Identifying & Managing Field Scale Soil Variability

MUSKOKA FARMS MATTER

January 30, 2016

Nicole Rabe

(Land Resource Specialist – EMB – OMAFRA)

Free Tool #1

Introducing the New and Improved Agricultural Information Atlas

Create maps, find data and generate records with larger map views, faster responses, updated air photos and new user-friendly tools for simple and easy navigation.

The Agricultural Information Atlas

Land owners, land use planners, agricultural consultants and engineers, municipal government and academics can go to the **Agricultural Information Atlas website** to get agricultural information and create maps.

- **Agricultural Information Atlas Help**
- **Tutorial Series: Agricultural Information Atlas Help**
- **Create maps for Tile Drainage Records**
- **Create maps for Nutrient Management Strategies and Non-Agricultural Source Material Plans**
- **Create maps using the GLASI template**

The Canada Land Inventory (CLI)

The **Canada Land Inventory (CLI)** provides a land use index for agriculture, forestry and recreation uses. Prefabricated CLI maps in PDF format can be downloaded.

OMAFRA Program Data Set Descriptions

Drainage Mapping

- **Constructed Drains**
- **Drain Connections**
- **Tile Drainage Project**

Train Yourself by Watching Another do it….

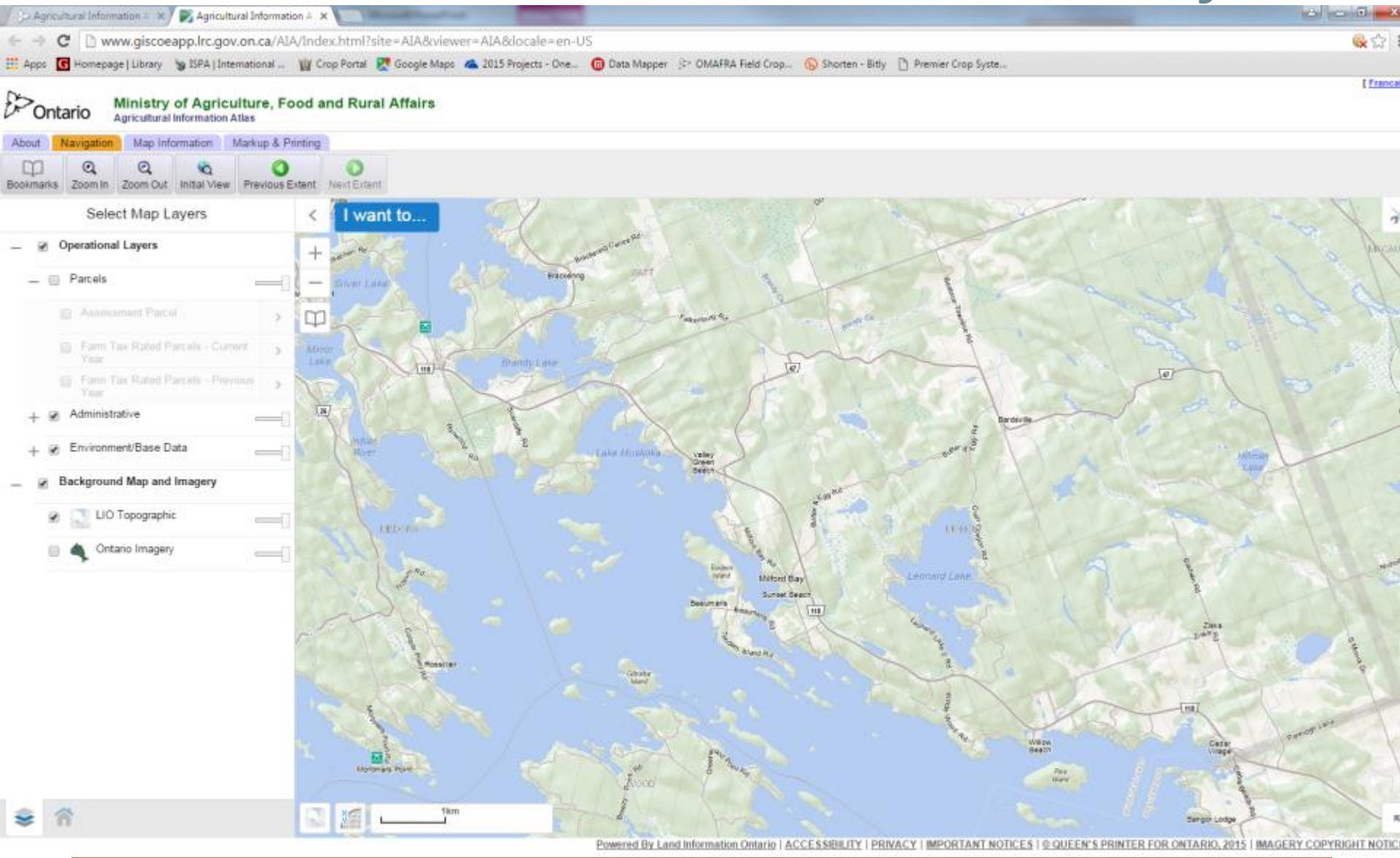
AgMaps Geographic Information Portal - Tutorials

We have developed a series of tutorials to help you use the Agricultural Information Atlas (AIA). The tutorials are straight-forward and provide easy to understand information on the functions of the AIA, as well as give basic instructions on how to use the application. Click on the titles below to start watching!

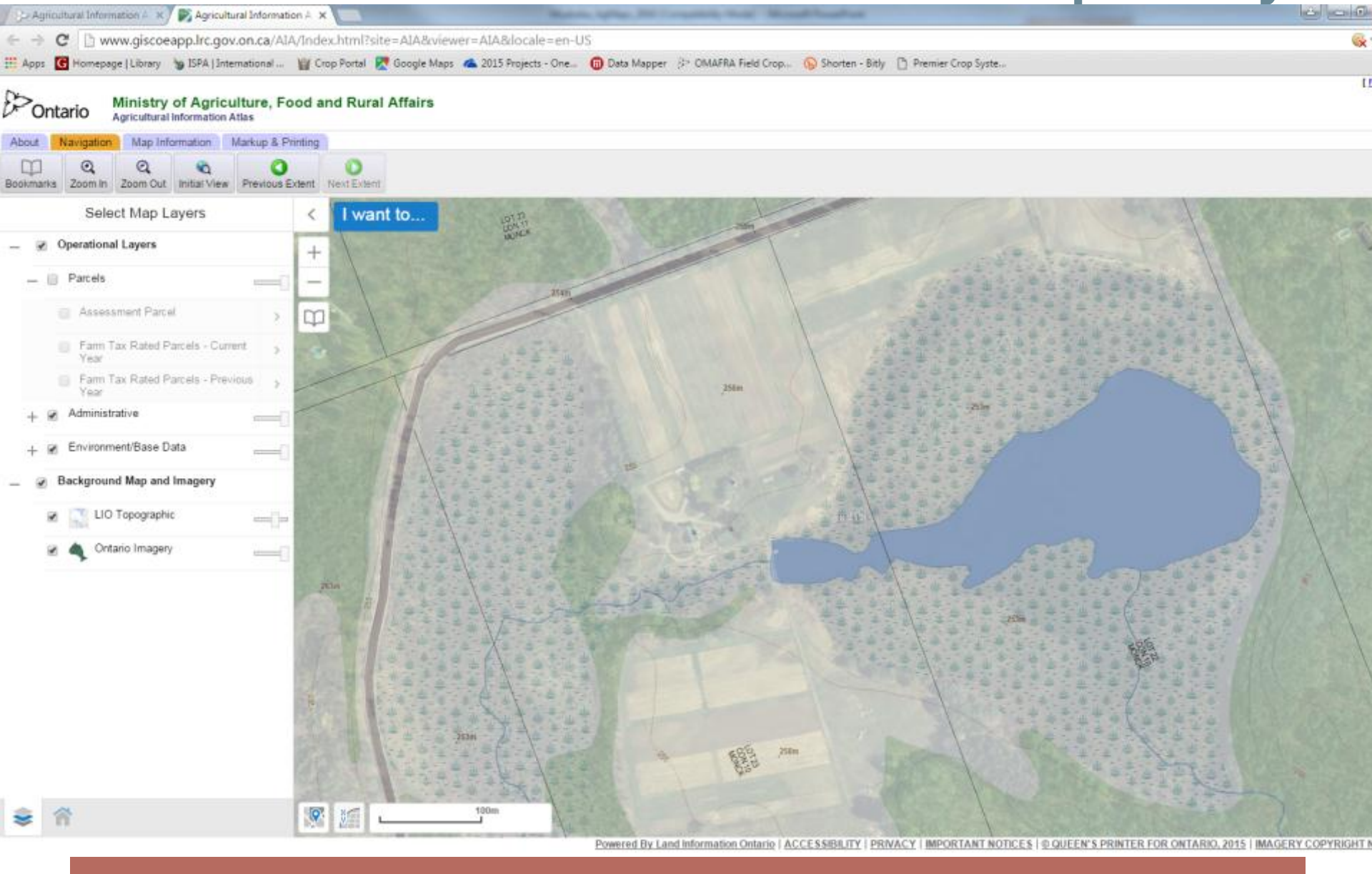
Please note the tutorials are currently only compatible on the following browsers: Internet Explorer 9 or later, Safari 5.1 or later and Google Chrome 17 or later.

