

2020-07-31

Ontario Growth Secretariat
Ministry of Municipal Affairs and Housing
777 Bay Street, 23rd Floor, Suite 2304
Toronto, ON M7A 2J3

Via email: growthplanning@ontario.ca

Dear Sir / Madam:

Re: Proposed Land Needs Assessment Methodology for A Place to Grow:
Growth Plan for the Greater Golden Horseshoe
ERO number: 019-1679
Re: Proposed Amendment 1 to A Place to Grow:
Growth Plan for the Greater Golden Horseshoe
ERO number: 019-1680

Thank you for the opportunity to submit feedback on the ‘Proposed Land Needs Assessment Methodology for A Place to Grow’, and the associated ‘Proposed Amendment 1 to A Place to Grow’.

BriCASFR’s focus is climate and sustainable food resources.

Both the subject Methodology’ and ‘Amendment’ needs to be withdrawn, modified to reflect critical missing components and include better representations of future scenarios. These can be then re-issued at a much future date based on encompassing the projected land-use needs of everyone.

With the ongoing Covid-19 impacts that commenced earlier in 2020, we were quickly and firmly reminded of the lessons that needed to be learned. One of these lessons being **the need to be self-sufficient in essential supplies - including food supplies.**

On an ongoing basis we are frequently and firmly reminded that **climate change will have far greater economic impacts** than Covid-19. These impacts will be reflected **in our food production, in our self-sufficient food supplies, and in food security for all** – there will be no vaccine for climate change.

Both the subject ‘Land Needs Assessment and Methodology’ and ‘Amendment 1’ fail to adequately address the need to balance the various constraints for land. There is a need to recognize that future land-use policies need to focus on more than only ‘Community Area Land Needs’ and ‘Employment Area Needs’. Land-use methodologies need to also include mitigating the impacts of climate change, adopting sustainable development goals, addressing resource constraints, adopting circular economy principles, and encompassing resilience. (Refer to Appendix A).

Further, methodologies for future land use assessments need to anticipate the rapidly changing effects that technological advances will have. Exponential or ‘S-shaped’ adoption curves are likely. Newer transportation modes, and ride sharing may result in fewer vehicles and roads. Technological advances include Cloud Services, Artificial Intelligence, Robotics, Digital Twins, Mixed Reality, & the Internet-of-Things. Also, newer Distribution Systems, Communication Systems, Learning Systems, Online Shopping, and Diets will result in major changes to workforces, employment types, office, and traffic systems – making any 30-year projections highly unpredictable.

The impacts of continued urban sprawl are well documented. Future land-use policies need to reflect that business-as-usual (BAU) and continued waste of valuable resources – especially prime land - are no longer options.

The Greater Golden Horseshoe (GGH) encompasses diverse land-use activities. The economic value of agricultural activities and food production in the GGH is well documented (Please refer to Appendix B).

Anticipating that the various shortcomings and omissions of the subject 'Methodology' and 'Amendment' are being addressed by other respondents, this response focuses on additional, mandatory, and essential land-use areas. An effective Land Needs Assessment and Methodology needs to:

- Preserve current and reserve additional prime agricultural land for food production. Increasing temperatures and extreme weather events are projected to result in decreasing yields with the need for more land to just maintain current production levels.
- Understanding that high production crop growing areas are based on favourable climates and soils. There is already a concern about the future economical feasibility of growing specific crops in the same areas that they are grown today
- Preserve land for ecosystems services including water and soil resources, and habitats for biodiversity services including pollinators and beneficial insects
- Preserve land for climate mitigation needs. Mandatory mitigation needs include land for carbon sequestration, soil carbon sequestration, tree planting and land for other needed bio-resources
- Preserve prime agricultural land to ensure self-sufficiency in food supplies, and counter future trade constraints. Availability of global food supplies may be more at risk as yield declines in major crop growing areas around the world
- Please refer to Appendix A for supporting information.

Ontarians want to do their share rather than let others do the heavy lifting. They prefer to look after the needs of many tomorrow rather than the needs of a few today. Ontarians recognize that the urban sprawl land-use policies of the 1950 and onward era can no longer apply in future years. Many in Ontario recognize that Ontario does not have plenty of land, nor that all agricultural land should be readily available for Community or non-agricultural Employment Needs.

Both the subject 'Methodology' and 'Amendment' needs to be withdrawn, and re-issued at a much future date by encompassing the projected land-use needs of everyone.

