ONTARIO CLIMATE CONSORTIUM

Agricultural Vulnerability Assessment to Climate Change in Peel Region

Town of Caledon's Community Agriculture Sector Meeting – May 26, 2015

With Support From:

YORK UNIVERSITÉ UNIVERSITY redefine THE POSSIBLE. McMaster University Western UNIVERSITY · CANADA CANADIAN CLIMATE FORUM LE FORUM CANADIEN DU CLIMAT Region of Peel Working for you Toronto and Region Conservation for The Living City GLISA

416.661.6600 | info@climateconsortium.ca | 5 Shoreham Dr., Downsview, ON M3N 1S4

www.climateontario.org

Background

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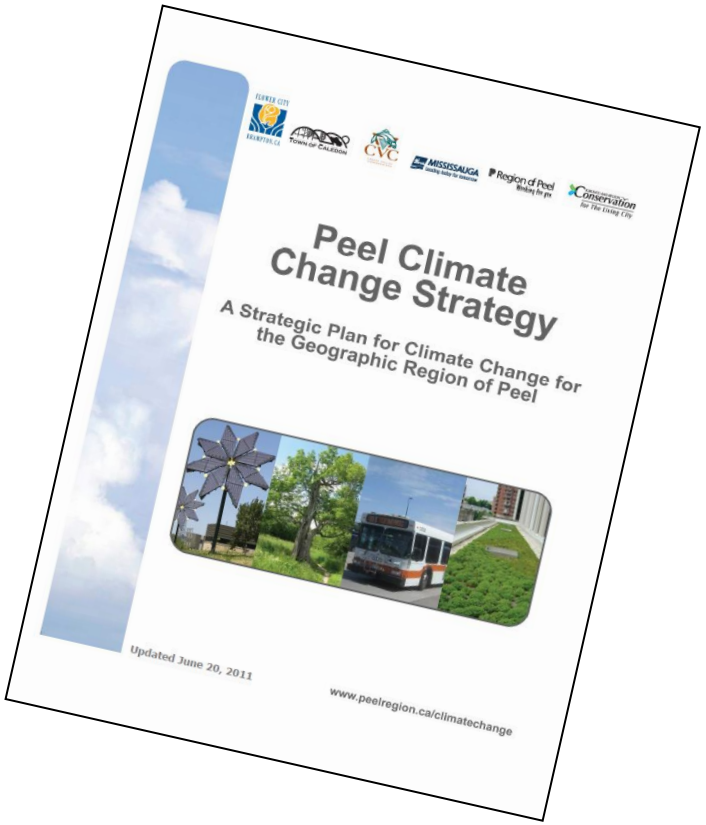
Peel Climate Change Strategy was adopted by Regional Council on June 23, 2011.

Partners have been attempting to achieve six goals by implementing 38 actions outlined in the Strategy.

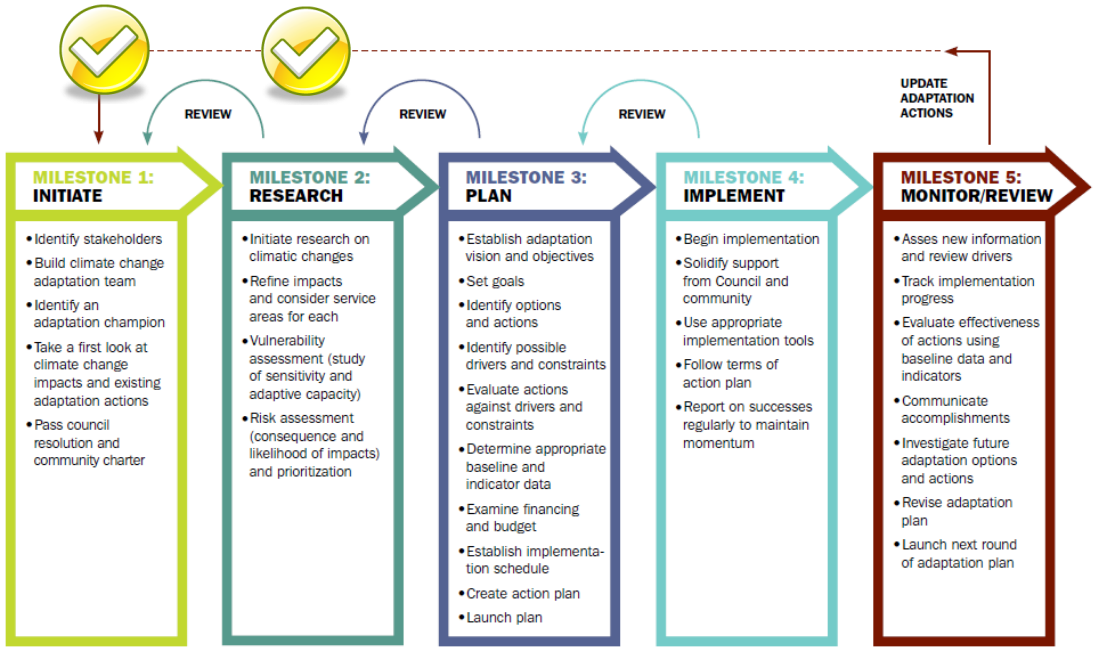


Partners:

BRAMPTON Flower City
TOWN OF CALEDON
CVC
MISSISSAUGA Leading today for tomorrow
Region of Peel Working for you
Toronto and Region Conservation for The Living City
GLISA

Planning Frameworks Adopted

Adaptation (ICLEI)



Mitigation (PCP)

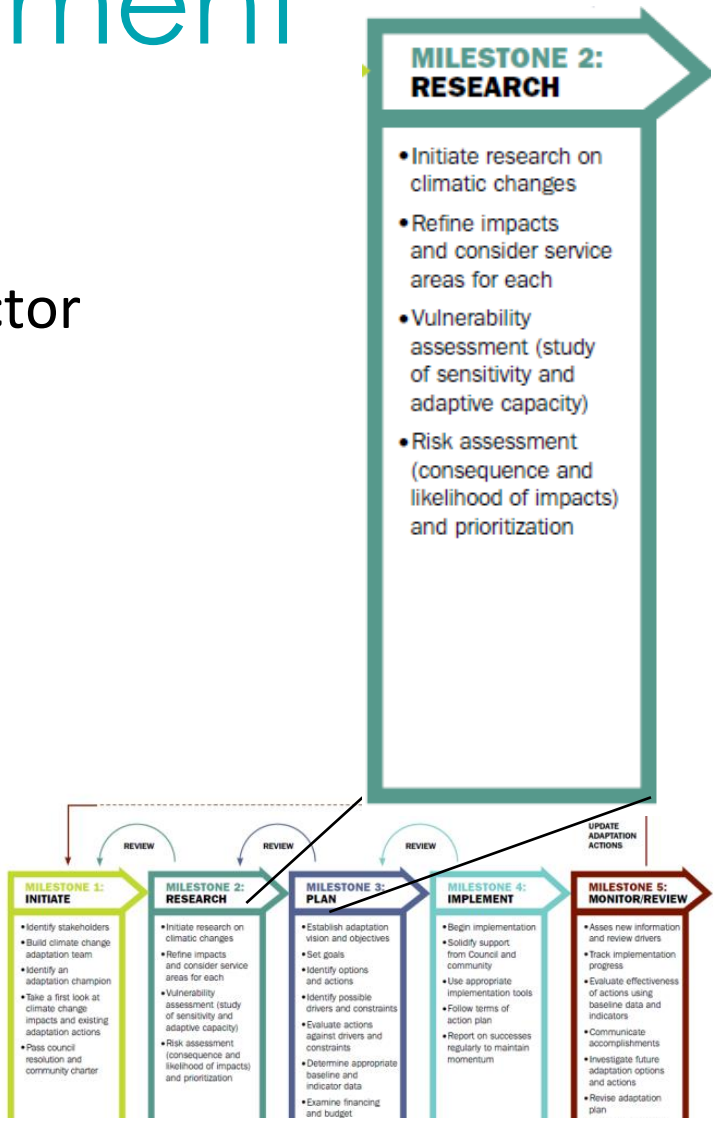
Agricultural Assessment

Purpose

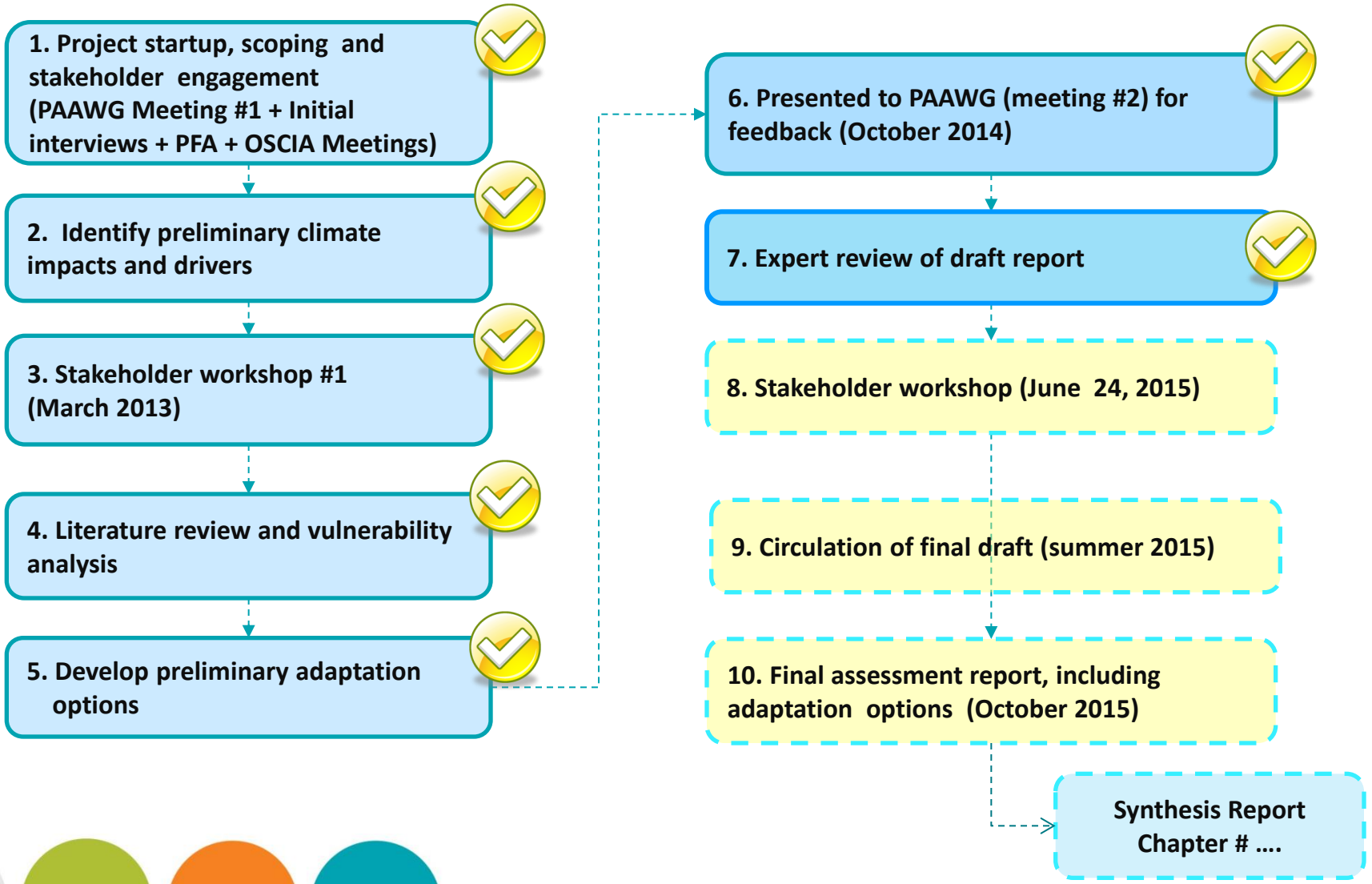