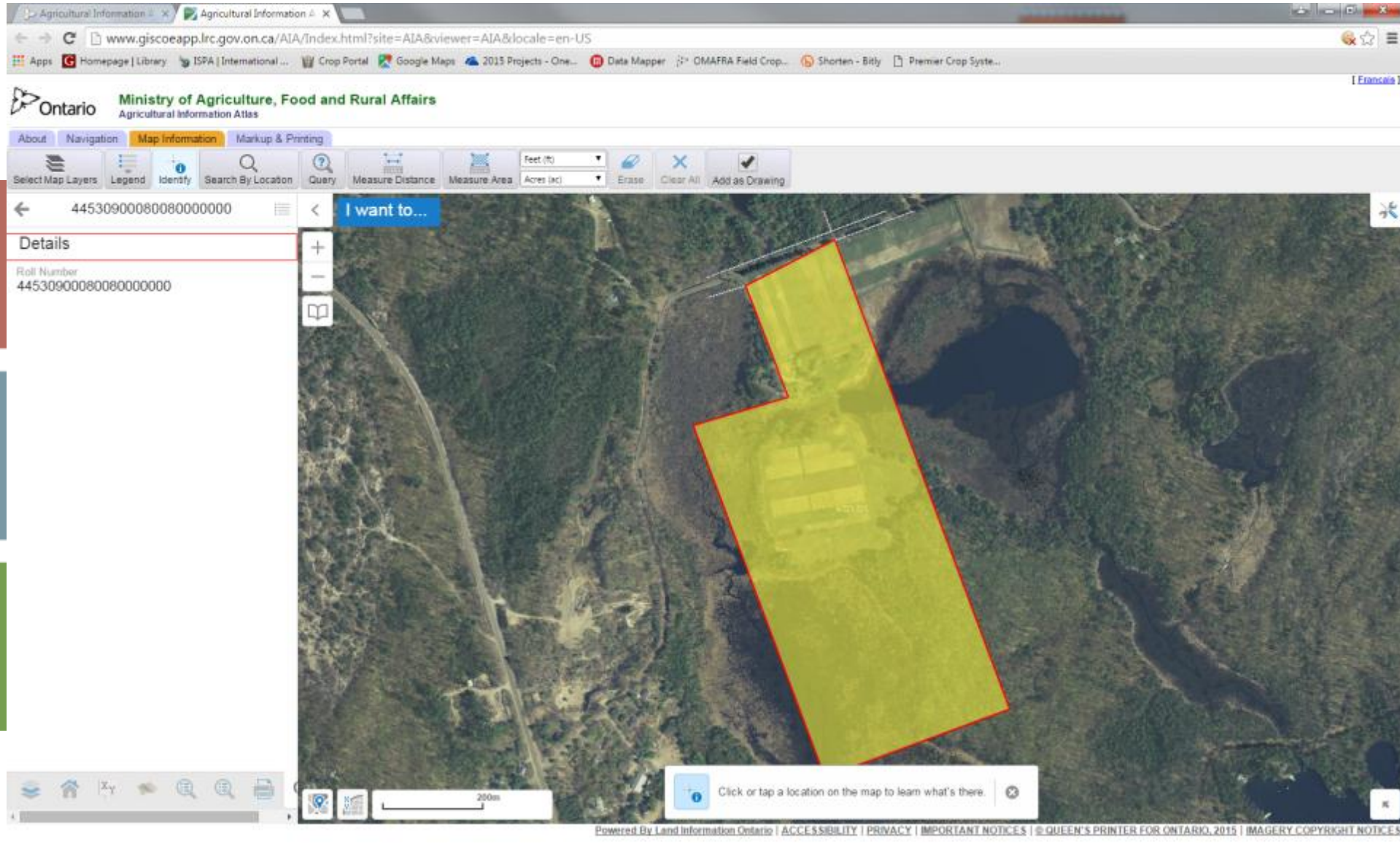
- **Tutorial #1: Introduction to AgMaps and the AIA** | **Transcript**
- **Tutorial #2: Layout and Tabs** | **Transcript**
- **Tutorial #3: Navigation and Bookmarking** | **Transcript**
- **Tutorial #4: Tools** | **Transcript**
- **Tutorial #5: Layers, Transparency and Legend** | **Transcript**
- **Tutorial #6: Measuring and Identifying Features** | **Transcript**
- **Tutorial #7: Searching** | **Transcript**
- Watching our tutorials? Fill out our **online evaluation** and let us know what you think!
- **Tutorial #8: Labeling a Map and Using Markup Tools** | **Transcript**
- **Tutorial #9: Creating a General Use Map** | **Transcript**
- **Tutorial #10: Creating a Tile Drainage Record** | **Transcript**
- **Tutorial #11: Creating an AgErosion Watershed Map** | **Transcript**
- **Tutorial #12: Creating a Farmstead Sketch** | **Transcript**
- **Tutorial #13: Creating a Field Map** | **Transcript**

