BriCASFR

Nov 30, 2022

The Honourable Steve Clark
Ministry of Municipal Affairs and Housing
Provincial Planning Policy Branch
777 Bay St., 13th Floor
Toronto, ON
M5G 2E5

Via email: Steve.Clark@pc.ola.org
Distribution   cc: see cc; below

Dear Sir / Madam:

Re: ERO Registry #019-6217 for input on Proposed amendments to the Greenbelt Area boundary regulation

Thank you for the opportunity to submit feedback on ERO Registry #019-6217.

BriCASFR's focus is climate and sustainable food resources.

BriCASFR does not support the proposed amendments to the Greenbelt Area boundary:
BriCASFR does not support the proposed amendments that would 'Remove lands from the Greenbelt Area that could be suitable for residential development in the near term'. The Greenbelt offers substantial economic activity and opportunities from food production, ecosystem services, climate mitigation, nature-based investments, cultural and recreational activities... Verified analysis need to be carried out to determine the value of adding land parcels. Urban development should only proceed under the earlier slated, more than adequate supply of developable lands.

Need for Land Agricultural Food Production:
It is globally recognized and scientifically reported that food supplies and food security are increasingly at risk from climate change, extreme weather events, global unrest, supply chain disruptions, and potential protection-based trade restrictions. Ontario is not exempt! One of many climate impact examples include the drying up of vegetable and fruit growing areas in southwestern U.S. where we import a notable quantity of our food. Further, many crops are only profitably grown in specific areas based on climate characteristic and soil textures. With these limitations, it is incorrect to think that Ontario has lots of agricultural land available for future needs. Please refer to Appendix A.

Need for Land for Ecosystem and Biodiversity Services:
Ecosystem services along with biodiversity services are essential for sustainable food production. These services have economic value. As noted by the Taskforce on Nature-related Financial Disclosures (TNFD): 'Nature loss poses a major risk to businesses, while moving to nature-positive investments offers opportunity. Importantly, there is potential to be compensated via carbon credits for various verified nature-based actions including storing carbon in soils. Examples of ecosystem services include:

• Provisioning, or production of food, water, and fiber • Regulating, or controlling climate, pest and disease • Providing habitats for a wide range of biodiversity, genetic resources, and genetic diversity. • Providing habitats for pollinators and other beneficial insects • Maintaining water supplies and water purification services • Supplying materials for soil development	• Supporting soil organisms and microbial networks • Recycling organic waste materials • Storing and recycling nutrients in soil reservoirs • Supporting nutrient cycling, microbial activity, and oxygen production • Sequestering and storing carbon in soils • Cultural, such as spiritual and recreational benefits • …

Economic Assessments Steps to Ensure Current and Future Additional Greenbelt Areas Are Not Removed:
Steps need to be put in place to ensure that additional Greenbelt areas are not removed, and specifically not removed for unaffordable urban sprawl. Without needed steps, one can only expect ongoing Greenbelt removals and ultimate systems destructions to continue in 2023, 2024, 2025…

Important steps for Greenbelt protection include: (1) assessing the current economic ecosystem value of the Greenbelt, (2) assessing potential revenue from Greenbelt ecosystem services, (3) accessing potential revenue from nature-based investments, and (4) assessing the cost of Greenbelt ecosystems destruction. Following are a few examples of assessments that could or should be carried out:

- Use LandScale to evaluate sustainability impacts. includes three components to help the private sector, governments, and civil society access robust insights that can guide and incentivize sustainability improvements for land-use at scale. https://www.landscale.org/

- Use SBTi-FLAG (Forest, Land, Agriculture) in land-use planning assessments. Currently in draft, the SBTi's FLAG Guidance provides the world's first standard method for companies in land-intensive sectors to set science-based targets that include land-based emission reductions and removals from agriculture, forestry and other land use. https://sciencebasedtargets.org/sectors/forest-land-and-agriculture

- Assess the tax efficiency for land-use in Ontario communities (i.e., view: https://youtu.be/7Nw6qyyrTeI)

Assess the wisest use of tax efficiency of communities by illustrating the unsustainable costs of urban sprawl versus the net gain from i.e., walkable communities. Plus, energy efficiency gains, meeting climate Net Zero targets… Suburbia is Subsidized: Here's the Math [ST07] Not Just Bikes ~ 2022 https://youtu.be/7Nw6qyyrTeI	

- Assess future revenue potential from nature-based services investments:
  Nature-based investments through voluntary carbon markets pay people to verifiably enhance natural systems. Examples include paying farmers to sequester carbon in soils, sequester carbon in forests, and carry out other nature-based activities that help to achieve Net Zero climate targets. Note that the UN Biodiversity Conference (COP 15) is being held in Montreal from Dec. 7-19, 2022. One of the goals is to end biodiversity loss.

- Comparing the price of ecosystem services
  Compare the economic value of respective land parcels to be added to the Greenbelt.

- Education
  The release of Bill 23 and ERO Registry #019-6217 illustrates the need for education.

The findings from these assessments would help ensure that additional Greenbelt areas are not removed.

