Growing Together

Regenerative Agriculture and Agritourism as a Sustainable Future for Caledon Ontario

by Adrianna Anastacio

A practicum submitted to the Faculty of Graduate and Postdoctoral Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

Master of Landscape Architecture

Department of Landscape Architecture
Faculty of Architecture
University of Manitoba

Winnipeg, Manitoba
December 2025

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By: Adrianna Anastacio

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Figure 1. Regenerative Agriculture Render

To Marcella Eaton, thank you for your continued support throughout my entire academic career. Your time, guidance, and encouragement have been invaluable.

To Alan Tate, thank you for challenging my design thinking and bringing insight and clarity to every discussion.

To Nasem Badreldin, thank you for sharing your wealth of knowledge and for your inspiring perspective.

To Sam, thank you for your unwavering support and constant encouragement.

To my family and friends, thank you for your patience, motivation, and belief in me throughout this journey.

Key Terms

GHG	greenhouse gas
CH4	methane
CO2	carbon dioxide
CO2eq	carbon dioxide equivalent
N	nitrogen
N2	nitrogen gas
NH3	ammonia
NH4+	ammonium
N2O	nitrous oxide
NO2	nitrogen dioxide
NO3-	nitrate
ha	hectare
km	kilometer
kWh	kilowatt-hour
m	meter
MW	megawatt
TWh	terrawatt-hour
RA	Regenerative Agriculture
Tillage	the practice of preparing soil for planting crops by mechanically disturbing the soil.

Abstract

This practicum investigates the potential of regenerative agriculture and agritourism in Southern Ontario as strategies for addressing climate change. Agriculture in Canada is a notable contributor to greenhouse gas emissions while also having significant potential for carbon sequestration and ecological regeneration. Focusing on Melville Park, a 624-acre site in rural Caledon, this study incorporates literature review, spatial analysis, and applied design research to re-imagine farmland as a multifunctional landscape. The practicum proposes design strategies that present agriculture as a productive landscape, as well as a site for education, recreation, and climate resilience.

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‘Everything is dying’: Prairie farmers, crops struggling with yearly droughts

Red lentils are shown growing in a dry field on June 29, 2025, on Quinton Jacksteit's farm near Golden Prairie in southwest Saskatchewan. THE CANADIAN PRESS/Handout - Quinton Jacksteit (Mandatory Credit)

By Jeremy Simes, The Canadian Press
Posted July 6, 2025 8:00 am. Last Updated July 6, 2025 9:22 am.

REGINA — It's the ninth year in a row Quinton Jacksteit's farm has experienced drought.

The southwest Saskatchewan farmer, who also is the reeve for the Rural Municipality of Big Stick, says his crops are extremely short, and he plans to salvage most of them for animal feed.

"They're not going to be able to make much of a yield," he said in a recent interview from his home near Golden Prairie, east of the Saskatchewan-Alberta boundary.

Agriculture and Agri-Food Canada's drought monitor shows swaths of the country have been anywhere from abnormally dry to extremely parched.

Trevor Hadwin, an agri-climate specialist with the department, said southwest Saskatchewan, near the Alberta boundary, has been severely depleted of moisture for eight years. This year, he said, pastures have dried up and ranchers are looking to buy extra hay they can't grow.

Environment and Climate Change Canada's forecast predicts a warmer-than-usual summer with uncertain precipitation levels. Bill Merryfield, a research scientist with the weather office, recently said human pollution has been a key influence on hotter summers.

Don Connick, who farms near Gull Lake in southwest Saskatchewan, said long-term planning is needed to deal with persistent drought.

A director with the Agricultural Producers Association of Saskatchewan, Connick said farmers should consider changing how they graze cattle and create a network to supply hay to those in short supply.

More research and water retention ponds also are needed, he added.

This report by The Canadian Press was first published July 6, 2025.

Jeremy Simes, The Canadian Press

THE LINDSAY Advocate

HOME NEWS

Environment Kawartha Lakes Weekly

Drought-like conditions bedevil local farmers

By Kirk Winter and Robyn Best *August 11, 2025*

Dunsford beef and crop farmer Barry Baxter says crops are in survival mode now. Photo: Robyn Best.

Multiple heatwave warnings have been issued in the city this summer and for good reason. With temperatures reaching the high 30s and low 40s, it has been a scorching season. Now, local farmers are struggling to keep both their crops and animals alive and their farms financially viable.

"This is a very critical time in the growth cycle for corn and soybeans. When the corn plant is stressed, pollination does not occur as it should, and the cob will abort kernels and reduce yield." Livestock farmers are very concerned about having enough grass and water for the cattle on pastures. They do not want to be dipping into their winter feed supply five months before winter begins.

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News & Events / News / 2025 / August

Failing fields, dry wells: Eastern Ontario’s summer of drought

By **Michelle Dorey Forestell, Local Journalism Initiative Reporter, The Kingstonist**

The ongoing drought in eastern Ontario is significantly impacting farmers, leading to crop damage, reduced yields, and potential financial losses. Farmers are struggling with heat stress on crops, a lack of sufficient rainfall for proper growth, and an increased workload due to irrigation efforts. Some farmers are even forced to let crops die due to the severity of the conditions. Similarly, hobby farmers, gardeners, and even families who depend on wells for water are struggling day to day with the challenge of the drought.

According to Agriculture Canada, in July, eastern Ontario faced some of the driest conditions in central Canada. Many areas saw less than 40 per cent of their normal July rainfall, causing drought zones to spread and new dry pockets to form. The hot, dry months have stressed crops and left more than a third of the region's farmland in drought conditions. According to Canada Weather Stats, July 2025 only saw 18.7 mm of rain accumulation.

According to Brian Windover of Bayview Farms, the drought is already taking a toll on his family-run farm located on the shores of Hay Bay, a mixed farming operation consisting of hay, beef, soy beans, and wheat.

“It's bad,” Windover told Kingstonist. “Our soybeans will be almost a total failure.”

The beans, planted on shallow ground, have turned grey and will not even produce any crop to harvest, he said.

Unfortunately, Windover doesn't have crop insurance, so this will be a total loss to the farm. He explained that the choice not to have crop insurance is a decision they've made based on diversification of their products, “and we have to live with that decision… One crop doesn't ruin us, but it will hurt.”

Fresh Plaza

Wednesday, August 27, 2025

News per sector ▾

Smaller crops, high costs

Ontario farmers suffer through severe drought

Severe drought in parts of southern and eastern Ontario means that farmers are facing smaller crops and higher costs. According to the chair of the Ontario Fruit and Vegetable Growers' Association, Jason Verkaik, this is the driest transition from June to July he has ever seen.

“All we've been doing for the last three and half weeks is watering,” said Verkaik, who owns a vegetable farm in Ontario's Holland Marsh.

Even so, he said, some of his carrot crop has been “burning off,” suffering from the dryness and heat.

Verkaik has been irrigating his crops 20 hours a day, six days a week in that period. In a year of more typical precipitation levels, he would have only spent three or four nights watering in June and July, he said.

He added such high levels of watering can run up operating costs for farmers, with longer hours for workers and more money spent on fuel for watering pumps.

Preface

My motivation for this practicum began in my Master of Landscape Architecture Studio Four, where we explored climate change mitigation in Southern Manitoba to achieve net-zero carbon emissions. It was through this studio that I recognized both the urgent need for action and the powerful impact that small, cumulative efforts can have when brought together.

My primary area of interest from this studio was agriculture, a domain simultaneously vulnerable to climate change and uniquely positioned to address it. This recognition prompted me to examine the challenges facing farmers today more closely, not just through academic research, but also through the lived realities reported across the country. The collage of news articles included in this preface captures the immediacy of this challenge. Farmers across the country are struggling with drought, unpredictable growing seasons, and the economic pressures of shifting trade dynamics. These stories reveal the tension between human activity and natural systems, highlighting both the fragility of farmland and the urgency of innovative approaches.

Figure 2. Climate Change News Affecting Ontario's Agriculture.

01 / Grounds

This chapter tells the story of Southern Ontario, a region shaped by water, soil, and people. It explores the effects of early agriculture and the impact of urban expansion. The landscapes of this area demonstrate both continuity and change, prompting reflection on the delicate balance between human and nature. This theme will guide the focus of this practicum.

Between Lakes and Land

Located in Southern Ontario, this practicum unfolds in a landscape shaped by the vastness of the Great Lakes and fed for centuries by fertile soils. However, the very abundance that once defined the region is now at risk with intensifying development pressures. What was once farmland and open space is constantly changing, raising the question of how design and planning might respond to preserve both productivity and place.

Figure 3 / Southern Ontario's Road Network and Surrounding Great Lakes

2006 Aqua Modis Satellite

This 2006 satellite image of Southern Ontario reveals a landscape in transition. Agriculture is present, causing the landscape to be fragmented, but it has not yet fully evolved into the highly structured and intensively managed system seen today. While fields and pastures are visible, much of the land retains traces of its natural contours, woodlands, and wetlands.

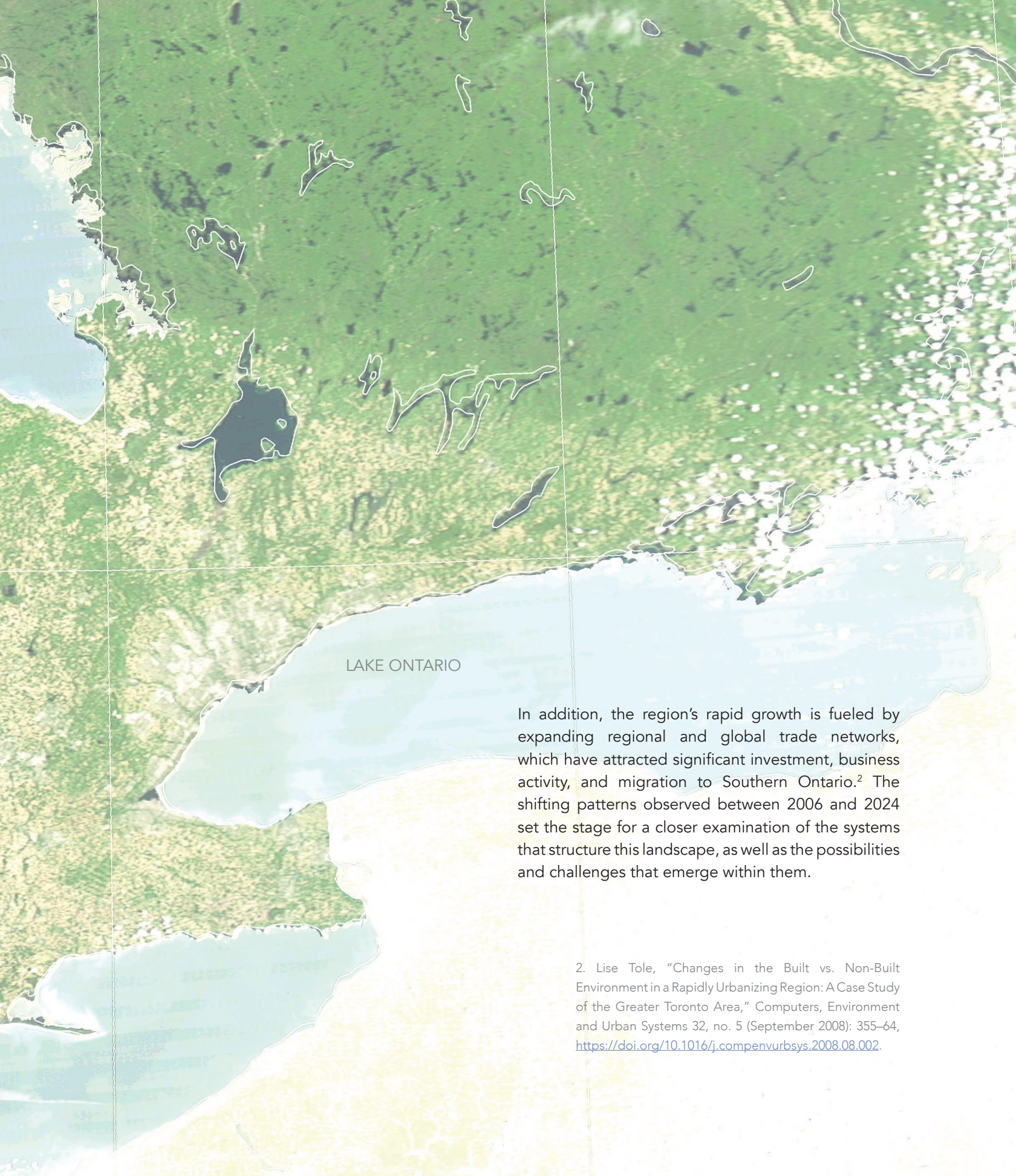
Figure 4 / 2006 Southern Ontario Aqua Modis Satellite Image

2024 Aqua Modis Satellite

By 2024, the landscape appears more fragmented, with larger consolidated fields and increasing encroachment from urban expansion. What began with early societies of farmers has, over time, produced a highly structured and intensively managed agricultural landscape. These shifts illustrate how agriculture has both defined Southern Ontario's identity and contributed to the pressures now placed on its ecological systems.

The images show that the region continues to be shaped by and shape agriculture. Together, these images expose the tensions embedded in the land itself. Southern Ontario is a hub for agriculture, an ecological corridor, and a rapidly urbanizing region. Southern Ontario is an attractive place to live due to its climate that is moderated by the great lakes, generally characterized by warm summers, cool winters, and consistent precipitation throughout the year.[1]

1. Bavrlic Kata and Kuntz Tim, "CVC Watershed Plan Characterization Report Chapter 5: Climate and Climate Change," Credit Valley Conservation, 2025, https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter5_ClimateAndClimateChange_f_20250522_pa.pdf, 1.

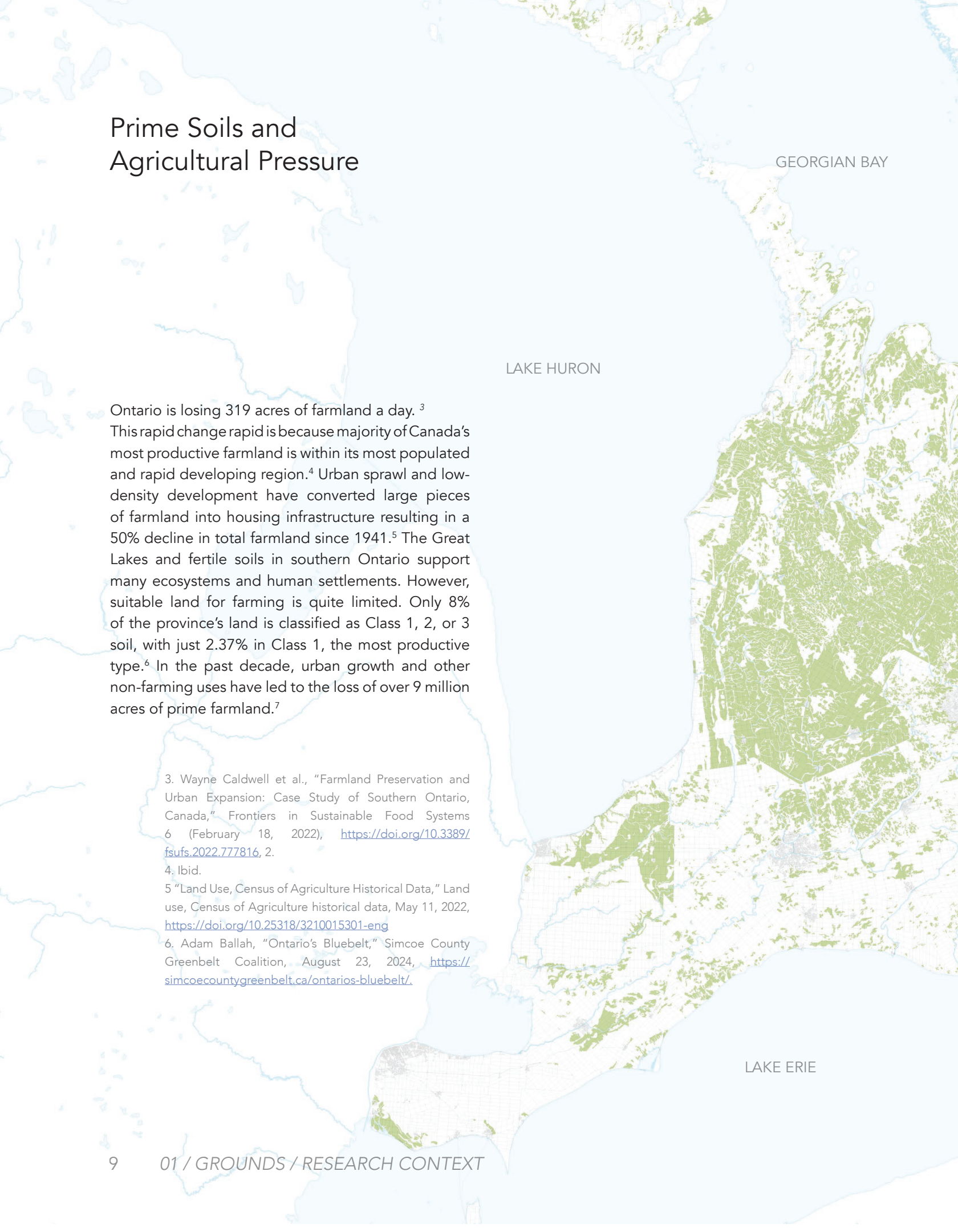


In addition, the region's rapid growth is fueled by expanding regional and global trade networks, which have attracted significant investment, business activity, and migration to Southern Ontario.[2] The shifting patterns observed between 2006 and 2024 set the stage for a closer examination of the systems that structure this landscape, as well as the possibilities and challenges that emerge within them.

2. Lise Tole, "Changes in the Built vs. Non-Built Environment in a Rapidly Urbanizing Region: A Case Study of the Greater Toronto Area," Computers, Environment and Urban Systems 32, no. 5 (September 2008): 355–64, https://doi.org/10.1016/j.compenvurbsys.2008.08.002.

Figure 5 / 2024 Southern Ontario Aqua Modis Satellite Image

Prime Soils and Agricultural Pressure



Ontario is losing 319 acres of farmland a day. [3]
This rapid change rapid is because majority of Canada's most productive farmland is within its most populated and rapid developing region.[4] Urban sprawl and low-density development have converted large pieces of farmland into housing infrastructure resulting in a 50% decline in total farmland since 1941.[5] The Great Lakes and fertile soils in southern Ontario support many ecosystems and human settlements. However, suitable land for farming is quite limited. Only 8% of the province's land is classified as Class 1, 2, or 3 soil, with just 2.37% in Class 1, the most productive type.[6] In the past decade, urban growth and other non-farming uses have led to the loss of over 9 million acres of prime farmland.[7]

3. Wayne Caldwell et al., "Farmland Preservation and Urban Expansion: Case Study of Southern Ontario, Canada," Frontiers in Sustainable Food Systems 6 (February 18, 2022), https://doi.org/10.3389/fsufs.2022.777816, 2.
4. Ibid.
5 "Land Use, Census of Agriculture Historical Data," Land use, Census of Agriculture historical data, May 11, 2022, https://doi.org/10.25318/3210015301-eng
6. Adam Ballah, "Ontario's Bluebelt," Simcoe County Greenbelt Coalition, August 23, 2024, https://simcoecountygreenbelt.ca/ontarios-bluebelt/.

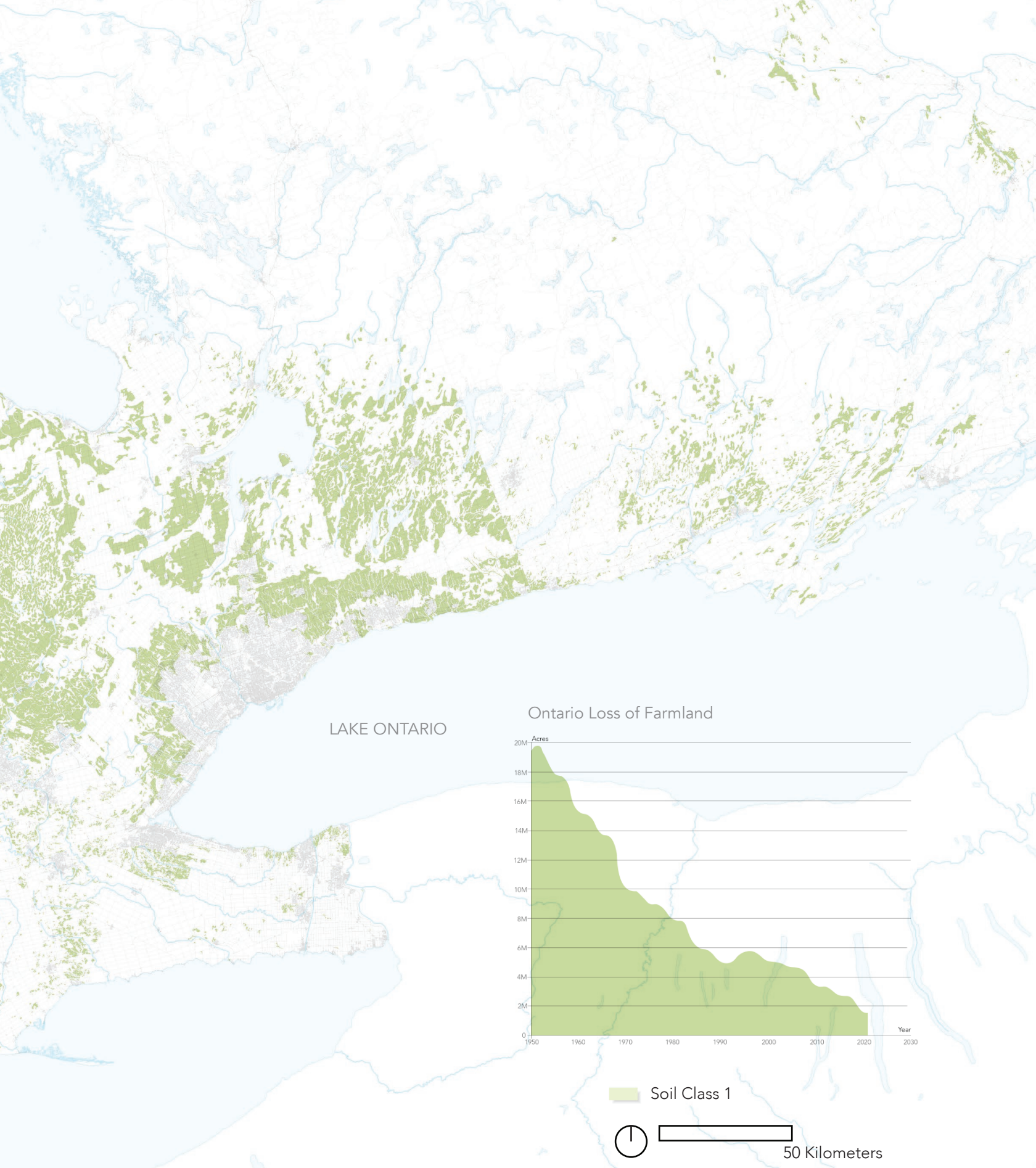
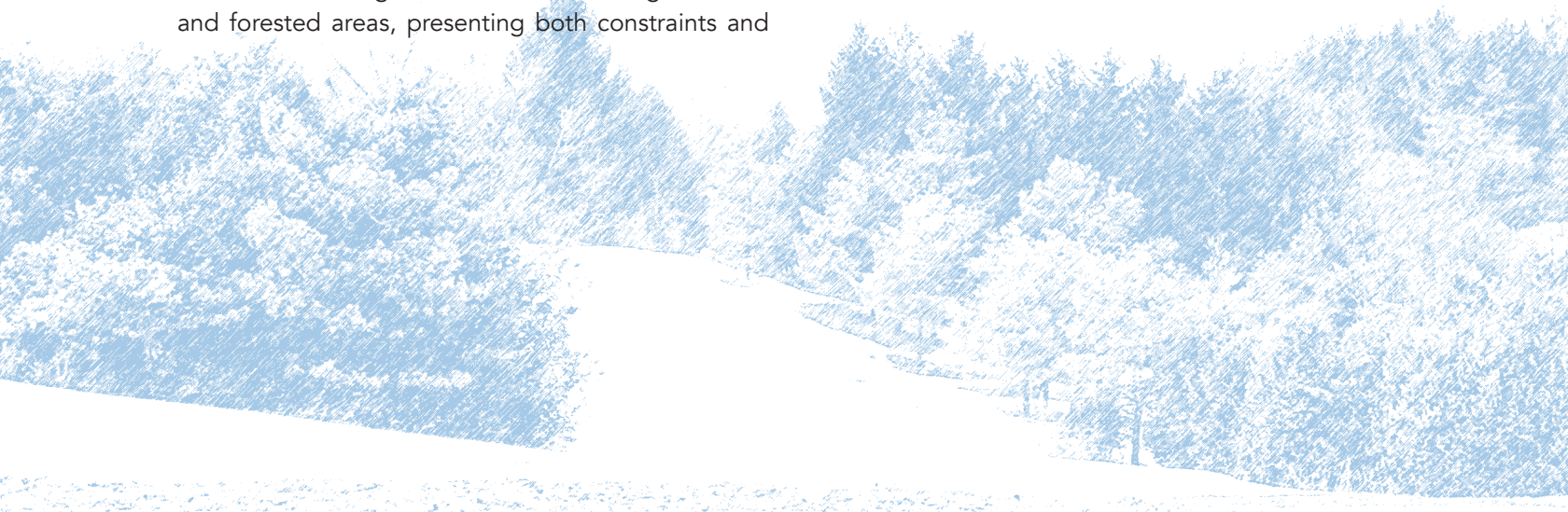


Figure 6 / Southern Ontario Class One Agriculture Lands
Figure 7 / Ontario Loss of Farm

Background

Ontario's agricultural landscapes are both ecologically fragile and economically vital. Agriculture contributes significantly to Canada's greenhouse gas emissions, yet it also holds immense potential for carbon storage if practices are reoriented toward regenerative models. In Southern Ontario, issues like urban development, soil loss, and climate change make this change urgent. Caledon, Ontario, located within the Greater Toronto Area, sits at the intersection of these tensions. Its fertile soils and proximity to large urban populations position it as an important agricultural hub, however, these same factors also place the land under significant ecological and economic pressure. Melville Park, a 625-acre site within Caledon, highlights these tensions. The site features a diverse range of habitats, including farmland, wetlands, grasslands, and forested areas, presenting both constraints and opportunities for re-imagining sustainable agricultural futures. This practicum assumes that the current agricultural practices must evolve beyond mono cultural agriculture practices and toward systems that are ecologically regenerative and economically diverse. While the scope of this research does not attempt to model farm-level economics or provide exhaustive ecological data, it focuses on landscape-scale design strategies that integrate agricultural and ecological processes with opportunities for agri-tourism. By narrowing the lens from the regional landscape to Melville Park, this work investigates how agricultural lands can be managed thoughtfully, balancing agricultural productivity, ecological function, and economic stability.