Base Layers

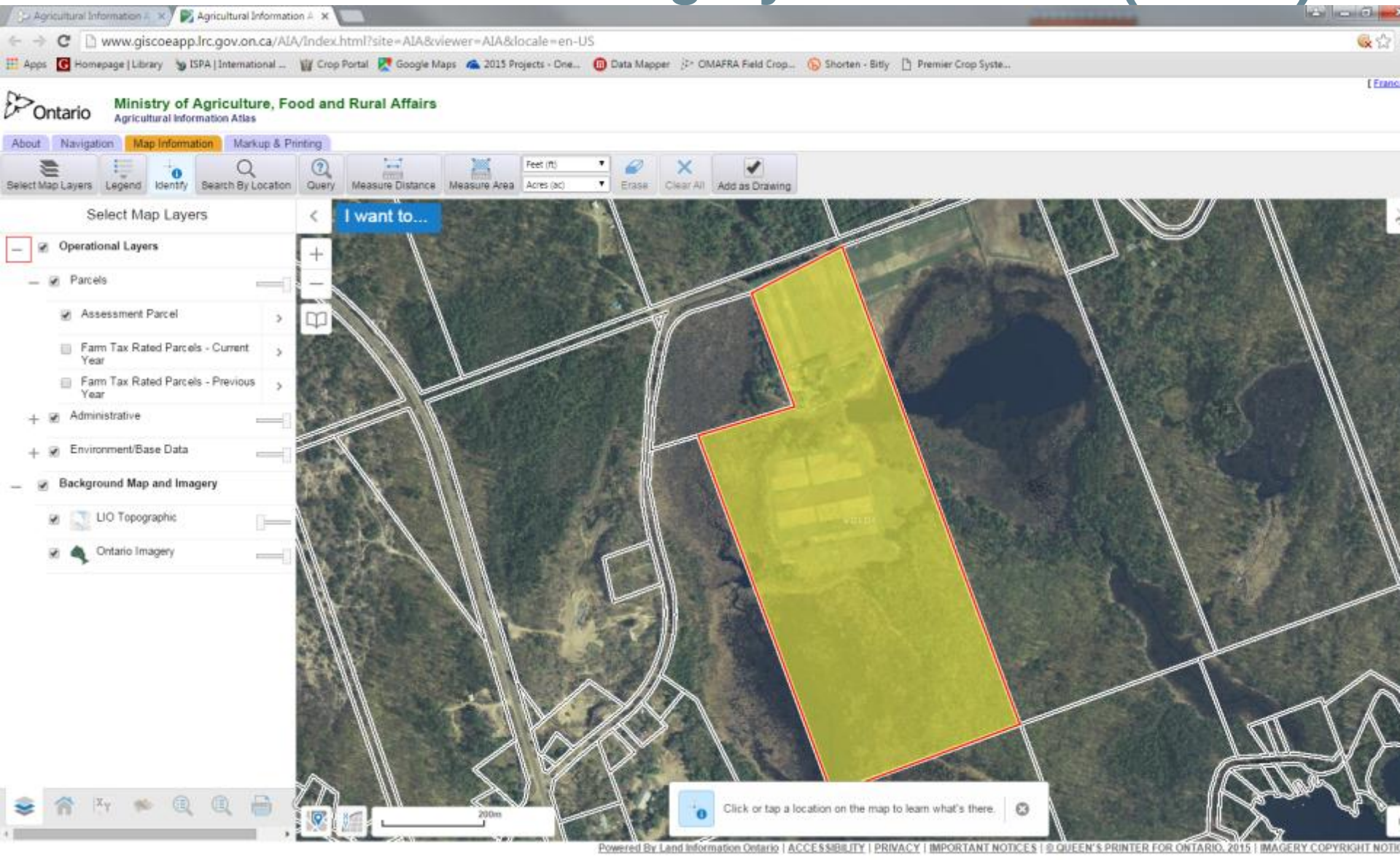

Agricultural Information
www.giscoeapp.lrc.gov.on.ca/AIA/Index.html?site=AIA&viewer=AIA&locale=en-US
Ontario
Ministry of Agriculture, Food and Rural Affairs
Agricultural Information Atlas
About
Navigation
Map Information
Markup & Printing
Bookmarks
Zoom In
Zoom Out
Initial View
Previous Extent
Next Extent
Select Map Layers
I want to...
Operational Layers
Parcels
Assessment Parcel
Farm Tax Rated Parcels - Current Year
Farm Tax Rated Parcels - Previous Year
Administrative
Environment/Base Data
Background Map and Imagery
LIO Topographic
Ontario Imagery
Lake Muskoka
Leonard Lake
Milford Bay
Bracebridge
Bardsville
1km
Powered By Land Information Ontario | ACCESSIBILITY | PRIVACY | IMPORTANT NOTICES | © QUEEN'S PRINTER FOR ONTARIO, 2015 | IMAGERY COPYRIGHT NOTICE

Transparency

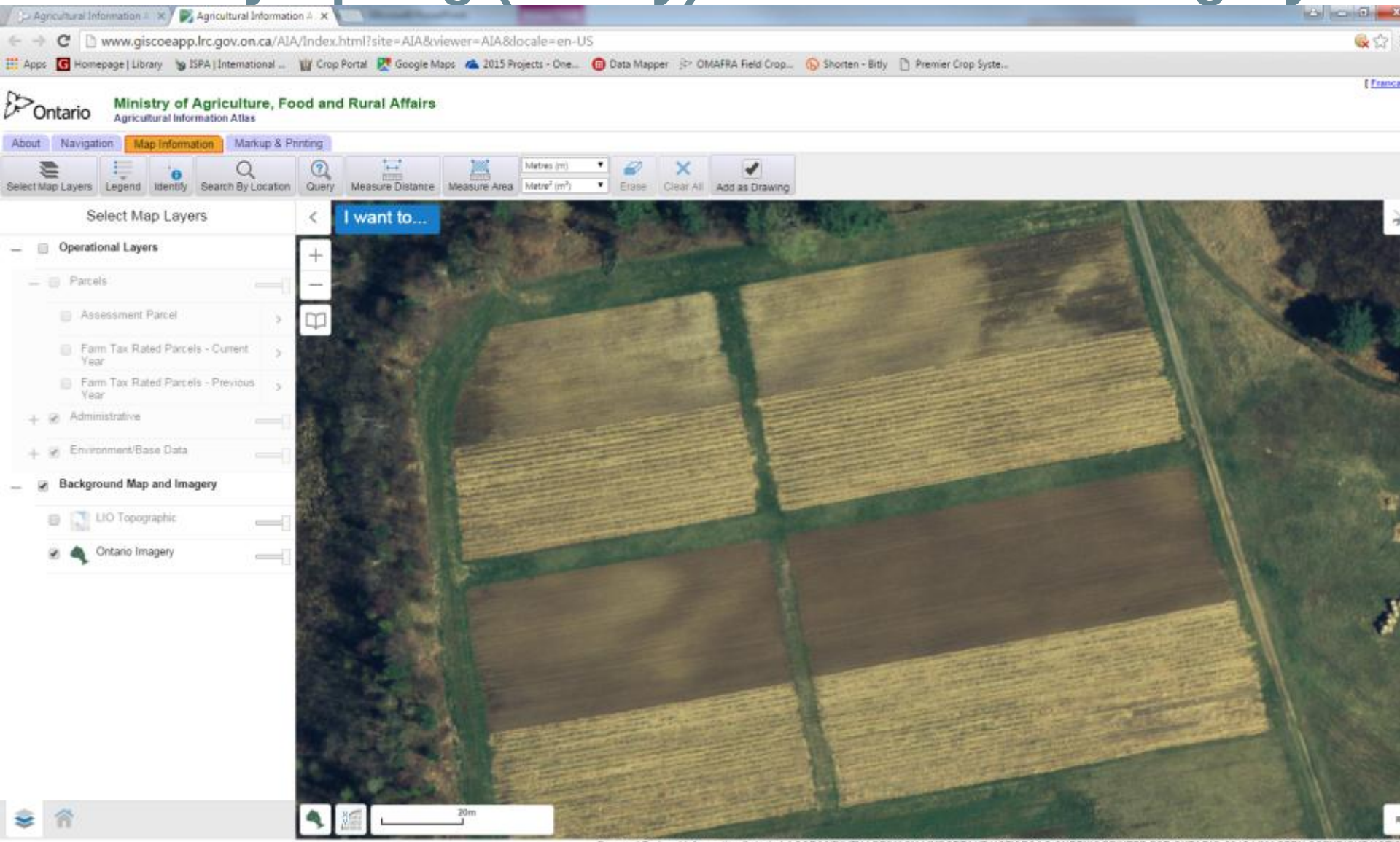



Agricultural Information
www.giscoeapp.lrc.gov.on.ca/AIA/Index.html?site=AIA&viewer=AIA&locale=en-US
Ontario
Ministry of Agriculture, Food and Rural Affairs
Agricultural Information Atlas
About
Navigation
Map Information
Markup & Printing
Select Map Layers
Legend
Identify
Search By Location
Query
Measure Distance
Measure Area
Erase
Clear All
Add as Drawing
44530900080080000000
Details
Roll Number
44530900080080000000
I want to...
Click or tap a location on the map to learn what's there.
Powered By Land Information Ontario | ACCESSIBILITY | PRIVACY | IMPORTANT NOTICES | © QUEEN'S PRINTER FOR ONTARIO, 2015 | IMAGERY COPYRIGHT NOTICES

