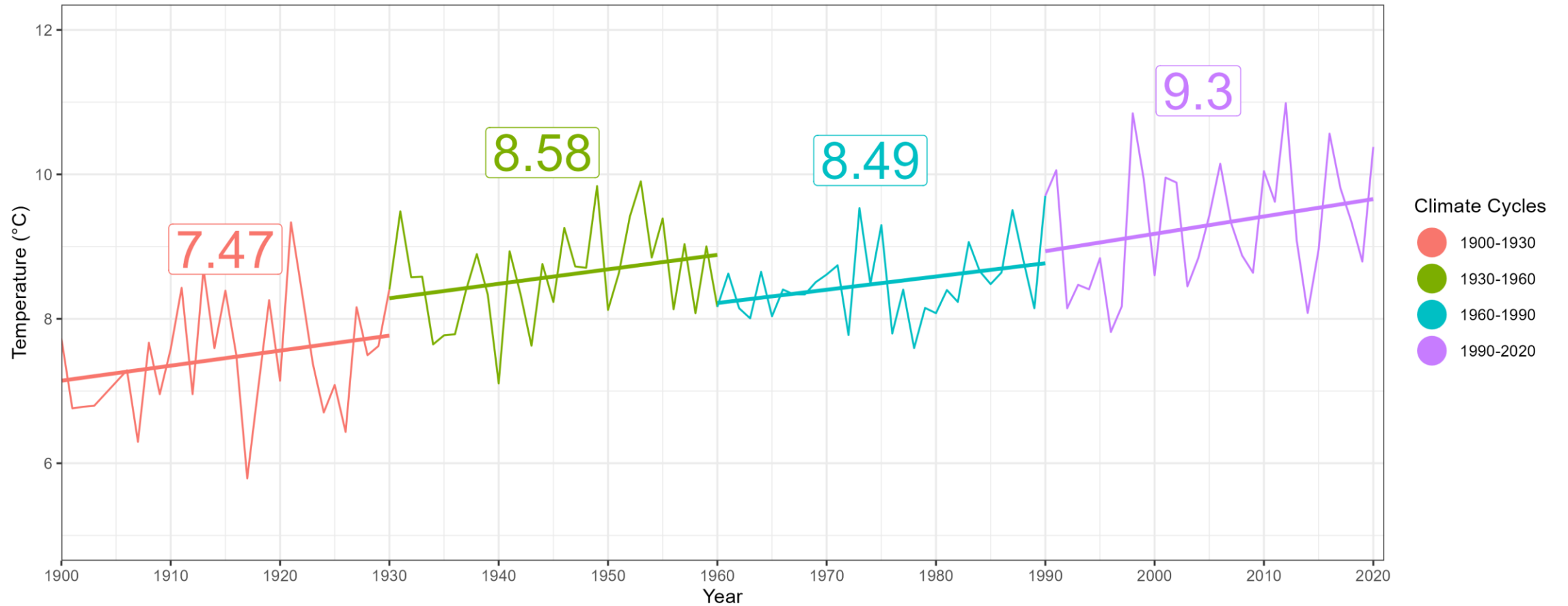
 = North tier stations

 = Central tier stations

 = South tier stations

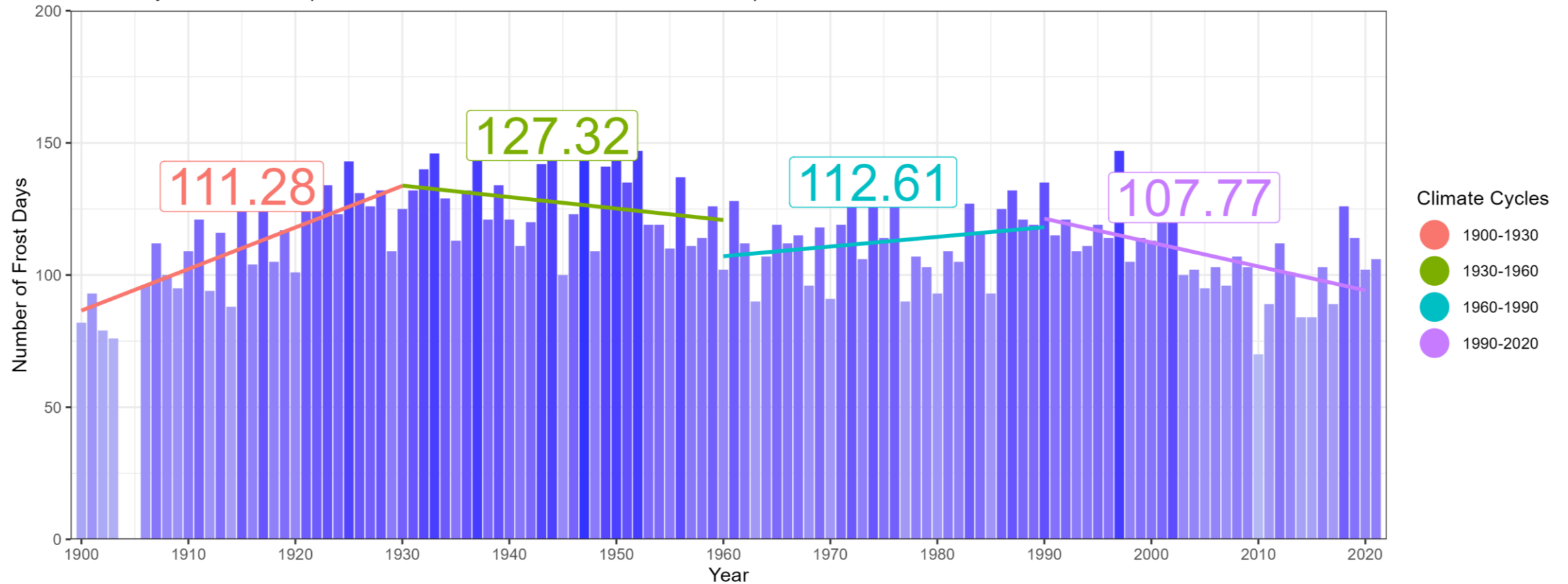


Niagara Region Annual Mean Temperature