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In Summary:
In summary, 'Bill 23, More Homes Built Faster Act, 2022' needs to repealed and re-issued at a much future date with a focus on preserving earlier designated Greenbelt lands, and eliminating the many ongoing criticisms documented about Bill 23.

And ERO Registry #019-6217 needs to be withdrawn, confirming that no lands should be removed from the Greenbelt.

 Yours truly,

Brian Davies

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Appendix A – Climate, Soil and Cropping Growing Areas

A1. High Production Crop Growing Areas Today

High production crop growing areas for many crops are based on appropriate climate and soils along with other natural resources:
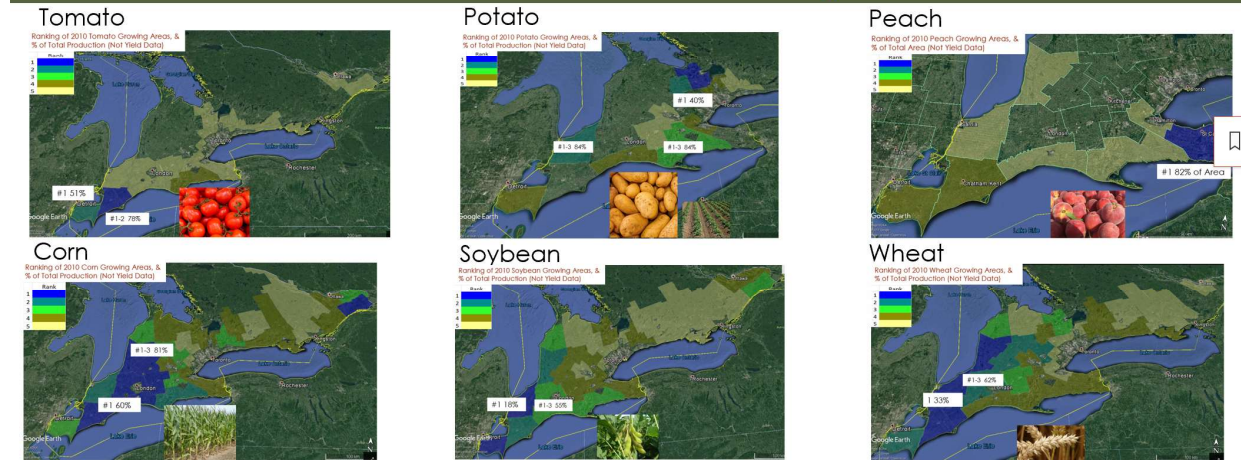
- High production areas for tomatoes currently are in Essex and Kent based primarily on climate and soils
- High production areas for potatoes are in a portion of Simcoe County primarily based on soils and climate
- High production areas for Fruits are the Niagara Region and Essex County based on climate and soils
- Highest production areas for Corn, Soybeans, Wheat are towards the southwest based on climate and soils
- High production areas for Canola are a bit farther north where temperatures are cooler
- High production areas for Dry Beans are in the cooler farther north, today only Dry Beans are grown in Ontario
- High production ares for Grapes (wine production) today are the more southerly areas.

Note: High production areas for most crops grwon in Ontario can not be in the Golden Horseshoe where a signifcant portion is for various urban uses – excluding Greenbelt protected areas.

A2. Land Classes
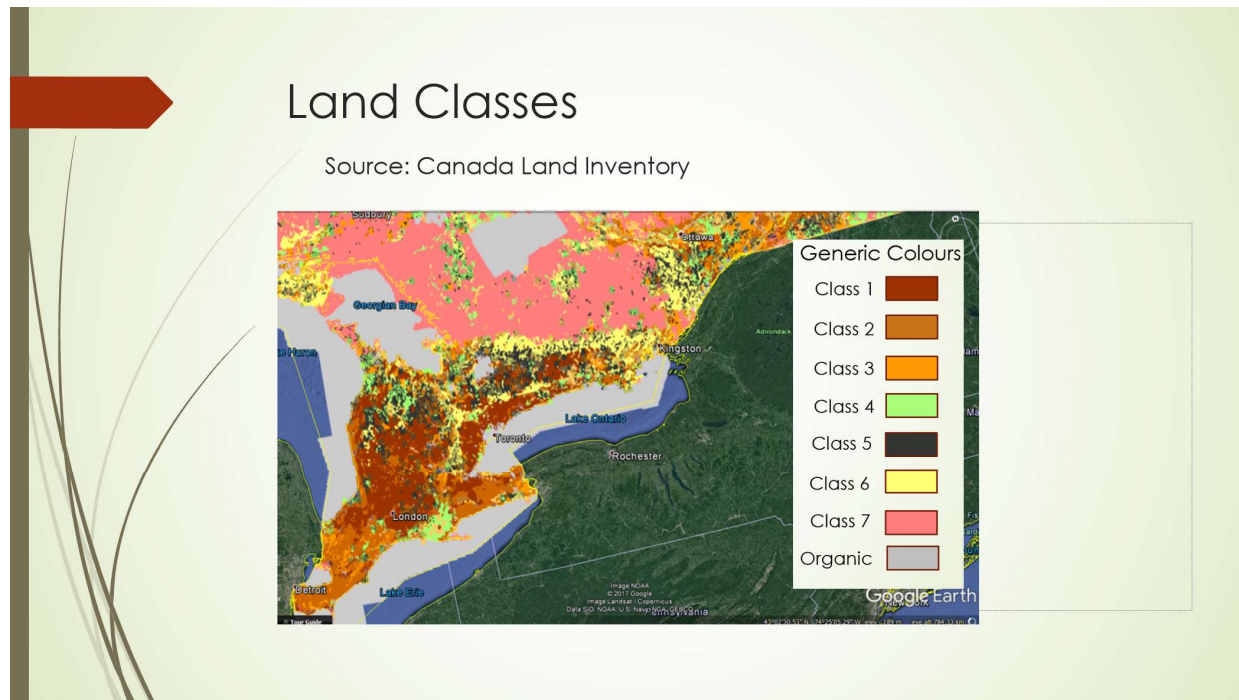
Large amounts of Prime Agricultural Land (Class 1, 2 & 3) are found in major portions of southern Ontario and in particular the Greater Golden Horseshoe (GGH).