- To identify key impacts & vulnerabilities to the agriculture sector in Peel Region.
- To present adaptation options.

Methods

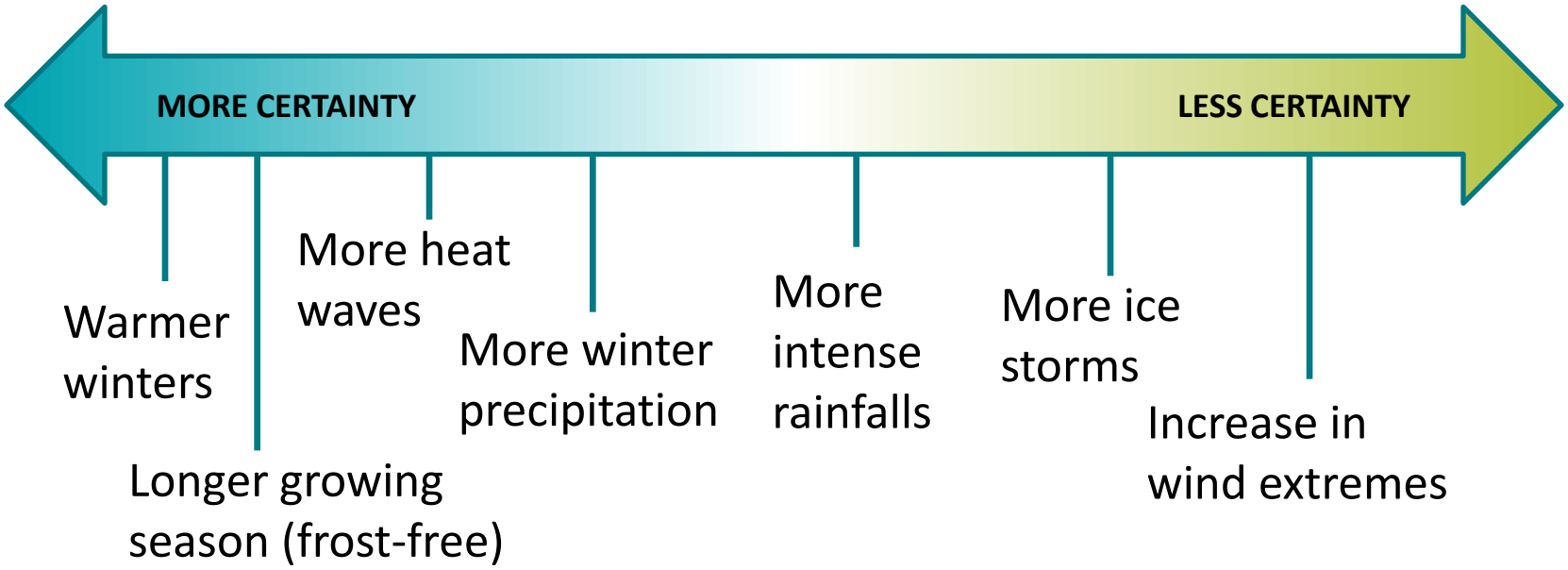
- Systematic literature review
- Applied agriculture vulnerability assessment framework
- Analyzed and used climate drivers
- Stakeholder consultation



