

Citizen Scientists Explore the Roots of Soil Health



A.D. Latornell Conservation Symposium

November 20, 2019

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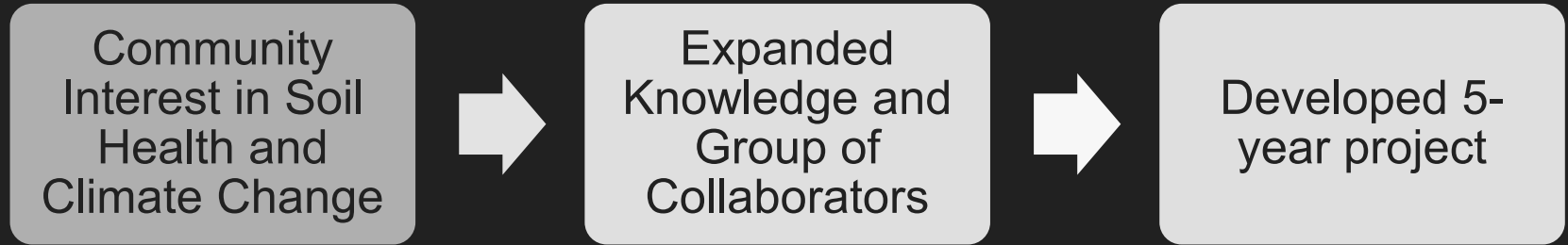
**Soil
Health
Coalition**

OUTLINE

- Project Background: Soil Health Coalition of Erin
- Citizen Scientist Design
- Concluding Thoughts: Our Experience with Citizen Scientists

Soil Health Coalition

IN THE BEGINNING - 2016

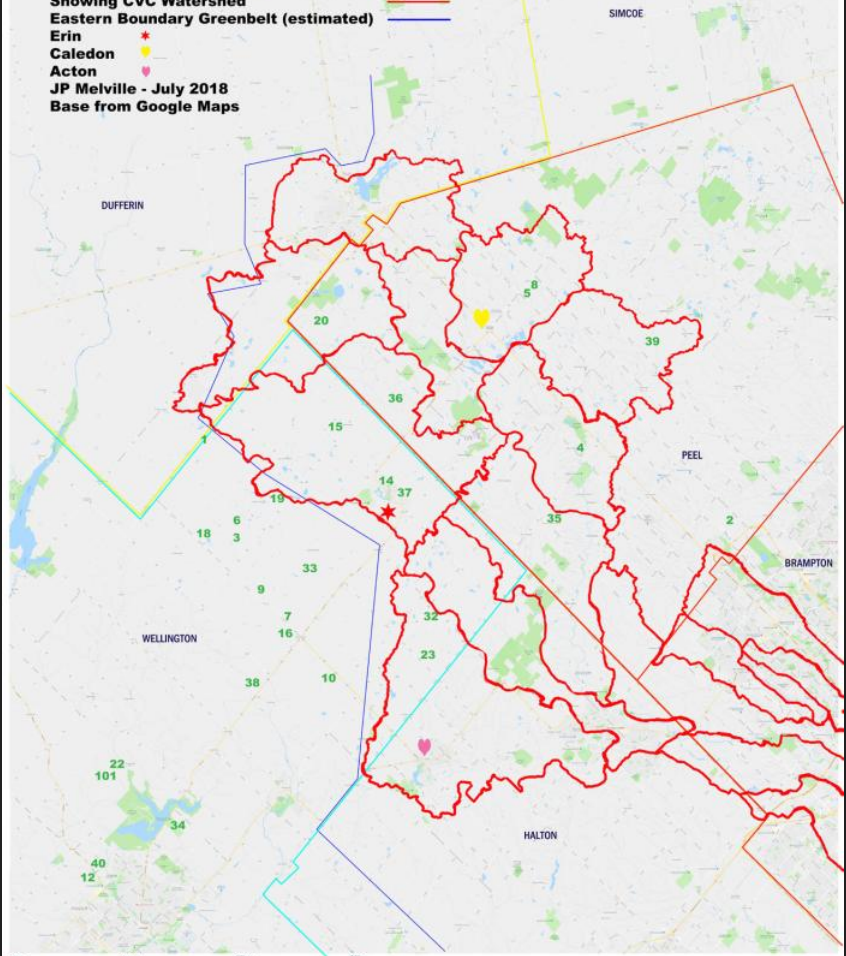


Soil Health Coalition

Map Soil Health Coalition - Erin Chapter - Test Sites ONLY
Showing CVC Watershed
Eastern Boundary Greenbelt (estimated)

- Erin ★
- Caledon ★
- Acton ★

JP Melville - July 2018
Base from Google Maps



Scale is approximate

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GOAL

To engage the community in the learning, understanding and practice of soil health building principles for long-term improvements to soil quality, hydrologic function and carbon sequestration.