The seven land classes presented here are based on definitions, and prime agricultural land typically refers to the top 3 classes plus organic soils. There is a substantial amount of Class 1, 2, and 3 lands in the southern locations, and hardly any class 7. The area to the north having a similar colour to 7 is not classified, and not agricultural land.

Large amounts of prime agricultural land are now converted to urban or are planned to be converted.

Remaining prime agricultural lands are constrained for specific crop growing based on soil type and climate.

Prime agricultural lands need to be preserved for food production, habitats, biodiversity, bio-resources, greenhouse gas removal, and other related essential land-use needs

A3. Soil Textures / Soil Resources

Specific crops prefer specific types of soils: clay, loam, sand, silt

- The grayish-shaded areas soils contain a higher percentage of clay materials, with some areas having a much higher clay content than other areas.
- The brownish-shaded areas represent various types of predominantly loams.
- The small black area in the Holland Marsh represents one of the organic soil areas
- The area in the mid south contain a higher sand component

Specific crops grow better in specific soils. Soils help determine the crop specific high production growing areas.

A4. Do We Have Enough Land?
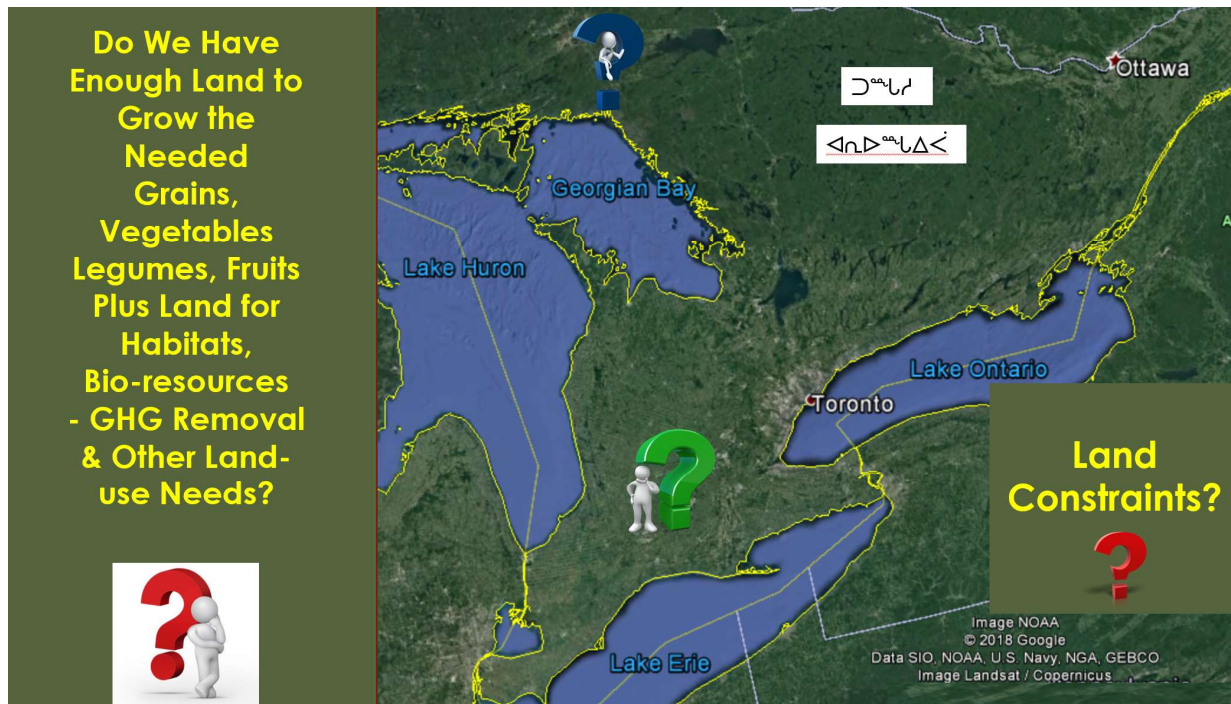
In addition to crop growing areas, land is also need for Habitats for Pollinators and Beneficial Insects, Bio-resources, Greenhouse Gas Removal, Soil Carbon Sequestration – plus other land use needs...