Agricultural Assessment Process

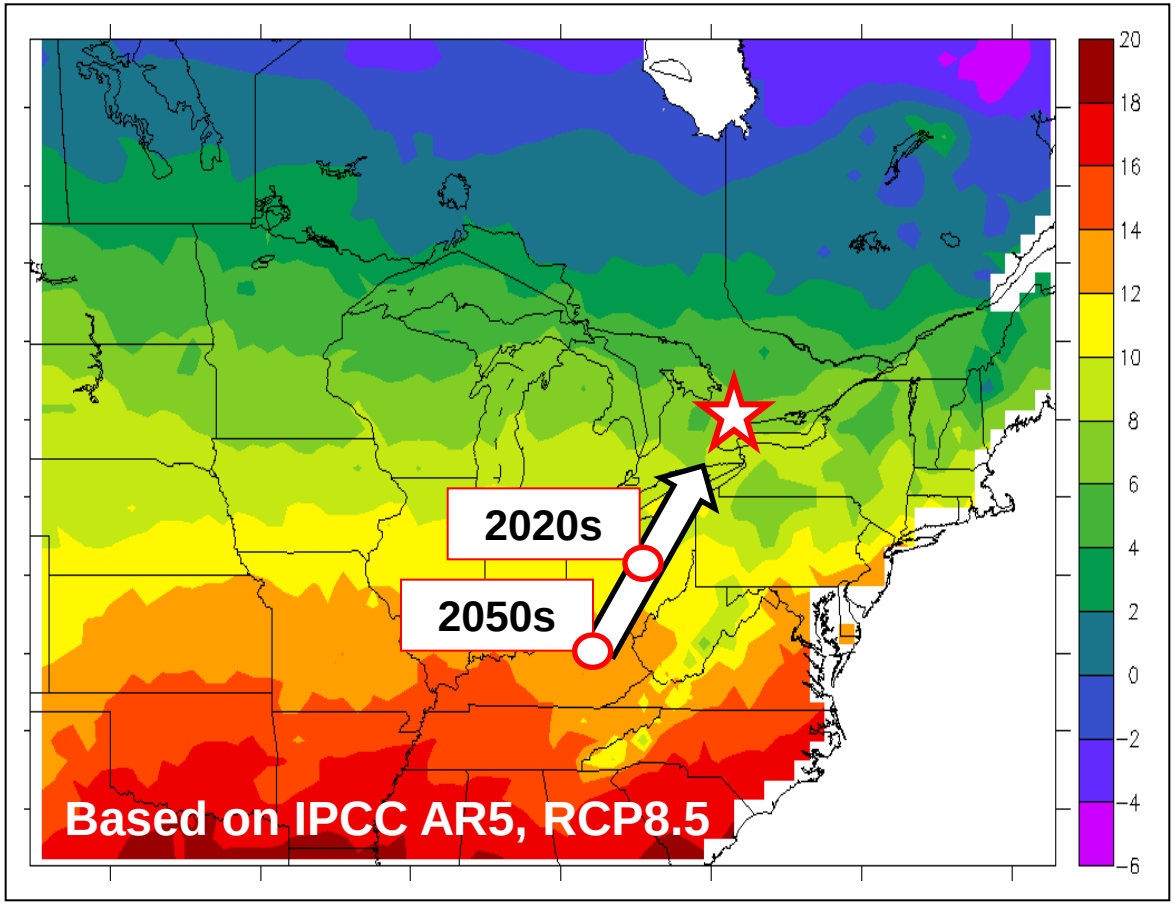


Summary of Projected Local Climatic Changes



Final technical report in preparation (RSI and TRCA)

