For the SCEAC Meeting of Sept 1, 2021

Adaptation to Climate Change – Discussion Starting Document for the Sustainability and Climate Emergency Advisory Committee

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Main Headings for Adaptation Needs

1) Temperatures.

a) Higher summer high temperatures

Ontario average 2050s est at +2.4C above 1990s, and by 2080 4.7C with extreme events to be much more common.

Cobourg mean July high temperatures could go from 24.3 (1981) to 26.6 (2050) to 29.2 (2099)

S. Ontario could get as many as 40 days above 30C (currently about 8 days)

b) Lower winter extreme low temperatures (but higher mean winter temperatures)

Ontario average 2050s est at +5.3 C above 1990s, with northern areas experiencing the greater part of the warming

Cobourg mean January minimum temperature could go from -10.6 (1981) to -6.3 (2050) to -2.3 (2099), but some experts also predict more extreme events, including possible colder extreme lows.

2) More rain and more intense rainfalls (get estimate of Cobourg rainfall extremes for, say 2050)

Ontario average Spring rain increase est. at 12%

Cobourg April precip could go from 63mm (1981) to 83mm (2050) to 100mm (2099)

Cobourg July precip could go from 54mm (1981) to 63mm (2050) to 75mm (2099)

3) Snow fall extremes? (get estimate of Cobourg temps for, say 2050)

Ontario average winter precipitation increase est. at 24%

4) Greater probablility of high windspeeds and tornados. (get estimates for Cobourg for, say 2050)

5) Longer periods of droughts (get estimate of Cobourg for, say 2050)

6) Regional Changes affecting Cobourg

7) Global Changes affectiong Cobourg

Potential Effects and Adaptation Measures

1) Temperatures

a) Without adaptation measures higher summer extreme temperatures result in greater hospitalization rates and more deaths, especially for the elderly and the very young. Some currently rare diseses (e.G. Lymes Disease) are likely to become more common.

Adaptation Measures

Attempt to reduce heat island effects by preserving and adding greenery, especially trees, to all areas.

Promote the use of green roofs, or solar panels.

Encourage reducing the use of black roofs and pavement as much as possible.

Prepare for high electricity usage due to air conditioning demand, and promote the most efficient air conditioning systems (SEER>20).

Promote local, easily accessible, cooling centres.

Prepare mechanisms to anticipate and identify new diseases.

b) Most people will be happy with warmer average winter temperatures, but, low temperatures could be more extreme. In general, outdoor winter sports will be adversely affected.

2) Rainfall

Increased intensity of rainfall events will produce greater likelihood of flooding.

Adaptation Measures

Plan all new and replacement storm drainage systems to accommodate potential expected flows.

Develop measures to increase the overall permeability of the land and roadways .

Retain forests, woodlots, and parkland areas as much as possible.

Promote use of retention areas and ponds that can accommodate some of the excess flow in emergencies.

Redefine floodplains to allow for increase in intensity of rainfall events. Prevent any building or filling of lands on floodplains.

3) Snow fall extremes

Although winter temperatures will be higher, so will winter precipitation. This can result in larger snowfalls if the preciptation occurs when temperature is just below freezing, and could produce increased floodiing if melt period coincides with high rainfalls.

Adaptation Measures

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4) Greater probablility of high windspeeds and tornados.

Adaptation Measures

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5) Longer periods of droughts

Local effects would largely be on agricultural community, very liitle of which is in Cobourg. These could produce shortages of local foods.

Adaptation Measures

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6) Regional Changes affecting Cobourg

Upstream changes in land use in Hamilton Township could exacerbate some of the above climate change effects.

Adaptation Measures

Track proposed land use changes upstream from Cobourg and support planning initiatives that are in line with above adaptive measures

7) Global Changes affecting Cobourg

Climate change will likely have extremely serious global effects. These are likely to include food shortages, water shortages, serious conflicts resulting from the above, and increasing numbers of climate refugees.