A5. Climatic Zones and Vegetable Production
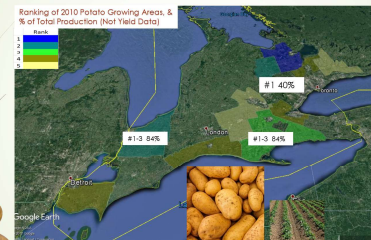
Climatic Zones and Vegetables

Cool Weather	Cool-Warm Weather	Warm Weather
Pulses	Green Peas	Sweet Corn
Potatoes	Onions	Snap Beans
		Tomatoes

Canola Areas and Production
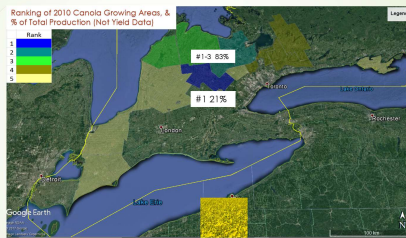
The higher production areas for the canola oil crop are in the more northerly and cooler areas.

Potato Growing Areas & Production

For vegetables, potatoes prefer cooler temperatures,

Tomato Growing Areas & Production

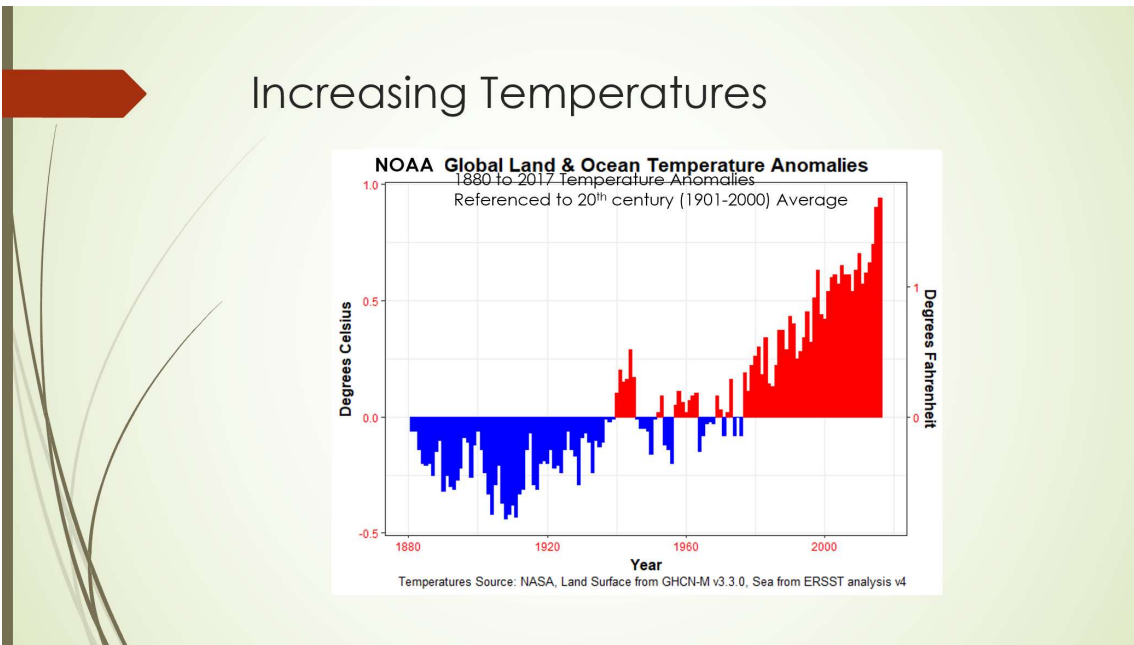While tomatoes prefer warmer temperatures.

Legumes - Pulses

- Only Dry Beans are grown in Southern Ontario

Pulses prefer the more northerly and cooler areas. Only Dry Beans are gown in Southern Ontario.

A6. Recent Increasing Global Temperatures

Under BAU, temperatures are projected in increase – potentially too high for speciic crops or too high for economic high production growing areas.

Examples include current southerly tomato growing areas, current southerly canola growing areas, current high production potato growing areas, current vegetable and grape growing areas. Yields for many crops will decrease as temperatures increase above crop specific limits.