Yours truly,

Brian Davies



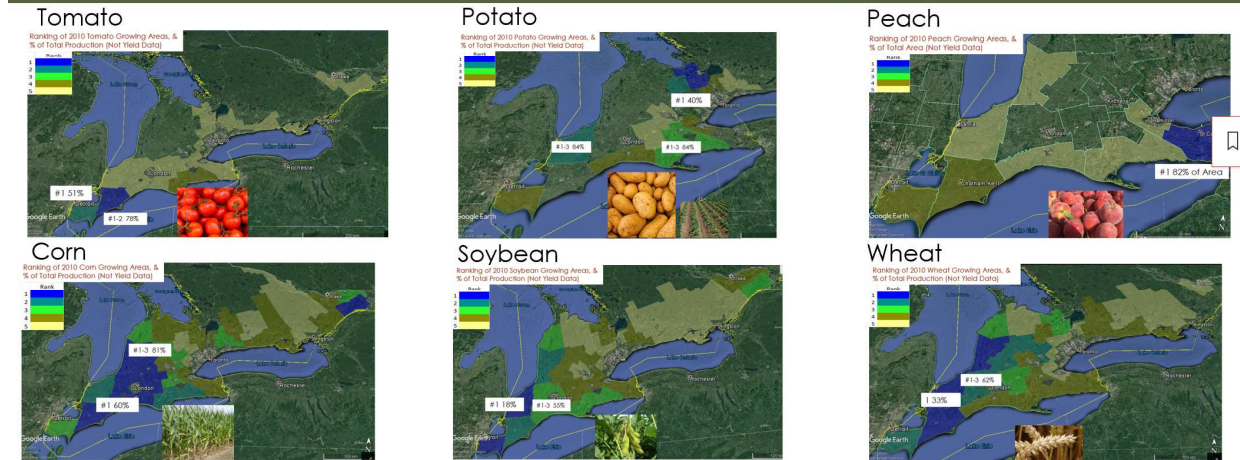
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Appendix A

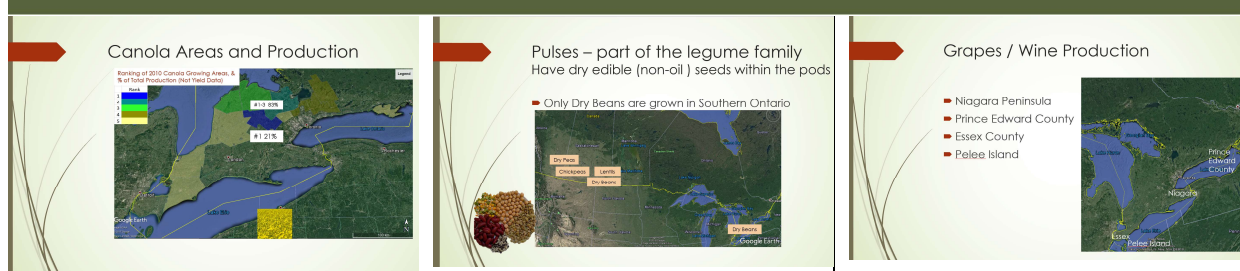
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A1. High Production Crop Growing Areas Today

Our major crop growing areas today!
 How will these change...as our climates change,
 temperatures increase,
 & natural resources change?



Climate and Sustainable Food Resources

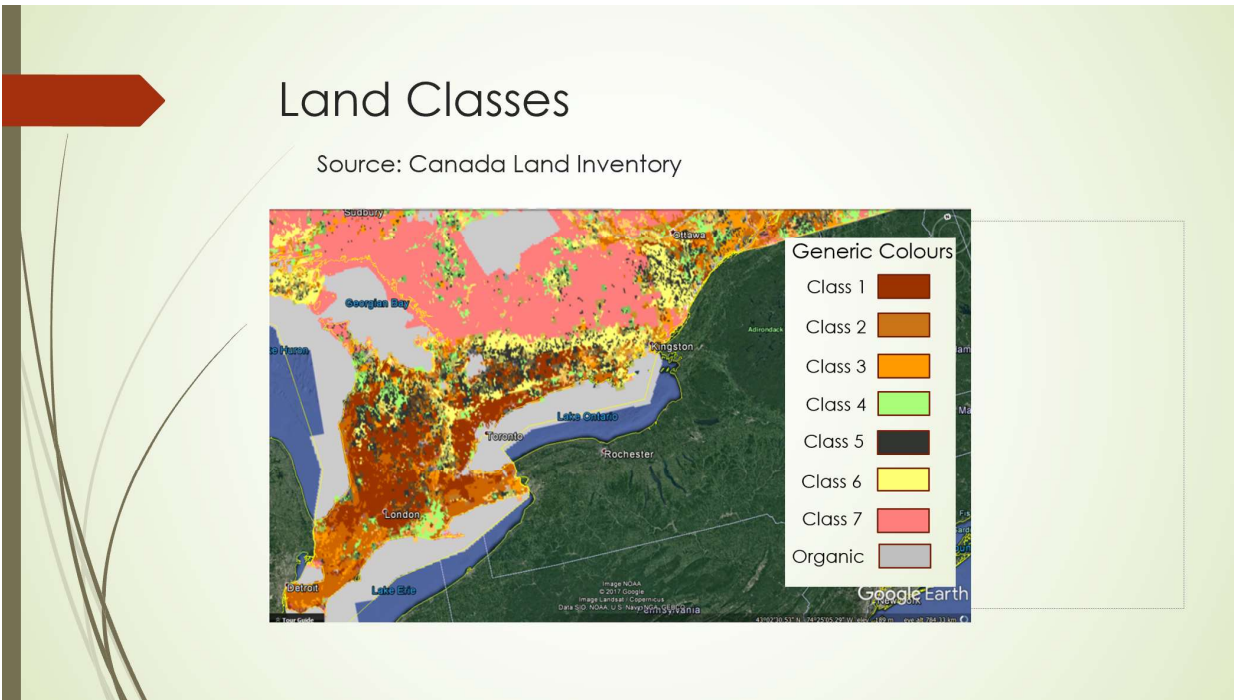


High production crop growing areas for many crops are based on appropriate climate and soils along with other natural resources:

- 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 areas for Grapes (wine production) today are the more southerly areas.