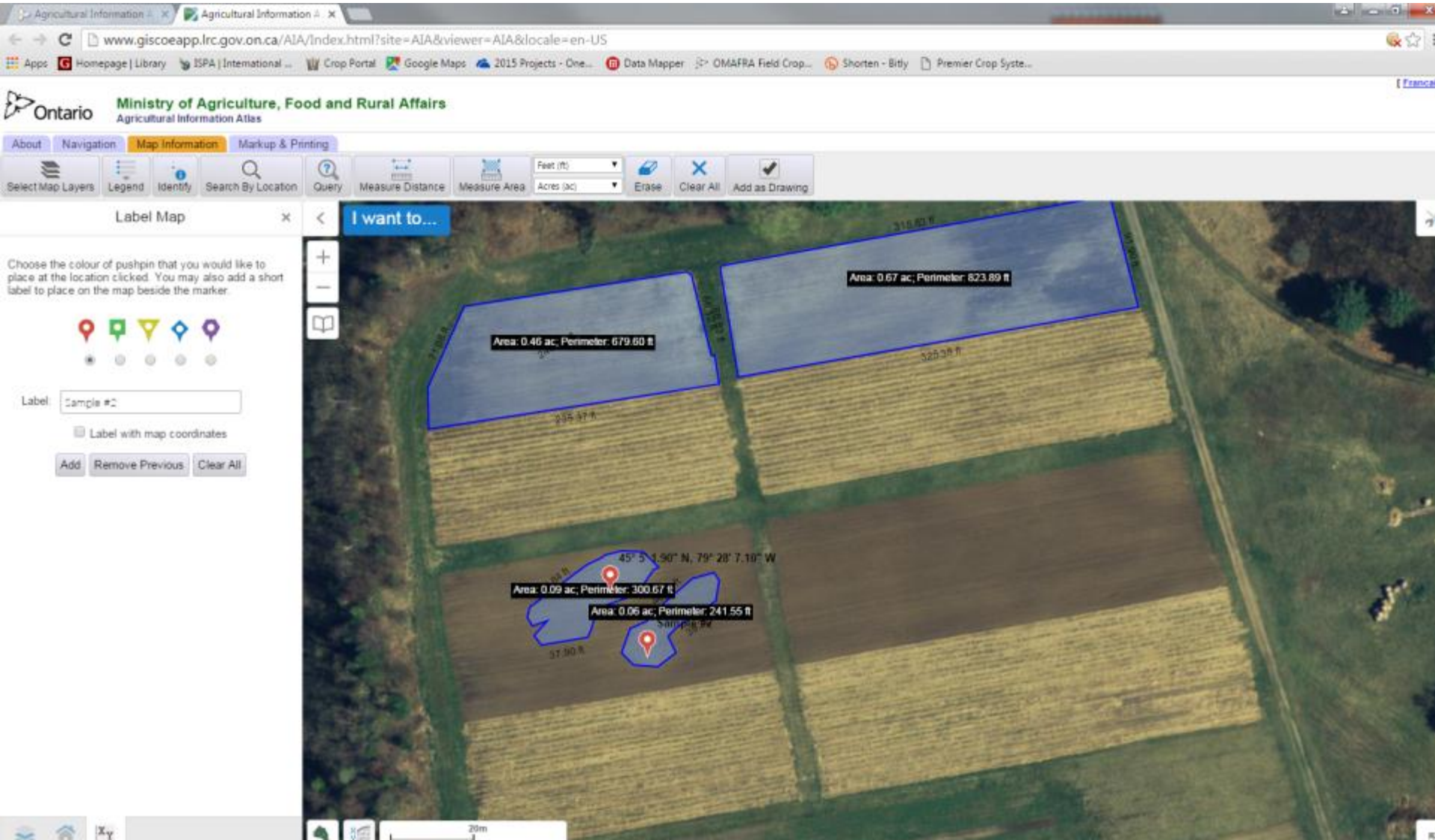
Imagery and Parcel (Roll #)



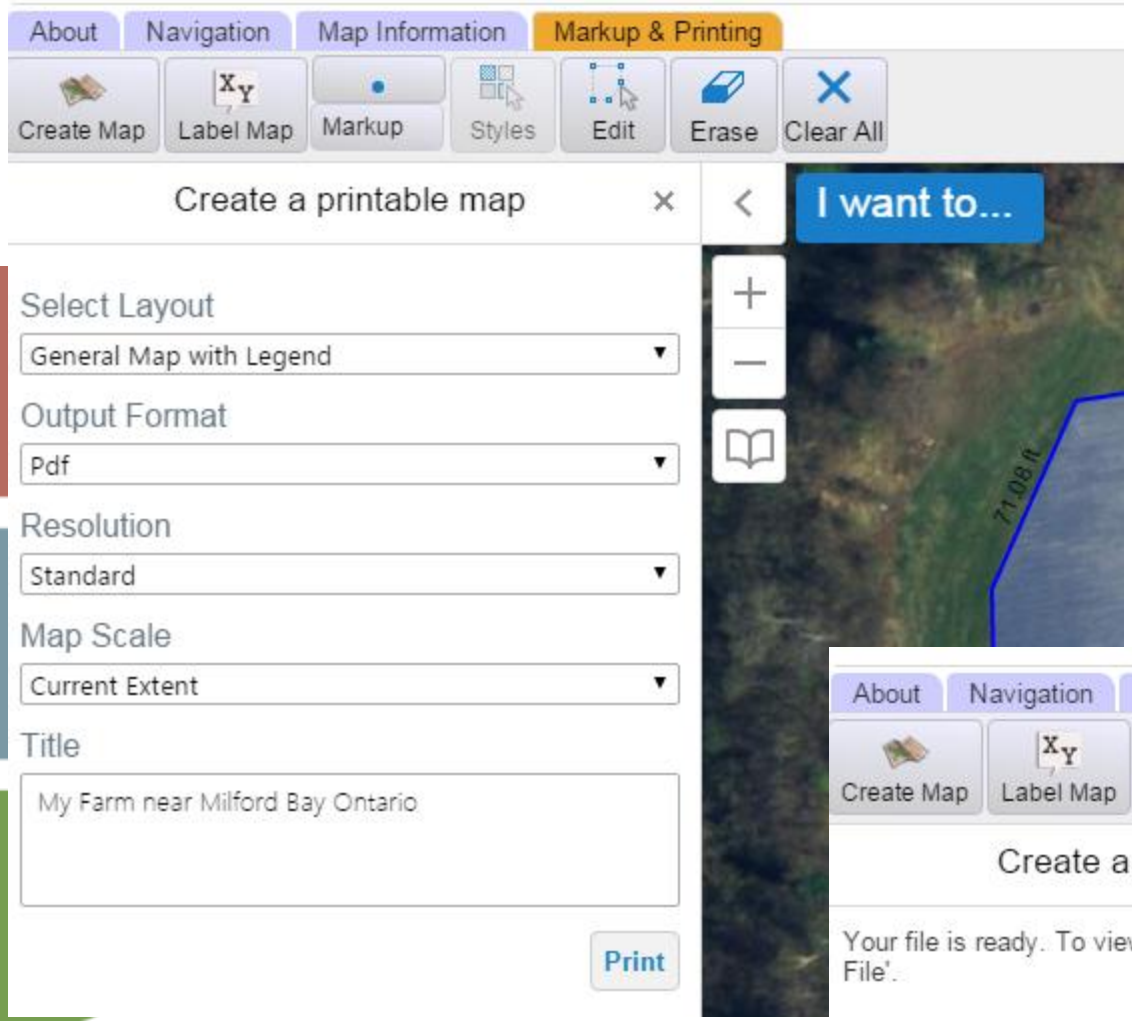
Early Spring (nearly) Bare Ground Imagery

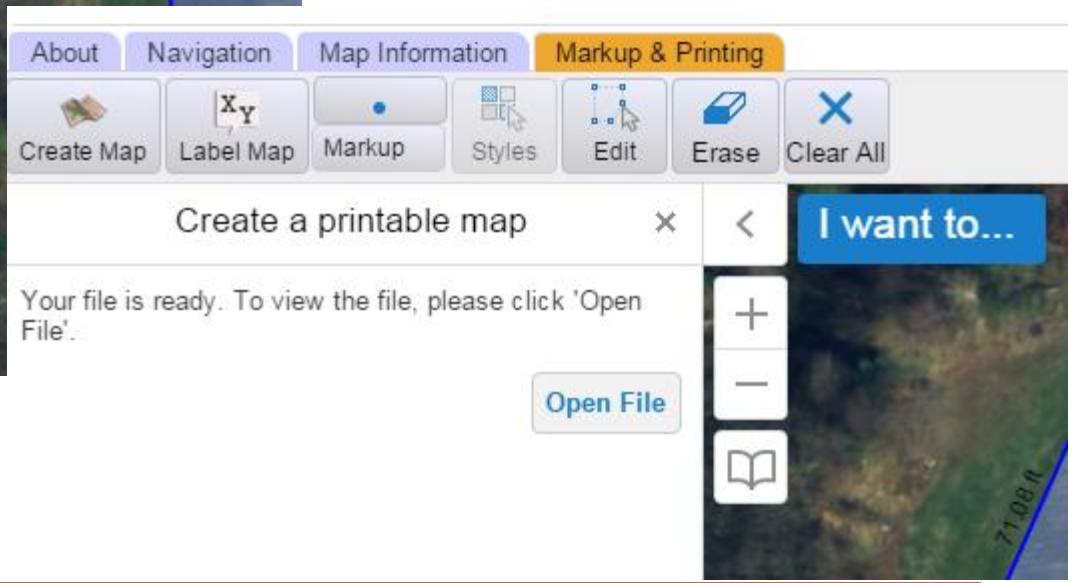


Labelling the map with points or measuring area (acres)