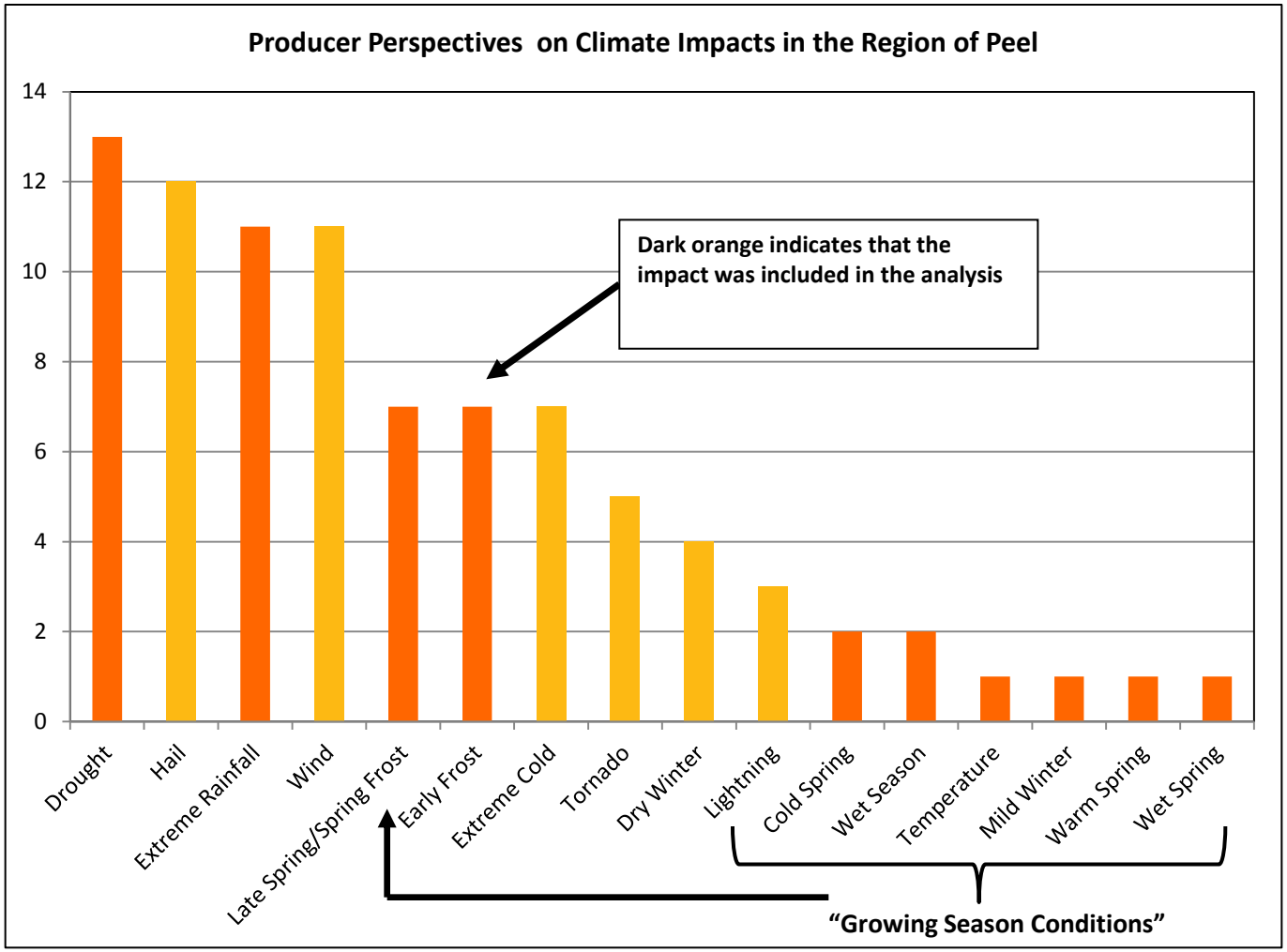
Where will we be in the future?



"Which location now has a mean temperature closest to the future projections for Peel Region?"

2020s: Ohio
2050s: Kentucky

Climate Drivers of Interest

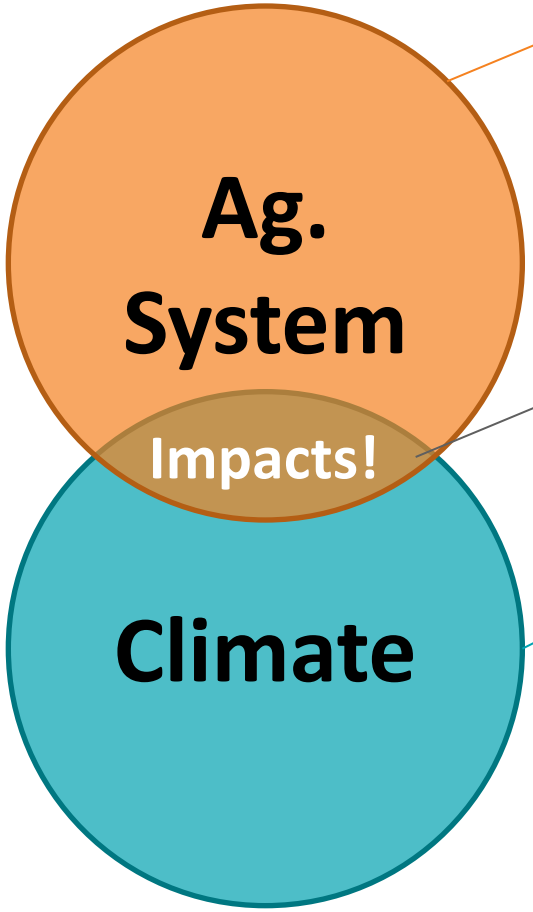


Summary of Peel's Local Agricultural Sector

Peel Farms classified by industry group	# in 2006	# in 2011	% change
Dairy cattle and milk production	42	25	-40%
Beef cattle ranching and farming	70	46	-32%
Hog and pig farming	0	0	0%
Poultry and egg production	8	8	0%
Sheep and goat farming	9	9	0%
Oil seed and grain farming	76	108	42%
Vegetable and melon farming	19	20	5%
Fruit and tree-nut farming	26	22	-15%
Greenhouse, nursery and floriculture production	59	47	-20%
Other types*	174	155	-11%
Total	483	440	-10%