Note: High production areas for most crops grown in Ontario can not be in the Golden Horseshoe where a significant 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).

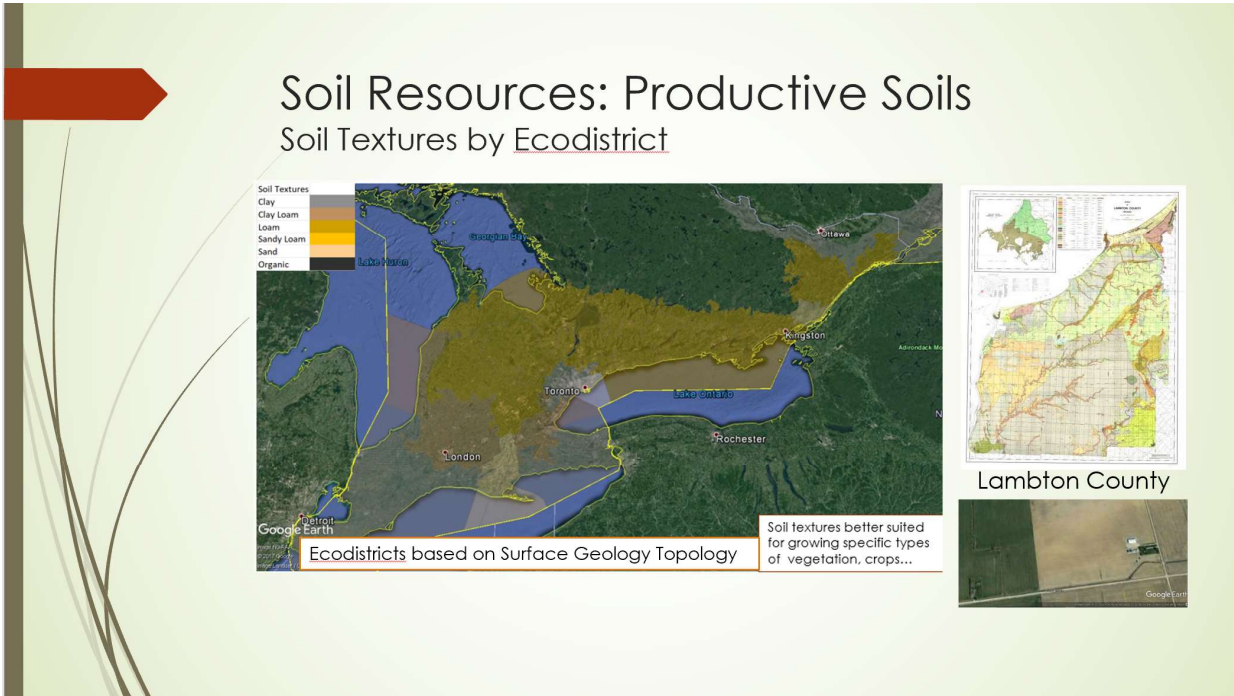
The seven land classes presented here are based on definitions, and prime agricultural land typically refers to the top 3 classes plus organic soils. There is a substantial amount of Class 1, 2, and 3 lands in the southern locations, and hardly any class 7. The area to the north having a similar colour 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