A7. Projected Future Temperature Scenarios
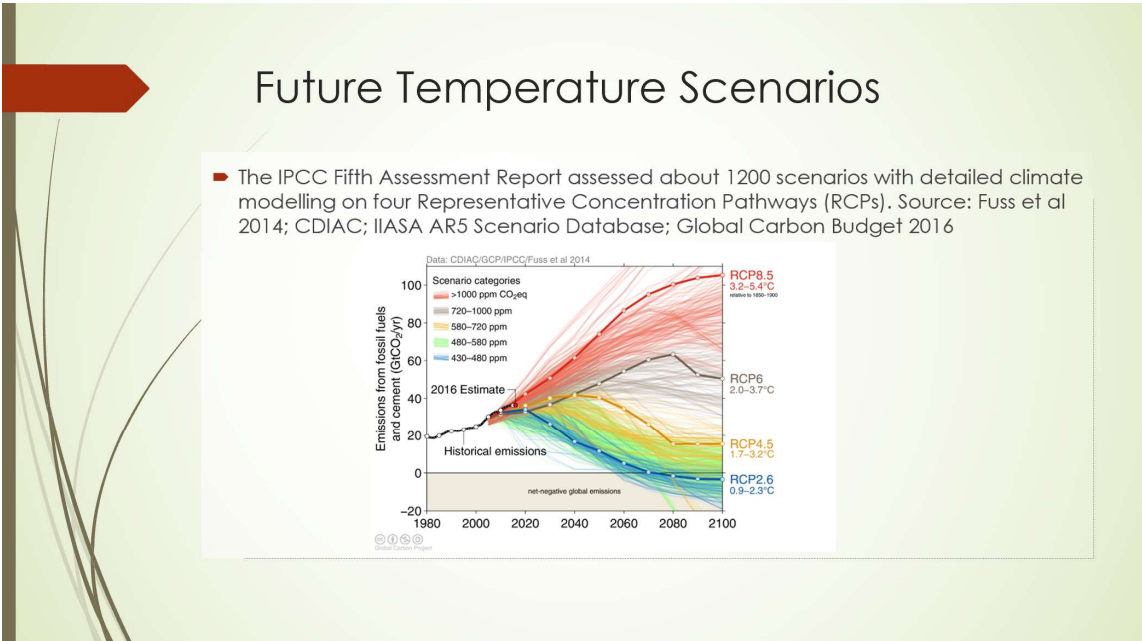
Various Crop Modelling Research actvities project crop yield declines as temperatures increase above crop specific levels.

A8. Example of Current versus Future Local Temperature Increases
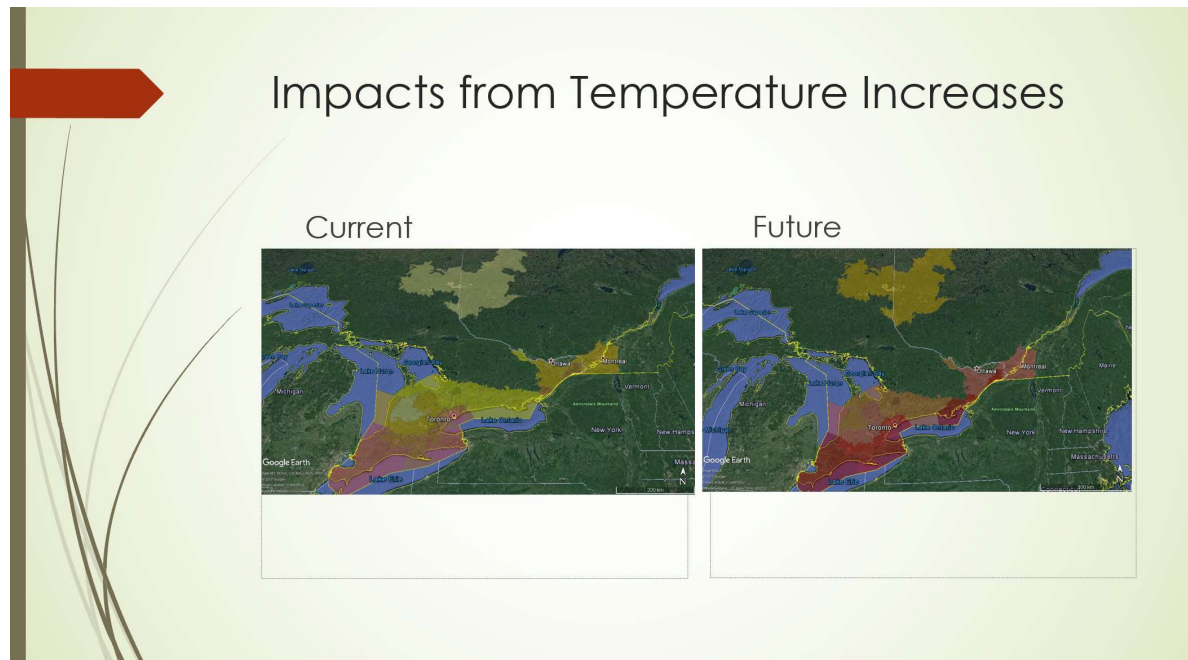
An illustration only of relative temperature increases by ecoregion, comparing current temperatures versus future temperatures.