Statement of Purpose

The purpose of this practicum is to investigate how regenerative agriculture and agritourism can work together to create climate resilience against climate change and diversify income streams for farmers in Southern Ontario. This study focuses on Melville Park in Caledon, Ontario, and explores how farmland can be utilized for food production, carbon sequestration, education, and attracting visitors, thereby redefining agricultural areas as spaces for multiple uses. By implementing regenerative farming methods alongside small-scale agritourism, the study aims to develop a landscape design that enables farmers to earn multiple income streams while simultaneously improving the environment. In the context of Southern Ontario, where agriculture faces challenges such as drought, unpredictable growing seasons, soil depletion, and broader climate change impacts, this practicum proposes that combining regenerative practices with on-farm tourism can reduce greenhouse gas emissions, diversify income streams, and serve as a model for a sustainable future for the province's agricultural sector.

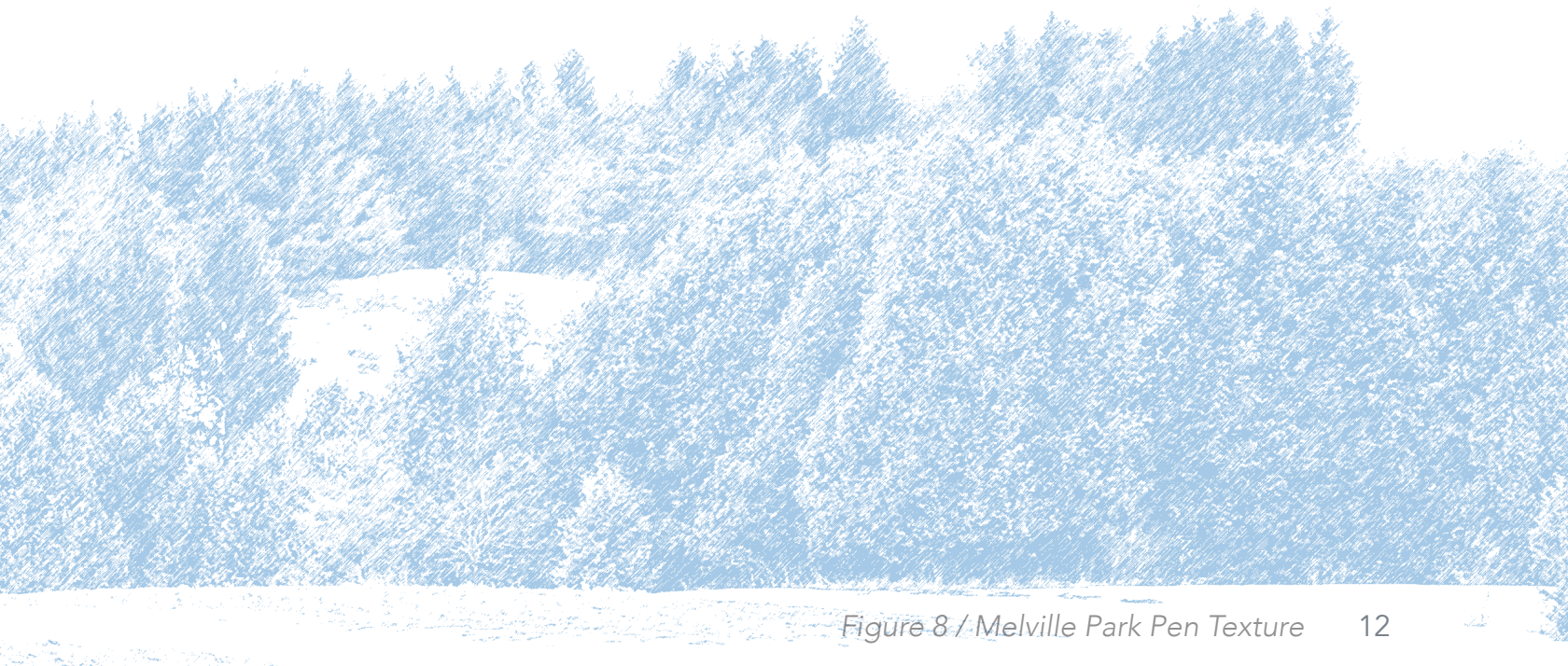


Figure 8 / Melville Park Pen Texture

Research Questions

How can regenerative agriculture reduce emissions and build climate resilience on Southern Ontario farmland?

How can landscape architecture balance farming with agritourism in rural landscapes?

How can working farms function as both productive and educational landscapes?

How can water systems strengthen farm resilience while enriching the landscape experience?

Methodology

The methodology for this practicum will be structured to transition from broad contextual analysis to site-specific design exploration, integrating literature review, spatial analysis, and applied design research. This process will unfold in four interrelated phases:

Underlay

Literature Review and Regional Analysis

The research begins with a critical review of scholarly and professional literature on regenerative agriculture. This review will be paired with a regional-scale assessment of Southern Ontario's agricultural landscapes to establish ecological and socio-economic context.

Situate

Site Documentation and Analysis

Field investigations provide detailed documentation of site conditions, including soils, hydrology, vegetation, infrastructure, and patterns of use. On-site photography, observational recording, and qualitative assessment of landscape character are used to situate Melville Park.

Tensions

GIS Mapping and Spatial Analysis

Geospatial maps are created and analyzed to evaluate land use, soil classifications, hydrology, and settlement patterns at both regional and site scales. Mapping is used to identify spatial relationships and pressures, informing opportunities for design interventions.

Design

Design Research and Development

This method will explore design strategies that integrate regenerative agricultural practices and agritourism. The design will create a design that shows how agriculture, and agritourism can be brought together in a working landscape.

Figure 9 / Highpoint Road Pen Texture

02 / Underlay

This chapter lays the groundwork for understanding Southern Ontario's agricultural landscape, revealing the interplay of trade, climate, and emissions over time.

History of Ontario's Agricultural Landscape

Land cared for by Anishinaabe, Haudenosaunee, and Huron-Wendat nations

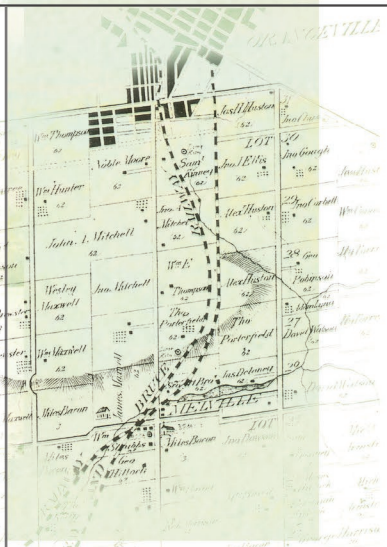
Three Sisters Agriculture technique

British and European settlers clear forests for wheat farms replacing traditional land techniques

1790 - 1900

Pre-Contact to 1700s

Mississauga and Haudenosaunee land treaties open the region to settlement



Railways link farms to Toronto, growing livestock, fruit, and dairy as export industries

To understand the present landscape, It is important to trace its history, how the land that is now Caledon has continuously evolved. Before European settlement, the land was inhabited by he Anishinaabe, Haudenosaunee and Huron-Wendat nations.They cared for the land through controlled burning and the Three Sisters planting technique. The land was managed in a way that sustained biodiversity and soil fertility, where corn, beans, and squash worked together as a self-supporting growing system. By the mid-1700s, a series of land treaties opened this region to settlement. Forests were cleared, and the landscape began to shift toward wheat production.

By the 1850s, mixed farming had taken hold, with grain, dairy, and livestock forming the foundation of local agriculture. The arrival of the railway to Toronto connected these farms to larger markets. By the 1960s and 1970s, highways and suburban expansion began pushing north from Toronto into Caledon, marking the start of the development pressures that continue to shape the region today.

Gas-powered tractors and combines arrive

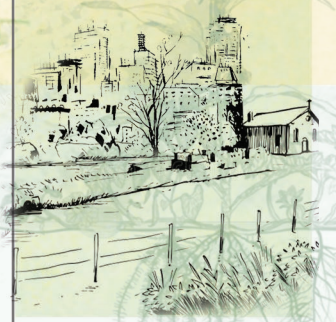
1900-1950

1960-1980

Farmland begins converting to aggregate extraction

Highway 410/401 and suburban growth reach Caledon

1990-2000s



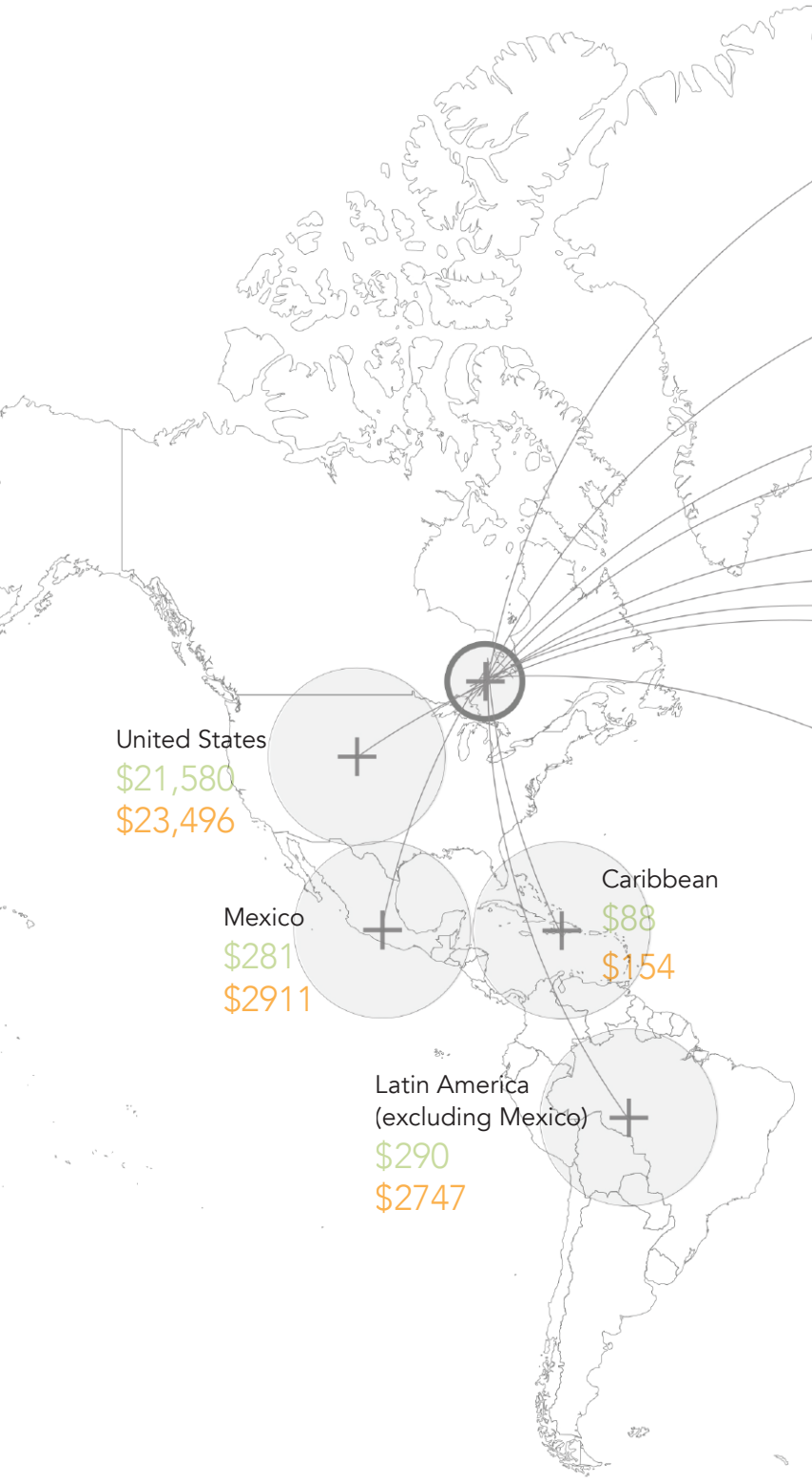
Expanding suburbs and push north from Toronto into Caledon, fragmenting farmland

Ontario Agri-Food Trade

2023

Total Exports $26,237
Total Imports $38,478

(Billion CDN $)



Ontario is an important province for agriculture in Canada due to its rich soil, and proximity to major markets. Ontario is able to grow many different products because of its varied landscapes. It produces over 60% of Canada's grain corn, soybeans, and winter wheat. Its horticultural sector grows three-quarters of the country's greenhouse tomatoes, peppers, and cucumbers.[8] Dairy and poultry are key parts of the provincial farm economy, along with beef and pork.[9]

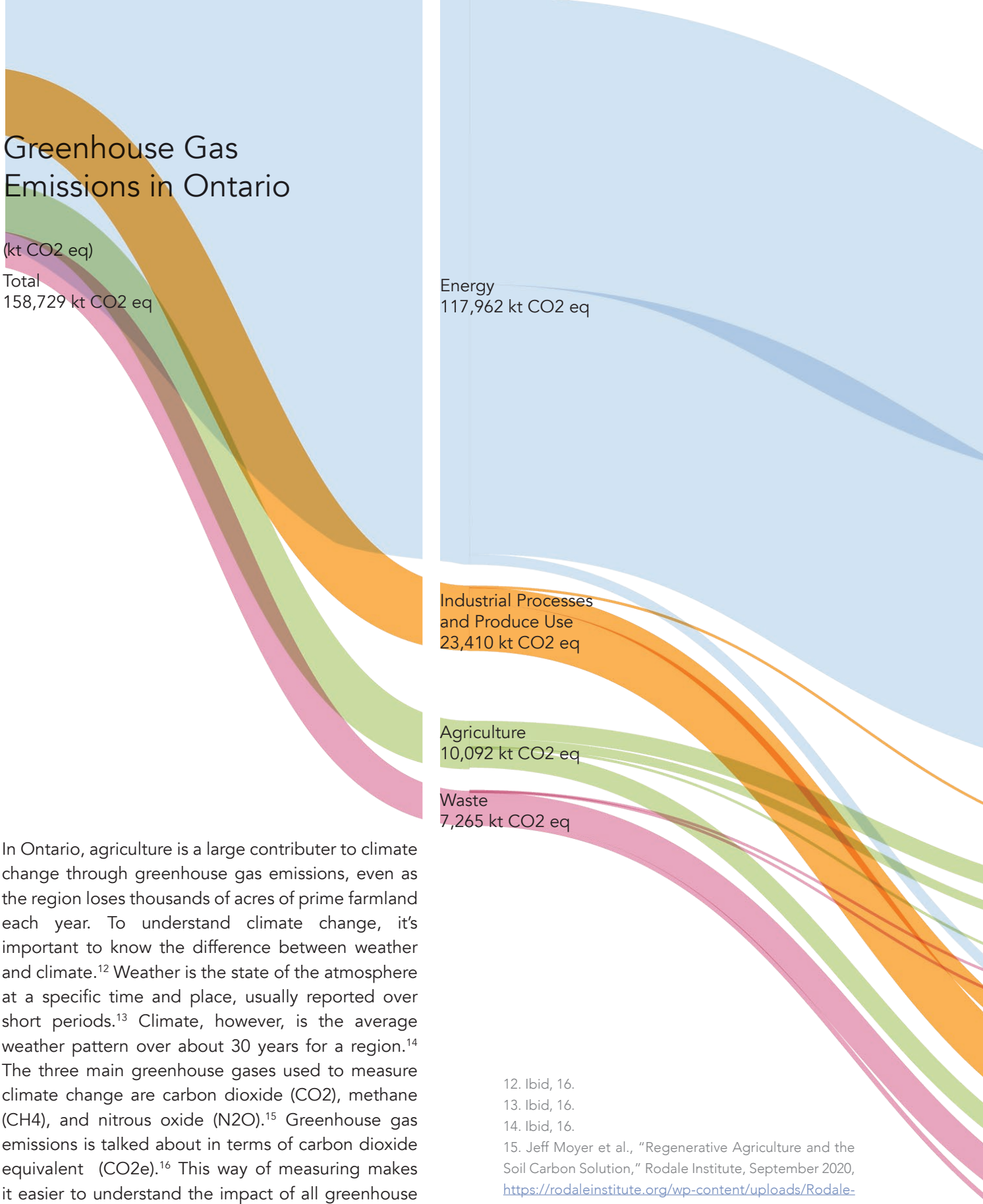
Ontario's farmland supports food security across Canada and plays a large role in global trade. In 2023, Ontario exported over $26 billion in food and agricultural products to global markets with more than 80% of that going to the United States.[10] Grains, oilseeds, red meats, and processed foods make up most of this trade, supporting international markets.[11]

This situation creates a paradox: while Ontario produces a large amount of food, its residents rely on imports that are increasingly affected by geopolitical conflicts and climate issues.

7. Ibid.

8. Zong Jia Chen, "Ontario Is an Agricultural Powerhouse That Leads in Many Farming Categories," Statistics Canada, June 15, 2022, https://www150.statcan.gc.ca/n1/pub/96-325-x/2021001/article/00006-eng.htm
9. Ibid.
10. "Published Plans and Annual Reports 2024–2025: Ministry of Agriculture, Food and Rural Affairs," Government of Ontario, April 23, 2025, https://www.ontario.ca/page/published-plans-and-annual-reports-2024-2025-ministry-agriculture-food-and-rural-affairs.
11. Ibid.

Figure 11 / Ontario Agriculture Food trade by Region



In Ontario, agriculture is a large contributer to climate change through greenhouse gas emissions, even as the region loses thousands of acres of prime farmland each year. To understand climate change, it's important to know the difference between weather and climate.[12] Weather is the state of the atmosphere at a specific time and place, usually reported over short periods.[13] Climate, however, is the average weather pattern over about 30 years for a region.[14] The three main greenhouse gases used to measure climate change are carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).[15] Greenhouse gas emissions is talked about in terms of carbon dioxide equivalent (CO2e).[16] This way of measuring makes it easier to understand the impact of all greenhouse gases by comparing them to the warming effect of carbon dioxide.

12. Ibid, 16.
13. Ibid, 16.
14. Ibid, 16.
15. Jeff Moyer et al., "Regenerative Agriculture and the Soil Carbon Solution," Rodale Institute, September 2020, https://rodaleinstitute.org/wp-content/uploads/Rodale-Soil-Carbon-White-Paper_v11-compressed.pdf, 7.
16. Ibid, 7.

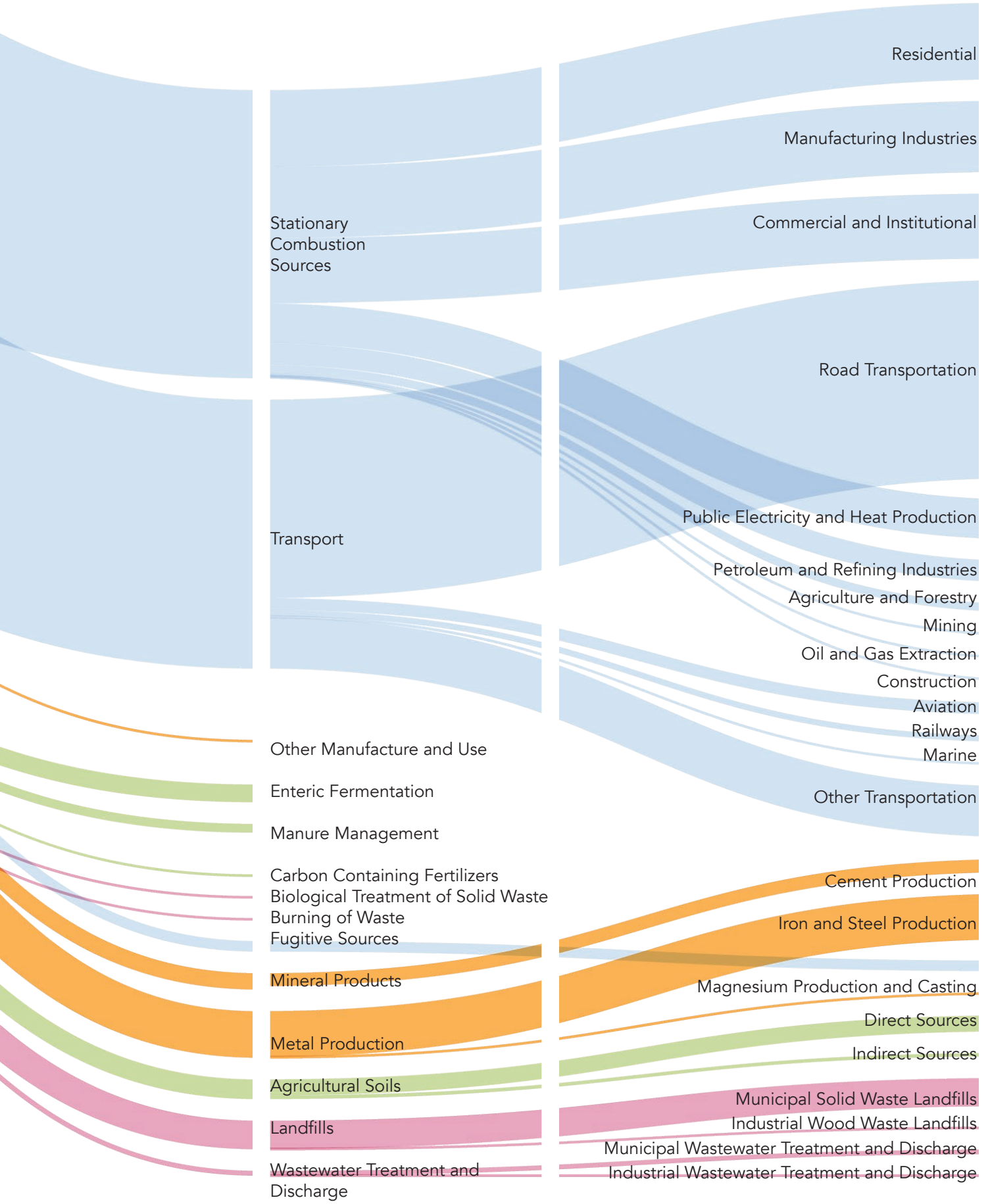


Figure 12 / Greenhouse gas Emissions in Ontario 22

Agriculture as a Source of Greenhouse Gas Emissions

Agriculture
10,092 kt CO2 eq

Ontario's agriculture produces a significant amount of methane (CH4), nitrous oxide (N2O), and carbon dioxide (CO2).[17] Methane mainly comes from livestock digestion and manure storage.[18] Nitrous oxide results from applying fertilizer and manure, along with crop residues, irrigation, and leaching.[19] Carbon dioxide emissions come from losing carbon in the soil due to tillage and mono-culture of crops, plus the use of fossil fuels in farming and fertilizer production.[20] Other sources include managing of manure, burning crop residues in the field, and applying lime, urea, and other fertilizers with carbon. [21]

In 2020, agriculture in Ontario produced 34% of the province's methane emissions and 69% of its nitrous oxide emissions.[22]

Agricultural soils have the opportunity to store significant amounts of carbon, yet current farming practices often harm this ability. In central and eastern Canada, over 80% of agricultural soils are estimated to emit more carbon than they store, mainly due to heavy tilling, growing the same crops repeatedly, and having few crop rotations.[23] These practices lead to soil damage and carbon loss, making agriculture both a part of the climate problem and a potential part of the solution.[24]

17. Pratt, "National Inventory Report 1990–2020: Greenhouse Gas Sources and Sinks in Canada," 145.
18. Ibid, 145.
19 . Ibid, 145.
20. Ibid, 145.
21. Ibid, 145.
22. Pratt, "National Inventory Report 1990–2020: Greenhouse Gas Sources and Sinks in Canada," 27.
23. "New Horizons: Ontario's Agricultural Soil Health and Conservation Strategy," ontario.ca, April 10, 2025, https://www.ontario.ca/files/2024-04/omafra-new-horizons-ontarios-agricultural-soil-health-and-conservation-strategy-en-2024-04-04.pdf,10.
24. Ibid, 5.