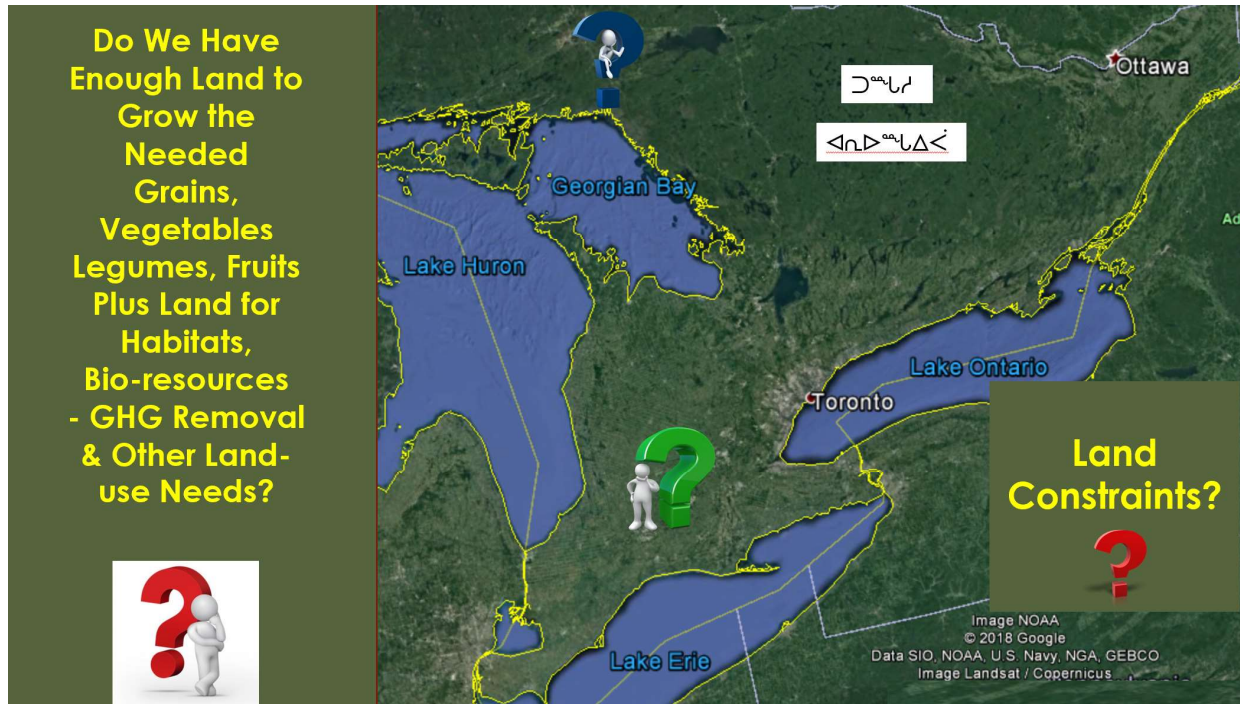


Specific crops prefer specific types of soils: clay, loam, sand, silt

- 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?



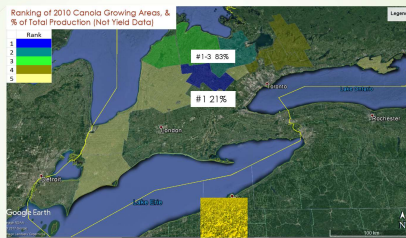
In addition to crop growing areas, land is also need for Habitats for Pollinators and Beneficial Insects, Bio-resources, Greenhouse Gas Removal, Soil Carbon Sequestration – plus other land use needs...

A5. Climatic Zones and Vegetable Production

Climatic Zones and Vegetables

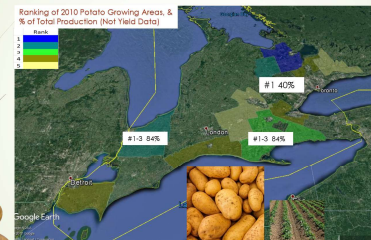
Cool Weather	Cool-Warm Weather	Warm Weather
Pulses	Green Peas	Sweet Corn
Potatoes	Onions	Snap Beans
		Tomatoes

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.