Soil Health Building Principles

- Keep it Covered
- Minimize Disturbance
- Plant Diversity
- Maximize Live Roots
- Integrate Livestock



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FIVE OBJECTIVES

1. Acquire outcome metrics from soil and water infiltration measurements
2. Support peer-to-peer shared learning with a focus on the impacts of management decisions for improving soil health and addressing climate change
3. Culture citizen scientists to assist with data collection and serve as community ambassadors for soil health within the community
4. Engage broader community participation to support farmers and land managers and to build connections across the community
5. Develop evaluation techniques for measuring impact of the metrics and peer-to-peer learning on behaviour change and adaptive management for soil health.

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CORE VALUES

- Active listening and sharing
- Accept everyone where they are at
- No system or tool is better than another
- Food connects community and food choices impact the landscape
- Connection to the land with hands-on learning is lasting

Soil Health Coalition

COMMUNICATIONS

www.soilhealthcoalition.ca, twitter, facebook, e-newsletter

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Soil Health Coalition

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Events

News

Videos

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Field Data

Core Login

Erin Chapter

Helping restore soil and improve water quality

JOIN NOW



EVENTS

- 15 events
- 541 participants



COMMUNITY ACTION, CLIMATE CHANGE and SOIL HEALTH

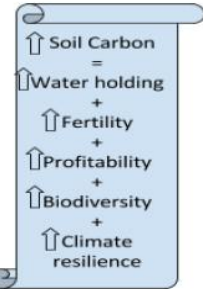
Erin's Soil Carbon Challenge

A Farmer-led pilot project to measure and build soil carbon



Farmers Can Make a Difference!

You're Invited...



WHAT: Local Farmer Forum

WHEN: Thurs., March 23 - 10am-3pm
Coffee and Registration at 9:30am

WHERE: Hillsburgh Baptist Church
21 Trafalgar Road in Hillsburgh

COST: Free, register by Mon, March 20
Hot, locally sourced lunch included

Facilitators: Agronomist Ruth Knight and *Soil Carbon Coalition* co-Founder, Peter Donovan



Possibility grows here.

"Unleash the potential to recover CARBON from the atmosphere & return it to our SOIL through innovative land management practices"

To Register: [Eventbrite: Erin's Soil Carbon Challenge](#)

Other contacts : soilregen@gmail.com, or Val 519-833-0712

*Project supporters: Town of Erin, Friends of the Greenbelt Foundation, Organic Consultant, Inc., Ecological Farmers Association of Ontario, Transition Erin, Climate Change Action Group of Erin, Citizens Climate Lobby (Erin)
Credit Valley Conservation, Grand River Conservation

SOIL SAMPLING AND WATER INFILTRATION

25 farms sampled, 1 old growth forest, 1 golf course, 1 school



Unmanaged Area

Managed Area

Total C, Inorganic C,
Organic C, O.M. &
Part. Size Dist.

Water
Infiltration

Bulk
Density



Example 1: Sample Site Data Package

SOIL HEALTH COALITION ERIN SOIL AND WATER METRIC REPORT -SOIL CARBON, ORGANIC MATTER AND PARTICLE DISTRIBUTION

Soil Bulk Density, Carbon & Organic Matter						
21	DEPTH	Bulk Density	Carbon Package			Organic Matter
		g/cm ³	TC % dry	IC % dry	OC % dry	Organic Matter % dry
Disturbed	M15	1.33	2.75	0.154	2.60	4.6
Managed	M30	1.51	1.43	0.0880	1.35	2.4
UN Disturbed	UM15	0.77	3.76	0.0550	3.71	6.7
UN Managed	UM30	0.96	2.91	0.0520	2.86	4.9

Particle Size Distribution											
21	DEPTH	Gravel	Sand	Very Fine Sand	Fine Sand	Medium Sand	Coarse Sand	Very Coarse Sand	Silt	Clay	Texture
		%	%	%	%	%	%	%	%	%	
Disturbed	M15	0.6	43.8	19.7	15.5	5.3	1.9	1.4	40.8	15.4	Loam
Managed	M30	0.6	46.0	20.2	17.9	5.3	1.7	0.9	37.7	16.3	Loam
UN Disturbed	UM15	0.0	41.0	20.1	14.0	4.8	1.7	0.5	41.9	17.1	Loam
UN Managed	UM30	0.8	41.7	21.4	13.6	4.0	1.6	1.1	43.5	14.8	Loam

SOIL HEALTH COALITION ERIN SOIL AND WATER METRIC REPORT - WATER INFILTRATION

Water Infiltration at Each Site in Disturbed and Undisturbed Areas
Using 3 pours of water in 3 separate rings each pour is 473 ml