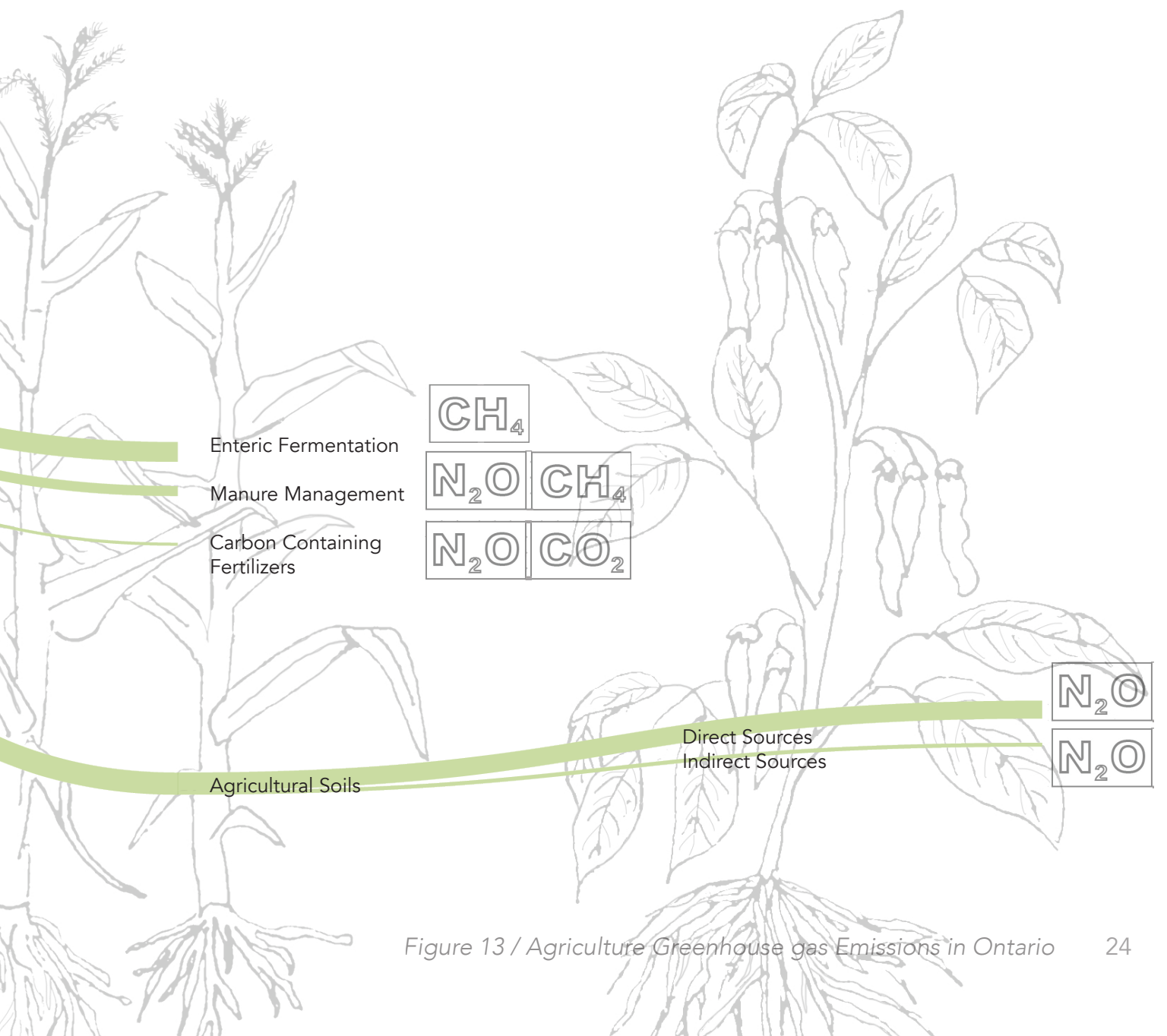


Figure 13 / Agriculture Greenhouse gas Emissions in Ontario

The Opportunity:
Regenerative Agriculture

Principles

Minimize soil disturbance

Keep soils covered

Keep living roots in soil year round

Encourage diversity

Integrate livestock

Practices

No/Minimum tillage

Diverse Crop Rotations

Multi-species cover crops

Inter-cropping

Composting

The Process of Carbon Sequestration

Solar Energy

Plants Absorb CO_2

Soil organisms release CO_2 through respiration

Plants use CO_2 from the air and water from the soil to build carbohydrates

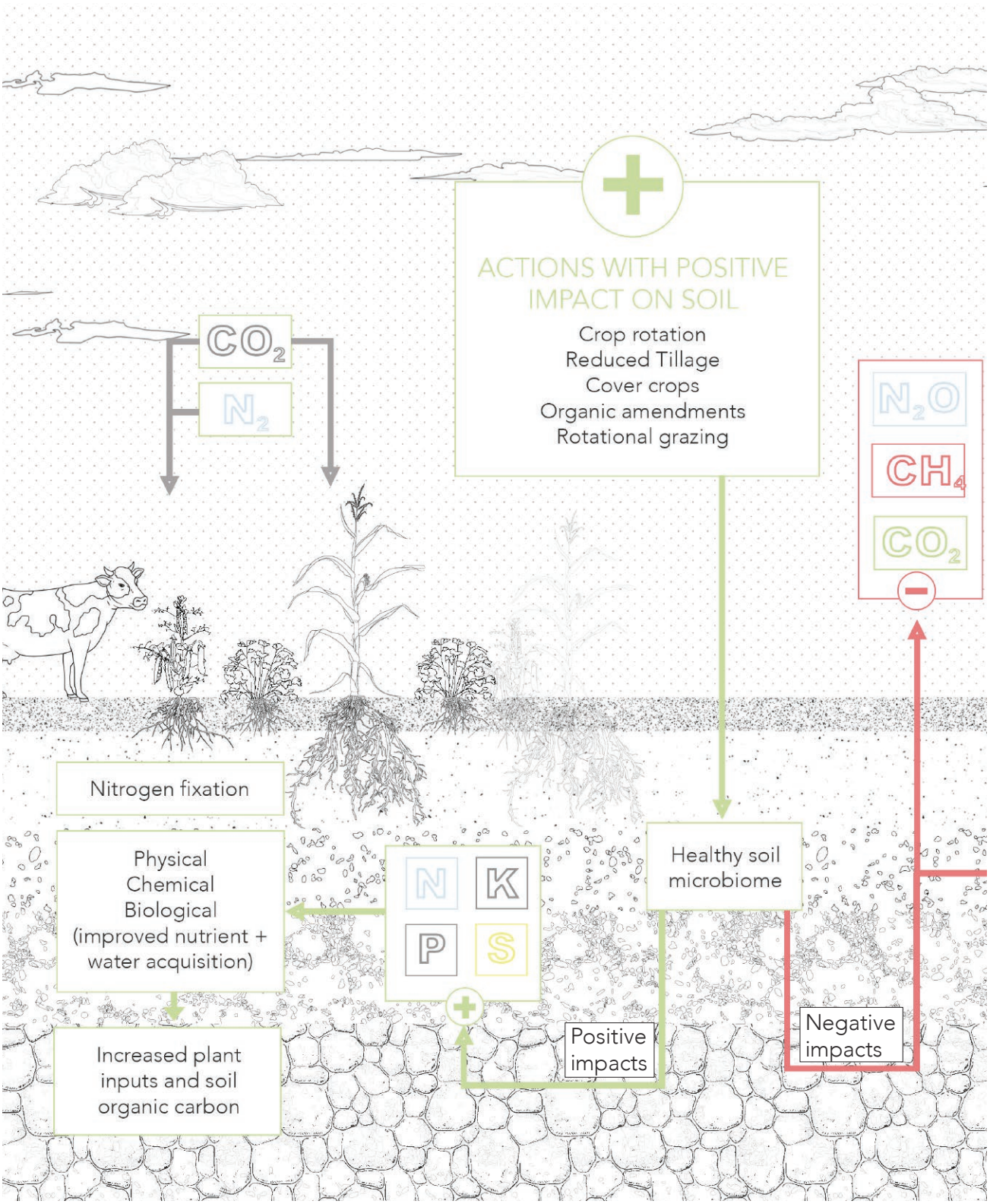
Plants exude carbohydrates through their roots to feed soil organisms

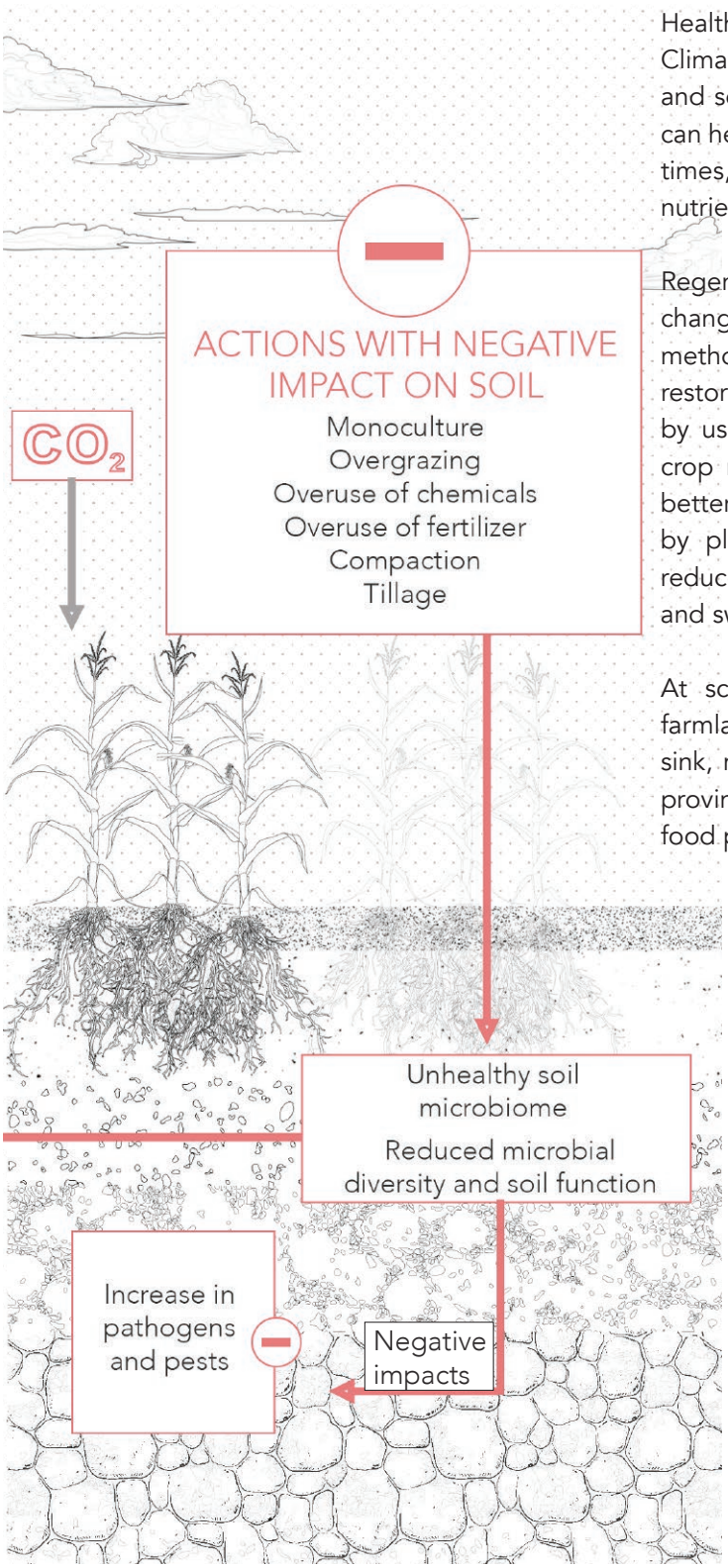
Soil health can help mitigate the effects of climate change through plants by converting carbon into sugar and storing it underground through a process called carbon sequestration.[25] Healthy soil contains many types of bacteria, fungi, and microscopic species.[26] Together, they create a network that helps plants grow, cycle nutrients, and manage water.[27] Carbon sequestration starts with plants. Through photosynthesis, crops and grasses take in carbon dioxide and turn it into sugars.[28] These sugars go into the soil through roots and organic matter.[29] The carbon compounds feed microbes, which then create stable carbon in the soil as biomass and dead microbes.[30] When this carbon bonds with soil minerals like clay and silt, it can stay stored for a long time.[31] The healthier and more diverse the soil life, the better it captures and holds carbon.

25. Jeff Moyer et al., "Regenerative Agriculture and the Soil Carbon Solution," 11.
26 Ibid, 13.
27. Ibid, 13.
28. Ibid, 14.
29. Ibid, 14.
30. Ibid, 14.
31. Ibid, 13.

Figure 14 / RA Principles and Practices
Figure 15 / Carbon Sequestration Diagram

Farmland Re-imagined





Healthy soil is very important for farming in Ontario. Climate change increases risks like drought, flooding, and severe weather. Healthy soil with organic matter can help farms adapt. It holds water longer during dry times, drains better during heavy rain, and recycles nutrients back to plants.[33]

Regenerative agriculture offers solutions for this change. Unlike traditional farming, regenerative methods do more than just sustain. They actively restore the land.[34] These practices rebuild soil carbon by using cover crops, reducing tillage, and varying crop rotations.[35] They also cut nitrogen waste with better manure management, increase carbon storage by planting trees and creating buffer zones, and reduce fossil fuel use by using machines efficiently and switching to renewable energy.[36]

At scale, these practices can transform Ontario's farmland from a source of emissions into a net carbon sink, making agriculture a central component of the province's climate strategy while ensuring resilient food production for generations to come.

33. Ibid, 11.
34. Ravjit Khangura et al., "Regenerative Agriculture—a Literature Review on the Practices and Mechanisms Used to Improve Soil Health," Sustainability 15, no. 3 (January 27, 2023): 2338, https://www.mdpi.com/2071-1050/15/3/2338, 3.
35. Ibid, 3.
36. Ibid, 5.

Figure 16 / RA Diagram

03 / Tensions

This chapter examines the spatial pressures that shape Southern Ontario's landscapes. The land that sustains is also the land most sought after for settlement, infrastructure, and growth. By mapping layers of ecological protection, soil fertility, and patterns of human expansion, this chapter reveals the invisible tensions shaping Southern Ontario's future.

Spatial Layers

To situate Melville Park within the broader dynamics of Southern Ontario, this practicum employs GIS mapping at three scales.

1:1,700,000: At the broadest scale, the maps establish the regional context, positioning the site within provincial land use frameworks and ecological systems.

1:300,000: The intermediate scale highlights the regional pressures of urban expansion, agricultural land use, and ecological systems that shape the viability of farmland.

1:20,000: The site scale brings the focus directly to Melville Park, where contours, soils, and hydrology inform detailed design decisions.

This approach ensures that the practicum remains grounded in both the larger forces shaping Southern Ontario and the specific conditions of the site itself.

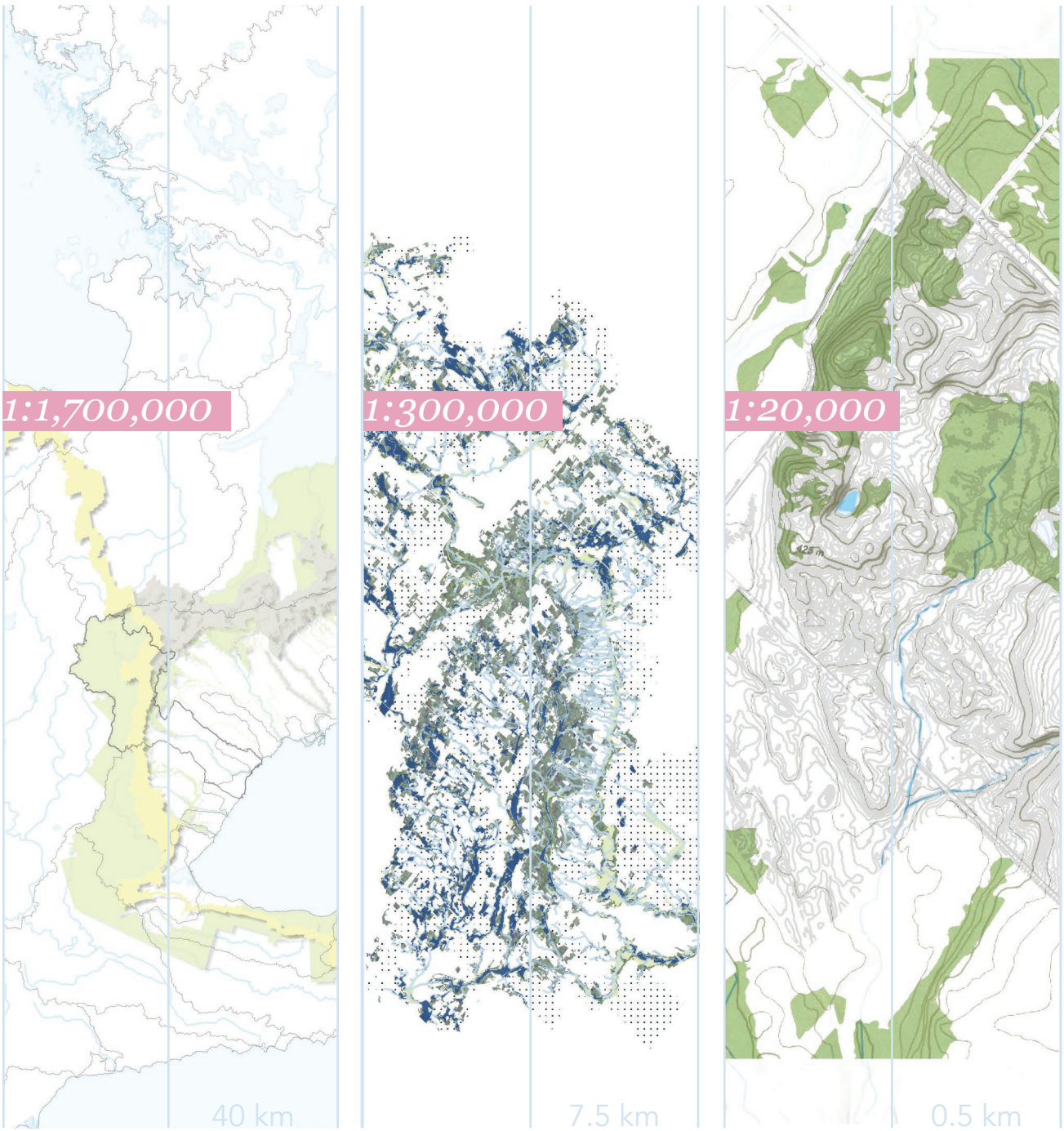


Figure 17 / Southern Ontario Ecological Regions
Figure 18 / Credit Valley Landuse
Figure 19 / Melville Topography

Southern Ontario's Regional Landscape

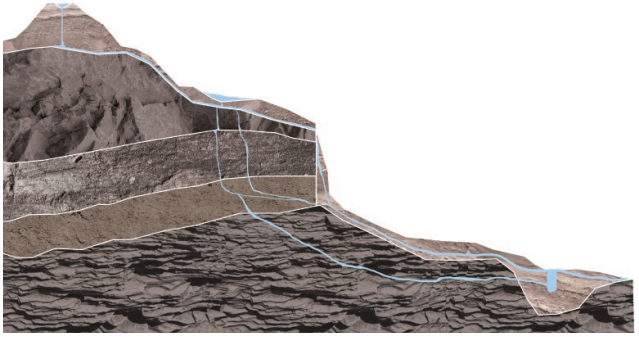
At a scale of 1:1,700,000, the satellite image shows the broader Southern Ontario landscape, illustrating the large-scale patterns of settlement, ecological regions, and major land uses. This broad perspective highlights the overarching forces: urbanization, forest cover, and agricultural.

Figure 20 / 1:1,700,000 Satellite Image

Southern Ontario's Ecological Regions

Niagara Escarpment

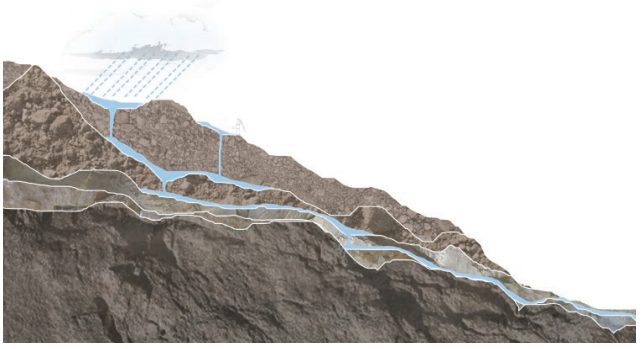
Figure 21 / Niagara Escarpment Diagram



Precipitation infiltrates the porous soils of the Moraine, recharging groundwater that flows through the underlying permeable rock layer.[37] This groundwater emerges as springs and seeps along the escarpment, where the impermeable shale forces it to the surface. It continues to move down through porous layers, feeding creeks and nearby channels.[38]

Oak Ridge Moraine

Figure 22 / Oak Ridge Moraine Diagram



Rain and snow soak into the permeable surface of the Moraine, filtering through layers of sand, gravel, and clay to collect in aquifers.[39] Water is drawn from these aquifers by wells and eventually surfaces as springs, wetlands, and streams, forming the headwaters of rivers that flow into Lake Ontario.[40]

Green Belt

The Greenbelt is one of Ontario's most significant land-use protections, spanning over two million acres around southern Ontario's urban core, protecting farmland, forests, and wetlands from urban sprawl.[41] Its connected landscapes regulate water cycles, filter air and water, and provide habitat corridors for biodiversity.[42]

37. "Niagara Escarpment Geoscape Toronto," Canadian Geoscience Education Network, accessed March 3, 2025, https://www.cgenarchive.org/uploads/2/5/2/6/25269392/escarp_activ3_e.pdf, 3.
38. Ibid, 3.
39. D.R. Sharpe et al., "Groundwater Prospects in the Oak Ridges Moraine Area, Southern Ontario," Oak ridges Moraine Hydro geology Project, accessed October 4, 2025, https://www.sfu.ca/geog/paleo_glaciology/pubs_files/_Sharpeetal_96_GroundwaterProspects_GSC-CR.pdf, 7.
40. Ibid, 7.
41. "Greenbelt Plan," Government of Ontario, May 2017, https://files.ontario.ca/greenbelt-plan-2017-en.pdf, 3.
42. Ibid, 3.

Figure 23 / Southern Ontario Ecological Regions 36

Credit River
Watershed Region

The landscape unfolds in a layered transition, forests and farmland in the uplands gradually give way to towns, highways, and dense city grids along the lakeshore. At a scale of 1:300,000, the satellite image captures this shift, showing how rural, suburban, and urban environments overlap across this area. Natural systems such as wetlands, woodlands, and river valleys provide drinking water, recreation, and vital ecological services. These same systems are increasingly strained by urban expansion, even as they continue to regulate floods, recharge groundwater, and sustain biodiversity.

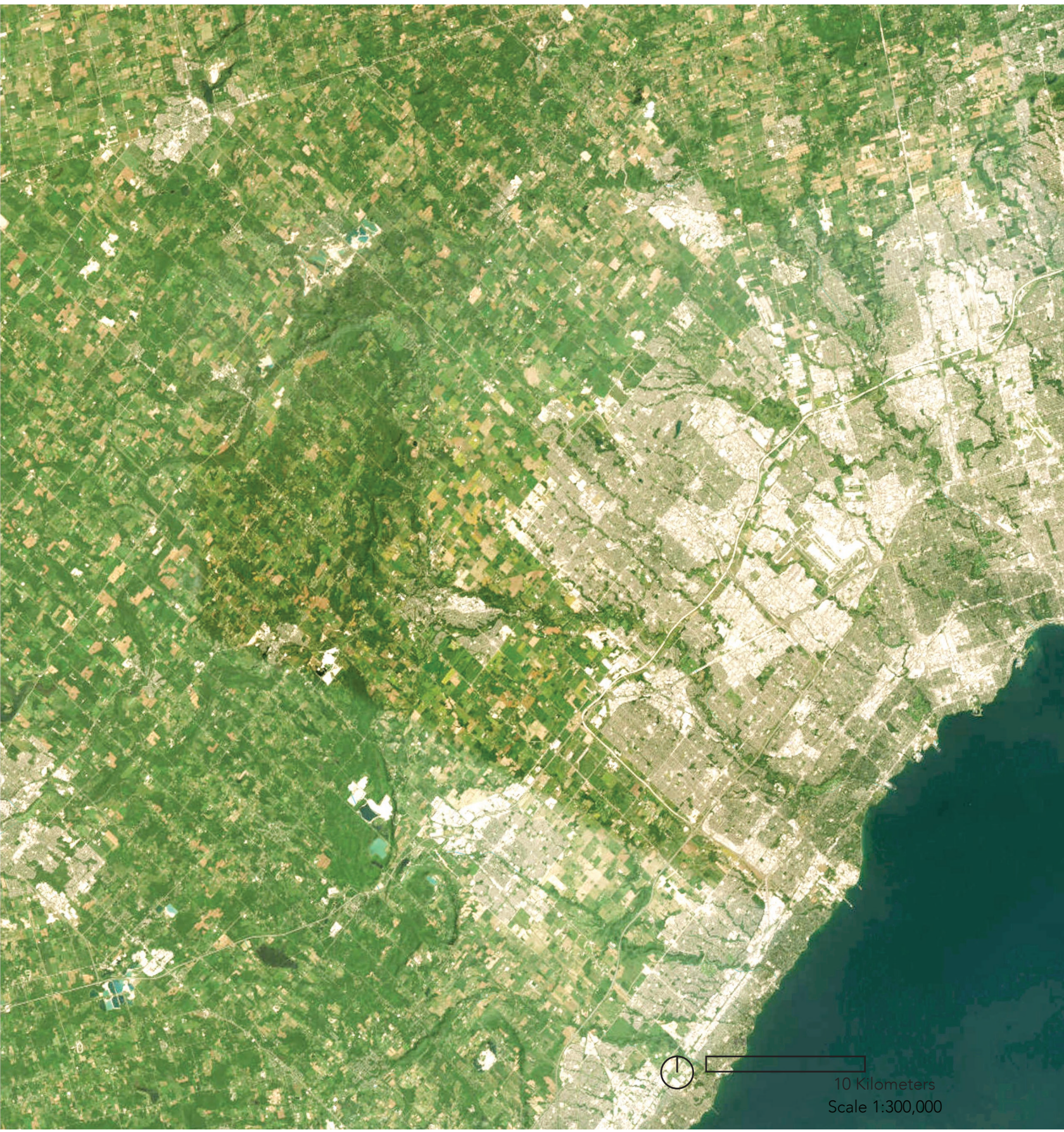


Figure 24 / 1:300,000 Satellite Image

Credit River Watershed

The Credit River Watershed is an important landscape that stretches 90 kilometers from Orangeville, Erin, and Mono to its end at Lake Ontario. It includes parts of the Niagara Escarpment, Oak Ridges Moraine, and Ontario's Greenbelt. The watershed not only drains the Credit River but also several smaller creeks.[43] It is comprised of approximately 35% natural cover, 34% agriculture and open space, and 31% urban development.[44] This diversity supports many forests, wetlands, and meadows, along with farms, parks, and growing communities across nine municipalities.[45] The watershed plays a key role in filtering water, supporting wildlife, mitigating floods, and recharging aquifers.[46] This makes it a crucial part of southern Ontario.

43. Shanice Badior, Kata Bavrlic, and Ray Tufgar, "CVC Watershed Plan Characterization Report Chapter 1: Introduction" Credit Valley Conservation, 2025, https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter1_Introduction_f_20250522_pa.pdf, 1.
44. Ibid, 2.
45. Ibid, 4.
46. Ibid, 5.