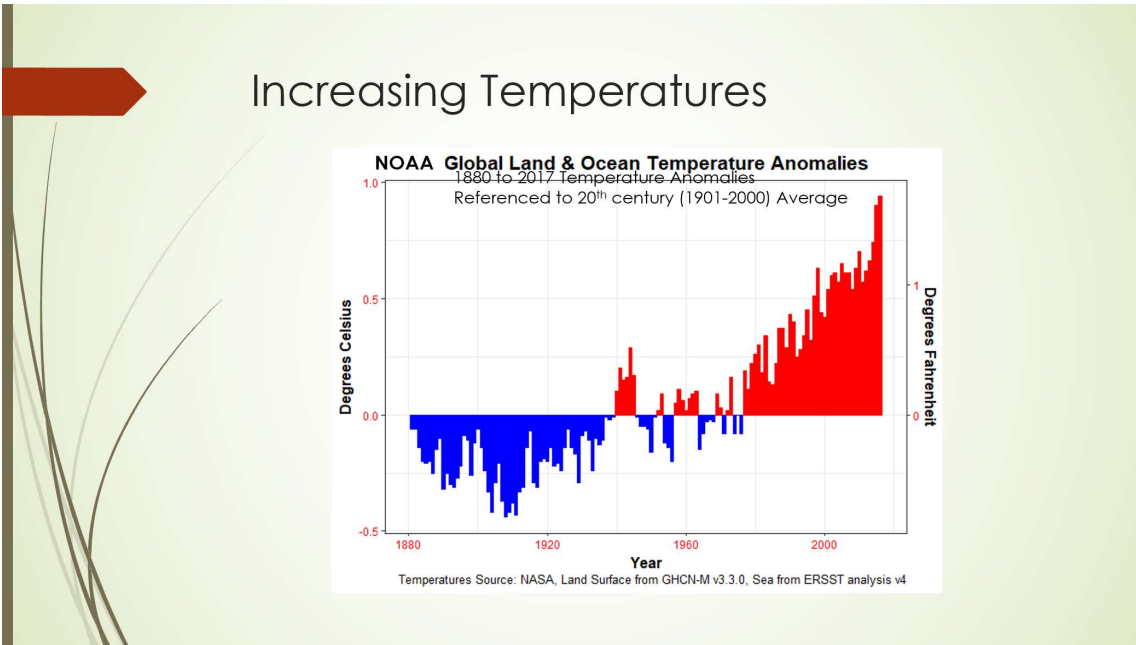
Legumes - Pulses

Only Dry Beans are grown in Southern Ontario



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

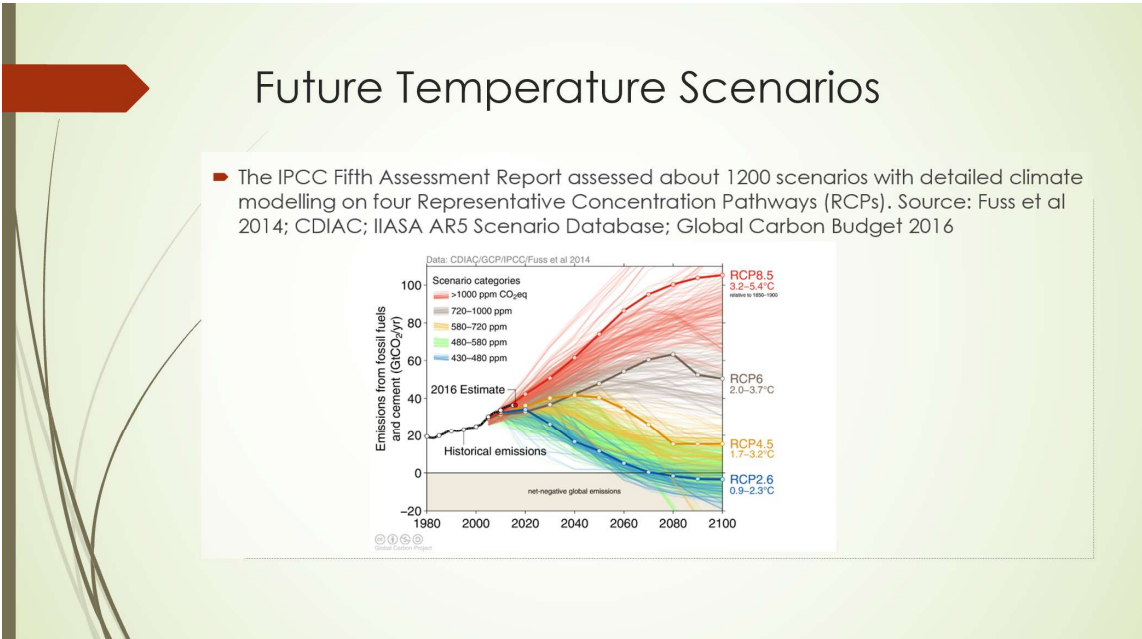
A6. Recent Increasing Global Temperatures



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

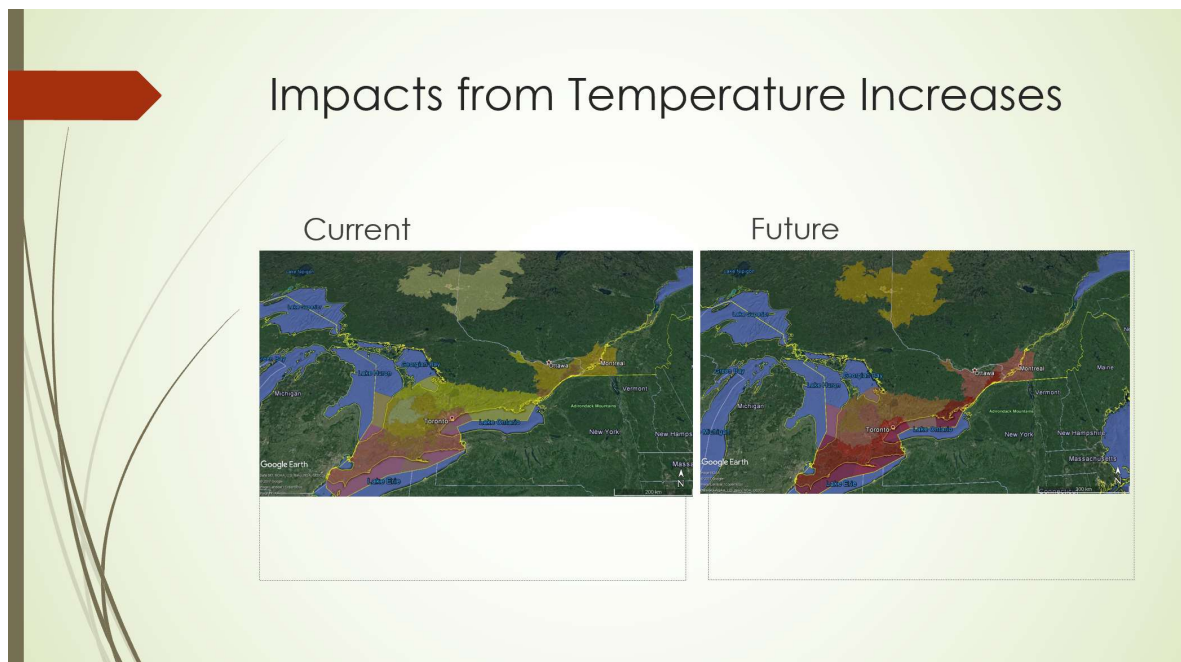
Examples include current southerly tomato growing areas, current southerly canola growing areas, current high production potato growing areas, current vegetable and grape growing areas. Yields for many crops will decrease as temperatures increase above crop specific limits.

A7. Projected Future Temperature Scenarios



Various Crop Modelling Research activities 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.