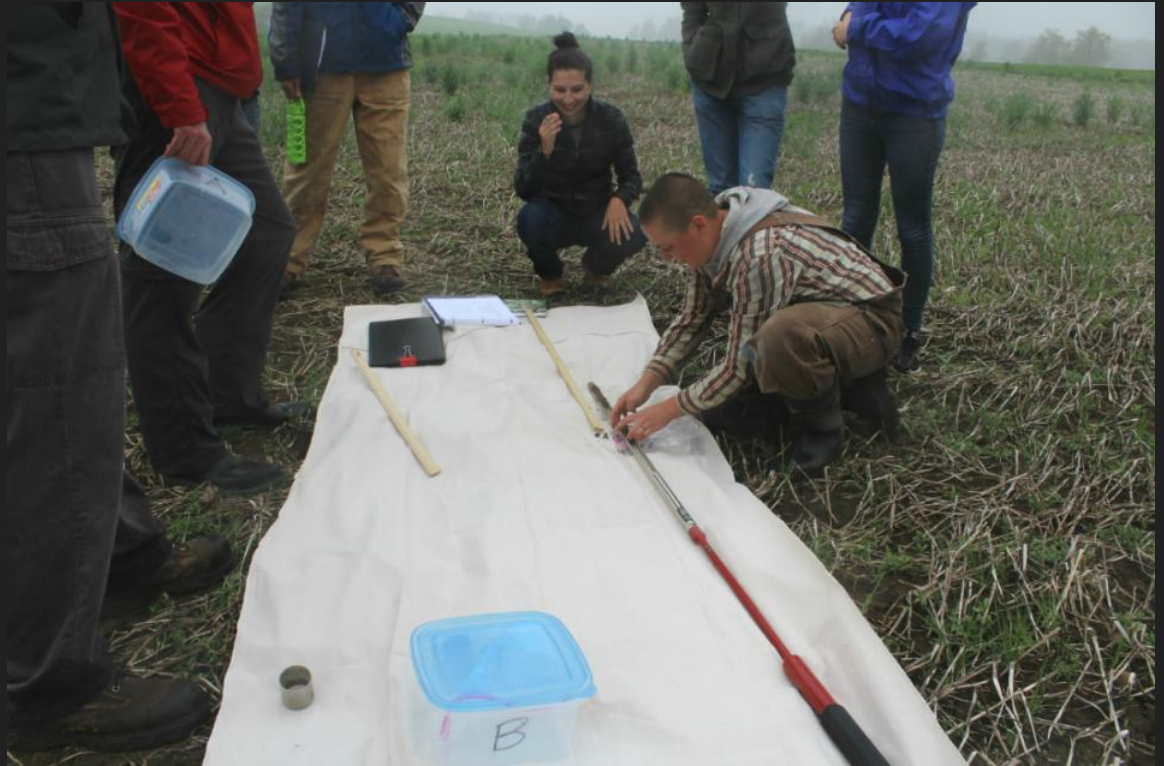
21	Time Recorded for Individual Pours									Total time for Each Ring		
	Elapased Time RING 1			Elapased Time RING 2			Elapased Time RING 3			Total Time		
	Pour 1	Pour 2	Pour 3	Pour 1	Pour 2	Pour 3	Pour 1	Pour 2	Pour 3	RING 1	RING 2	RING 3
Disturbed Managed	0:09:44	0:31:20	0:36:54	0:03:24	0:17:36	0:20:15	0:18:56	#	#	1:17:58	0:41:15	
UN Disturbed UN Managed	0:00:27	0:00:34	0:00:45	0:00:16	0:00:29	0:01:07	0:00:23	0:00:42	0:00:52	0:01:46	0:01:52	0:01:57

Above you will see each pour for each ring has been recorded. The individual times are important however the time for all 3 pours combined offer more ease for comparing managed areas versus unmanaged areas. Generally in the field we found infiltration faster in the unmanaged areas. # Where time exceeded 1 hour the measurement was abandoned.

- * **Step 1** Using the Total Time - Compare the Managed to UnManaged Times
- ** **Step 2** Using the Total Time - Compare the variability between the 3 rings of the Managed versus UnManaged areas.
- *****Step 3** Compare the soil types for the Managed versus UnManaged areas and they are generally well matched. And for the whole 28 sites the soil type is generally sandy- sandy loam

CITIZEN SCIENTIST DESIGN

- Recruitment
- Training
- Retention
- Leadership



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CULTURING FUTURE CITIZEN SCIENTISTS