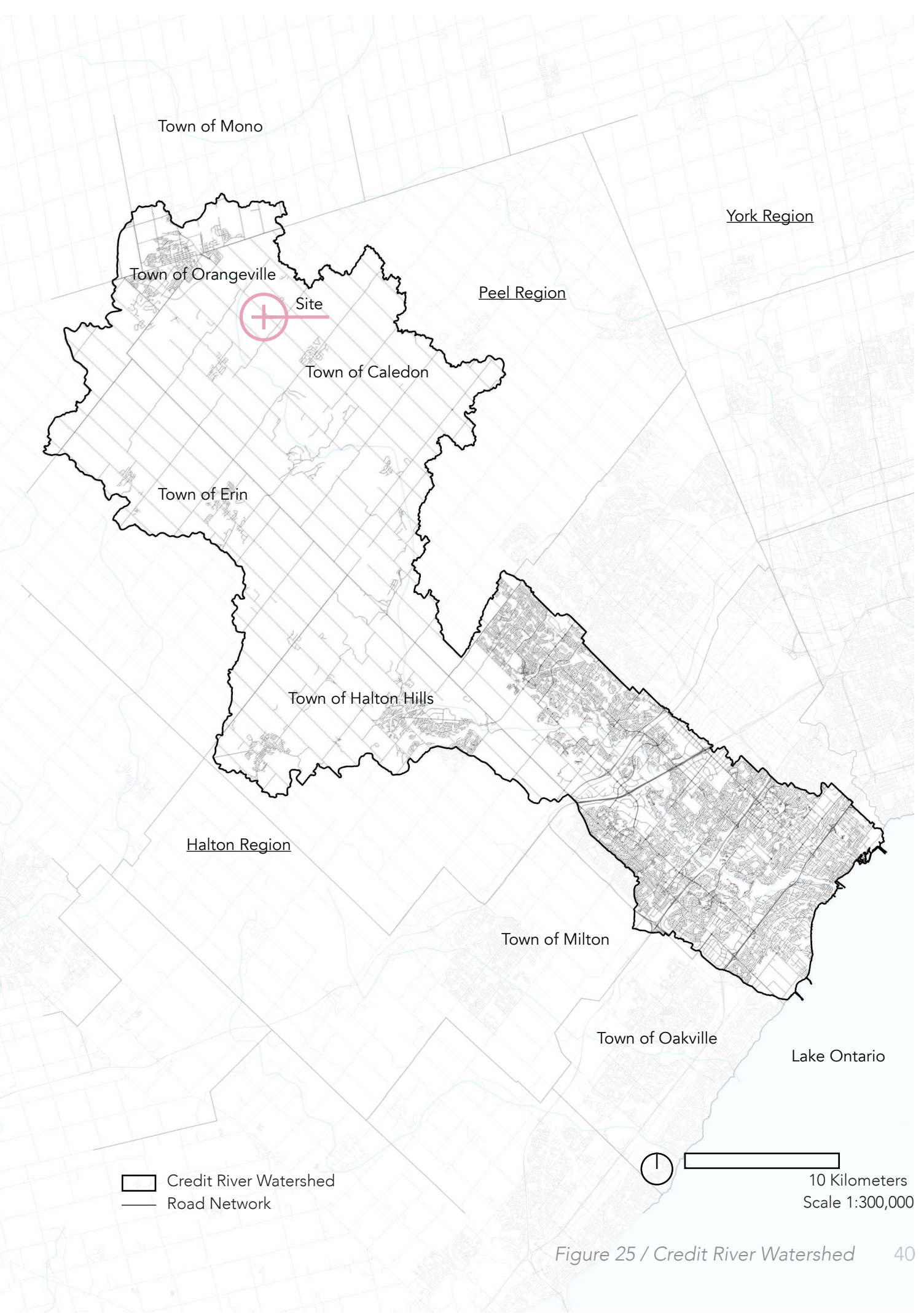
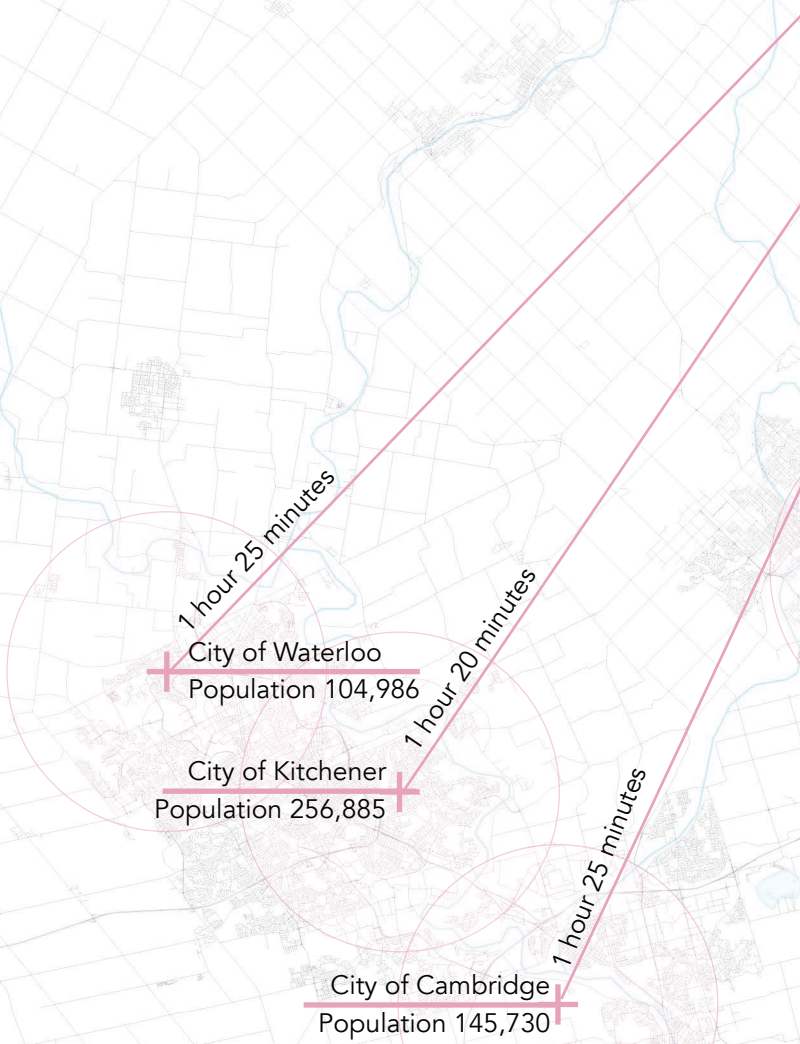


Figure 25 / Credit River Watershed

Urban Context and Accessibility to Melville

The surrounding urban context highlights Melville Park's proximity to some of Ontario's fastest-growing cities. The map situates the site in relation to Waterloo, Kitchener, Cambridge, Guelph, Vaughan, Brampton, Toronto, and Mississauga, noting both population size and travel time. These cities are projected to experience significant population growth in the coming decades, driven by immigration and economic opportunities.[47] This growth will further increase the demand for accessible green space and recreational destinations, as millions of residents are already within a one-hour drive, with more to come as urban growth accelerates.



47. Yvette Roy, "CVC Watershed Plan Characterization Report Chapter 7b: Anthropogenic Land Use," Credit Valley Conservation, 2025, https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter7b_AnthropogenicLandUse_f_20250522_pa.pdf, 18.

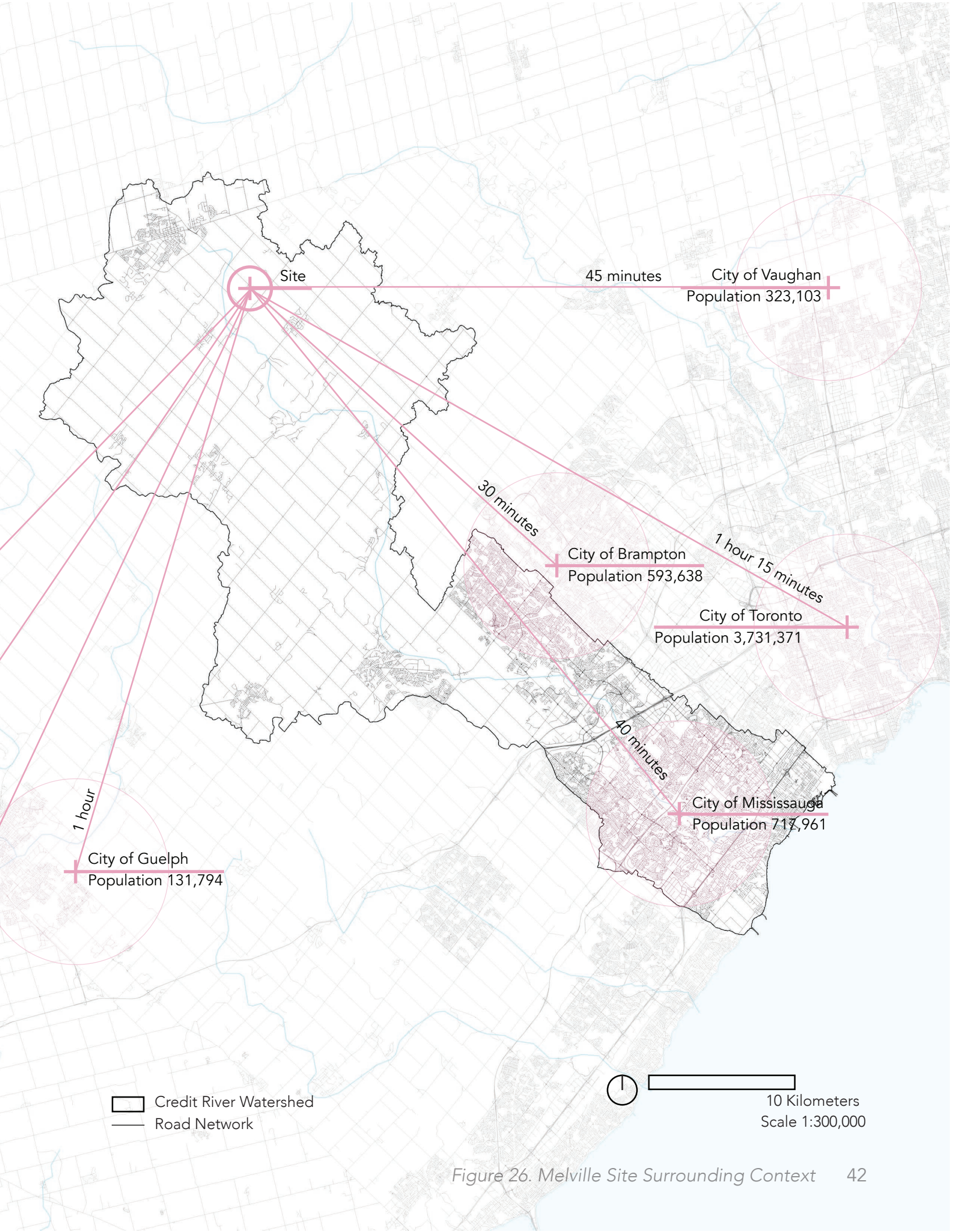


Figure 26. Melville Site Surrounding Context

Credit River
Watershed Land Use

Figure 27 / Credit Valley Intensive Agriculture

25,095 ha

Figure 28 / Credit Valley Non-Intensive Agriculture

7,592 ha

Figure 29 / Credit Valley Wetlands

6,440 ha

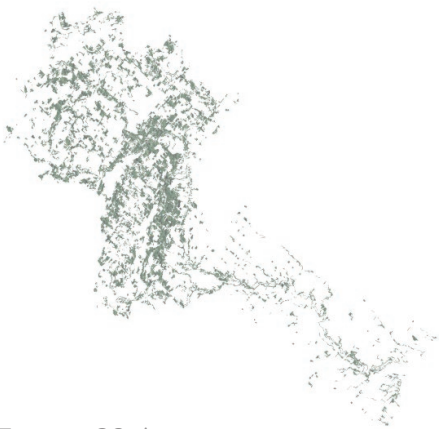


Figure 30 / Credit Valley Forests

20,874 ha

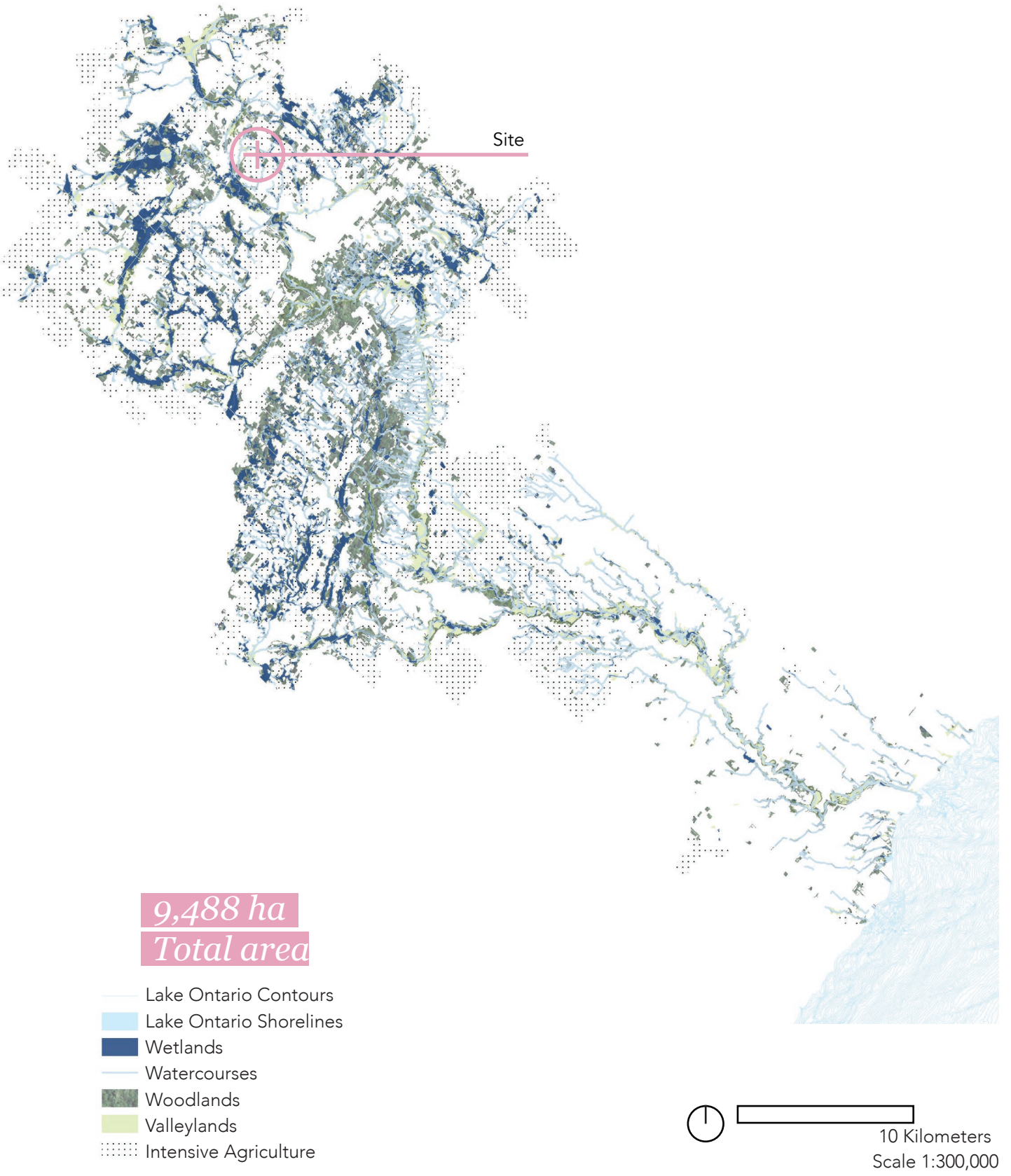


Figure 31 / Credit Valley Landuse

Credit River
Watershed Water Systems

Wellhead Protection Area: Designated areas that are critical for protecting the quantity of groundwater required by a municipality to meet current and future drinking needs.[48]

Significant Groundwater Recharge Area: Areas of land where rain or snow infiltrate the ground and flows into the aquifer.[49] A recharge area is considered significant when it helps maintain the water level in an aquifer that supplies drinking water or coldwater ecosystem.[50]

Highly Vulnerable Aquifers: Aquifers that are more susceptible to contamination due to their proximity to the surface and/or because they are overlaid with highly permeable materials such as sand and gravel.[51]

This map highlights the groundwater and surface water infrastructure within the Credit River Watershed, including wellhead protection areas, significant recharge zones, highly vulnerable aquifers, and Lake Ontario intakes. These are significant areas for sustaining both human populations and agricultural systems. They ensure reliable access to clean water for irrigating crops, sustaining livestock, and supporting productive farmland.[52] At the same time, agricultural inputs such as fertilizers, pesticides, and manure can threaten water quality if they infiltrate vulnerable aquifers or recharge zones.[53] Climate change, marked by increasing droughts and extreme rainfall, places these systems under heightened stress; therefore, protecting these systems is a priority. [54]

48. Hailey Ashworth and Yvette Roy, "CVC Watershed Plan Characterization Report Chapter 6: Physical Geography," Credit Valley Conservation, 2025, https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter6_PhysicalGeography_f_20250522_pa.pdf, 28.
49 Ibid, 20.
50. Ibid, 20.
51. Ibid, 20.
52. Hailey Ashworth et al., "CVC Watershed Plan Characterization Report Chapter 9: Water Resource Management," Credit Valley Conservation, 2025, https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter9_WaterResourceManagement_f_20250522_pa.pdf, 16.
53. Yvette Roy, "CVC Watershed Plan Characterization Report Chapter 7b: Anthropogenic Land Use," Credit Valley, 10.
54. Kata Bavrlic and Tim Kuntz, "CVC Watershed Plan Characterization Report Chapter 5: Climate and Climate Change," Credit Valley Conservation, 2025, https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter5_ClimateAndClimateChange_f_20250522_pa.pdf, 18.

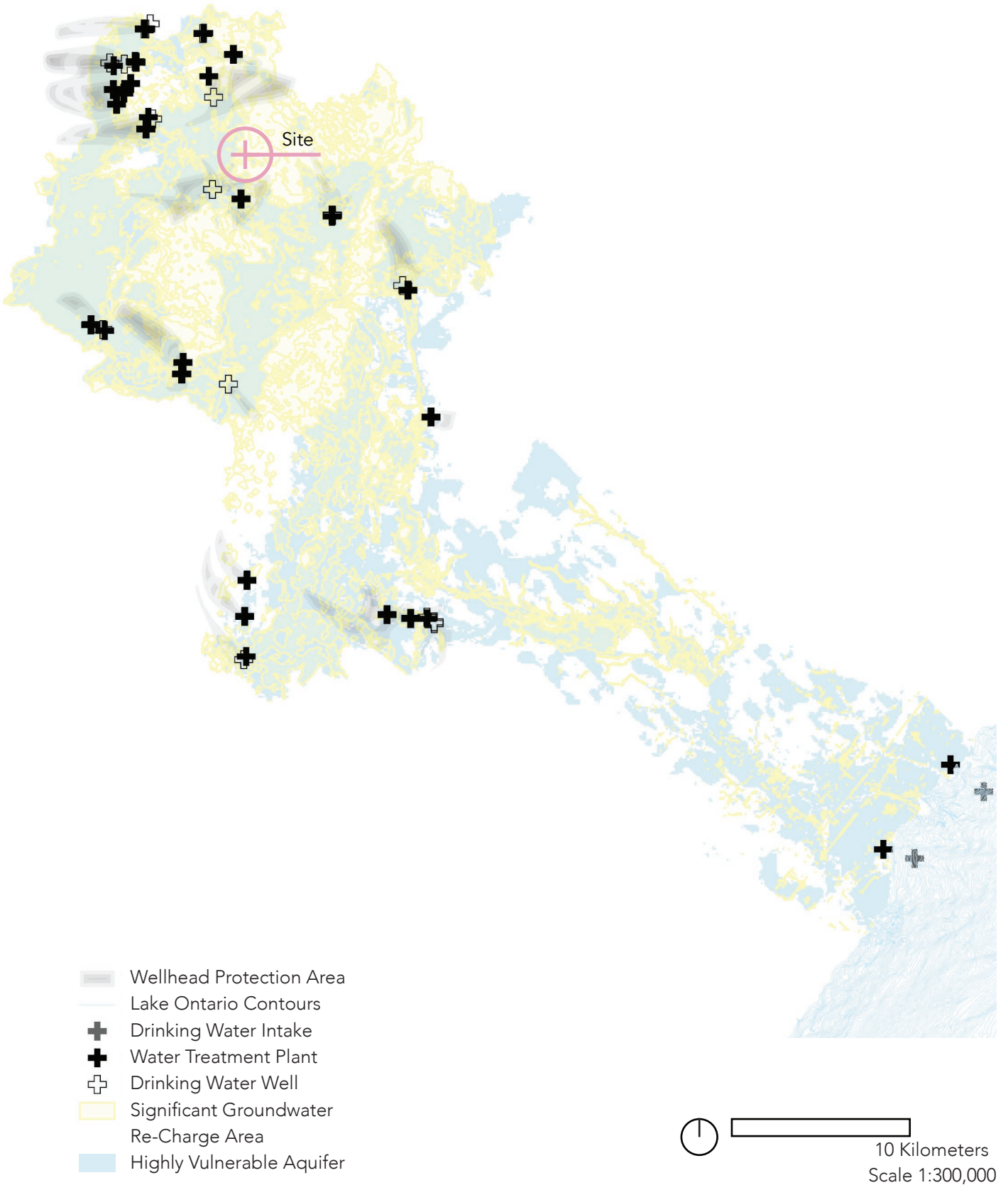


Figure 32 / Credit Valley Water System 46

Credit River Watershed
Emissions and Carbon Capture

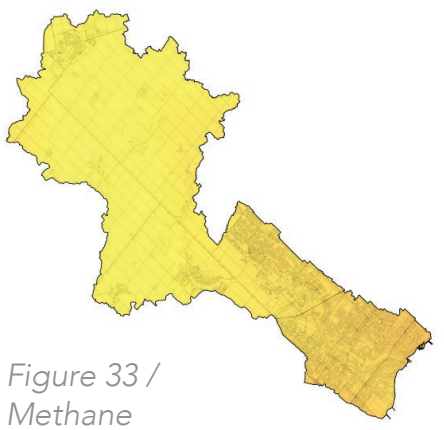


Figure 33 /
Methane

CH4

1680 1980

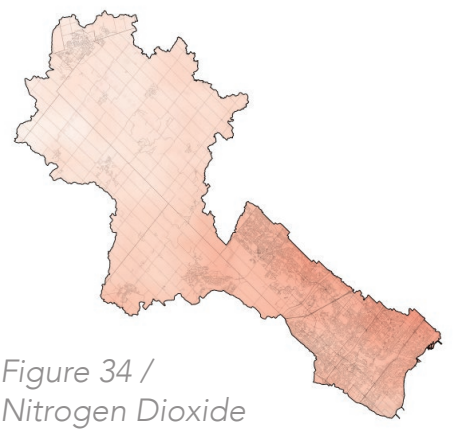


Figure 34 /
Nitrogen Dioxide

NO2

0 180

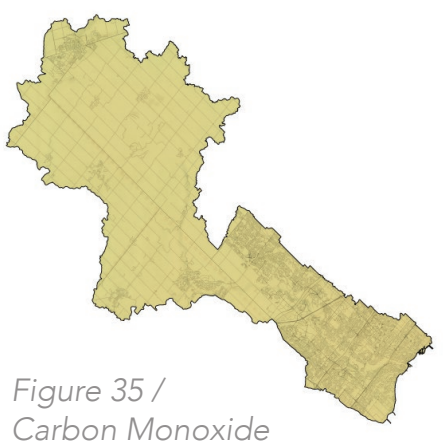


Figure 35 /
Carbon Monoxide

CO

60 175

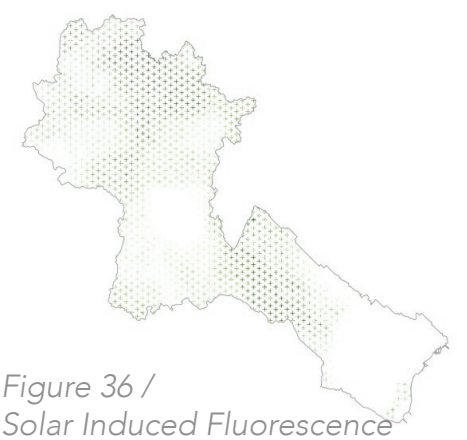
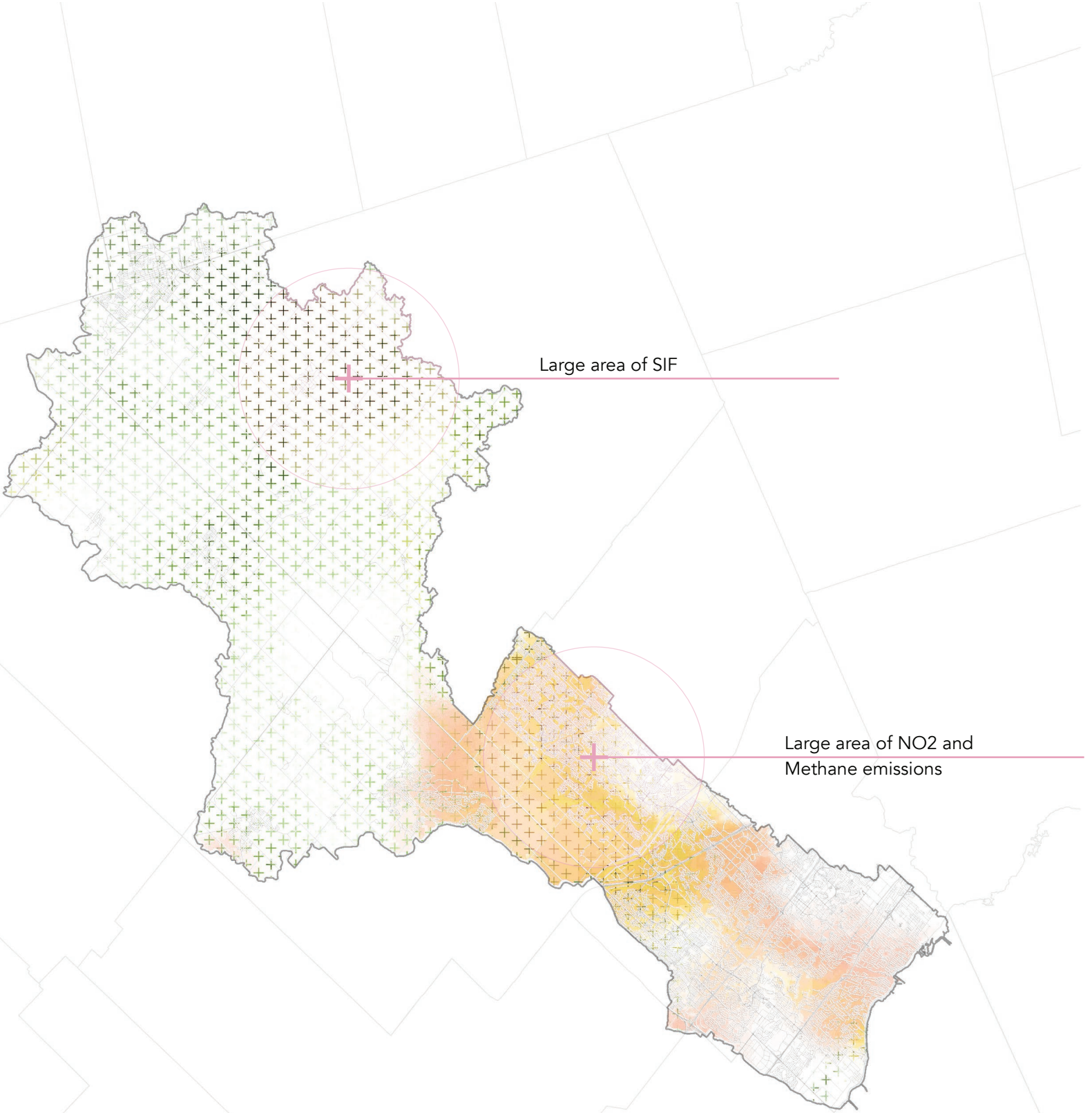


Figure 36 /
Solar Induced Fluorescence

SIF

-0.6 3.0



These maps show methane, nitrogen dioxide, carbon monoxide, and solar-induced fluorescence across the Credit River Watershed. Emissions are highest near urban areas, highways, and intensive farmland, while photosynthetic activity is strongest in forested areas in the north.