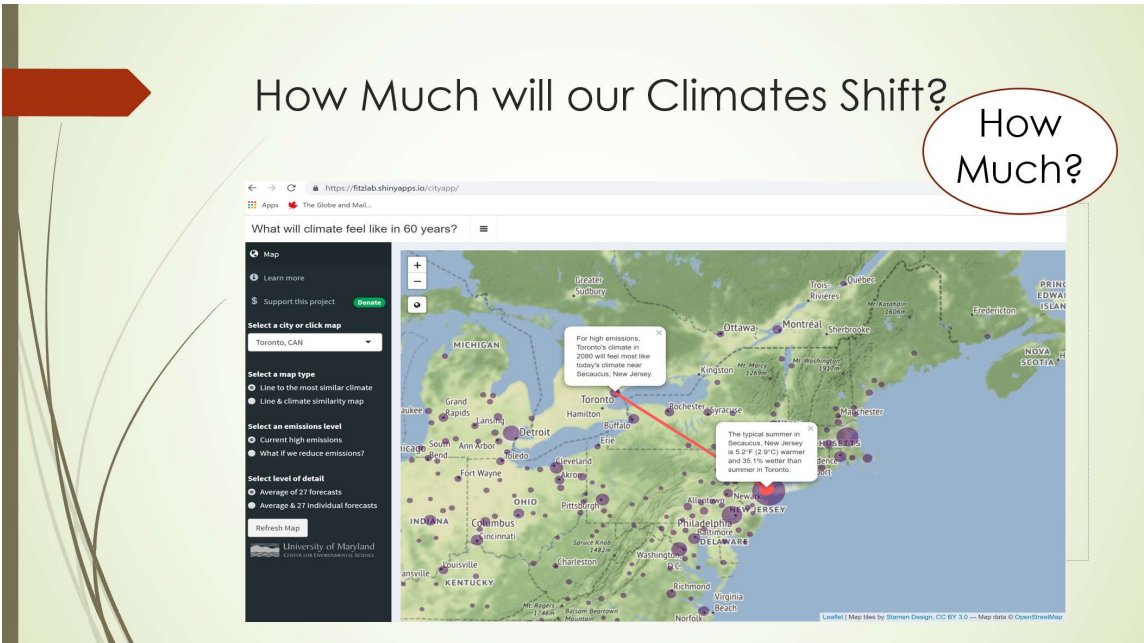
With increasing temperatures, there are an increased number of extreme weather events, an increased number of pests and disease outbreaks, and increased food loss over the value chain.

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 to those much farther south today - influencing today's 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:

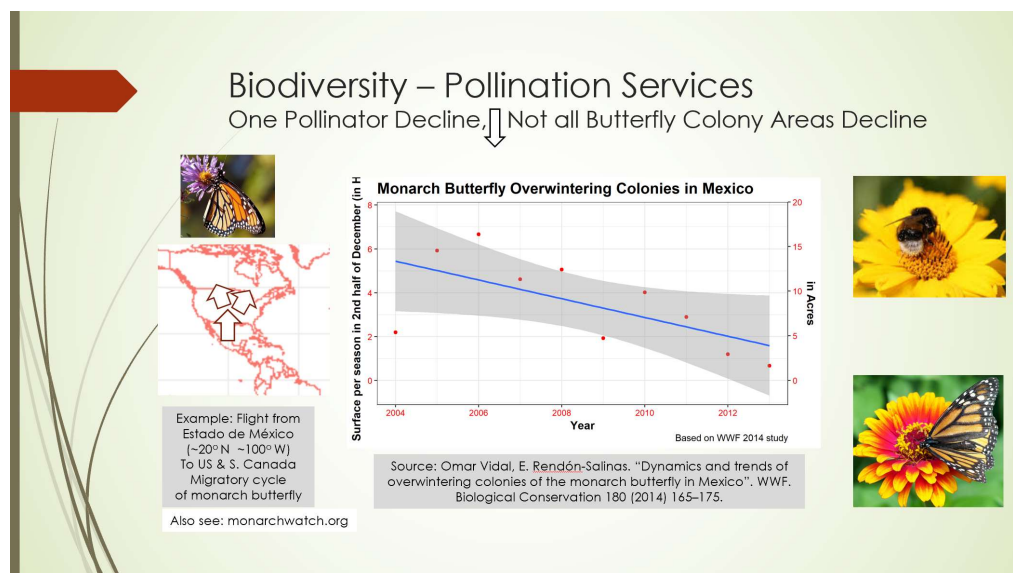
<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2017.2140>