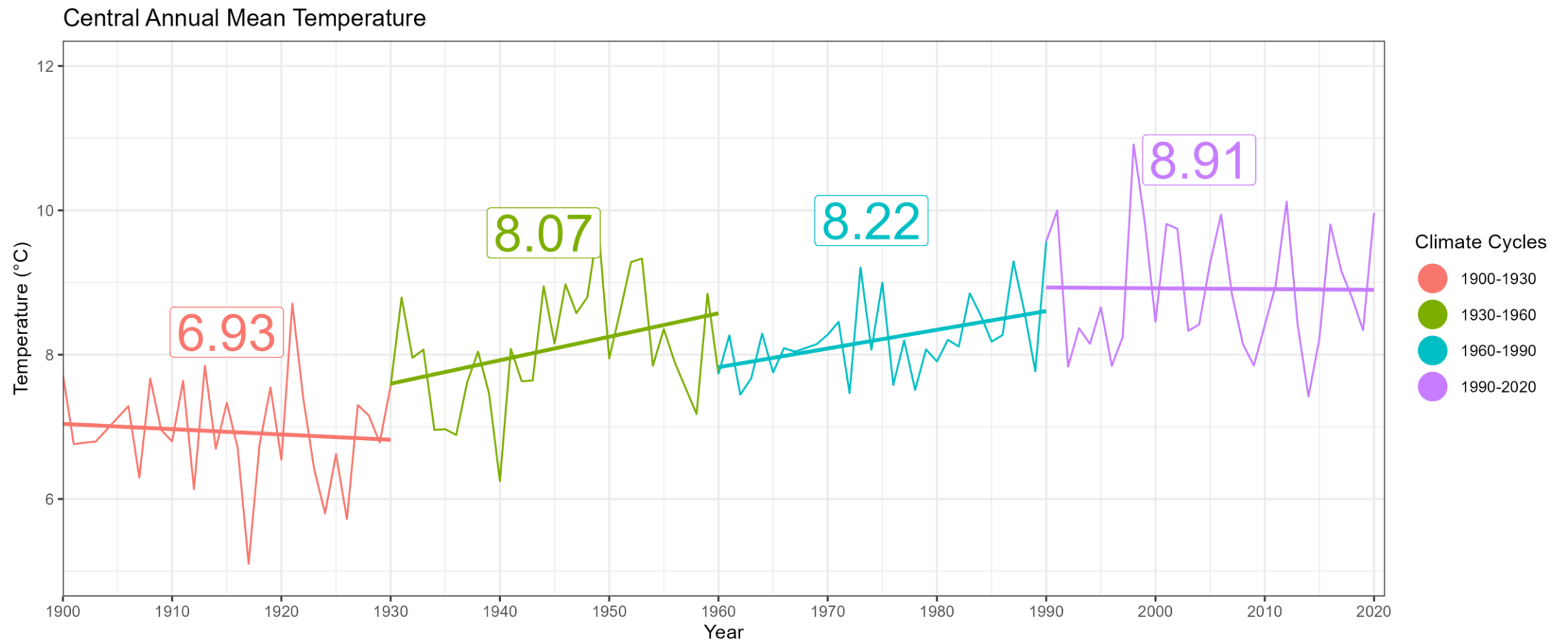


Frost Days/Annum in the Niagara Region

A frost day is when the temperature fluctuates above and below 0°C in a 24h period