Adaptation Measures

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References

https://lamps.math.yorku.ca/OntarioClimate/index_app_introduction.htm#/

https://www.tvo.org/article/what-climate-change-has-in-store-for-ontario

https://figshare.com/articles/dataset/Annual_values_of_ensemble_mean_for_150_municipalities_of_Ontario/10308224?file=18731786

https://climate-adapt.eea.europa.eu/knowledge/tools

https://www.canada.ca/en/health-canada/services/climate-change-health.html

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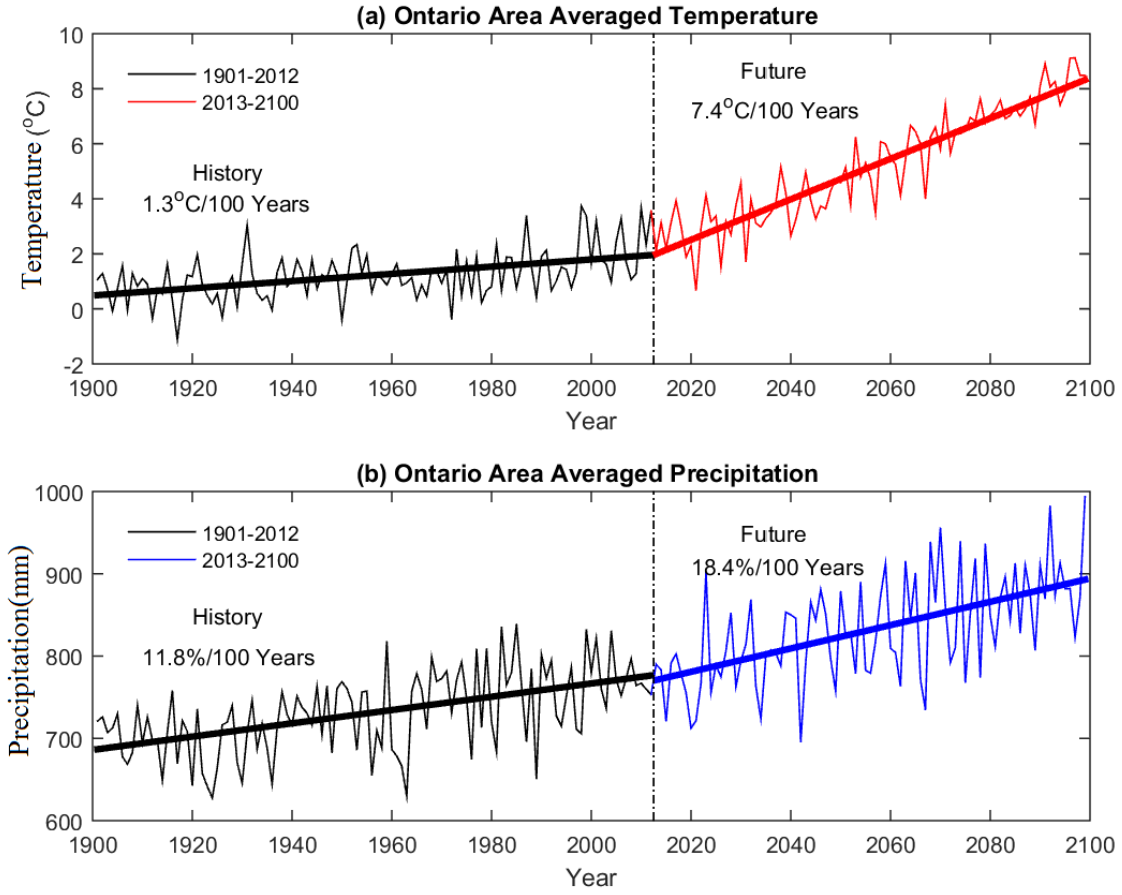
Historical and Projected Climate Trends over Ontario

Annual temperature & precipitation have been changing in the past, will change more rapidly in the future.



- **Historical**: based on the CRU data;
- **Future**: ensemble using all available IPCC AR5 RCP8.5 projections;
- **Bias-corrected** and area-weighted averages over the entire province, York University.

From https://lamps.math.yorku.ca/OntarioClimate/assets/img/plot/OntarioClimateChangeTrend.png