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

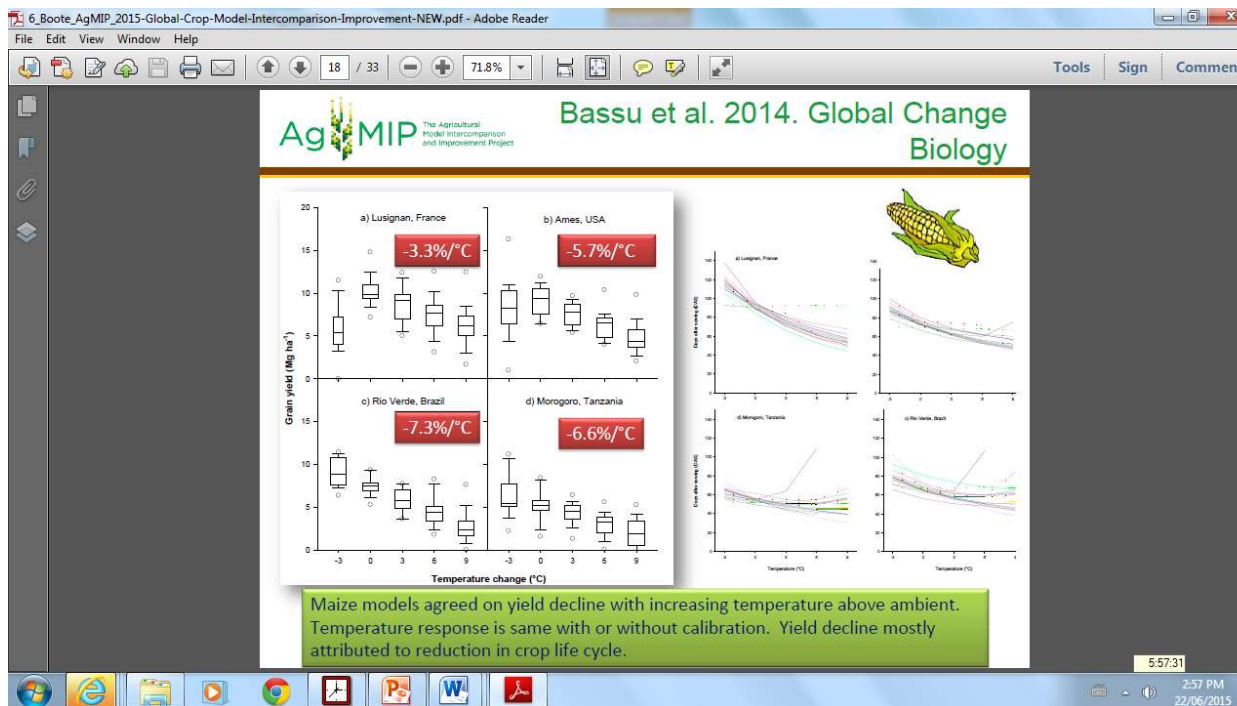
Illustration of earlier Decline in Butterfly Populations

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.

A11. Projected Decline in Global Crop Yields



Graphic GC1: Maize models and yield decline with temperatures above ambient...

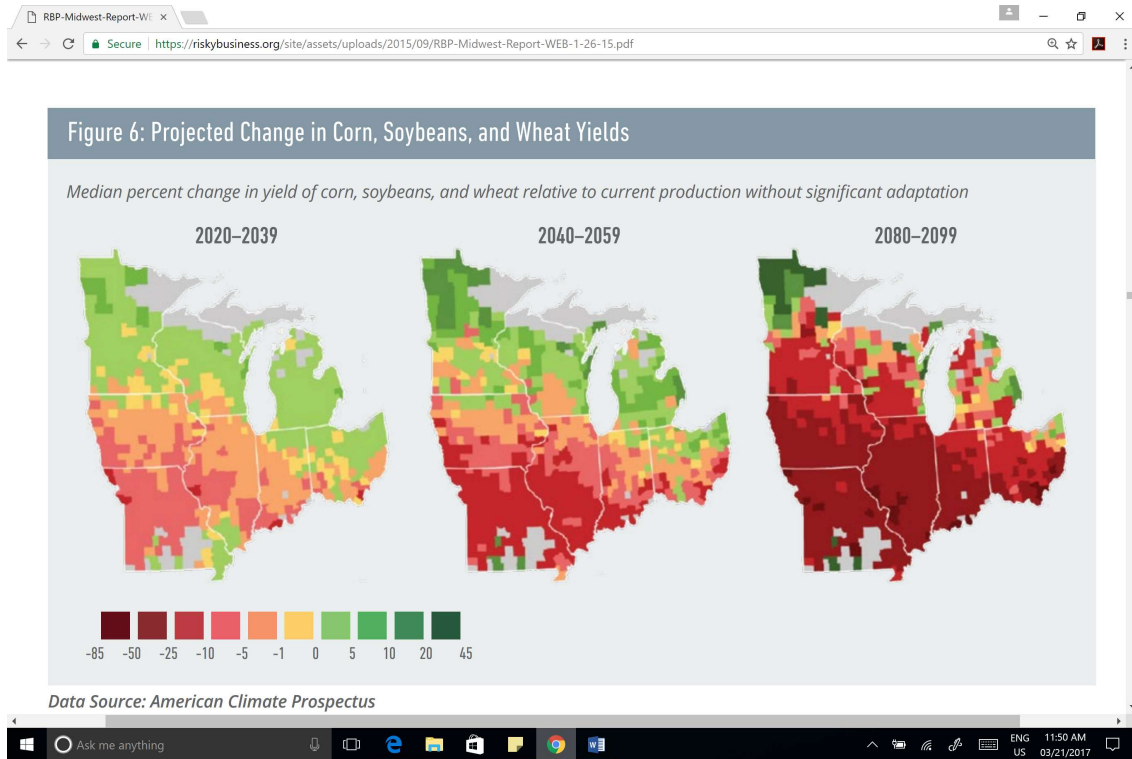
Source: Bassu et al. 2014, Global Change Biology, via AgMIP workshop presentation material

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 °C 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 CO₂ 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>>.