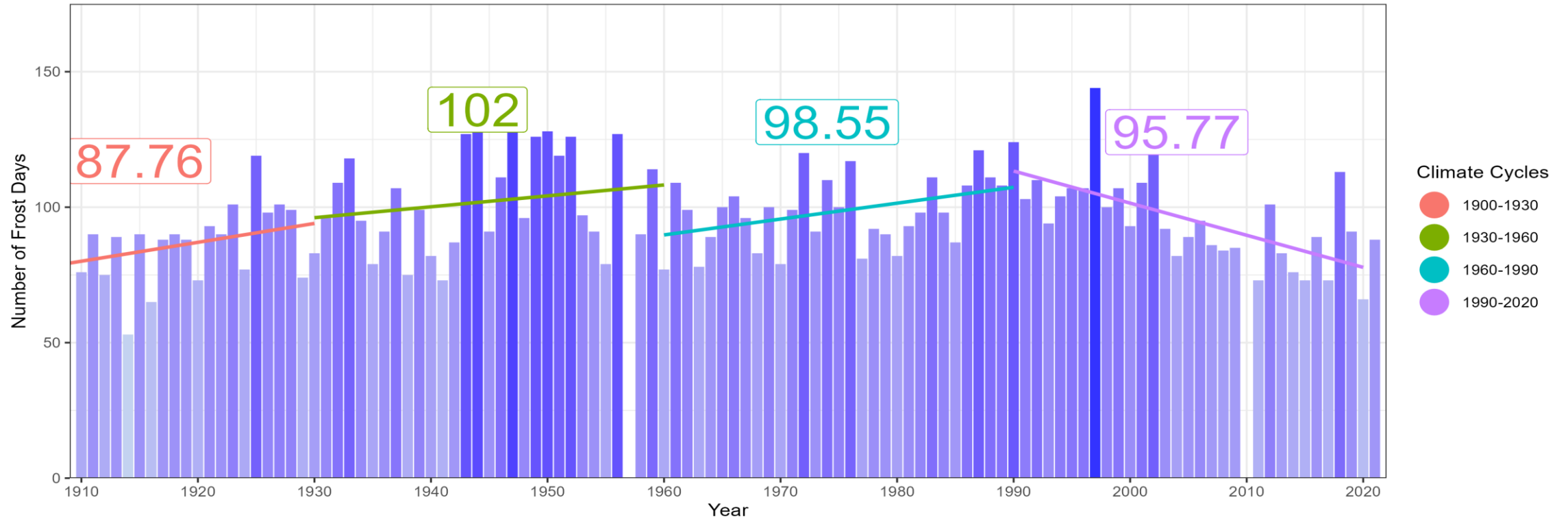


Where Pelham is located

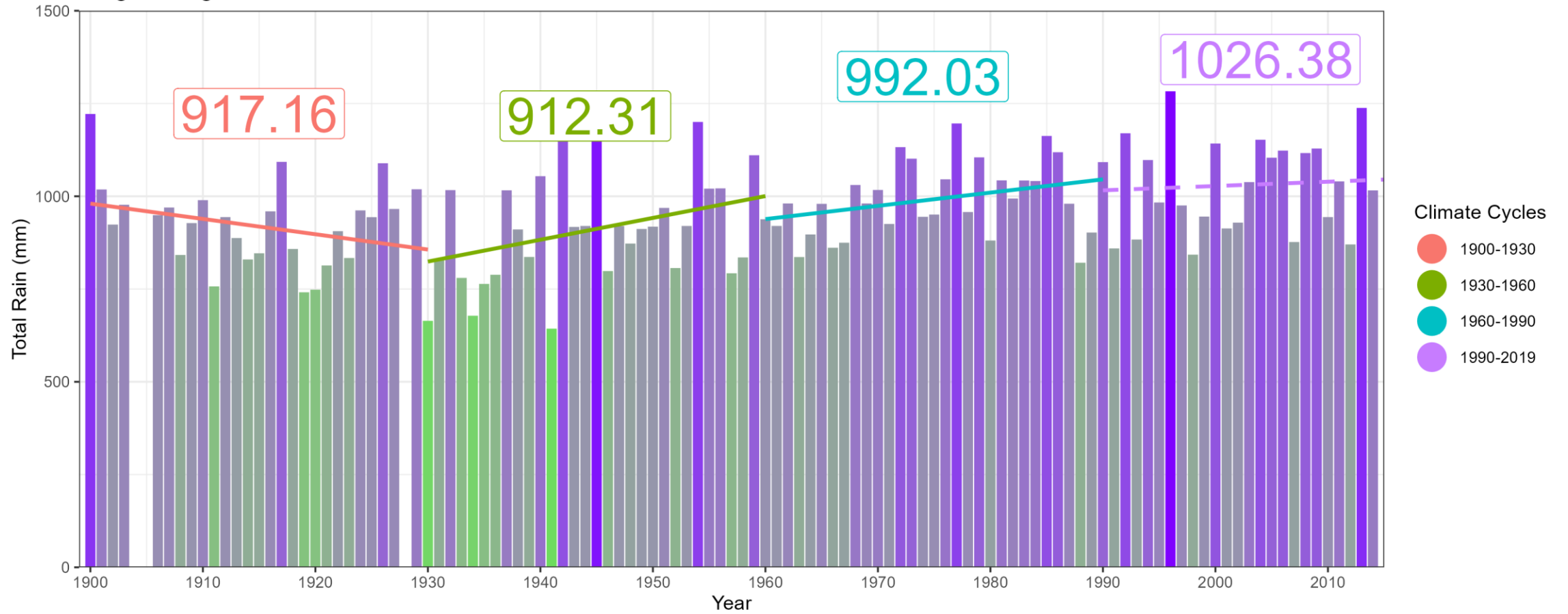


Frost Days/Annum in the Central Tier