Figure 37 / Sentinel 5P Data Map 48

Credit River Watershed Soils

The soils of the Credit River Watershed form the backbone of the region's agricultural and ecological systems. Ranging from fertile, well-drained Class 1 and 2 soils to more limited Class 4 and 5 areas, these soils dictate where crops can thrive, where pastures can be maintained, and where conservation practices are essential.[55] The Canada Land Inventory classifies soils into seven capability classes based on their suitability for common field crops, ranging from the highest quality Class 1 to Class 7, which is unsuitable for agriculture.

Class 1: No significant limitations; soils are deep, well-drained, nutrient-rich, and highly productive.

Class 2: Moderate limitations; may require some conservation practices but still productive for most crops.

Class 3: Moderately severe limitations affecting tillage, planting, harvesting, or crop choice; fair to moderately high productivity.

Class 4: Severe limitations requiring careful management; low to medium productivity for most crops, higher for specialized crops.

Class 5: Very severe limitations; suitable mainly for perennial forage, with some potential for improvement.

Class 6: Unsuitable for cultivation; limited use for unimproved permanent pasture; terrain or soil limits mechanized improvement.

Class 7: No agricultural capability; includes marshes, rock-lands, or very steep slopes.[56]

55. Yvette Roy, "CVC Watershed Plan Characterization Report Chapter 7b: Anthropogenic Land Use," 6.
56. "CLI Agriculture Classification," Government of Canada, May 31, 2013, https://sis.agr.gc.ca/cansis/nsdb/cli/classdesc.html

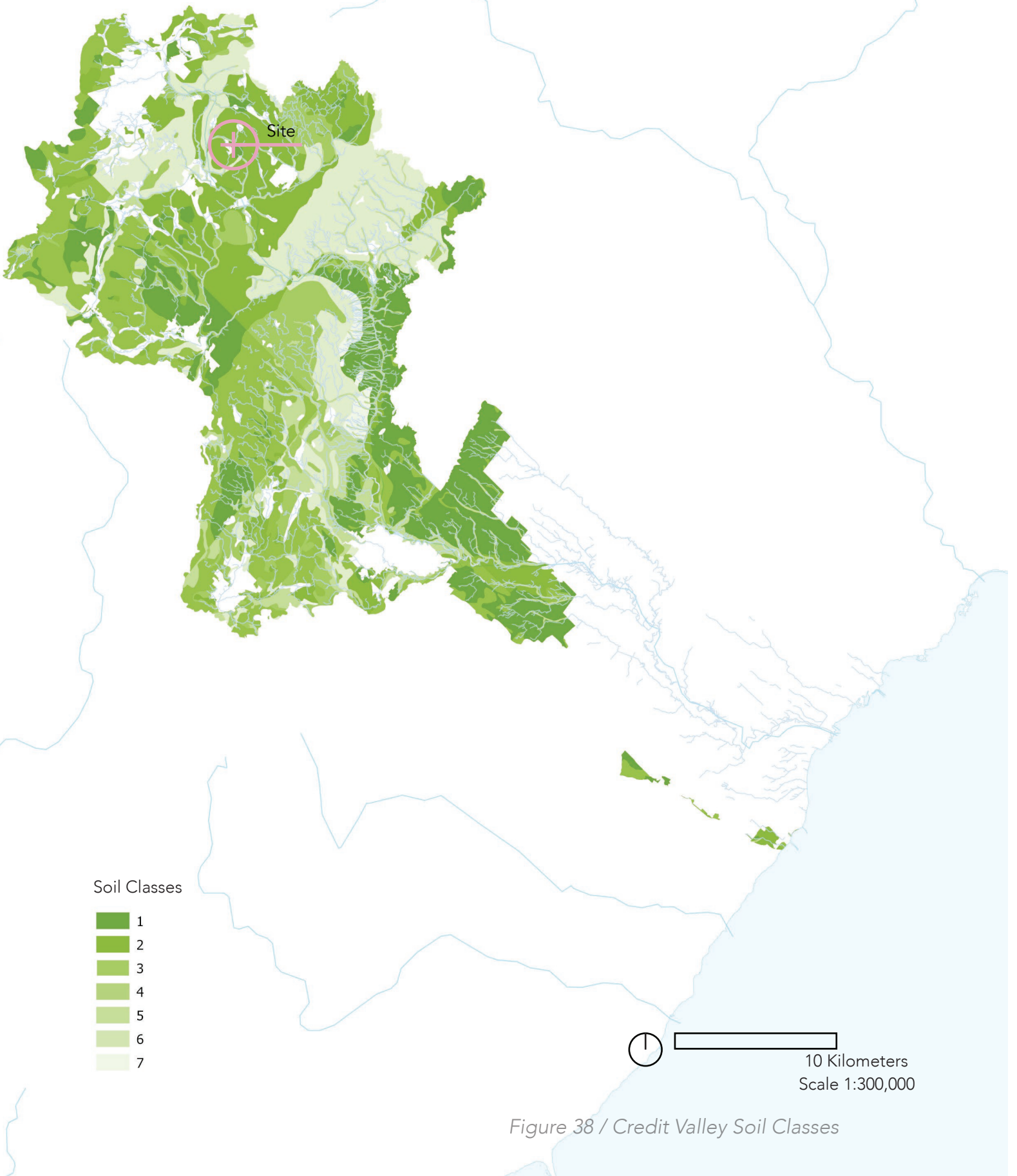


Figure 38 / Credit Valley Soil Classes

Melville Park

Location: Melville, Rural Caledon, ON
Size: 624.5 acres

Melville Park, located in Melville, Rural Caledon, Ontario, encompasses 624.5 acres of mixed undeveloped land and productive farmland, with significant portions of protected wetlands and woodlands. Adjacent to the small settlement area at Willoughby Road and Highpoint Side road, recognized in the Caledon Official Plan and Green Belt Plan. At a scale of 1:20,000, the focus shifts directly to the site itself, where contours, soils, and water systems provide critical insight for detailed design decisions.

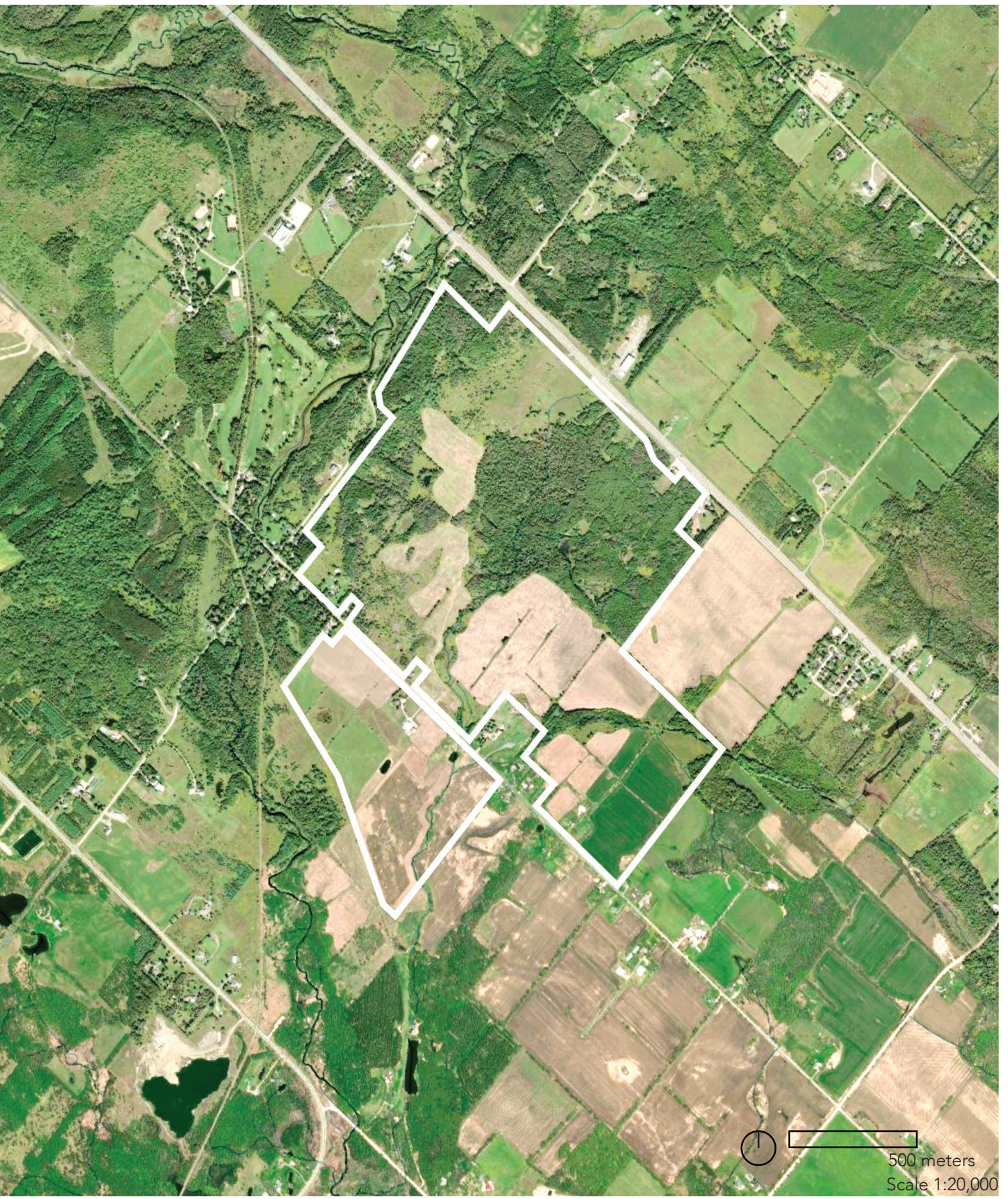


Figure 39 / 1:20,000 Satellite Image

Melville Park
Topography

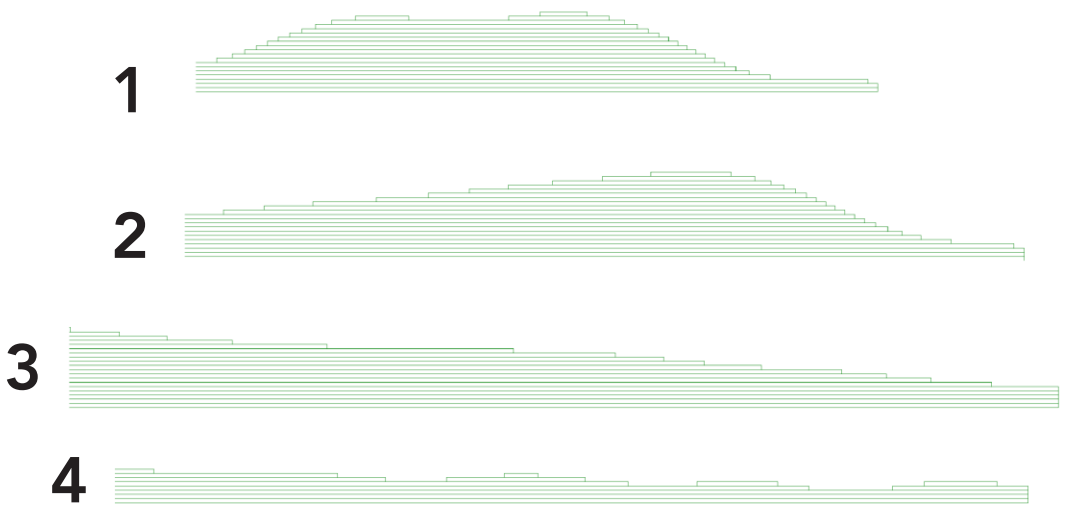


Figure 40 / Melville Park Topography Sections

100 meters

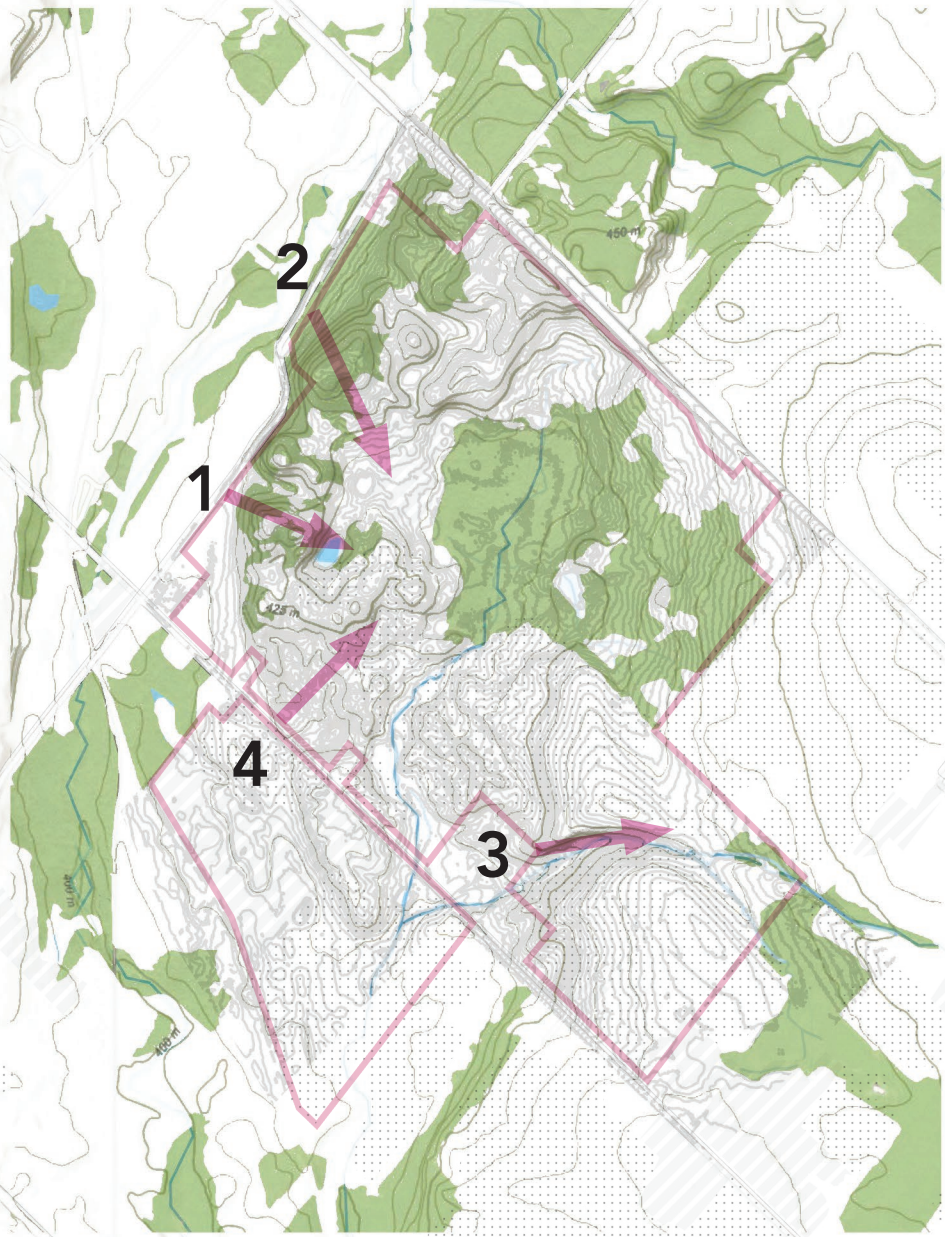


Figure 41 / 1:20,000 Melville Park Diagram

04 / Situate

This chapter begins to tell the story of Melville Park as a landscape with forests, fields, and wetlands. The Melville Park Design Competition serves as an opportunity for imagining how this land can become a model of resilience and regeneration.

The Melville Park
Design Competition

Base Plan Provided by Longridge Partners

The Melville Park Design Competition, hosted by Longridge Partners, provided the foundation for the practicum research and design exploration. Longridge, a real estate investment firm dedicated to preserving and enhancing over 2,000 acres of land, launched the competition to inspire innovative landscape and business concepts that connect people to nature while ensuring long-term sustainability. The focus site, Melville Park in rural Caledon, is a 624.5-acre property of woodlands, wetlands, farmland, and settlements. Governed by the Town of Caledon's Official Plan and the Greenbelt Plan, the site allows for low-intensity recreation and tourism uses while requiring protection of ecologically sensitive areas. Participants were encouraged to propose original designs that balance ecological integrity with economic feasibility, and innovation.

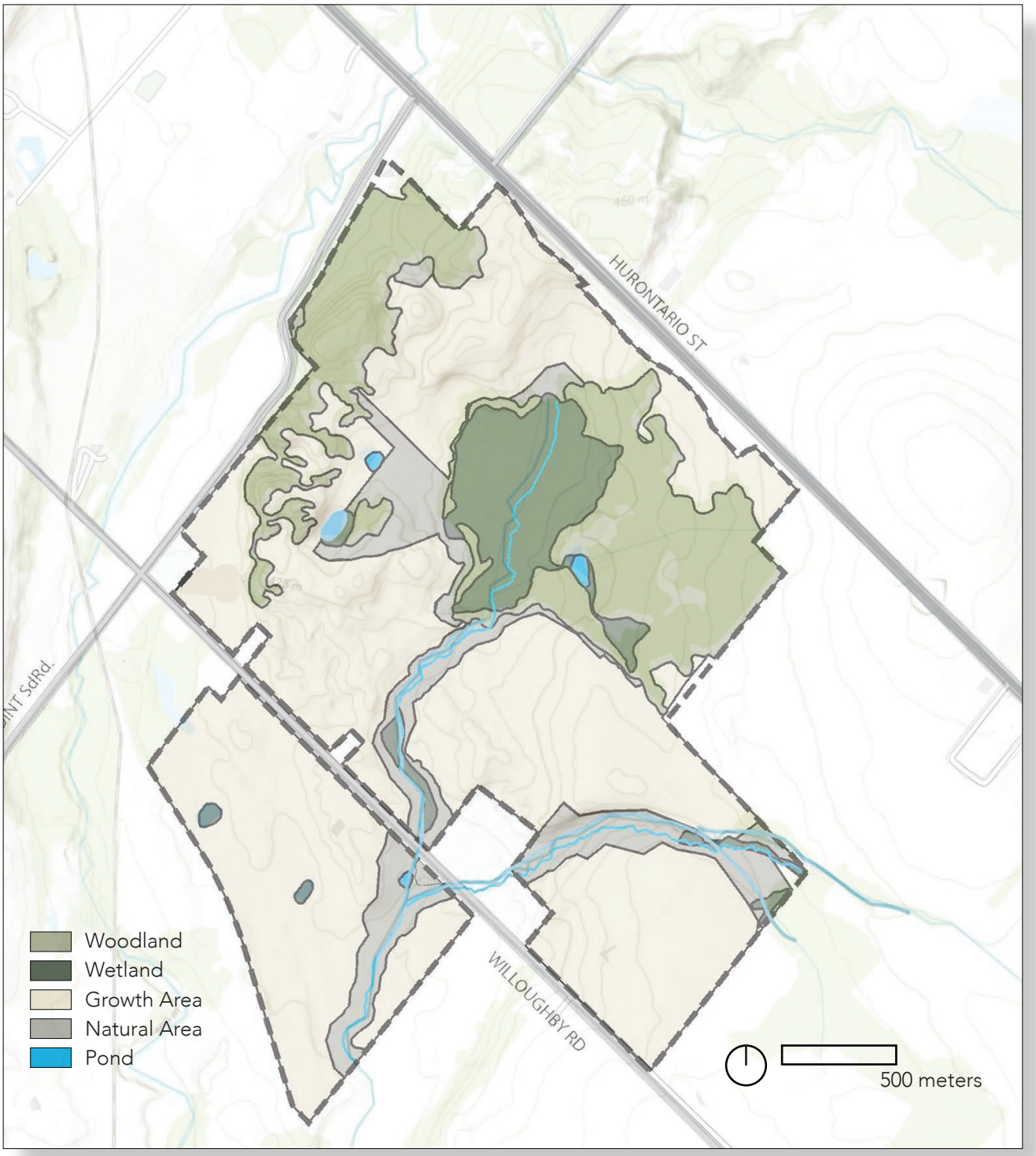


Figure 42 / Longridge Melville Park Site Plan 58

Doug Carrick
Golf Course Design

Doug Carrick Golf Course Design

The property had previously been approved for a 27-hole golf course accompanied by stay-and-play cottages, reflecting an earlier vision for the site as a recreation-focused destination. This design was prepared by Doug Carrick, a landscape architect recognized for his expertise in golf course planning and design. His design for Melville Park included a complete course, club facilities, and a cluster of cottages. For the design competition, this existing plan was made available as a reference point. Participants were encouraged to review the Carrick design. However, they were not required to adopt it, allowing for varied approaches, from reworking or adapting aspects of the original golf course concept to proposing entirely new frameworks for the park. In this way, the competition opened space to question the necessity of a golf course, particularly given that fourteen already exist within a forty minute drive of the site.

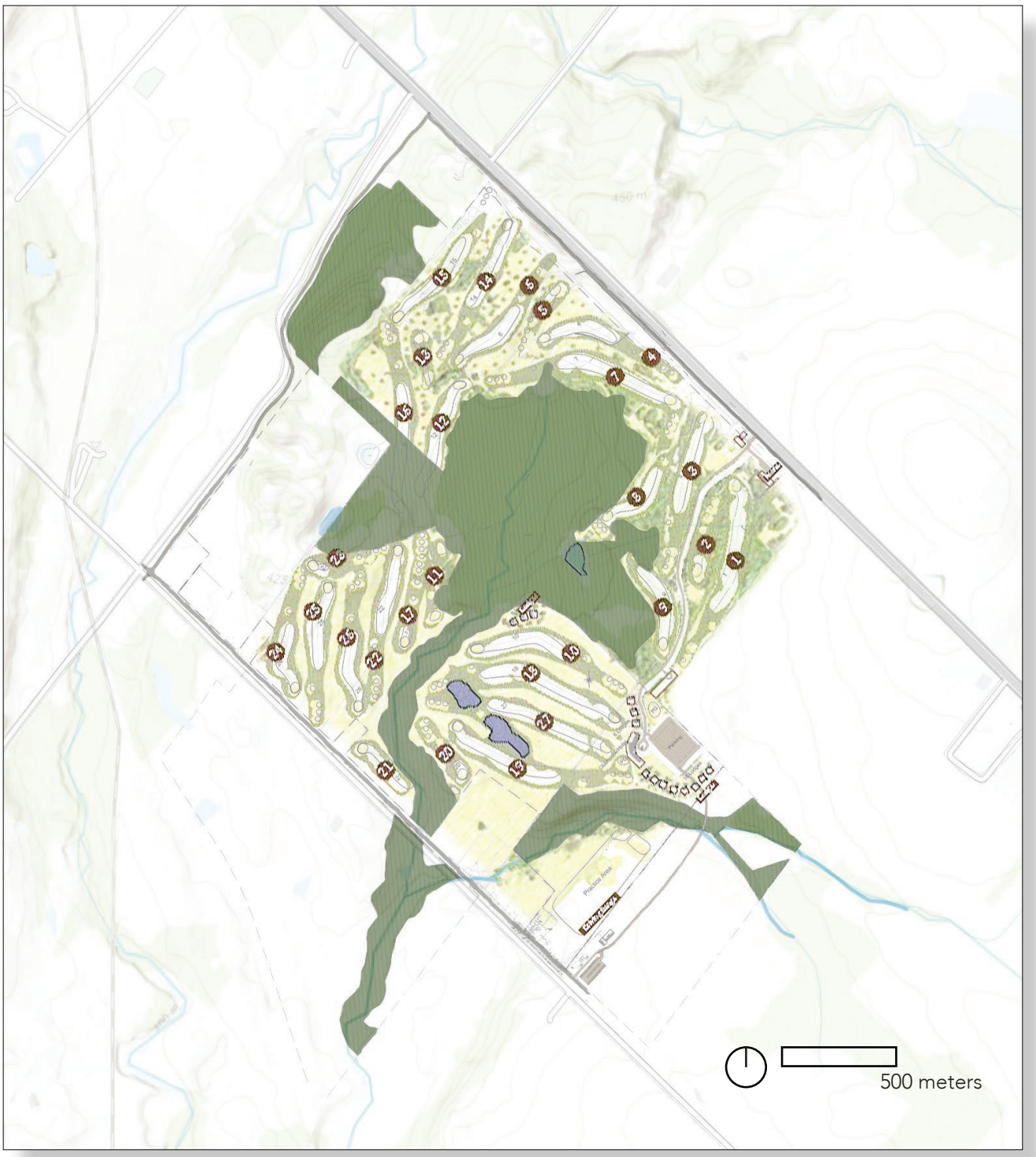


Figure 43 / Longridge Doug Carrick Golf Course Plan 60

Melville Park:
A Regenerative Escape

Competition Entry by Adrianna Anastacio

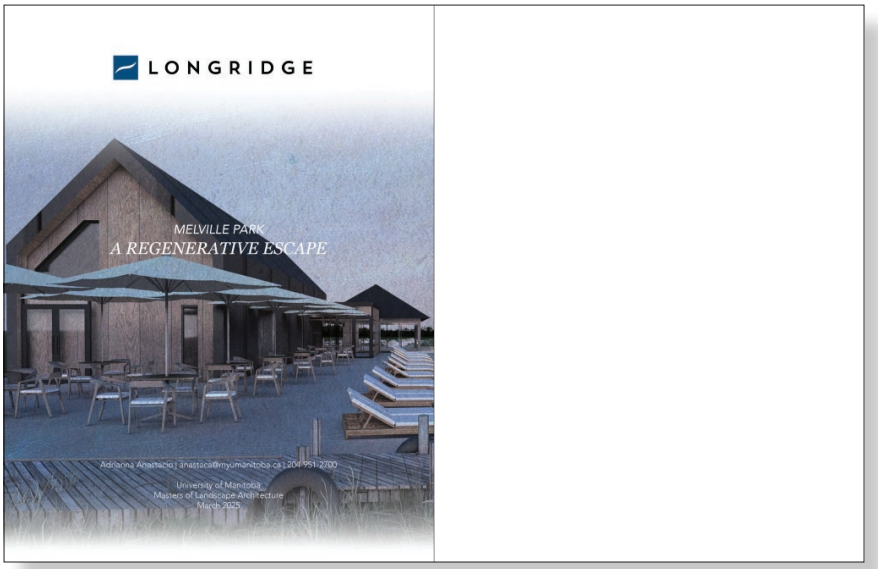
> “A common misunderstanding about place is that it is something that we need to create. We do not. Perhaps one of the greatest determinants of place is that it cannot be created; place is derived from what is already there and what was there before. The task of design is to disclose a place and make it expressive in order to be perceived. [57] ”

This quote by Saskia de Wit led me throughout this process and inspired this project. Set within the rolling hills of Caledon, Ontario, the site is already rich with character. Framed by farmland, forest, and water, it holds a quiet complexity that speaks to its history and potential. My approach began with listening to the land, its ecology, its past, and its stories. The design focuses on bringing its hidden beauty to the surface, rather than imposing something entirely new.