Erin Public School
Soil Health Workshop











Soil Health Coalition

Juke Bike



STORIES FROM CITIZEN SCIENTISTS



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MagnaSpread

2 Premier

⚠ DANGER



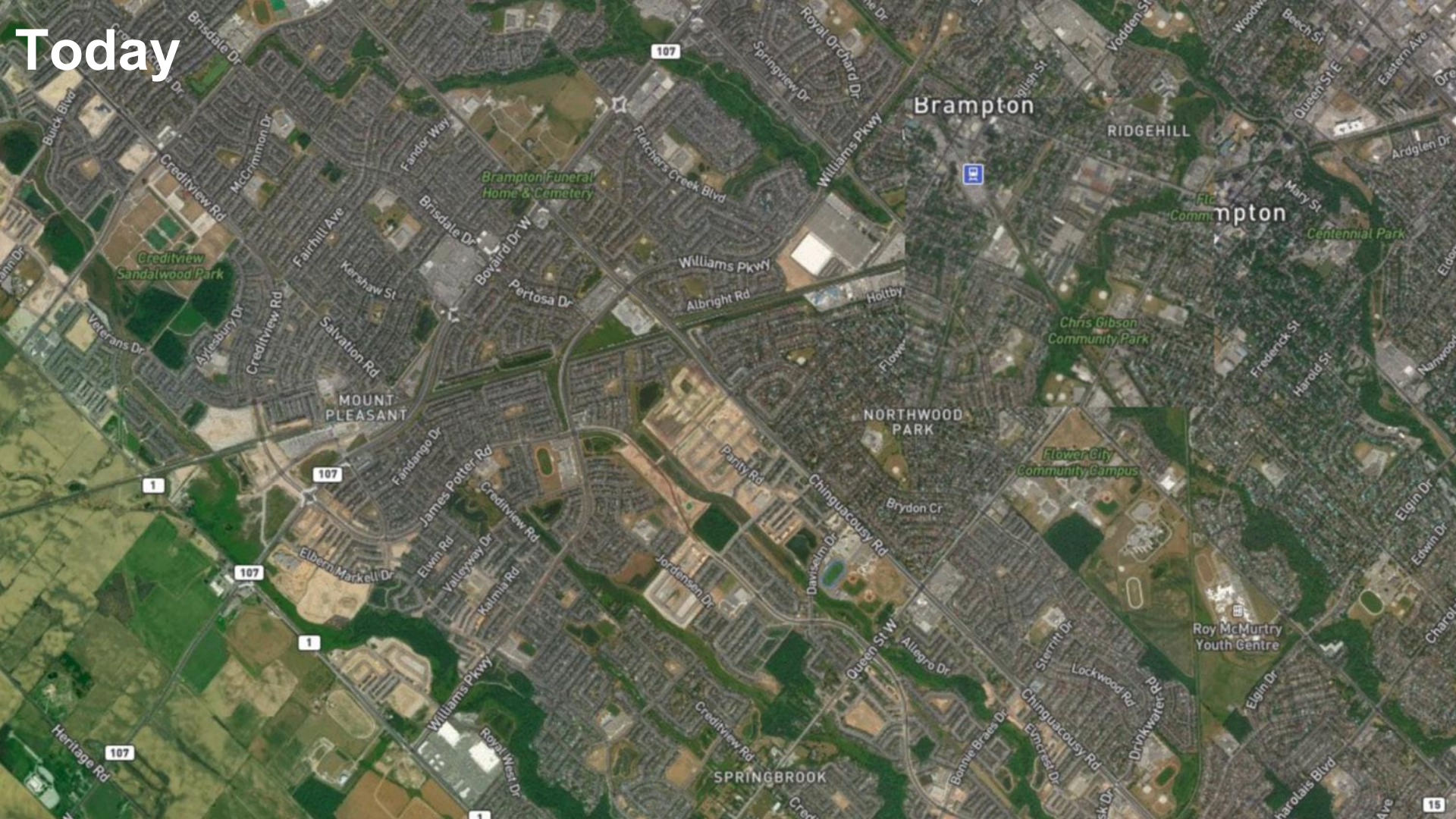





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Today



FARMER ACKNOWLEDGEMENT

- 
- "Citizen scientists are an important liaison to the general public and even between farms"
 - "Citizen scientists present questions and perspectives that are not in the farmers general purview"
 - "Farmers are under attack from the public so its good to have others [citizen scientists] try to learn"

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OUR EXPERIENCE WITH CITIZEN SCIENTISTS

- Build citizen scientists into the program
 - Shared responsibility
 - Vectors of knowledge
 - Connectors of shared values and meaning
- Build project with intentional design
- Language –all in this together

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CITIZEN SCIENTIST PROGRESSION

Collect Data



Democratize Knowledge



Ambassadors



Mindset – Value Soil Health



Transformation !!!!

Soil Health Coalition

THANK YOU!



**Credit Valley
Conservation**
inspired by nature

Soil Health Coalition