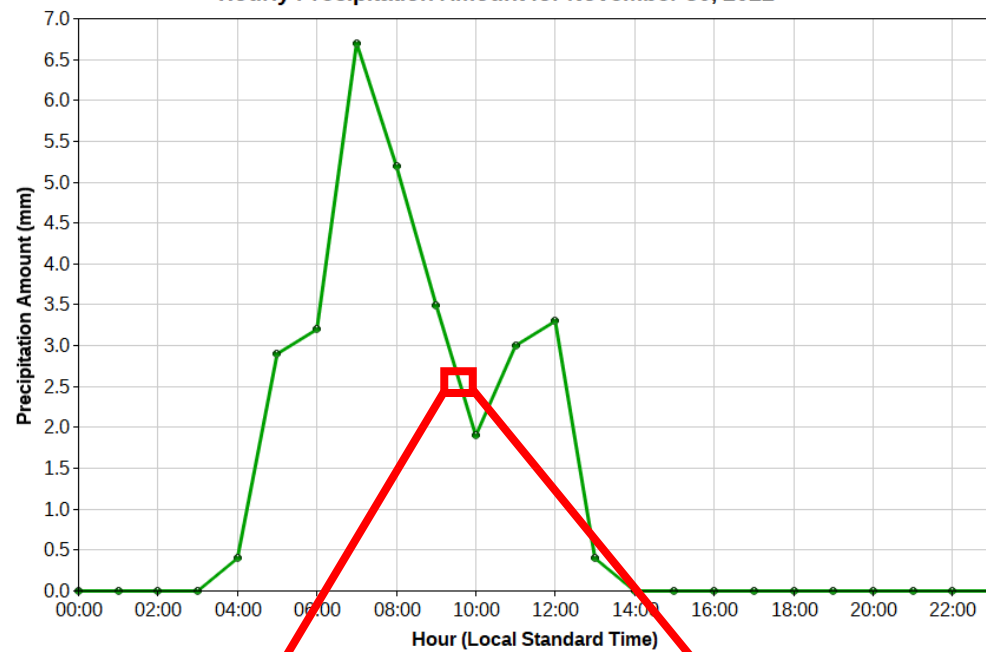
A frost day is when the temperature fluctuates above and below 0°C in a 24h period