*other types include: miscellaneous animal production, tobacco farming, hay farming, fruit and vegetable combination farming, maple syrup and products production, and other miscellaneous crop farming

Climate Drivers and Systems Analyzed



System Focus (important components):

- Crop Production (dominant sector)
- Soil (production-limiting factor)

Impact Focus (main ag. objective)

- Crop productivity

Climate Drivers (major threats):

- Drought
- Extreme Rainfall
- Extreme Heat
- Changes in Seasonality (e.g. early spring frost)

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Characterizing Impacts and Vulnerabilities in Production Systems

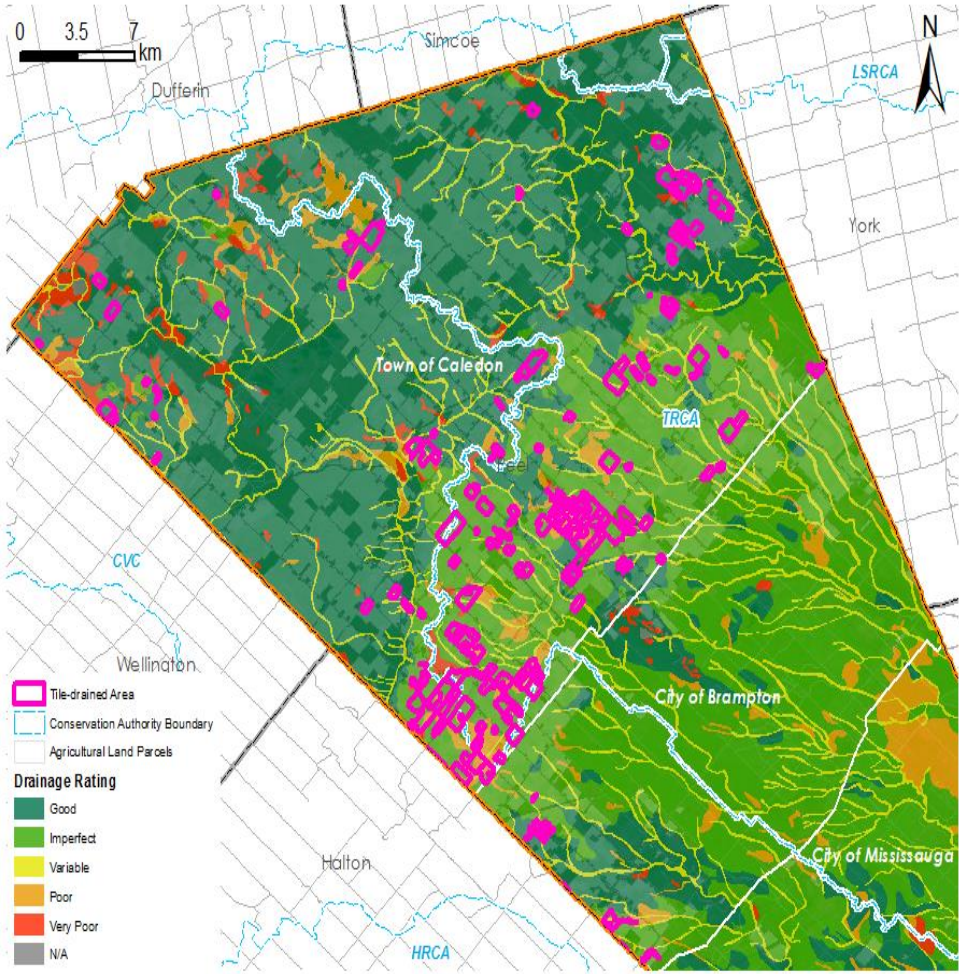
Storyline 1. Extreme Precipitation Impacts on Crop Productivity

Main Processes:

- water logging and flooding of soil;
- soil nutrient availability alteration (loss & transformation);
- pest and disease infestation;
- physical plant damage and changes in plant development.

Main Impact:

- Reduced/lost crop productivity
- Higher in low lying areas with slower-draining soils