Melville Park stands as a pioneering model in Canada, uniquely combining regenerative agriculture, solar-powered infrastructure, and a net-zero carbon footprint for its farming operations. This holistic approach to sustainability, encompassing food production, energy use, and tourism, sets it apart from any existing project in the country.

My competition submission here was among the top five national finalists, selected from entries across the country. I traveled to Toronto to present my research before a judging panel and members of the local community. My proposal was awarded Runner-Up and received a $10,000 cash prize. More meaningful than the award itself, however, was the feedback I received during and after my presentation. Local farmers approached me to learn more about regenerative agriculture and expressed interest in adopting these practices on their own land. For me, this was the most rewarding outcome, as it demonstrated that my research is not only relevant but also actionable, capable of making a tangible impact on both agriculture and the community.

57. Saskia de Wit, Hidden Landscapes: The Metropolitan Garden as a Multi-Sensory Expression of Place (Amsterdam: Architectura & Natura, 2018), 389.



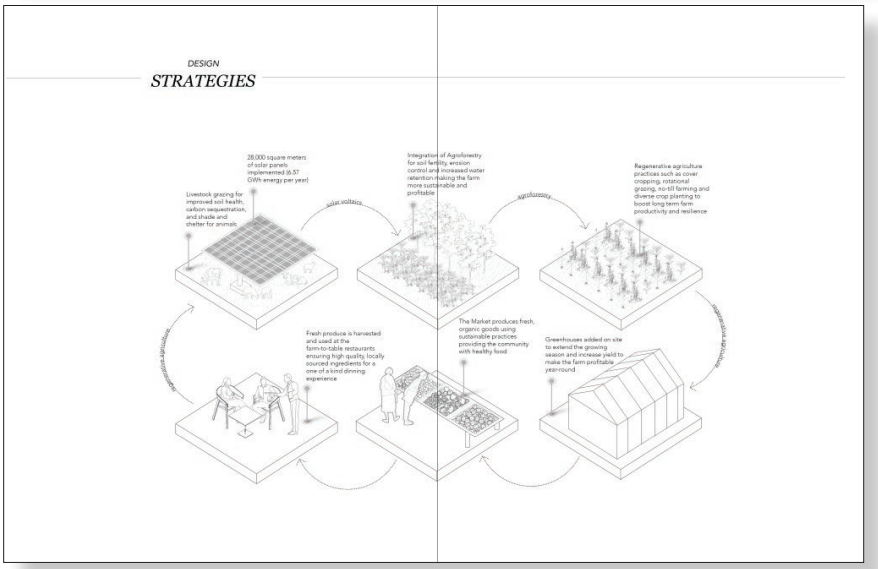


Figure 44 / Longridge Competition Entry 62

Melville Park:
A Regenerative Escape

MELVILLE
MARKET

organic food, community, & sustainability

At Melville Market, the land provides everything needed. Visitors wander through lush vineyards and abundant orchards, selecting fresh, organic produce harvested just steps away. The market is a celebration of regenerative farming, where every bite tells a story of sustainability and care.

Café & Restaurants
Serving farm-to-table meals with locally sourced ingredients

Garden Rooms
Immersive dining spaces surrounded by nature

Organic Market
Fresh produce, artisanal goods, and regenerative farm products

Horseback Riding
Scenic trails for riders of all levels to connect with nature

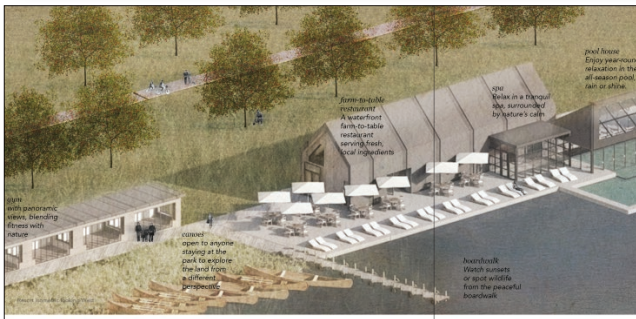
Pick-Your-Own Flower Gardens
Stroll through vibrant fields and take home fresh blooms

Workshops & Event
Culinary experiences, gardening classes, and sustainability talks

Sports Courts
Enjoy tennis, basketball, and other recreational activities

MELVILLE
RESORT

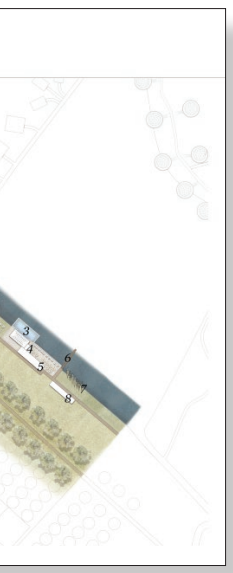
recharge, refresh, explore the waters

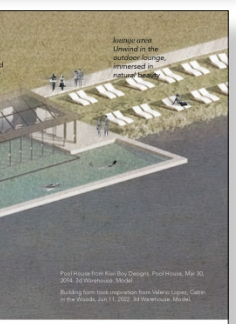


At Melville Resort, water is the heart of rejuvenation. Whether soaking in the spa, swimming in the pool, or unwinding in the gym, guests are always surrounded by uninterrupted views of the landscape. Designed with minimal intervention, the resort is a seamless extension of nature itself. Luxury without excess, comfort without compromise.

The Resort & Spa:
Experience-Based Revenue

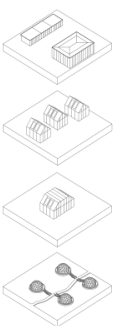
At Melville Park, health and wellness tourism flourishes thro its spa and wellness retreats, designed to provide guests with a transformative, immersiv nature experience. The spa offe rejuvenating treatments using locally sourced, organic ingredi while health programs. While





yoga retreats guide visitors toward physical and mental well-being. Nestled within the park's tranquil landscape, these experiences offer high-margin income potential, attracting those seeking relaxation, self-care, and a deep connection with nature.

retreat into relaxation



Garden Rooms + Family House
10 garden rooms overlooking vibrant flower gardens and a spacious 4-bedroom family house in the heart of the Melville Market.

Farm Cabins
36 cozy 1-2 bedroom cabins nestled by the agriculture fields for an authentic farm experience.

Waterfront Cabins
36 1-2 bedroom cabins by the water, offering peaceful views and a serene natural retreat.

Family Cabins
4 spacious cabins with hot tubs by the water, perfect for family relaxation and fun.

Eco-pods
12 unique pods tucked within the forest at the water's edge for the ultimate immersive nature getaway.

Melville Stays: Core Revenue Driver

With 75+ unique eco-lodges and cabins, including garden rooms, farm cabins, waterfront cabins, family cabins and eco-pods Melville offers a diverse range of accommodations with premium pricing of $250–$500 per night

Seasonal pricing models are implemented to maximize revenue and ensure an unforgettable stay across all types of lodgings, designed to immerse guests in nature while providing top-tier comfort and luxury.

Melville Park
Site Visit Reflection

In March, just a short time after submitting my design competition entry, I had the opportunity to travel to Caledon, Ontario, and visit the Melville Park site in person. The drive from Guelph, just under an hour, revealed a landscape of steep topography, rolling hills, and vast stretches of farmland punctuated by dense woodlands. As we approached from the north, the sound of the Credit River could be heard along the roadside, hidden from view by the thick forest canopy yet unmistakably close. The gradient of trees rose steadily toward the site's highest point, where the forest suddenly gave way to an expansive sweep of open farmland. Beneath the late-winter snow, remnants of corn and wheat hinted at the site's agricultural use. In contrast, areas marked as "natural" on Longridge's site map revealed themselves as a wet, meandering stream lined with tall grasses and seasonal wetland vegetation.

Walking this site after completing the competition entry allowed me to see my own design with new eyes. My competition entry had been completed before seeing the land firsthand, allowing me to reflect critically on my design. Walking the land, hearing the river, and observing the traces of past crops grounded my work in a way that was both humbling and inspiring, reminding me that good design begins not with the drawing board, but with listening to the land itself.

Figure 45 / Melville Park Approach

Figure 46 / Melville Park Forest Edge 68

Figure 47 / Melville Park Forest
Figure 48 / Melville Park Farmland and Forest

Figure 49.
Melville Park Farmland

Figure 50.
Melville Park Farmland Edge

Figure 51.
Melville Park Abandoned Entryway

Figure 52 / Melville Park Wetland

Figure 53 / Melville Park Undulating Topography

05 / Design

This chapter presents the complete design for Melville Park. This design is a model for how agriculture can diversify its land, protecting its wetlands and forests, celebrating its rolling hills and farmlands, and creating a model for sustainable rural development in Southern Ontario.

Melville Park
Site Plan

Melville Park stands as a pioneering model in Canada, uniquely combining regenerative agriculture, solar-powered infrastructure, and a net-zero carbon footprint for its farming operations. This holistic approach to sustainability, encompassing food production, energy use, and tourism, sets it apart from any existing project in the country. The project is organized around three interconnected spaces: The Market, The Stay, and The Resort. The Market transforms Caledon's farmland into a vibrant hub where local food, culture, and community come together to celebrate the region's agricultural roots. The Resort Nestled along the water's edge designed for reflection, wellness, and movement The Stay is designed for restoration, connection, and the simple pleasure of being immersed in nature.

1 Market
Detail Plan One

2 Resort
Detail Plan Two

3 Stay
Detail Plan Three

Figure 54 / Melville Park Design Site Plan 78

Melville Park Framework

Movement through Melville Park unfolds as a gentle progression, guiding visitors from the main entry point along Willoughby Road (1) toward deeper immersion in the landscape. Upon reaching the Market (2), vehicular access ends and circulation transitions to pedestrian, cycling, and small electric cart movement. From there, the path leads toward the Resort at the water's edge (3), where a central retention pond (4) anchors the design while managing stormwater, recharging groundwater, supporting adjacent farmland, and creating an engaging water-focused experience for visitors. The journey continues to Melville Stay, following a central axis that weaves through forested terrain (5) before opening to views of the surrounding countryside (6). Two additional points of access connect the park to its broader context: one at the northeast corner along Hurontario Street (7) and another at the southwest boundary linking Melville Park to the Upper Credit Conservation Area Trail (8). Together, these connections position the park as both a destination and an important node within a larger ecological and recreational corridor.

- Entrance
- Boardwalk
- 2.5 KM Trail Loop
- Walking/ Cart Trail
- Melville Market
- Melville Stay
- Melville Resort
- Regenerative Agriculture
- Parking
- Vehicle Traffic

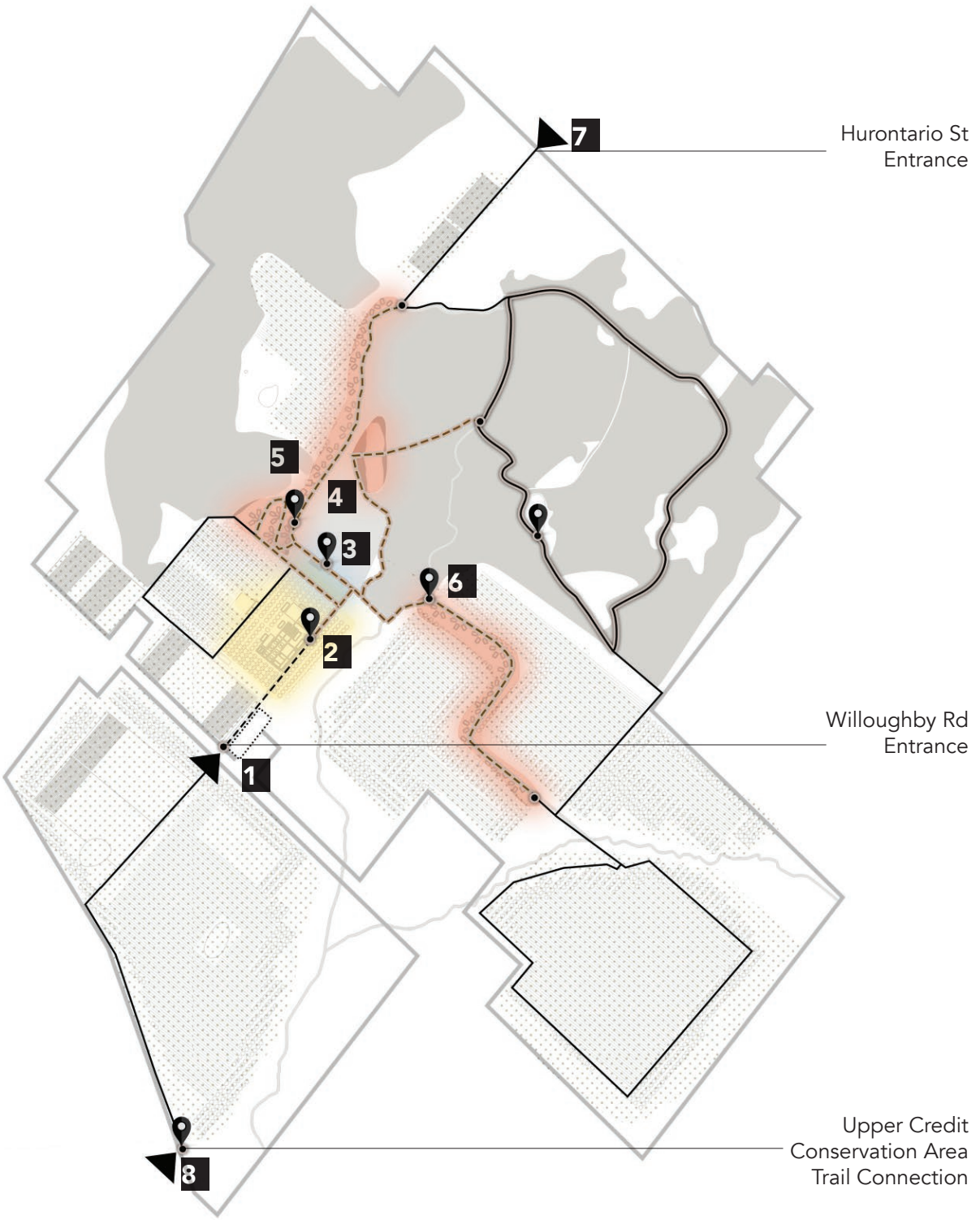
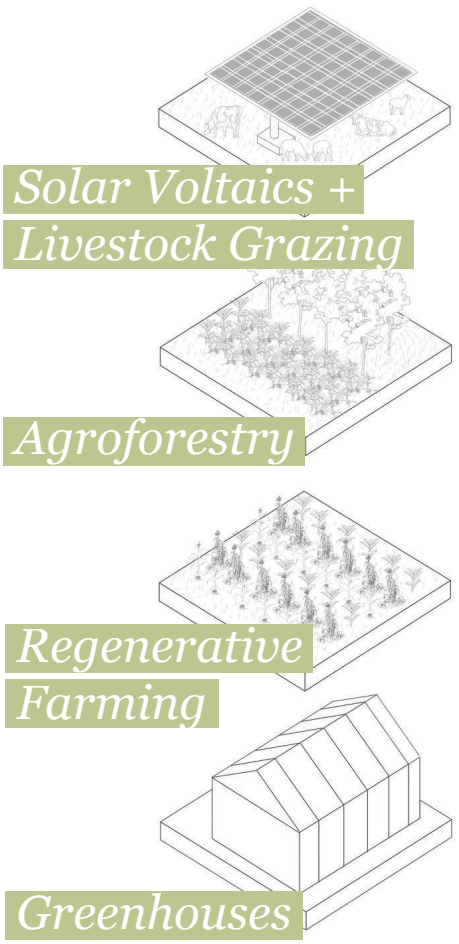


Figure 55 / Melville Park Design Framework 80

Melville Park
Regenerative Agriculture

Figure 56 / Melville Park RA Render

Regenerative Agriculture Framework



The regenerative agricultural system is designed not just to grow food, but to restore ecosystems, enrich the soil, and build long-term resilience. By sequestering carbon and improving land health, this approach positions Melville Park as a destination that meets growing demand for sustainable experiences. The framework starts with solar infrastructure and rotational livestock grazing, which naturally fertilize the land. Agroforestry promotes biodiversity, while no-till methods and crop diversity protect the soil. Greenhouses extend the growing season, creating a productive and resilient system that aligns with the natural rhythms of the land. What makes this design unique is its commitment to full sustainability. Once fully implemented, Melville Park's agriculture would operate at net-zero carbon emissions.

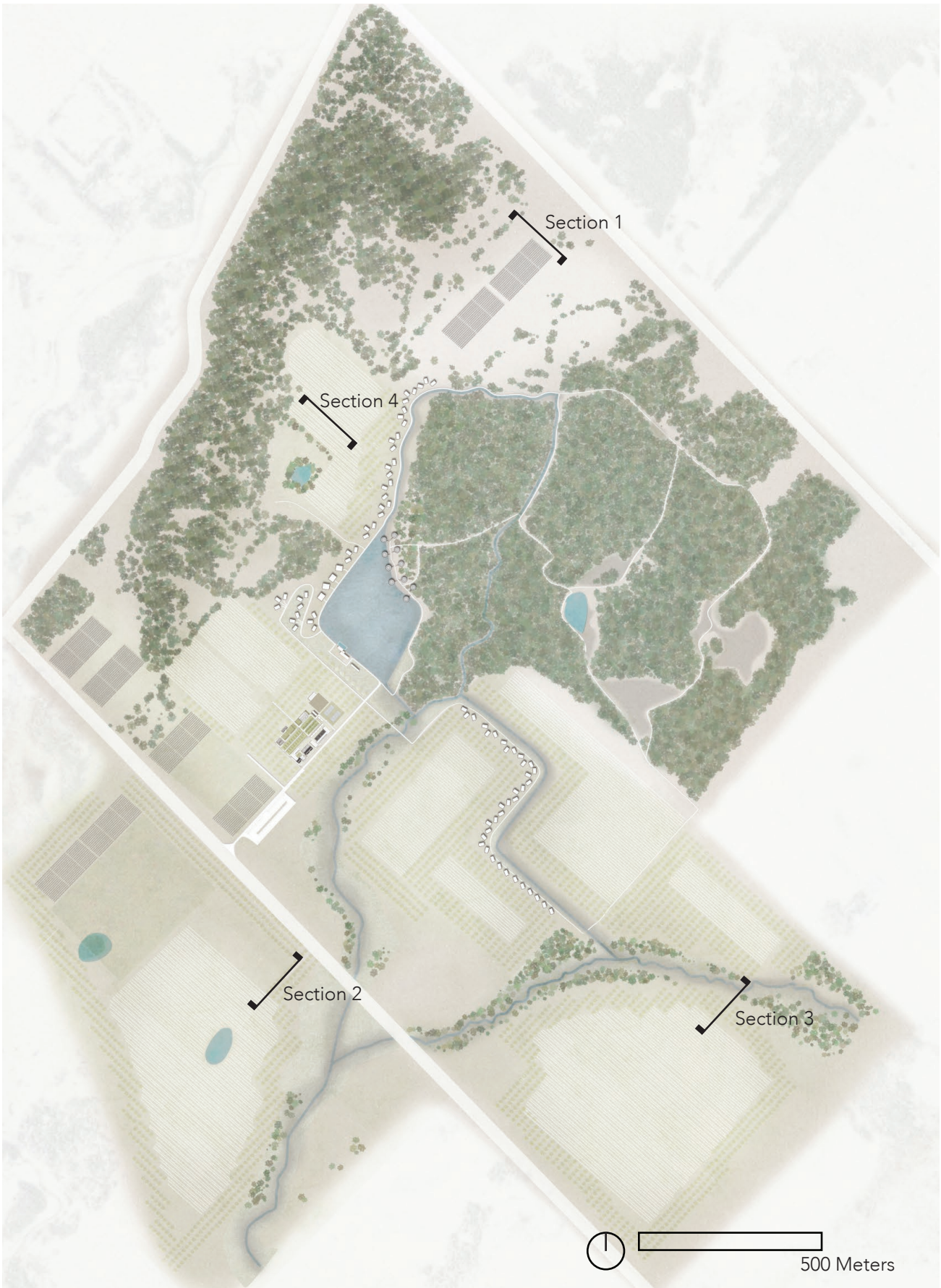


Figure 57 / RA Framework Axonometric Drawings
Figure 58 / RA Framework Plan

Regenerative Agriculture Sections

The proposed solar installation at Melville Park spans approximately 20 acres and features ground mounted solar panels. Each panel measures two meters by one meter, with a total of around 7,300 panels installed across the site. Utilizing fixed-tilt racking positioned at a 30-degree angle to the south, the solar panel system is projected to generate 4.8 kilowatt-hours (kWh) of renewable electricity annually.[58] Designed as a dual-use landscape, the solar fields will allow the land beneath the panels to remain productive for animal grazing. Native grasses and vegetation will be cultivated to stabilize the soil and enhance biodiversity. Melville Park also features 50 acres of rotational grazing land. This method of grazing allows pastures to rest between grazing periods, which promotes deeper root development and maintains continuous soil cover. Both of these factors are essential for long-term carbon storage and soil resilience. According to the Rodale Institute, regenerative grazing systems can sequester approximately 6 tonnes of CO2 per acre per year.[59] At this rate, Melville Park's grazing could capture around 300 tonnes of CO2 annually.

58. Jamil, Uzair, Bonnington, and Pearce. 2023. "The Agrivoltaic Potential of Canada" https://doi.org/10.3390/su15043228, 14.

59. 14.Jeff Moyer et al., "Regenerative Agriculture and the Soil Carbon Solution," 25.

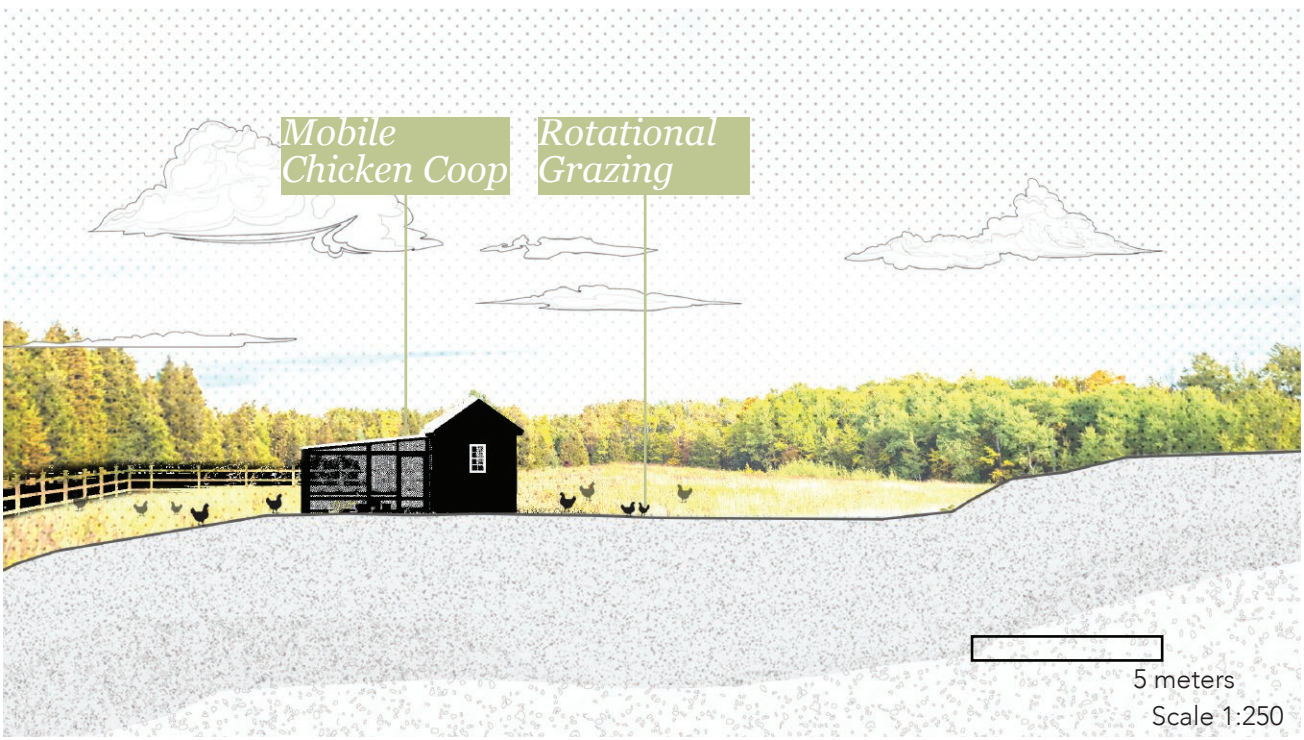


Figure 59 / Solar Fields Section
Figure 60 / Rotational Grazing Section

Regenerative Agriculture Sections

The 118 acres of cropland at Melville Park will be managed using diverse crop rotations, including the Three Sisters planting technique and winter cover crops. According to the Rodale Institute, these practices can sequester approximately 2.38 tons of CO2 per acre each year.[60] When applied across this area, this amounts to 281 tonnes of CO2 captured annually.

60 . Ibid, 16.