Niagara Region Total Annual Rain



Hourly Precipitation Amount for November 30, 2022

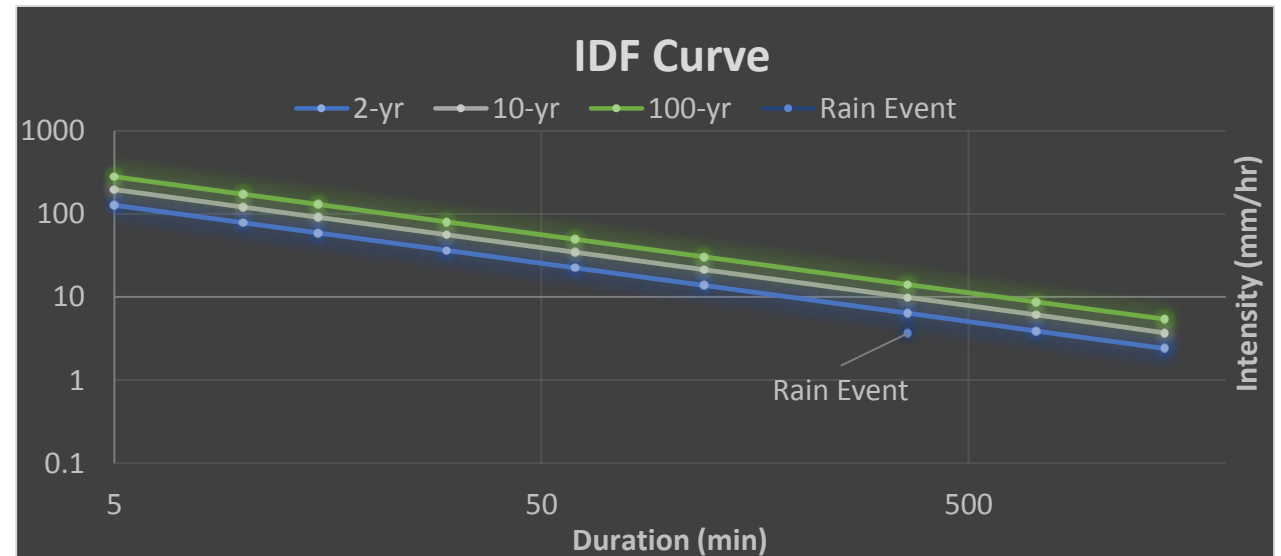


Rain event - 30th November 2022
floods Merrittville Hwy.
West side and north of Hwy 20.

21.9 mm of rain over 6 hours.

Questions???

- 1- Weather event?
- 2- Climate event?
- 3- Design?
- 4- Combo?



The Erosion Mitigation project at Rice Road and Highway 20 hits stumbling block

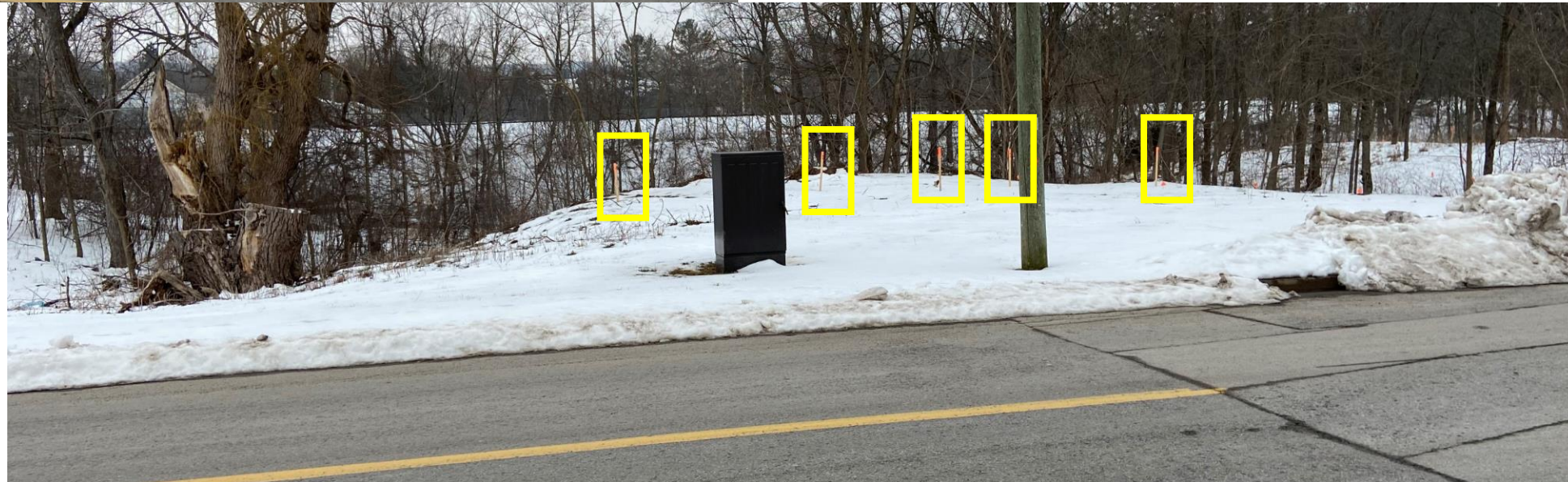
The Welland Tribune
(30 July 2022)



If there is an erosion problem...

Why is the area staked out for development?

Should we build in
floodplains and ravines?



To distinguish between weather and climate, attribution studies must be done.

Therefore, this presentation is a **foundation** for modelling future weather and climate change

Thank-you

Sources: Government of
Canada and NOAA databases.

~2 million temperature
points.

~2 million precipitation
points.