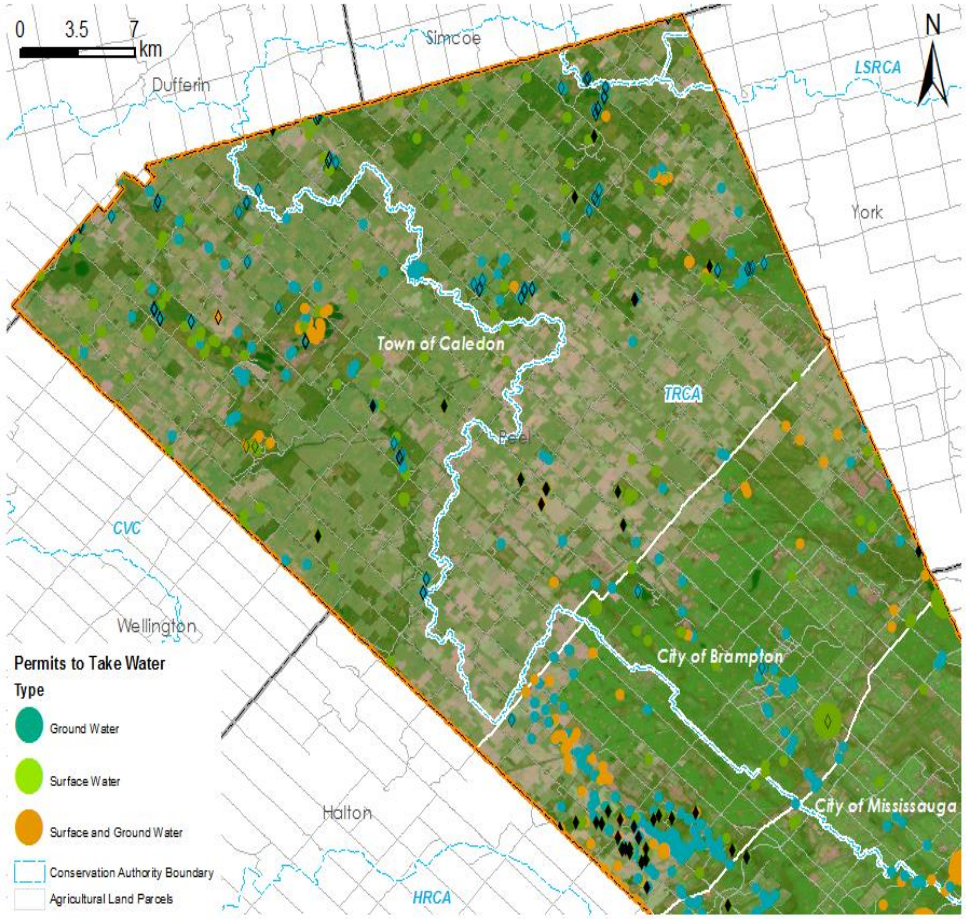
Storyline 2. Drought Impact on Crop Yield

Main Processes:

- soil moisture depletion;
- altered soil properties and nutrient availability;
- pest and disease infestation;
- impacted plant development.

Main Impact:

- Reduced/lost crop yield;
- Higher in areas without irrigation technology.



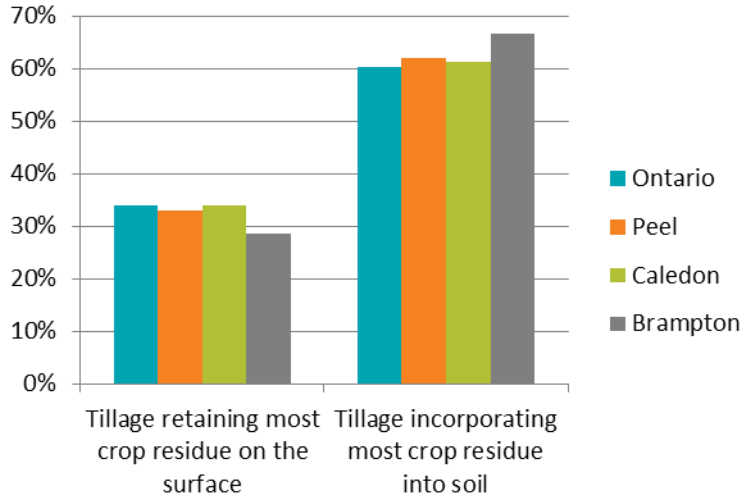
Storyline 3. Changes in Growing Season

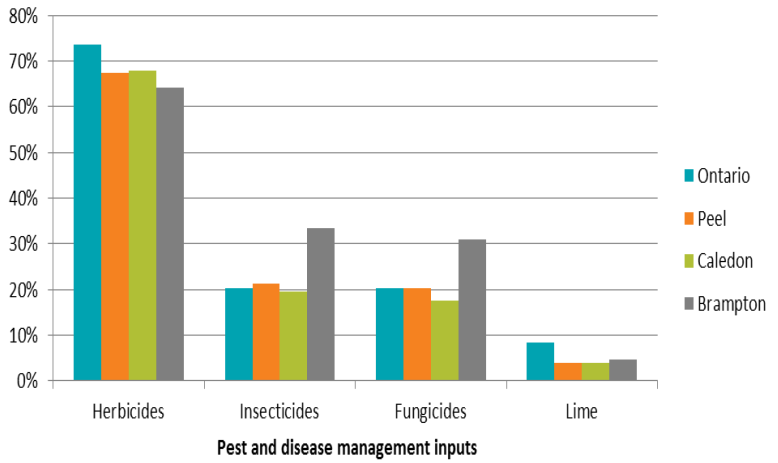
Main Processes:

- Changes in planting and harvesting date.