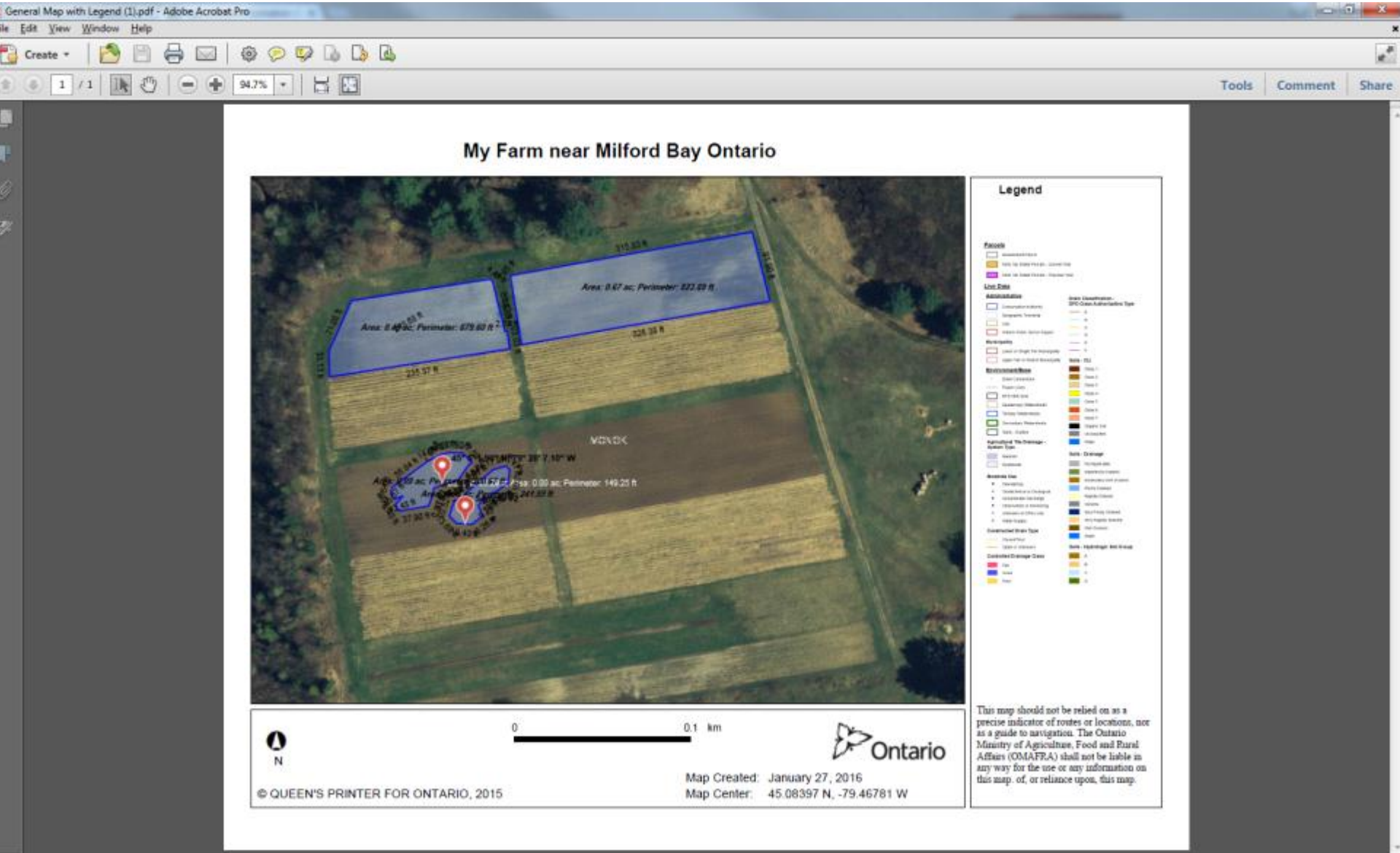


Layout and Printing /Saving a Map





Layout and Printing/Saving a Map

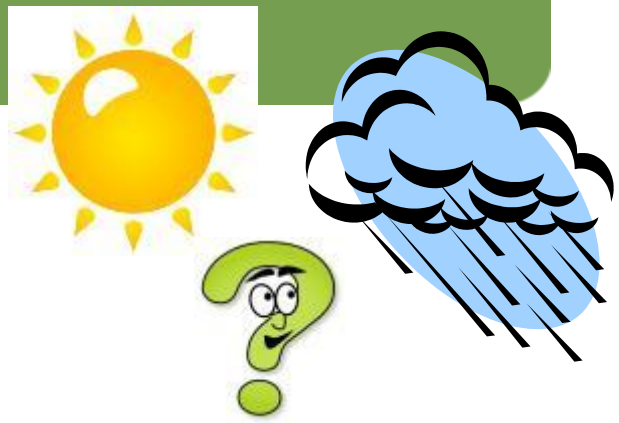


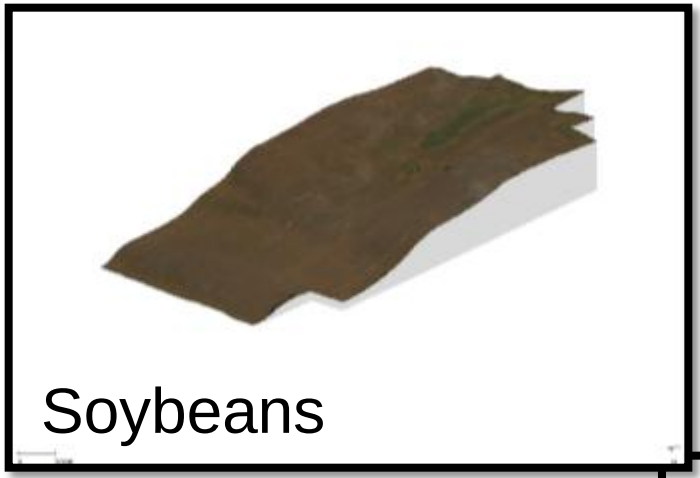
Google Earth

Free

Soybeans

Sept 4, 2013





Soybeans

Sept 27, 2013.