A12. Projected Change in US Corn, Soybeans and Wheat Yields

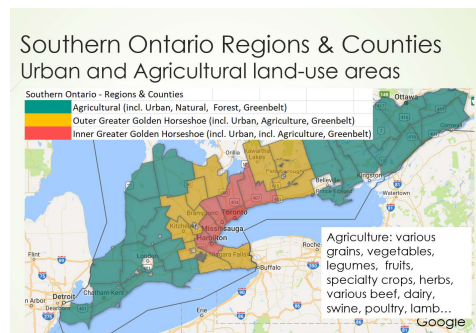


Source: American Climate Prospectus via the January 2015 Risky Business report titled: 'Heat in the Heartland: Climate Change and Economic Risk in the Midwest'
Co-chairs: Michael R. Bloomberg, Henry M. Paulson, Jr., Thomas F. Steyer

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?

Major Crop Growing Areas in the Future?

How will these change...as our climates change, temperatures increase, & natural resources change?

Tomato



Potato



Peach



Corn



Soybean



Wheat



Climate and Sustainable Food Resources

Appendix B

B1. Agricultural Land in the GGH: Our Best Farmland



Source: Statistics Canada Municipal Affairs and Housing
Farming in the Region

- 28% of Ontario's farmland is in the Greater Golden Horseshoe (GGH). It is home to over 40,000 hectares of Specialty Crop Areas, including the Niagara Peninsula Tender Fruit and Grape Area and the Holland Marsh.
- The GGH contains a large portion of Canada's most productive farmland. It has fertile soil, a favourable climate and easy access to water.

Source: Statistics Canada Census of Agriculture 1976 – 2010
Farmland Lost in the Region

In 35 years, over 340,000 hectares of farmland – an area the size of Peel Region, Halton Region and the City of Hamilton combined – was lost to other uses.

- Since 2006, over 65,000 hectares of farmland – an area larger than the City of Toronto – was lost.


Retrieved 2020-07-29 (Published earlier estimated date 2012)

<http://www.mah.gov.on.ca/AssetFactory.aspx?did=10864#:~:text=28%25%20of%20Ontario's%20farmland%20is,Area%20and%20the%20Holland%20Marsh.&text=The%20GGH%20contains%20a%20large%20portion%20of%20Canada's%20most%20productive%20farmland.>

B2. Agricultural Land Base for the Greater Golden Horseshoe

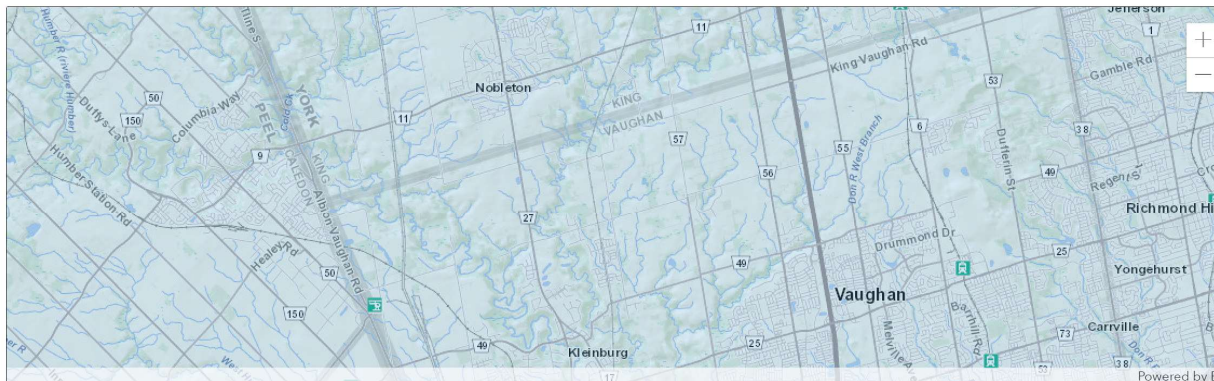
Agricultural Land Base for the Greater Golden Horseshoe ...geohub.lio.gov.on.ca › datasets
Last updated 2 months ago

SNIP of a Portion of the Agricultural Land Base for the Greater Golden Horseshoe:

 Ontario GeoHub [français](#)

Agricultural Land Base for the Greater Golden Horseshoe

Last updated 2 months ago



The agricultural land base for the Greater Golden Horseshoe is comprised of prime agricultural areas, including specialty crop areas, and rural lands that together create a continuous, productive land base for agriculture. The Province has issued the agricultural land base map as enabled by the Greenbelt Plan, 2017; the Growth Plan, 2017; the Oak Ridges Moraine Conservation Plan, 2017; and the Niagara Escarpment Plan, 2017. The agricultural land base mapping is to be used in conjunction with the Agricultural System policies in provincial plans, Implementation Procedures for the Agricultural System in the Greater Golden Horseshoe, and the Agricultural System Portal as a framework to protect farmland, while supporting the viability of the agri-food sector.

Legislated or Legal Authority for Collection:

Places to Grow Act

Greenbelt Act

Oak Ridges Moraine Conservation Act

Niagara Escarpment Planning and Development Act

Status

Completed: Production of the data has been completed

Source: About

Open Packages Group

Shared By: Land Information Ontario

Data Source: ws.gisettl.lrc.gov.on.ca

Accessed 2020-07-29

<https://geohub.lio.gov.on.ca/datasets/dcd2ec8a0da34f3fae280103a46b6a63>