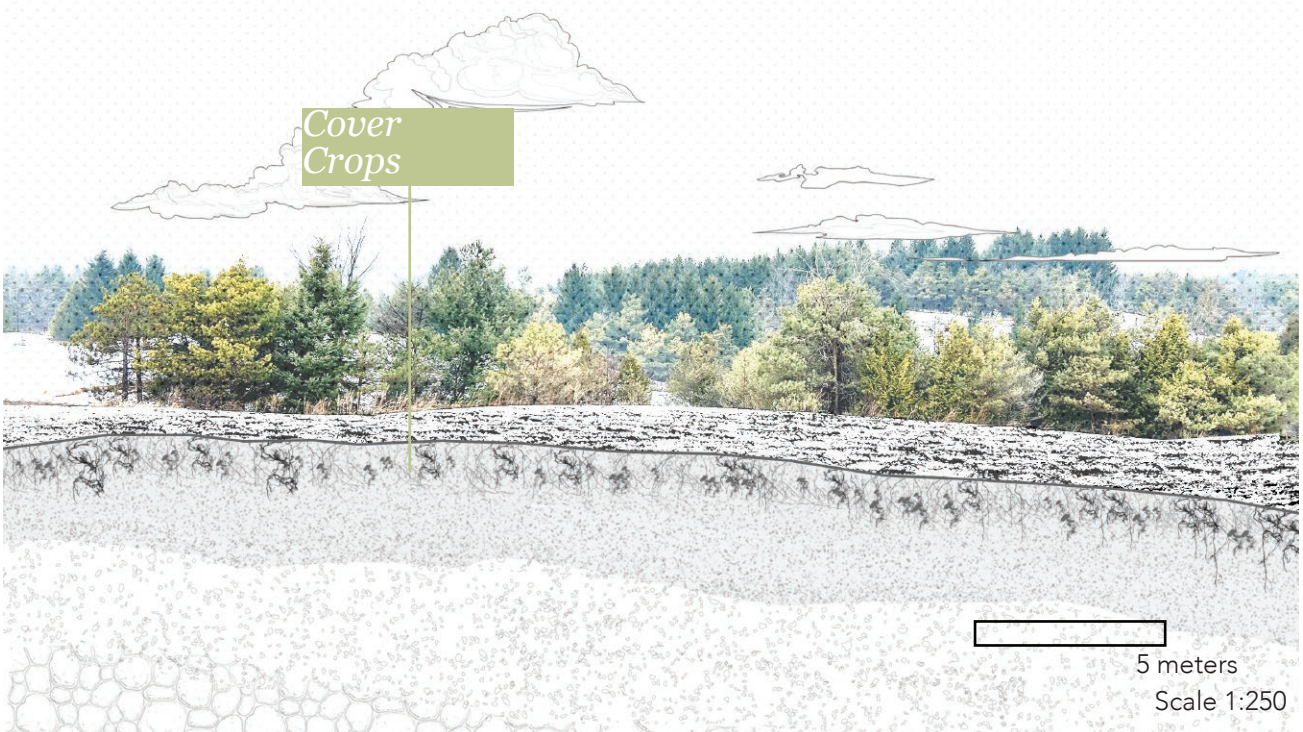


Figure 61 / Crop Rotations Section
Figure 62 / Cover Crops Section

Melville Market

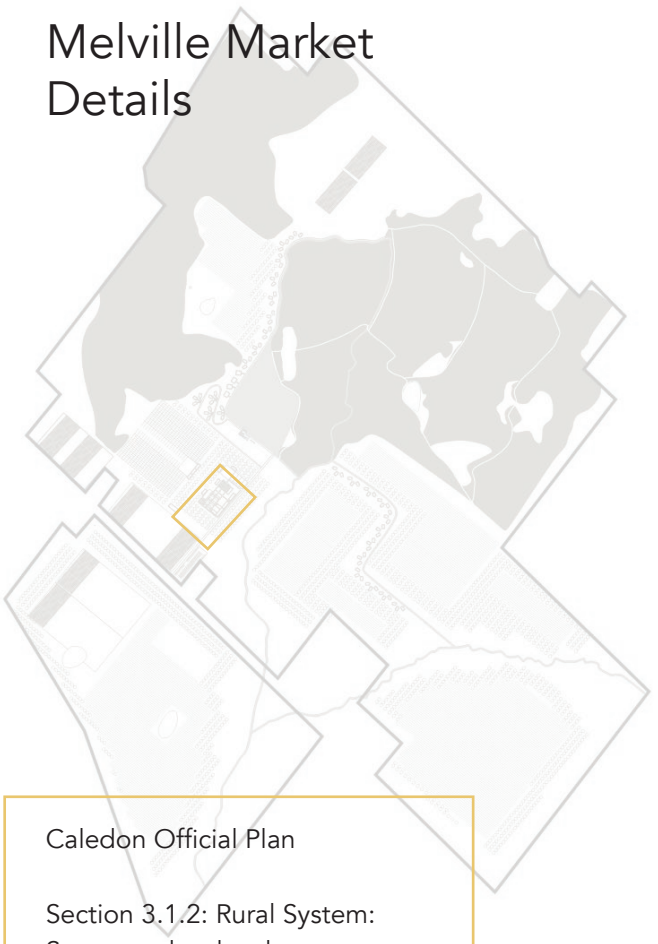
Figure 63 / Melville Market Render

Melville Market Framework

The Melville Market serves as the primary entry point and the heart of the public experience. Melville Market offers a selection of seasonal, organic goods, fosters community connection, and promotes sustainability. It also serves as a destination to support local small businesses and enjoy meaningful experiences rooted in the land. Its architecture is inspired by traditional agricultural buildings found throughout the region, especially barns and gabled farmhouses from Caledon's 19th-century agricultural expansion.

Figure 64 / Melville Market Axonometric Drawings
Figure 65 / Melville Market Framework Plan

Melville Market Details



Caledon Official Plan

Section 3.1.2: Rural System: Supports the development of agri-tourism initiatives that enhance the rural economy. Section 3.1.2: Agriculture and Food Sector: Encourages diversification of the rural economy through value-added agriculture activities.

Ontario Greenbelt Plan

Section 3.1.3: On-Farm Diversified Uses: Permits diversified farm uses, including agri-tourism and retail, to support the viability of agricultural operations.

The Market Framework aligns with the Caledon Official Plan and the Ontario Greenbelt Plan, aligning with regional goals for agri-tourism and on-farm sales to keep agriculture viable. The Market provides a place to buy local goods, serves the food grown on site, and allows the greater community to connect to the land in person.

The detailed plan highlights the approach to the market, where you are surrounded by orchards, gardens, and greenhouses that support food production. These edible landscapes allow visitors to see, touch, and taste the productivity of the land. A farm-to-table café and restaurant establish a direct connection between what is grown and what is served, while sports courts, paddocks, and trails create places for everyone to enjoy.

1. Orchard
2. Green houses
3. Family House
4. Glass Restaurant
5. Flower Garden
6. Vegetable Garden
7. Garden Rooms
8. Paddock
9. Sports Courts
10. Organic Market
11. Farm-to-table cafe
12. Farm-to-table restaurant

Figure 66 / Melville Park Plan
Figure 67 / Melville Market Detail Plan

The renderings show the back of the market, where materials such as steel and cedar, reflect Caledon's rural identity and are chosen to age gracefully. Native pollinator gardens planted with bee balm, new England aster, milkweed, golden rod, and blazing star are planted here for bumblebees, and other pollinator species. Limestone pathways guide visitors through the site, encouraging slow movement and interaction.

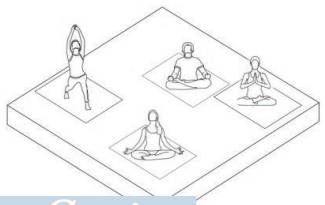
The rendering of the back of the greenhouses highlights how rainwater is captured and stored in a cistern, then reused to irrigate crops within the greenhouse. Beyond its functional role, the system is also designed as an interactive water feature, where collected water can be released into a shallow, playful stream for children and visitors to engage with.

Figure 68 / Melville Market Garden Rooms
Figure 69 / Melville Market Restaurant
Figure 70 / Melville Market Water Feature

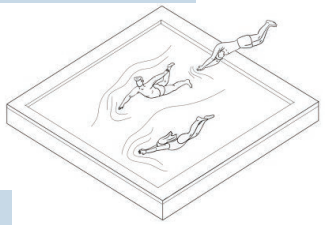
Melville Resort

Figure 71 / Melville Park Resort Render

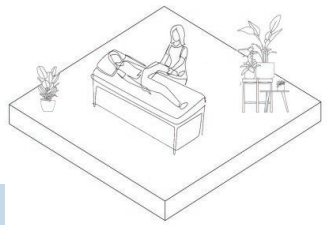
Melville Resort Framework



Active Center



Pool



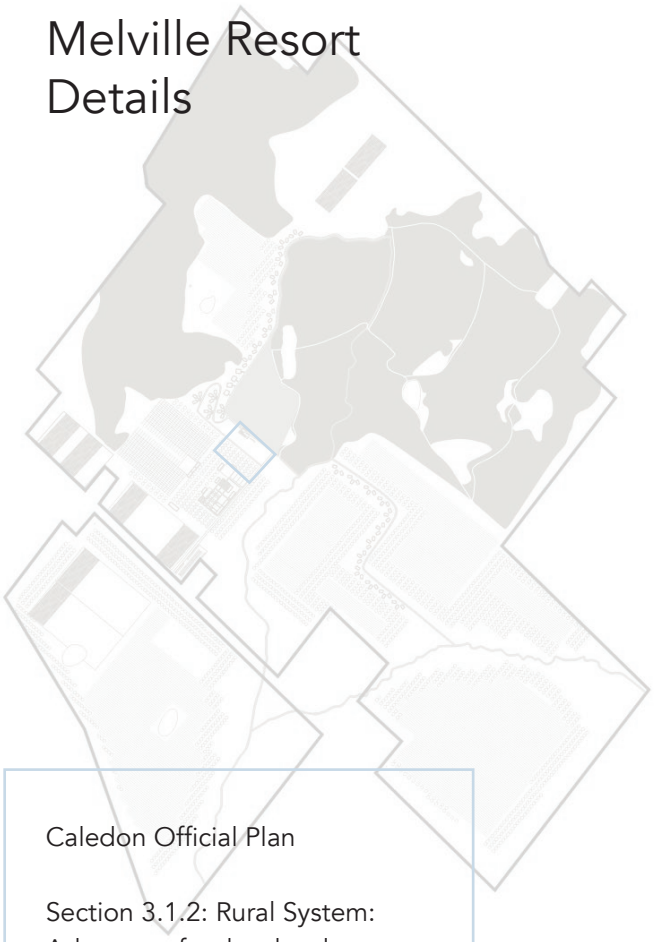
Spa

Water Activities

Next, we have Melville Resort which is nestled between farmland, forest, and water, envisioned as a restorative escape that balances movement, reflection, and wellness. The Resort serves as the park's wellness hub, encouraging both movement and reflection, with a spa, gym, all-season pool, and waterfront activities like canoeing and outdoor yoga.

Figure 72 / Melville Resort Axonometric Drawings
Figure 73 / Melville Resort Framework Plan

Melville Resort Details



Caledon Official Plan

Section 3.1.2: Rural System: Advocates for the development of wellness facilities that contribute to the health of residents and visitors.
Section 3.1.2: Rural System: Encourages tourism developments that showcase and preserve the town's natural and cultural heritage.

Ontario Greenbelt Plan

Section 3.1.3: On-Farm Diversified Uses: Allows for the development of wellness centers that are compatible with the natural features of the area.

The Resort supports regional policies that encourage wellness and eco-tourism by offering facilities that enhance the health and well-being of both residents and visitors. The Resort unfolds through a quiet sequence of spaces: the pool, boardwalk, and lounge area, each designed to feel part of the surrounding land and water. The pool sits within the retention pond, allowing the built form and natural landscape to merge seamlessly. The spa and gym follow the water's edge, keeping every space visually and physically connected to the land and water that provide for Melville Park.

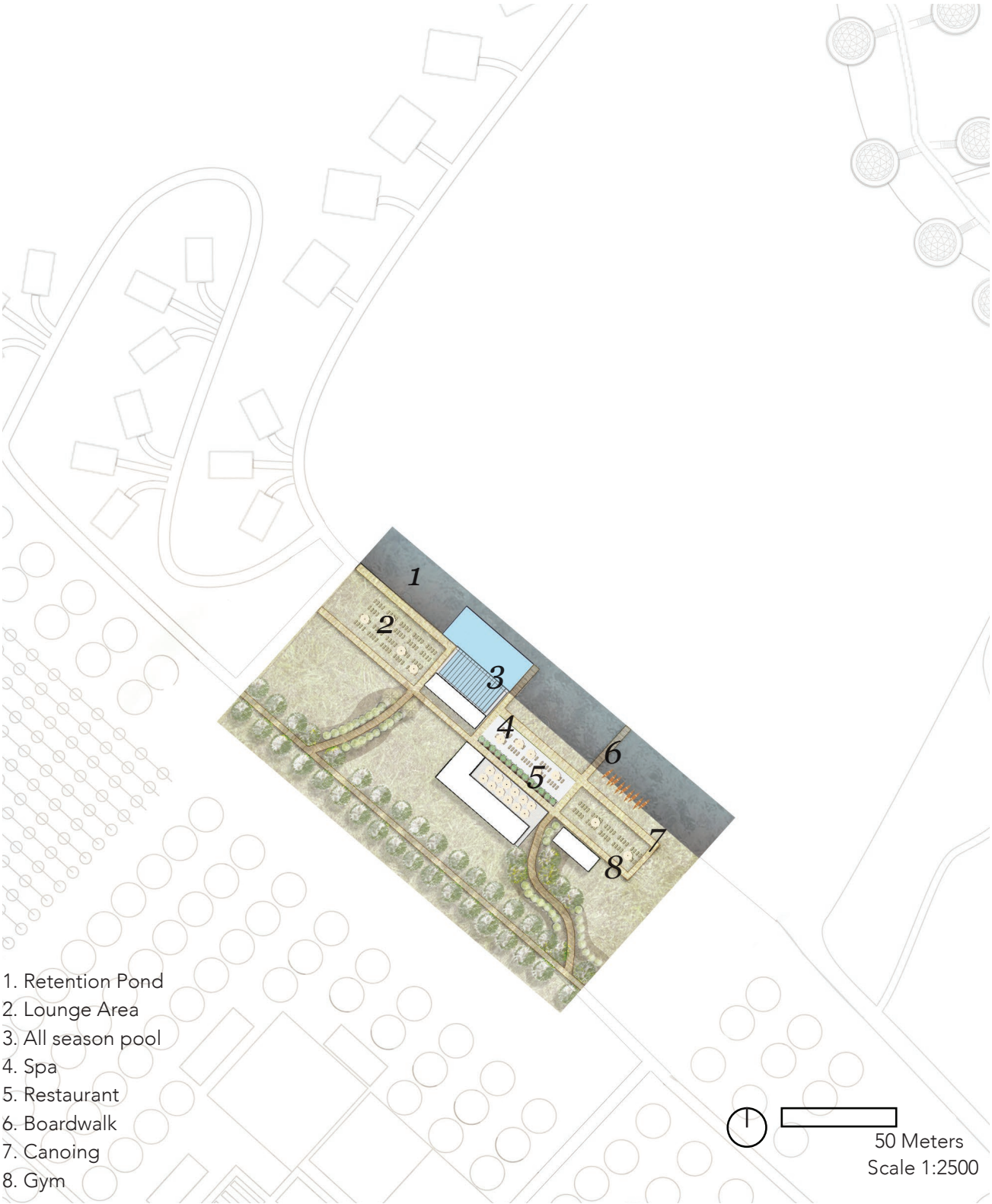


Figure 74 / Melville Park Plan
Figure 75 / Melville Resort Detail Plan

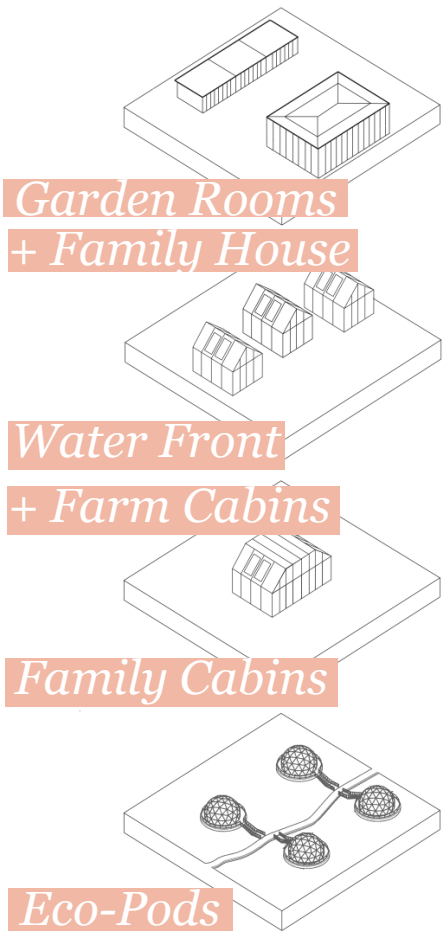
The renders show how planting is used to soften transitions, with native shoreline species like Blue Joint Grass, Tussock Sedge, and Prairie Cordgrass stabilizing the edge of the bank and creating habitat for wildlife. Every design element is positioned to create a view and connection with the land, whether it's a morning swim along the water's edge or a meal shared outdoors. In the winter, the pond turns into a rink where skating, snow shoeing, and sledding take place.

Figure 76 / Melville Resort Retention Pond
Figure 77 / Melville Resort Lounge Area
Figure 78 / Melville Resort Winter

Melville Stay

Figure 79 / Melville Stay Render

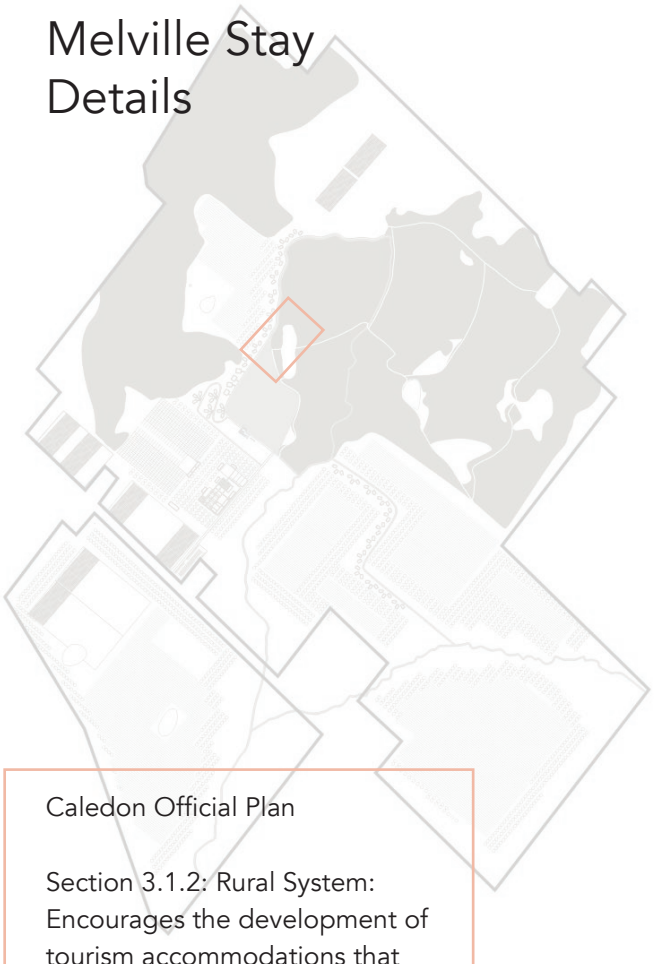
Melville Stay Framework



Melville Stay is the accommodation strategy designed to immerse guests in the landscape. Melville Stay blends comfort with nature, offering thoughtful retreats with low-impact design. It is a restful destination where the environment supports personal wellness, inviting guests to slow down, reconnect, and experience the land with intention.

Figure 80 / Melville Stay Framework Axonometric Drawings
Figure 81 / Melville Stay Framework Plan

Melville Stay Details



Caledon Official Plan

Section 3.1.2: Rural System: Encourages the development of tourism accommodations that respect the natural and rural character.
Section 3.1.2: Rural System: Promotes sustainable development practices, including energy efficiency and conservation.

Ontario Greenbelt Plan

Section 3.1.3: On-Farm Diversified Uses: Supports the establishment of tourism based accommodations that are compatible with the rural landscape.

Melville Stay aligns with both the Caledon and Greenbelt plans, which encourage accommodations that respect the rural character, protect the landscape, and prioritize low-impact, energy-efficient design. Its design preserves natural features, maximizes views, and utilizes solar orientation to maintain harmony with the environment. This detailed plan showcases the eco pods and waterfront cabins. It also shows how accessibility is central to its design. Ramps replace stairs, and a wheelchair-accessible boardwalk connects the eco-pods to the market and spa, ensuring inclusivity for all guests.

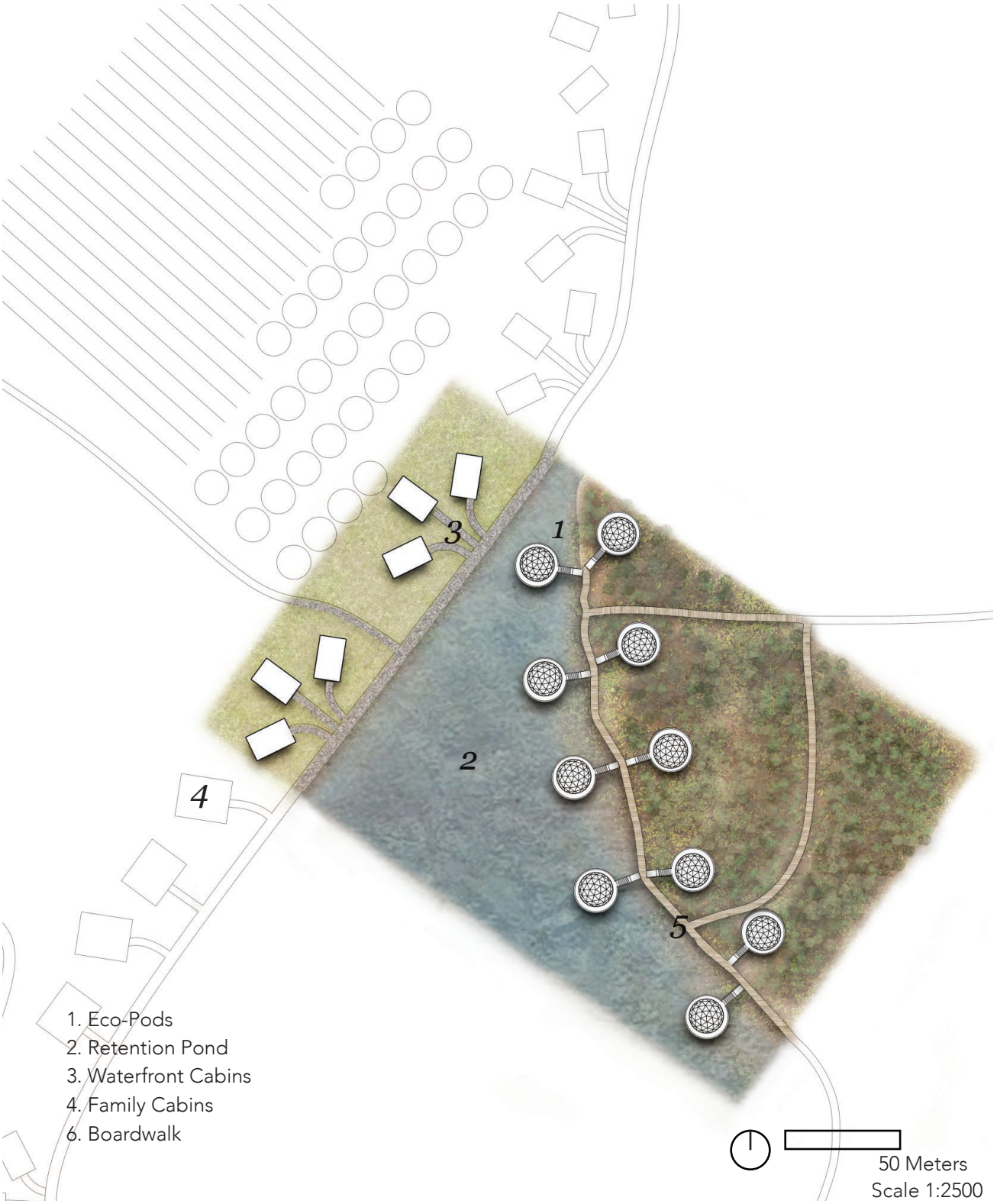


Figure 82 / Melville Park Plan
Figure 83 / Melville Stay Detail Plan

The renderings highlight two of these typologies: the farm rooms, which frame views toward the agricultural fields, and the eco-pods, positioned along the water's edge. Both of these dwellings would be prefabricated off-site using locally sourced, renewable materials and then transported to the park for installation. This approach hopes to minimize construction disturbance, allowing the dwellings to simply rest on the landscape rather than reshape it.

Figure 84 / Melville Stay Eco-Pods
Figure 85 / Melville Stay Farm Cabins
Figure 86 / Melville Park Stay Winter

06 / Echoes

This concluding chapter reflects on the journey of Growing Together, a practicum that reimagines how regenerative agriculture and agritourism can reshape Southern Ontario's rural landscapes. Echoes gathers the insights, lessons, and questions that have emerged throughout the research and design process and reflects on how they can be used to benefit both the climate and the community.

Reflections

This practicum began with my interest in the master's regional studio, where we focused on the International Geodesign Collaboration (IGC).

"The International Geodesign Collaboration (IGC) brings together universities and public, private, and non-profit sector partners, from across the globe, who use GIS to help diverse communities envision, at multiple scales, more sustainable, equitable, and resilient futures for themselves. The IGC focuses on sharing information, mutual learning, and collaborative efforts to enhance the public's understanding of the complex issues that the world now faces.[61]"

Peter Droege and Tom Fisher have shared valuable insights on how to utilize GIS systems to analyze complex challenges such as climate change. They have developed frameworks that rethink regional design and the management of land use. The ultimate goal of IGC is to achieve net-zero emissions globally, creating a basis where designers, policymakers, and politicians can discuss climate change on common ground, establishing a baseline for how various actions and decisions will impact land use. Marcella Eaton introduced this collaboration, along with Doug Olson, who served as a visiting scholar. Throughout the studio, I learned to analyze spatial data, apply it to policies, and present it in a manner that is accessible to the public. This multi-level systems thinking is invaluable knowledge that I will carry into my future endeavors as a landscape architect.