With increasing temperatures, there are an increased number of extreme weather events, an increased number of pests and disease outbreaks, and increased food loss over the value chain.
Climate change is impacting various ecosystem services, including the water cycle, soil microbial processes nutrient cycling, biodiversity, and pollination – all essential for food production

The graph on the left provides an illustration of representative current temperature gradients by ecoregion today, and the on the right an illustration of potentially higher temperatures in our major crop growing areas in the future.

Temperatures above crop specific limits results in heat stress for crops, especially during the reproductive stage. Yields are reduced.

A9. How Much Will Our Climate Shift?
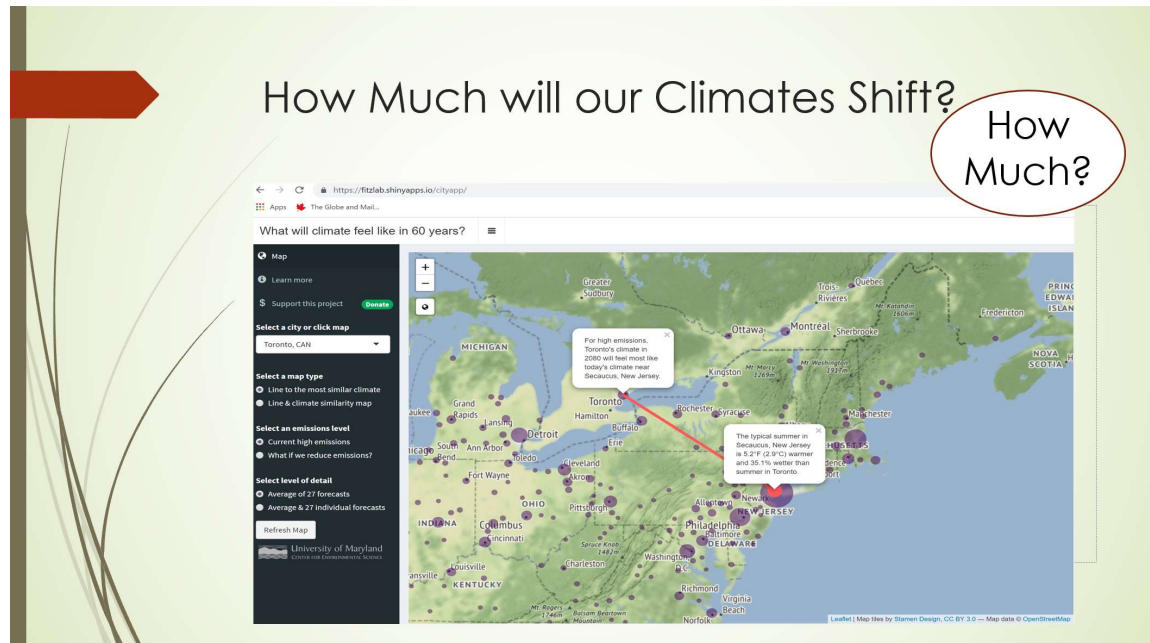
In future years, climates in Southern Ontario will be similar to those much farther south today – climate shifts.

The referenced scientific study projects that in 60 years the southern part of Ontario will experience temperatures similar too those much farther south today - influencing todays warm crop and cool crop growing areas
[As our climates shift, how much will our high production warm crop and cool crop growing areas shift.]

Source:
Nature Communications
February 2019
Matt Fitzpatrick & Robert Dunn
University of Maryland - Center for Environmental Science
DOI:10.1038/s41467-019-08540-3

A10. Declining Pollinator Populations

Climate change, land-use change, and pollution are all causing biodiversity loss. A loss of pollinators and a loss of insects in general has major consequences for ecosystems, including agro-ecosystems.

Data was analyzed from 130 farms in the US and Canada where apples, blueberries, sweet cherries, tart cherries, almonds, pumpkins, and watermelon were grown.

The researches found that lower yields due to less pollination by smaller bee populations in 5 crops with apples, cherries, and blueberries being hit the hardest.

Source:
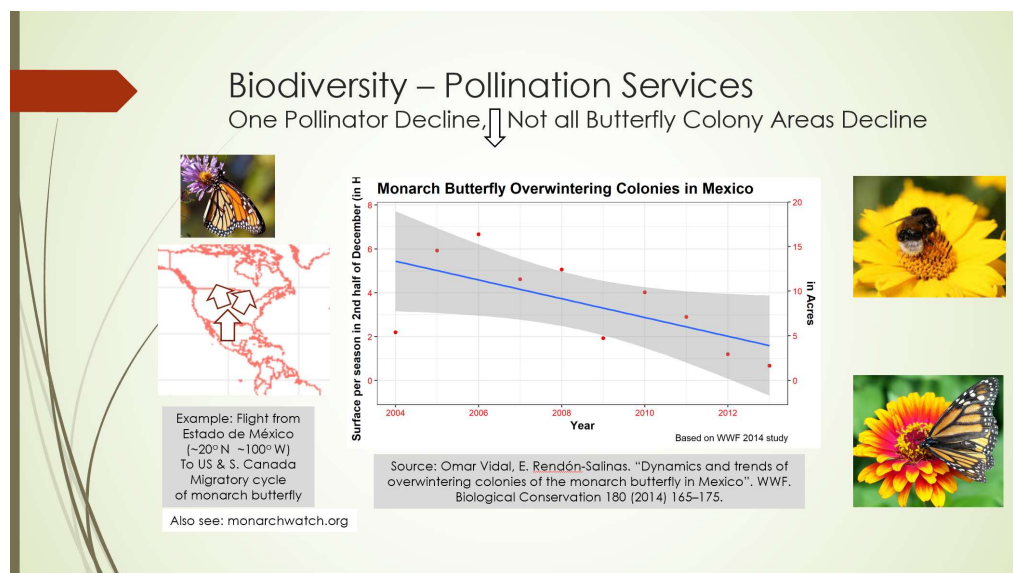https://royalsocietypublishing.org/doi/full/10.1098/rspb.2017.2140
The worldwide importance of honeybees as pollinators in natural habitats
Keng-Lou James Hung, Jennifer M. Kingston, Matthias Albrecht, David A. Holway and Joshua R. Kohn
Published:10 January 2018
https://doi.org/10.1098/rspb.2017.2140