Google Earth

April 23, 2014

Bare Ground

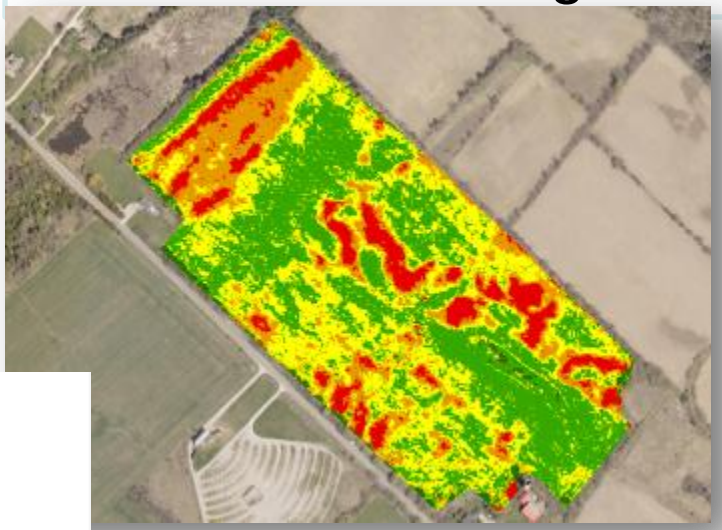
Near Bare Ground Analysis – Spring 2010

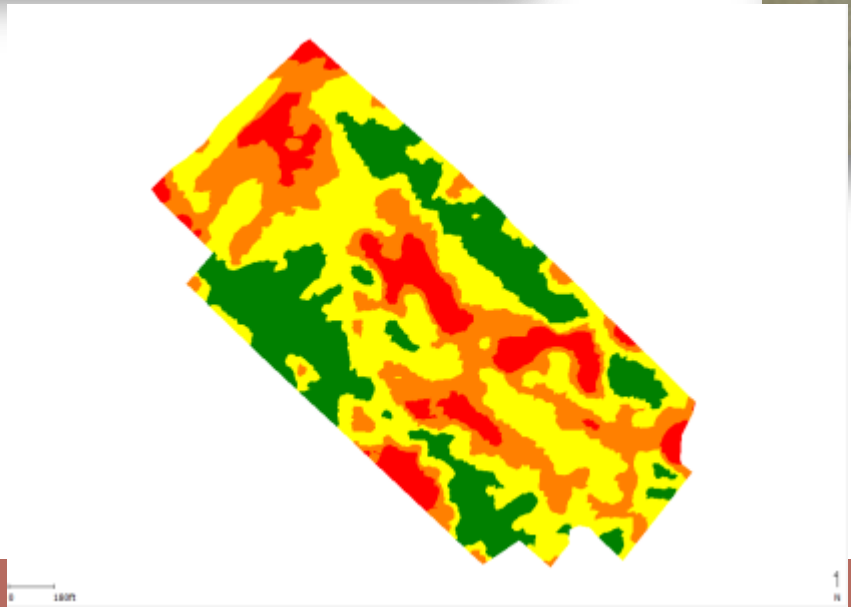
0 160ft

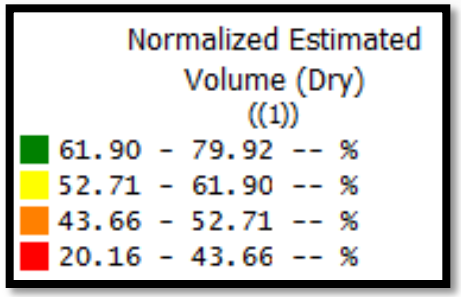
N

In-season analysis…

2014 Soybeans: Processed Image







NEW SOIL MAPPING TECHNOLOGIES IN THE PROVINCE….

PROXIMAL SOIL SENSING

Figure 1. (a) Soil Optix (Practical Precision)

(b) McGill University RTK-GPS and Dual EM™ on a sled.

(c) Soil Information System - Trimble (Premier Equipment)

(c) VERIS – MSP3 (Dupont Pioneer)

Electrical Resistivity / Electromagnetic Induction Sensing

Soil EC measurements are correlated with soil properties that affect crop productivity, including soil texture, cation exchange capacity, drainage conditions, salinity and subsoil characteristics (Kitchen et al., 2003; Grisso et al., 2009)

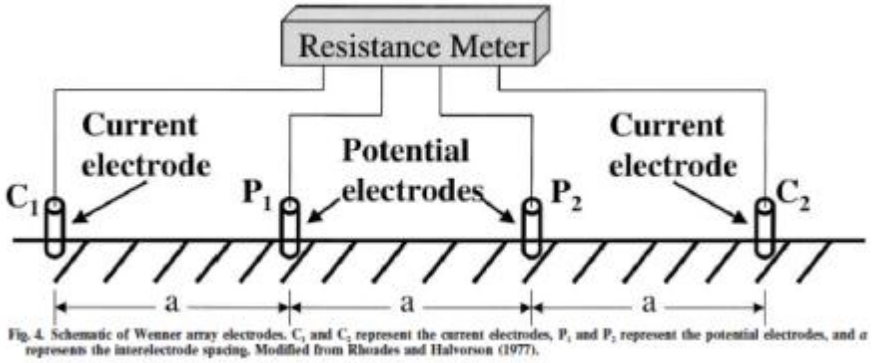
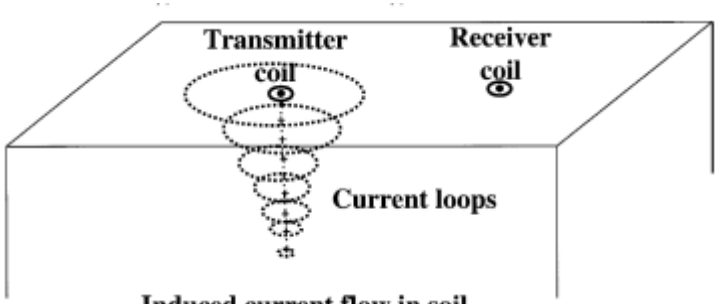
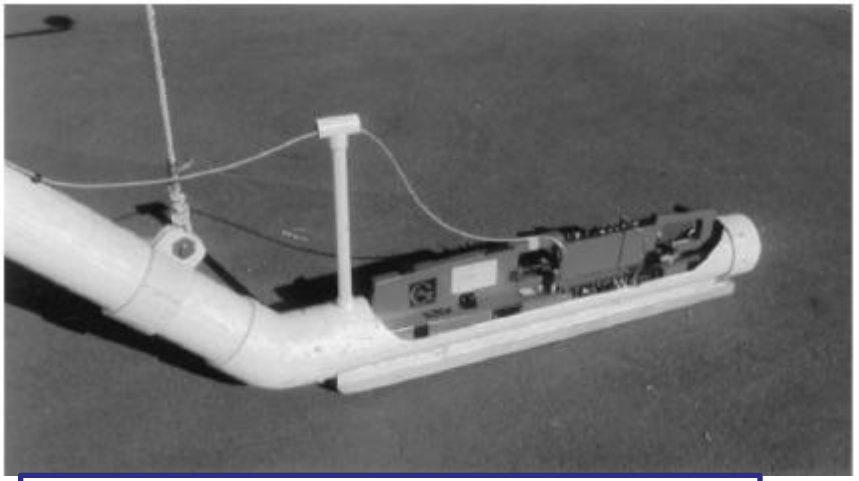


Fig. 4. Schematic of Wenner array electrodes. C_1 and C_2 represent the current electrodes, P_1 and P_2 represent the potential electrodes, and a represents the interelectrode spacing. Modified from Rhoades and Halvorson (1977).



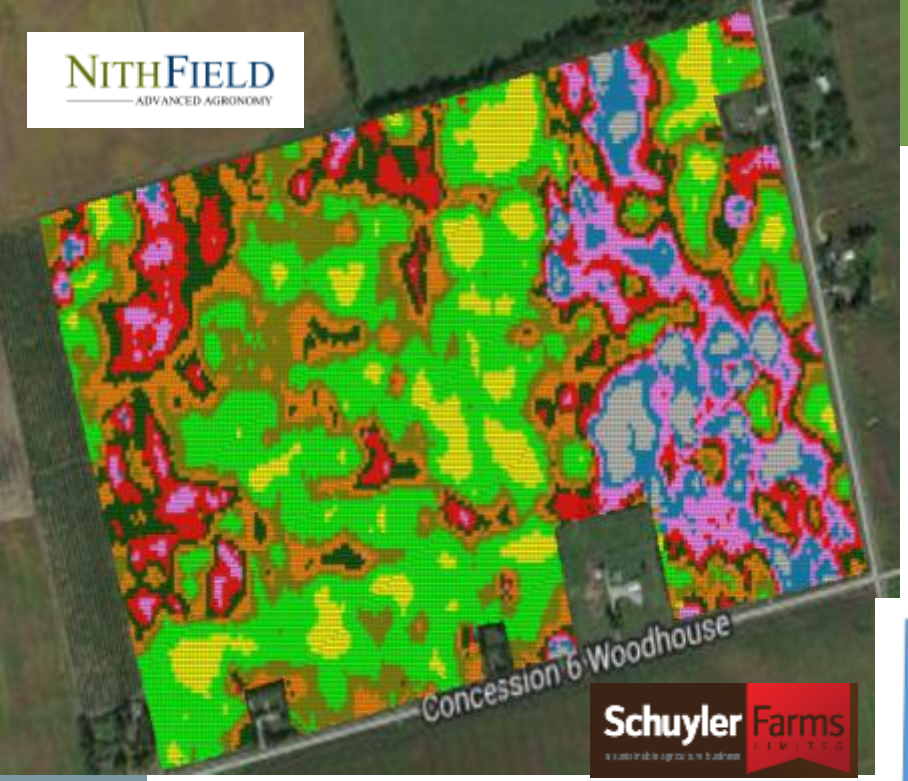
Induced current flow in soil

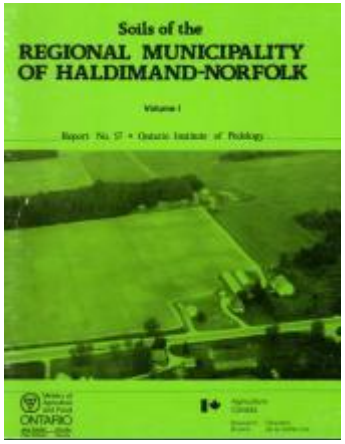


EMI Mapping for short…

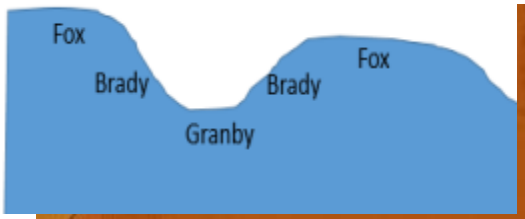
NITHFIELD
ADVANCED AGRONOMY

Putting Legacy Soil Maps on the Landscape using:



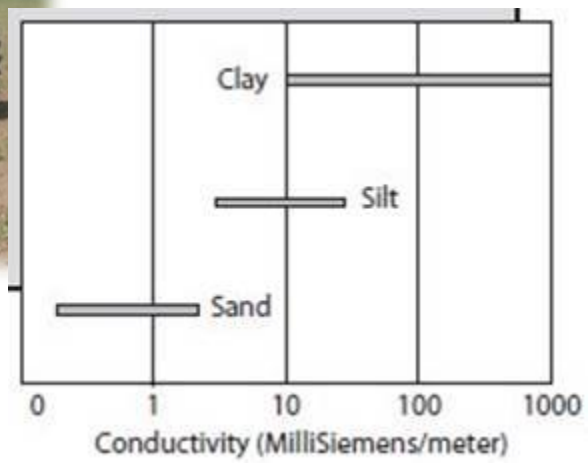


Predictive Digital Soil Mapping (PDSM):
- Digital Elevation Model (DEM)
- EMI mapping
- soil coring & pedology expertise

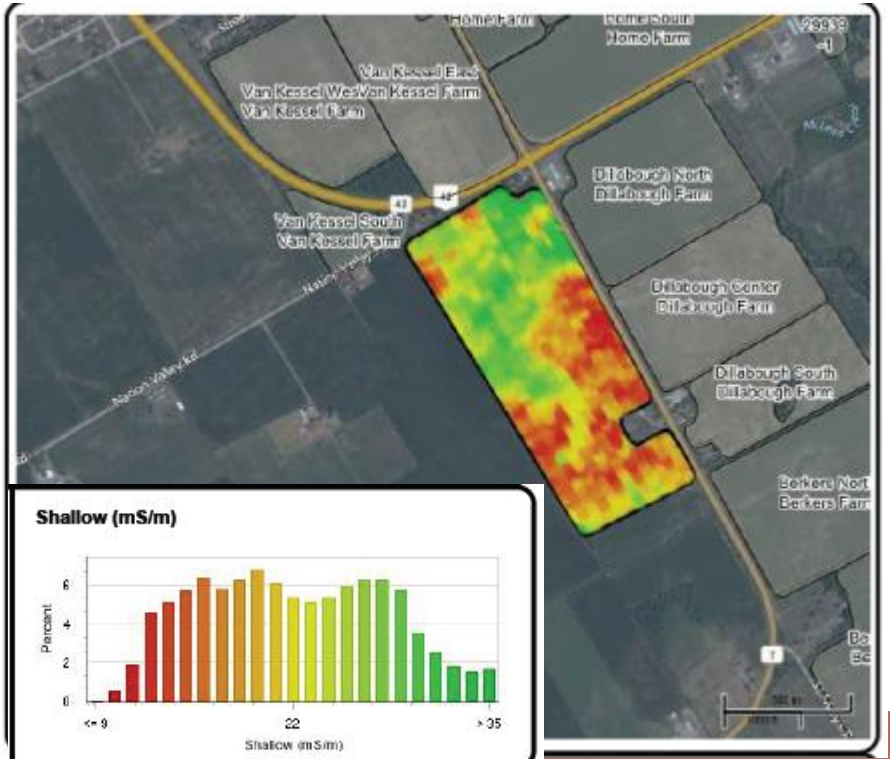


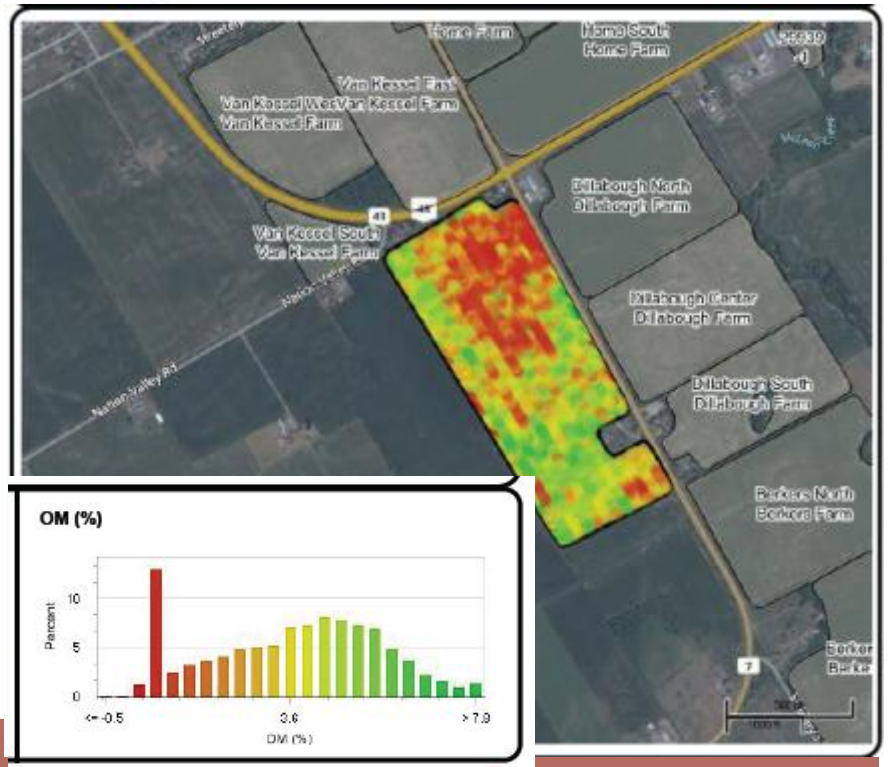
Fox	Well Drained	
Brady	Imperfectly Drained	SANDS/DEEP
Granby	Poorly Drained	
Bookton	Well Drained	
Berrien	Imperfectly Drained	SANDS OVER CLAY
Wausen	Poorly Drained	
Brantford	Well Drained	
Beverly	Imperfectly Drained	SILTY CLAY/CLAY
Toledo	Poorly Drained	