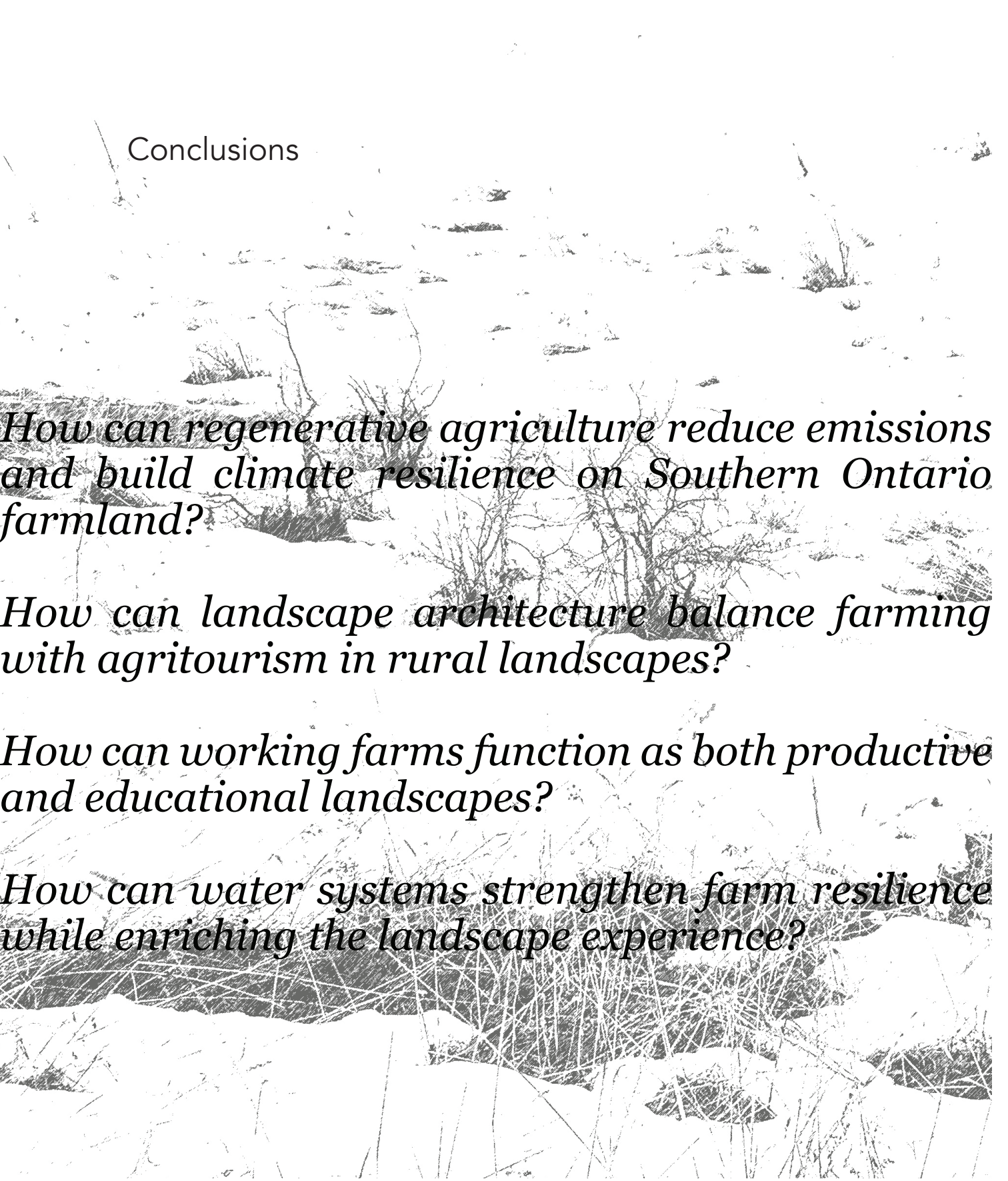
Both Marcella and Doug provided tremendous knowledge and support throughout this studio, which went and informed my inquiries, research, mapping, and design work for this practicum.

61. "IGC Collab," International Geo-design Collaboration, https://www-igcollab.hub.arcgis.com.

Following the international geo-design collaboration, this practicum aimed to explore how one specific land use, agriculture, could adopt practices to achieve net-zero emissions. While agriculture is a highly complex ecological system, it is also profoundly political. This practicum came at a time of shifting trade dynamics and uncertainty, which pushed me to think and question how agriculture can become more economically diverse. In addition to political factors, this practicum is set in Caledon, Ontario, which faces social pressures from the Greater Toronto Area to convert farmland to residential to aid in the growing population.

My objective for this practicum was to illustrate how landscape architecture can bridge all of these issues and propose strategies that are ecologically, economically, and socially beneficial. I aimed to develop a model that addresses these varying demands.

Figure 87 / Melville Park Grass Pen Texture
Figure 88 / Melville Park Land Pen Texture



How can regenerative agriculture reduce emissions and build climate resilience on Southern Ontario farmland?

How can landscape architecture balance farming with agritourism in rural landscapes?

How can working farms function as both productive and educational landscapes?

How can water systems strengthen farm resilience while enriching the landscape experience?

This practicum has found that regenerative agriculture provides an effective strategy for reducing carbon emissions while enhancing long-term climate resilience in Southern Ontario. By focusing on soil health, farmland can become a carbon sink instead of a detrimental source of emissions. Melville Park demonstrates how agricultural can provide food for a growing population, while also creating additional recreational spaces for the community. This multifunctionality is essential for the development of rural communities. It allows farmers to diversify their income through tourism and local food markets, thereby enhancing their economic resilience in the face of climate and trade uncertainty.

This design extends beyond simply adding paths and walkways; it aims to foster a direct relationship between the broader public and their food sources. When people take an interest in where their food comes from, what food is in season, what crops can be cultivated in their region, and how food is processed, it encourages individuals to consider the policies affecting farmland and the importance of protecting agricultural lands. My objective was to design spaces that allow visitors to interact with the land in a way that connects them to the land, fostering a sense of care similar to that of the farmers, thereby supporting regenerative agricultural practices.

Throughout this practicum, water emerged as both a design material and a metaphor for resilience. Located in a region surrounded by the Great Lakes, the site's natural hydrology, ponds, and runoff patterns formed the basis for its spatial organization. A retention pond and streams were designed not only to manage stormwater and enhance agricultural resilience during dry seasons, but also to enrich the sensory experience. The movement of water through the site serves as a narrative thread, revealing ecological processes through sight, sound, and touch. Streams near the cabin areas create moments of calm and awareness, while wetlands perform the task of purifying water. The role of design here is curatorial, transforming the land into a living classroom that illustrates ecological processes through direct experiences.

Ultimately, this practicum demonstrates that regenerative agriculture is not a single technique, but rather a cultural shift towards reciprocity with the land. The role of landscape architecture is to interpret and translate these values into spatial form. The Melville Park proposal demonstrates how a working farm can evolve into a regenerative landscape that produces food, sequesters carbon, nurtures biodiversity, and fosters meaningful connections with the land.

The echo of this work is an invitation, to see farmland not as a static commodity, but as a living landscape with capacity and potential to regenerate the land, the values, and the people around it.

Figure 89 / Melville Park Land Pen Texture

Figure List

Photographs and drawings have all been produced by the author, unless otherwise stated. All copyright has been obtained, where required, Permission to use personal photographs has been granted and credit has been given, where required.

Figure 14.
Regenerative agriculture principles and practices.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 15.
Carbon sequestration diagram.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 16.
Regenerative agriculture diagram.
Graphic created by the author using data from Khangura et al. (2023).

Figure 17.
Southern Ontario ecological regions.
Map created by the author using ArcGIS Pro with data from the Oak Ridges Moraine Conservation Plan, Greenbelt Plan, Niagara Escarpment Plan, and Credit Valley Conservation Authority, 2025.

Figure 18.
Credit Valley land use.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Land Use dataset).

Figure 19.
Melville topography.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 20.
1:1,700,000 satellite image.
Map created by the author using ArcGIS Pro with basemap imagery from Esri (World Imagery).

Figure 21.
Southern Ontario ecological regions.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Credit River Watershed and tertiary watersheds), the Niagara Escarpment, Oak Ridges Moraine, Greenbelt, Ontario rivers, and Ontario lakes, 2025.

Figure 22.
Niagara Escarpment diagram.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 23.
Oak Ridges Moraine diagram.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 24.
1:300,000 satellite image.
Map created by the author using ArcGIS Pro with basemap imagery from Esri (World Imagery).

Figure 25.
Credit River Watershed.
Map created by the author using data from Credit Valley Conservation and the Ontario Road Network, edited in Adobe Photoshop, 2025.

Figure 26.
Melville site surrounding context.
Map created by the author using data from Credit Valley Conservation and the Ontario Road Network, edited in Adobe Photoshop, 2025.

Figure 27.
Credit Valley intensive agriculture.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Intensive Agriculture dataset).

Figure 28.
Credit Valley non-intensive agriculture.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Non-Intensive Agriculture dataset).

Figure 29.
Credit Valley wetlands.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Wetlands dataset).

Figure 30.
Credit Valley forests.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Forests dataset).

Figure 31.
Credit Valley land use.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Land Use, Wetlands, Watercourses, Woodlands, Valleylands, and Intensive Agriculture layers) and Ontario Open Data (Lake Ontario Contours and Lake Ontario Shorelines).

Figure 32.
Credit Valley water system.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Wellhead Protection Areas, Drinking Water Intakes, Water Treatment Plants, Drinking Water Wells, Significant Groundwater Recharge Areas, and Highly Vulnerable Aquifers) and Ontario Open Data (Lake Ontario Contours).

Figure 33.
Methane (CH4).
Map created by the author using data from the S5P-PAL Mapping Portal (CH4 dataset).

Figure 34.
Nitrogen dioxide (NO2).
Map created by the author using data from the S5P-PAL Mapping Portal (NO2 Tropospheric dataset).

Figure 35.
Carbon monoxide (CO).
Map created by the author using data from the S5P-PAL Mapping Portal (CO dataset).

Figure 36.
Solar-induced fluorescence (SIF).
Map created by the author using data from the S5P-PAL Mapping Portal (SIF dataset).

Figure 37.
Sentinel-5P data map.
Map created by the author using data from the S5P-PAL Mapping Portal (CH4, NO2 Tropospheric, CO, and SIF datasets).

Figure 38.
Credit Valley soil classes.
Map created by the author using ArcGIS Pro with data from Credit Valley Conservation (Soil Classes dataset).

Figure 39.
1:20,000 satellite image.
Map created by the author using ArcGIS Pro with basemap imagery from Esri (World Imagery).

Figure 40.
Melville Park topography sections.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 41.
1:20,000 Melville Park diagram.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 42.
Longridge Melville Park site plan.
Base plan provided by Longridge Partners for the Melville Park Design Competition, 2025.

Figure 43.
Longridge Doug Carrick golf course plan.
Plan provided by Longridge Partners for the Melville Park Design Competition, 2025.

Figure 44.
Longridge competition entry.
Graphics created by the author using Adobe Photoshop, 2025.

Figure 45.
Melville Park approach.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 46.
Melville Park forest edge.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 47.
Melville Park forest.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 48.
Melville Park farmland and forest.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 49.
Melville Park farmland.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 50.
Melville Park farmland edge.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 51.
Melville Park abandoned entryway.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 52.
Melville Park wetland.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 53.
Melville Park undulating topography.
Photograph taken by the author in Caledon, Ontario, April 2025.

Figure 54.
Melville Park design site plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 55.
Melville Park design framework.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 56.
Melville Park regenerative agriculture render.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 57.
Regenerative agriculture framework axonometric drawings.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 58.
Regenerative agriculture framework plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 59.
Solar fields section.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 60.
Rotational grazing section.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 61.
Crop rotations section.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 62.
Cover crops section.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 63.
Melville Market render.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 64.
Melville Market axonometric drawings.
Graphic created by the author using Adobe Photoshop, 2025.
Figure 65.

Melville Market framework plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 66.
Melville Park plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 67.
Melville Market detail plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 68.
Melville Market garden rooms.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 69.
Melville Market restaurant.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 70.
Melville Market water feature.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 71.
Melville Park Resort render.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 72.
Melville Resort axonometric drawings.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 73.
Melville Resort framework plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 74.
Melville Park plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 75.
Melville Resort detail plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 76.
Melville Resort retention pond.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 77.
Melville Resort lounge area.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 78.
Melville Park Resort Winter.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 79.
Melville Stay render.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 80.
Melville Stay framework axonometric drawings.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 81.
Melville Stay framework plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 82.
Melville Park plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 83.
Melville Stay detail plan.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 84.
Melville Stay eco-pods.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 85.
Melville Stay farm cabins.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 86.
Melville Park Stay Winter.
Graphic created by the author using Rhinoceros 3D, Lumion Rendering Software, and Adobe Photoshop, 2025.

Figure 87.
Melville Park grass pen texture.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 88.
Melville Park land pen texture.
Graphic created by the author using Adobe Photoshop, 2025.

Figure 89.
Melville Park land pen texture.
Graphic created by the author using Adobe Photoshop, 2025.

Metadata

ESRI Geographic Information Systems.
ArcGIS Pro (Version 3.2.1.) Software 2025.

Ecological Land Classification and Land Use

Name: Credit Valley Conservation (CVC) – Ecological Land Classification (ELC) and Land Use (2025)
Provider: Credit Valley Conservation (CVC).
Geospatial Data Presentation Form: Polygon features
Description: Polygon dataset covering the Credit River watershed and surrounding area. It combines Ecological Land Classification for Southern Ontario with CVC's rural and urban land-use classes to map land cover, natural areas, and anthropogenic land uses across the jurisdiction.
Abstract: This is the ecological land classification and land use dataset that overlaps the Credit Valley Conservation (CVC) jurisdiction. The polygon delineation is based on a spring 2023 orthophoto (15 centimetre ground resolution).This dataset includes field work conducted up to the year 2024.
Dataset Attributes: Land use, Intensive and non-intensive agriculture, Forests and wetlands
Coordinate System: NAD 1983 UTM Zone 17N
Online Linkage: https://cvc-camaps.opendata.arcgis.com/datasets/camaps::ecological-land-classification-elc-and-land-use-2025/about

Credit River Watershed and Sub-Watersheds

Name: Credit Valley Conservation – Credit River Watershed and Sub-Watersheds
Provider: Credit Valley Conservation (CVC).
Title: Credit River Watershed vector tile layer and Subwatershed (tertiary).
Geospatial Data Presentation Form: Polygon features
Description: Polygon datasets delineating the Credit River watershed boundary and its subwatersheds.
Coordinate System: NAD 1983 UTM Zone 17N
Online Linkage: https://cvc-camaps.opendata.arcgis.com/maps/83f0162b485a4121bd0b8a878892e55a/explore

Source Water Protection Layers

Name: Credit Valley Conservation (CVC) / Source Water Protection program
Provider: Credit Valley Conservation (CVC).
Title: Source water protection layers
Geospatial Data Presentation Form: Point feature and Polygon features
Description: Datasets prepared under Ontario's Clean Water Act to identify vulnerable source-water areas, municipal water supply infrastructure, and groundwater recharge/aquifer vulnerability.
Abstract: This dataset displays municipal drinking water systems in the Credit Valley Source Protection Area (CVSPA) that serve residences.
Dataset Attributes: Wellhead Protection Areas (WHPAs). Drinking Water Intakes and Intake Protection Zones. Water Treatment Plants. Municipal Drinking Water Wells. Significant Groundwater Recharge Areas (SGRAs). Highly Vulnerable Aquifers (HVAs).
Coordinate System: NAD 1983 UTM Zone 17N
Online Linkage: https://cvc-camaps.opendata.arcgis.com/maps/6281915f89484382aa1a1223696dcea6/explore

Credit River Watershed Soil Classes

Name: Soil Classes
Provider: Credit Valley Conservation (CVC).
Geospatial Data Presentation Form: Polygon features
Description: Polygon dataset classifying soils within the Credit River watershed into soil groups or capability classes.
Coordinate System: NAD 1983 UTM Zone 17N
Online Linkage: https://cvc-camaps.opendata.arcgis.com/maps/328a668e255548e28f1df810121686ad/explore

Oak Ridges Moraine Plan

Name: Oak Ridges Moraine Conservation Plan mapping
Provider: Government of Canada
Geospatial Data Presentation Form: Vector
Description: Vector boundary and designation data for the Oak Ridges Moraine Conservation Plan area
Coordinate System: NAD 1983 UTM Zone 17N
Online Linkage: https://search.open.canada.ca/openmap/a9a08f4f-d554-40d9-b347-f83e0629dcf9

Green Belt Plan

Name: Greenbelt Outer Boundary
Provider: Ontario GeoHub
Geospatial Data Presentation Form: Geometry attribute.
Description: Polygon dataset delineating the Greenbelt Plan area and specialty crop areas, used to apply Greenbelt land-use policies in the Greater Golden Horseshoe.
Online Linkage: https://geohub.lio.gov.on.ca/datasets/lio::greenbelt-outer-boundary/about

Niagara Escarpment Plan

Name: Niagara Escarpment Plan Boundary
Provider: Ontario GeoHub
Geospatial Data Presentation Form: Spatial Multi-Non-Tessellating-Polygon
Description: Polygon dataset for the Niagara Escarpment Plan Area, Canada's first large-scale environmental land-use plan, used to regulate development and protect the escarpment landscape.
Online Linkage: https://geohub.lio.gov.on.ca/datasets/lio::niagara-escarpment-plan-boundary/about

Ontario Road Network

Name: Ontario Road Network (ORN) Road Net Element
Provider: Ontario Ministry of Natural Resources and Forestry - Provincial Mapping Unit
Geospatial Data Presentation Form: Line features
Description: The ORN is a provincewide geographic database of over 250,000 kilometres of municipal roads, provincial highways, and resource and recreational roads. The ORN is the source of roads data for the Government of Ontario.
Online Linkage: https://geohub.lio.gov.on.ca/datasets/mnrf::ontario-road-network-orn-road-net-element/about

Ontario Hydro Network

Name: Ontario Hydro Network (OHN) - Waterbody
Provider: Ontario Ministry of Natural Resources and Forestry - Provincial Mapping Unit
Geospatial Data Presentation Form: Line features
Description: OHN products provide authoritative hydrographic features (waterbodies, rivers, shorelines for Ontario. Lake Ontario bathymetric layers provide depth contours and elevation models derived from Great Lakes bathymetry surveys.
Dataset Attributes: Waterbody: lakes, reservoirs, ponds. Watercourse/Shoreline: rivers, shorelines. Lake Ontario Topo Bathymetric Digital Elevation Model / Bathymetric Contours.
Online Linkage: https://geohub.lio.gov.on.ca/datasets/22bab3c9f37a4dd0845eb89e7b247a9f_25/explore

World Imagery Basemap

Provider: Esri, ArcGIS Living Atlas of the World.
Title: World Imagery
Description: Global satellite and aerial imagery basemap providing ~1 m or better resolution in many areas and lower-resolution coverage worldwide. Used as background imagery and as a source for digitizing reference features.

Copernicus Sentinel-5P Mapping Portal

Provider: S5P-PAL (Sentinel-5P Product Algorithm Laboratory)
Title: World Imagery
Geospatial Data Presentation Form: Global gridded rasters
Description: Level-3 global gridded maps of atmospheric composition variables derived from Sentinel-5P Level-2 products, resampled to regular latitude-longitude grids and served as Web tile maps.
Dataset Attributes: Methane (CH4) – Total Column maps. Nitrogen Dioxide (NO2) – Tropospheric Column maps. Carbon Monoxide (CO) – Total Column maps. Solar-Induced Fluorescence (SIF) – SIF products mapped to global grids.
Online Linkage: https://maps.s5p-pal.com/no2-tropospheric/

Bibliography

Ashworth Hailey, Karen Finney, Kyle Menken, and Amna Tariq. "CVC Watershed Plan Characterization Report Chapter 9: Water Resource Management." Credit Valley Conservation, 2025. https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter9_WaterResourceManagement_f_20250522_pa.pdf

Ashworth Hailey, and Yvette Roy. "CVC Watershed Plan Characterization Report Chapter 6: Physical Geography." Credit Valley Conservation, 2025. https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter6_PhysicalGeography_f_20250522_pa.pdf

Badior, Shanice, Kata Bavrlic, and Ray Tufgar. "CVC Watershed Plan Characterization Report Chapter 1: Introduction" Credit Valley Conservation, 2025. https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter1_Introduction_f_20250522_pa.pdf

Ballah, Adam, and Adam Ballah. "Ontario's Bluebelt." Simcoe County Greenbelt Coalition, August 23, 2024. https://simcoecountygreenbelt.ca/ontarios-bluebelt/.

Bavrlic, Kata, and Tim Kuntz. "CVC Watershed Plan Characterization Report Chapter 5: Climate and Climate Change." Credit Valley Conservation, 2025. https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter5_ClimateAndClimateChange_f_20250522_pa.pdf

Caldwell, Wayne, Sara Epp, Xiaoyuan Wan, Rachel Singer, Emma Drake, and Emily C. Sousa. "Farmland Preservation and Urban Expansion: Case Study of Southern Ontario, Canada." Frontiers in Sustainable Food Systems 6 (February 18, 2022). https://doi.org/10.3389/fsufs.2022.777816.

Chen, Zong Jia. "Ontario Is an Agricultural Powerhouse That Leads in Many Farming Categories." Statistics Canada, June 15, 2022. https://www150.statcan.gc.ca/n1/pub/96-325-x/2021001/article/00006-eng.htm

"CLI Agriculture Classification." Government of Canada, May 31, 2013. https://sis.agr.gc.ca/cansis/nsdb/cli/classdesc.html

"ECCC Data Catalogue ." ECCC Data Catalogue . Accessed October 3, 2025. https://data-donnees.az.ec.gc.ca/data/substances/monitor/canada-s-official-greenhouse-gas-inventory/B-Economic-Sector?lang=en

"Greenbelt Plan 2017." Government of Ontario, May 2017. https://files.ontario.ca/greenbelt-plan-2017-en.pdf

Jamil, Uzair, Abigail Bonnington, and Joshua M. Pearce. 2023. "The Agrivoltaic Potential of Canada" Sustainability 15, no. 4: 3228. https://doi.org/10.3390/su15043228

Khangura, Ravjit, David Ferris, Cameron Wagg, and Jamie Bowyer. "Regenerative Agriculture—a Literature Review on the Practices and Mechanisms Used to Improve Soil Health." Sustainability 15, no. 3 (January 27, 2023): 2338. https://www.mdpi.com/2071-1050/15/3/2338

"Land Use, Census of Agriculture Historical Data." Land use, Census of Agriculture historical data, May 11, 2022. https://doi.org/10.25318/3210015301-eng

Montgomery, David R. Growing a revolution: Bringing our soil back to life. New York: W.W. Norton & Company, 2018.

Moyer, Jeff, Andrew Smith, Yichao Ru, and Jennifer Hayden. "Regenerative Agriculture and the Soil Carbon Solution." Rodale Institue, September 2020. https://rodaleinstitute.org/wp-content/uploads/Rodale-Soil-Carbon-White-Paper_v11-compressed.pd

"New Horizons: Ontario's Agricultural Soil Health and Conservation Strategy." ontario.ca, April 10, 2025. https://www.ontario.ca/files/2024-04/omafra-new-horizons-ontarios-agricultural-soil-health-and-conservation-strategy-en-2024-04-04.pdf

"Niagara Escarpment - Geoscape Toronto." Canadian Geoscience Education Network. Accessed October 4, 2025. https://www.cgenarchive.org/uploads/2/5/2/6/25269392/escarp_activ3_e.pdf

"Ontario Agri-Food Trade by Region." Ontario agri-food trade by region - Dataset - Ontario Data Catalogue. Accessed October 2, 2025. https://www.ontario.ca/page/published-plans-and-annual-reports-2024-2025-ministry-agriculture-food-and-rural-affairs.

"Ontario Provincial Climate Change Impact Assessment : Technical Report." PO Store, January 2023. https://www.ontario.ca/files/2023-11/mecp-ontario-provincial-climate-change-impact-assessment-en-2023-11-21.pdf

Pratt, Lindsay. "National Inventory Report 1990–2020: Greenhouse Gas Sources and Sinks in Canada." United Nations Climate Change, April 2022. https://unfccc.int/documents/461919

"Published Plans and Annual Reports 2024–2025: Ministry of Agriculture, Food and Rural Affairs." Ontario.ca, April 23, 2025. https://www.ontario.ca/page/published-plans-and-annual-reports-2024-2025-ministry-agriculture-food-and-rural-affairs

Roy, Yvette. "CVC Watershed Plan Characterization Report Chapter 7b: Anthropogenic Land Use." Credit Valley Conservation, 2025. https://files.cvc.ca/cvc/uploads/2025/05/rpt_Chapter7b_AnthropogenicLandUse_f_20250522_pa.pdf

Sharpe, D.R., L.D. Dyke, M.J. Hinton, and S.E. Pullan. "Groundwater Prospects in the Oak Ridges Moraine Area, Southern Ontario: Application at Regional Geological Models." Tole, Lise. "Changes in the Built vs. Non-Built Environment in a Rapidly Urbanizing Region: A Case Study of the Greater Toronto Area." Computers, Environment and Urban Systems 32, no. 5 (September 2008): 355–64. https://doi.org/10.1016/j.compenvurbsys.2008.08.002.

Oakridges Moraine Hydrogeology Project. Accessed October 4, 2025. https://www.sfu.ca/geog/paleoglaciology/pubs_files/_Sharpeetal_96_GroundwaterProspects_GSC-CR.pdf

Wit, Saskia de. Hidden landscapes: The metropolitan garden as a multi-sensory expression of place. Amsterdam: Architectura & Natura, 2018.

Jeremy Simes, "'Everything Is Dying': Prairie Farmers, Crops Struggling with Yearly Droughts," CityNews Toronto, July 6, 2025, https://toronto.citynews.ca/2025/07/06/everything-is-dying-prairie-farmers-crops-struggling-with-yearly-droughts/

CBC News, "Extreme Weather, Climate and Agriculture in Manitoba," CBC News, accessed November 3, 2025, https://www.cbc.ca/news/canada/manitoba/extreme-weather-climate-agriculture-1.7200925

"Ontario Growers Seek Support after Losses from Floods," FreshPlaza, August 15, 2017, https://www.freshplaza.com/north-america/article/2179768/ontario-growers-seek-support-after-losses-from-floods/

Michelle Dorey Forestell, "Failing Fields, Dry Wells: Eastern Ontario's Summer of Drought," CFRC News, August 2025, https://cfrc.ca/news-events/news/2025/august/failing-fields-dry-wells-eastern-ontario-s-summer-of-drought