Source: see Omar Vidal reference above
Illustration of earlier Decline in Butterfly Populations

Ecosystem services provide biodiversity essential for agriculture and sustainable food production. Insects are needed for pollination services. **Over seventy-five percent of the world's food crops rely on pollination including specific types of grains, vegetables, fruits, and oil crops. Beneficial insects also serve as natural predators for pest control.** A large diversity of both biodiversity and genetic resources plays a crucial role in food production and nutritional needs.
Other examples of ecosystem services include:
- Maintaining water supplies and water purification services
- Storing and recycling nutrients in soil reservoirs
- Supporting soil organisms and microbial networks
- Recycling organic waste materials
- Sequestering and storing carbon in soils.

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A11. Projected Decline in Global Crop Yields
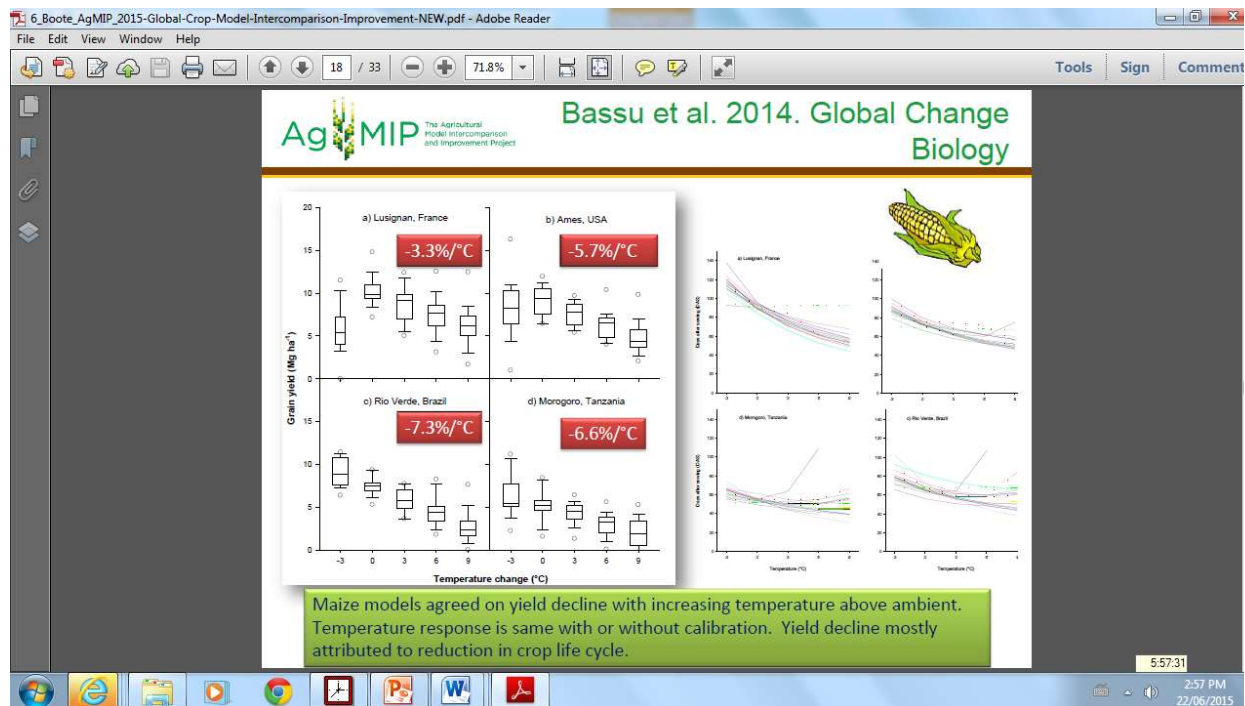
Graphic GC1: Maize models and yield decline with temperatures above ambient…
Source: Bassu et al. 2014, Global Change Biology, via AgMIP workshop presentation material