Main Impact:

- Crop productivity may increase if the appropriate cultivars are planted, nutrients are applied and tillage practices are used





Storyline 4. Plant and Soil Stress due to Extreme Heat

Main Processes:

- Heat stress threshold crossed, plant damage

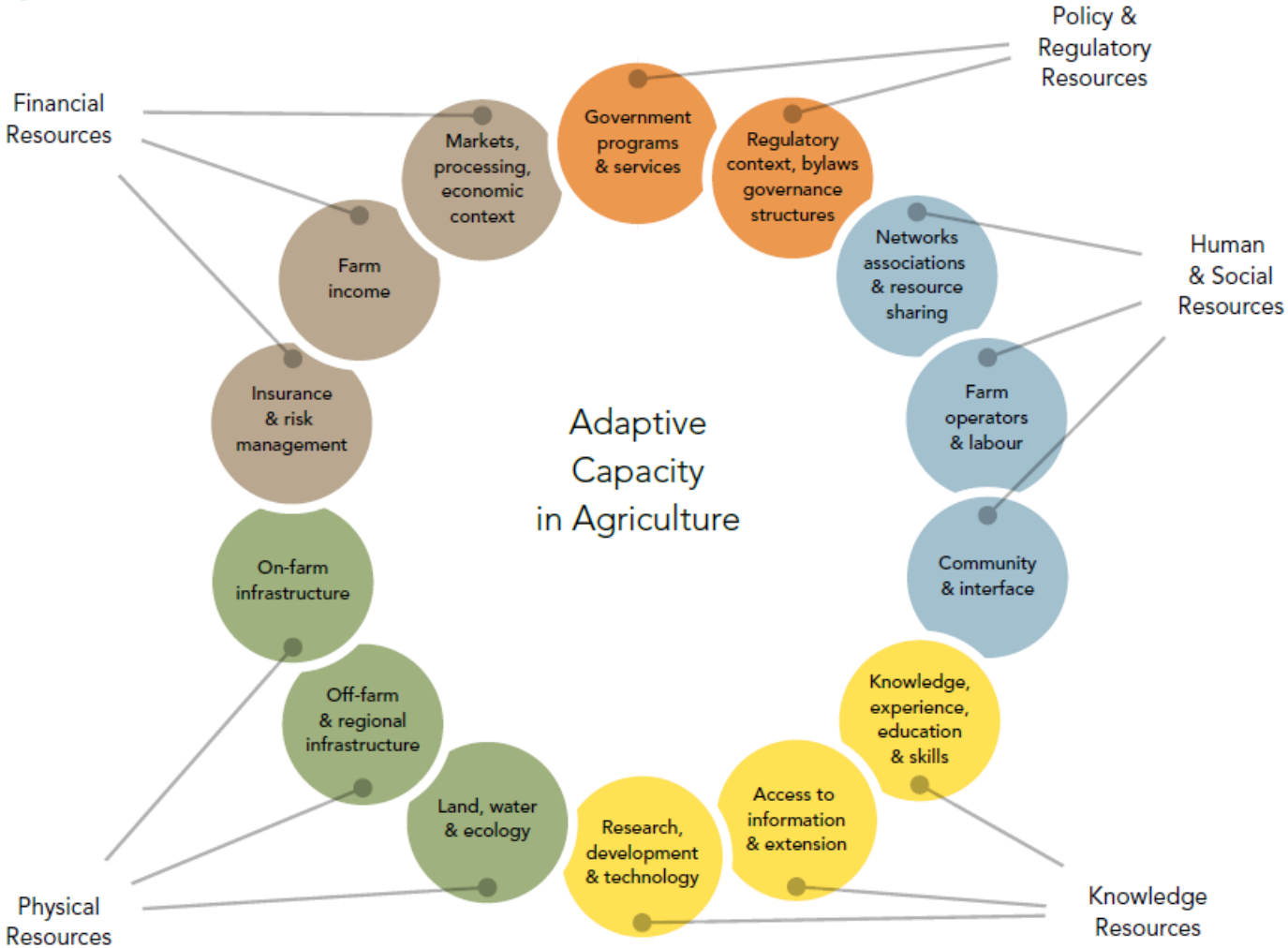
Main Impact:

- Potential reduced/lost crop productivity (varies by cultivar and phenological stage)

Climate Thresholds	Wheat	Soybeans	Corn
Days required for Growth	120-150	135-150	69-88
Ideal Temperature °C	26-30	25	33-35
Min Temp °C	5	8	0-10
Max Temp °C	35	40	45

Adaptation Options

Agricultural Adaptation Factors



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Initial Adaptation Options Identified

- Adaptive capacity strategies
- Identified Best Management Practices and their link to climate resiliency
- Additional BPMs to protect water resources
- List of on-farm and off-farm opportunities
- Identified potential benefits, vulnerabilities and outcomes of various climatic changes (i.e. increasing temperature, longer growing season, etc.)

Next Steps…

- Incorporate expert reviewer comments
- **June 24 Workshop**:
  - Present key impacts and vulnerabilities of Agriculture Sector & other sectors
  - Identify and discuss interactions of vulnerabilities in Peel Region across multiple sectors
  - Discuss consequences and management responses

- Circulated Final Draft Ag. Report to stakeholders **(summer 2015)**
- Final Agricultural Assessment Report **(October 2015)**
- Provide content for draft Peel Synthesis Report **(December 2015)**

Thank You!

For more information contact:

Christine Tu

Toronto and Region Conservation Authority

ctu@tcra.on.ca