Declining Maize, Soybean and Wheat Yields

(MAIZE, SOYBEAN, WHEAT) Implied yield losses in US crops of 49% for maize, 40% for soybean and 22% for wheat based on the regression coefficients derived from the historical observations and temperature shifts projected for the end of the century. Results based on the use of a major climate model and the highest climate warming scenario with crops experiencing projected exposure to increasing temperatures in the 30 to 36 0C range. This 2017 research study notes that the estimated yield responses under high levels of global warming should not be interpreted as predictions, since the Global Gridded Crop Models (GGCM) simulations do not commonly account for the implementation of potential management and adaptation options along with the respective differences both in the models and in how they account for these options. Without CO_2 fertilization, effective adaptation, and genetic improvement, each degree-Celsius increase in global mean temperature would, on average, reduce global yields of wheat by 6.0%, rice by 3.2%, maize by 7.4%, and soybean by 3.1%

Source: Zhao, Chuang et al. (2017-08-29). Temperature increase reduces global yields of major crops in four independent estimates. PNAS 114 (35). Retrieved from <http://dx.doi.org/10.1073/pnas.1701762114>.

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## A12. Projected Change in US Corn, Soybeans and Wheat Yields
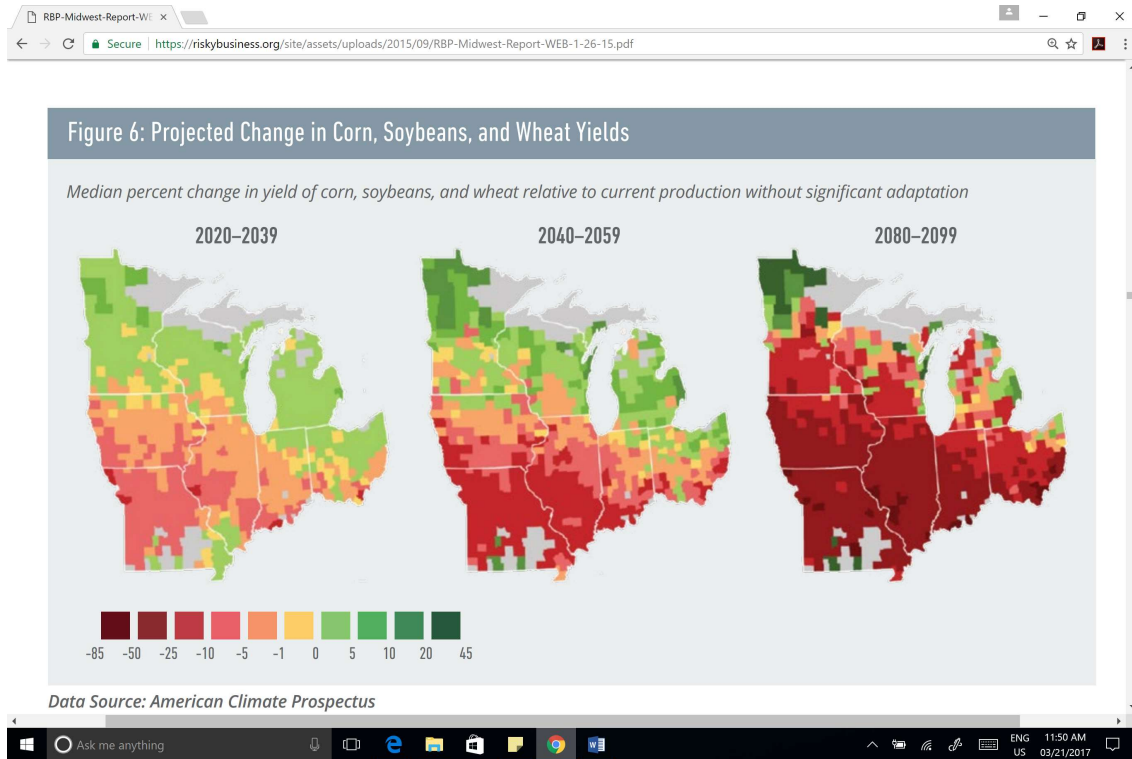
Source: American Climate Prospectus via the January 2015 Risky Business report titled:
'Heat in the Heartland: Climate Change and Economic Risk in the Midwest'
Co-chairs: Michael R. Bloomberg, Henry M. Paulson, Jr., Thomas F. Steyer

The areas of yield declines noted above in the US Midwest are at similar latitudes to those in southern Ontario:

Map of the US Yield Declines for Great Lakes Areas
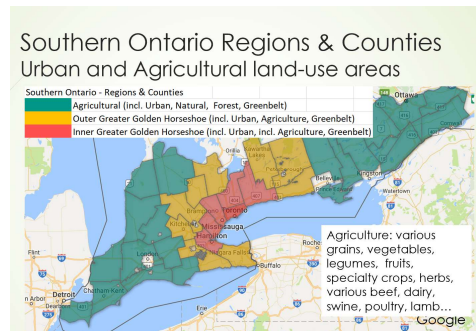
Map of GGH and Great Lakes

A13. Where Else and What Crops?