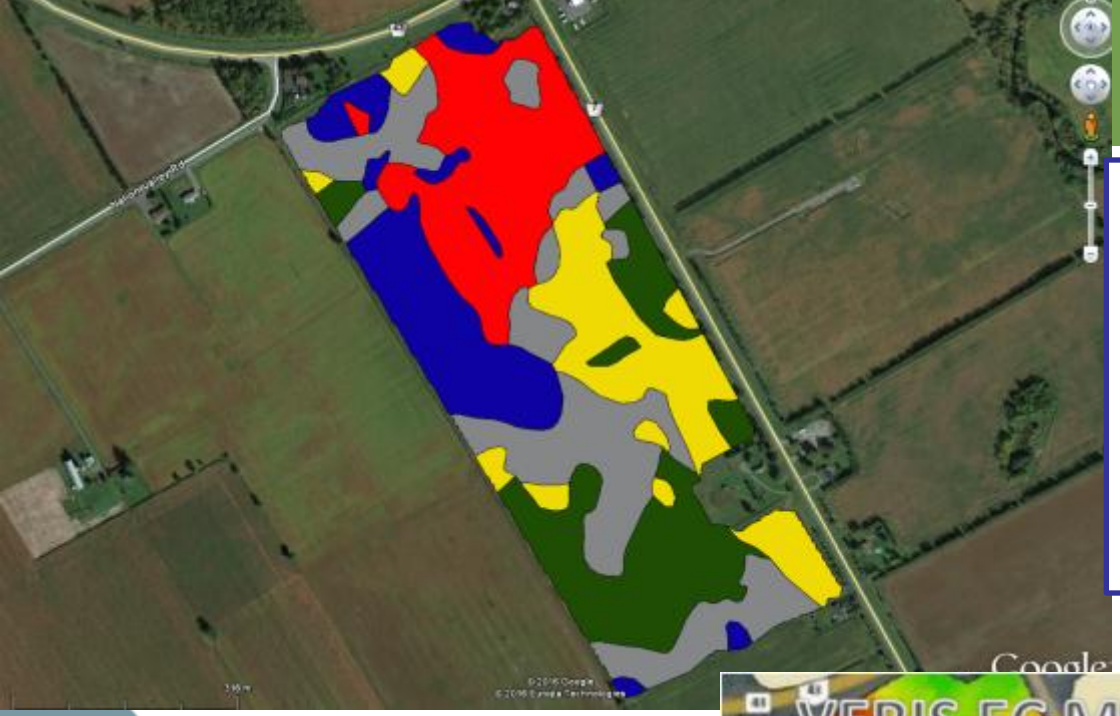
VERIS MSP3:



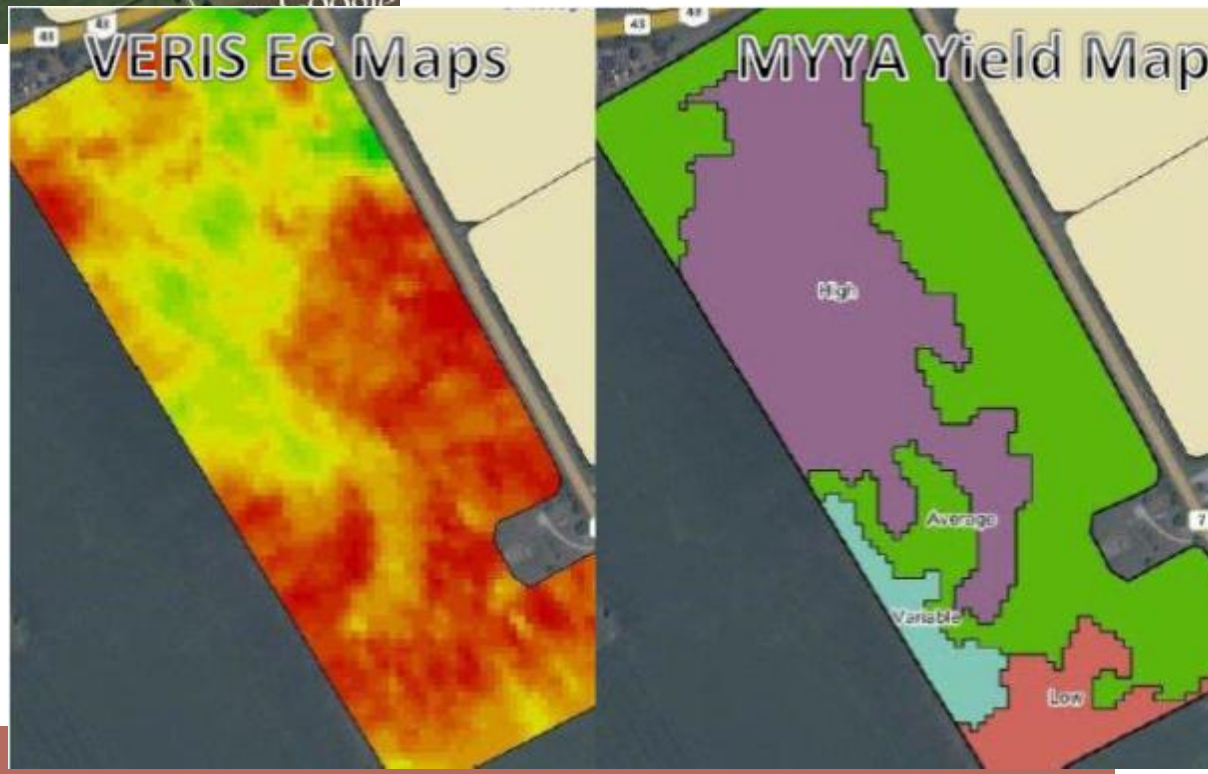
- Electrical Resistivity RTK-GPS: DEM/Topography
- Organic Matter Camera
- pH sensor





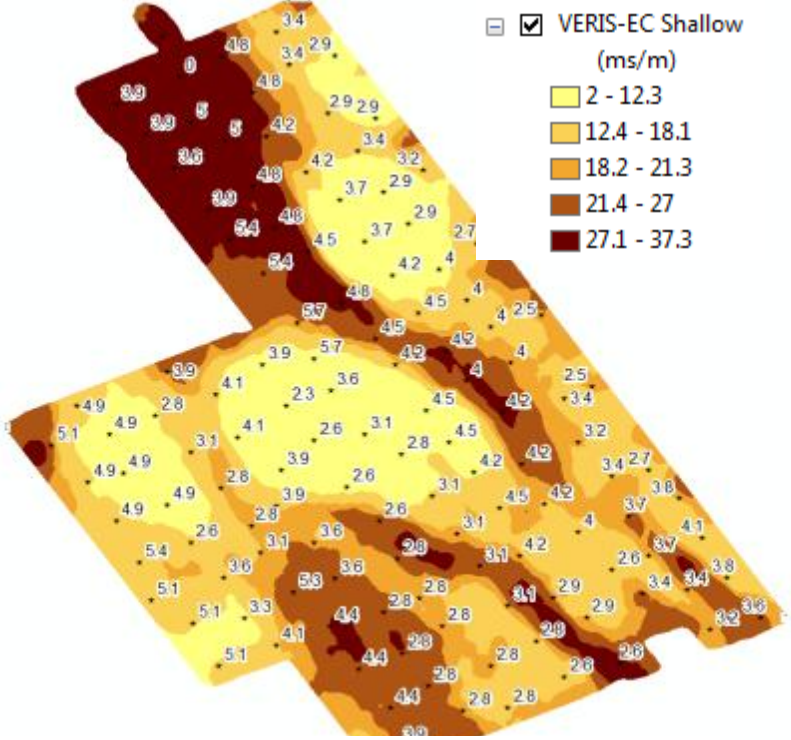


- Dark Green: coarse texture, dark soil
- Dark Blue: Finer Texture, Dark Soil
- Yellow: Coarse Texture, lighter soil
- Red: Fine Texture, Lighter Soil
- Grey: Nominal



DUPONT

PIONEER



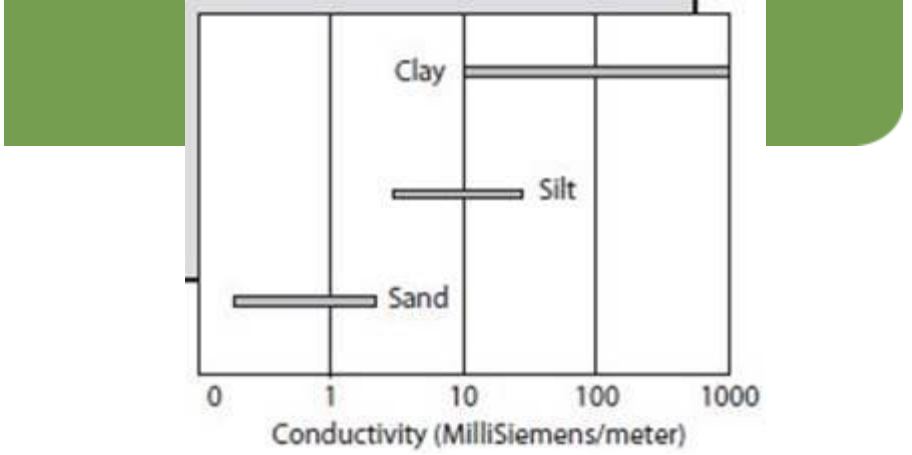
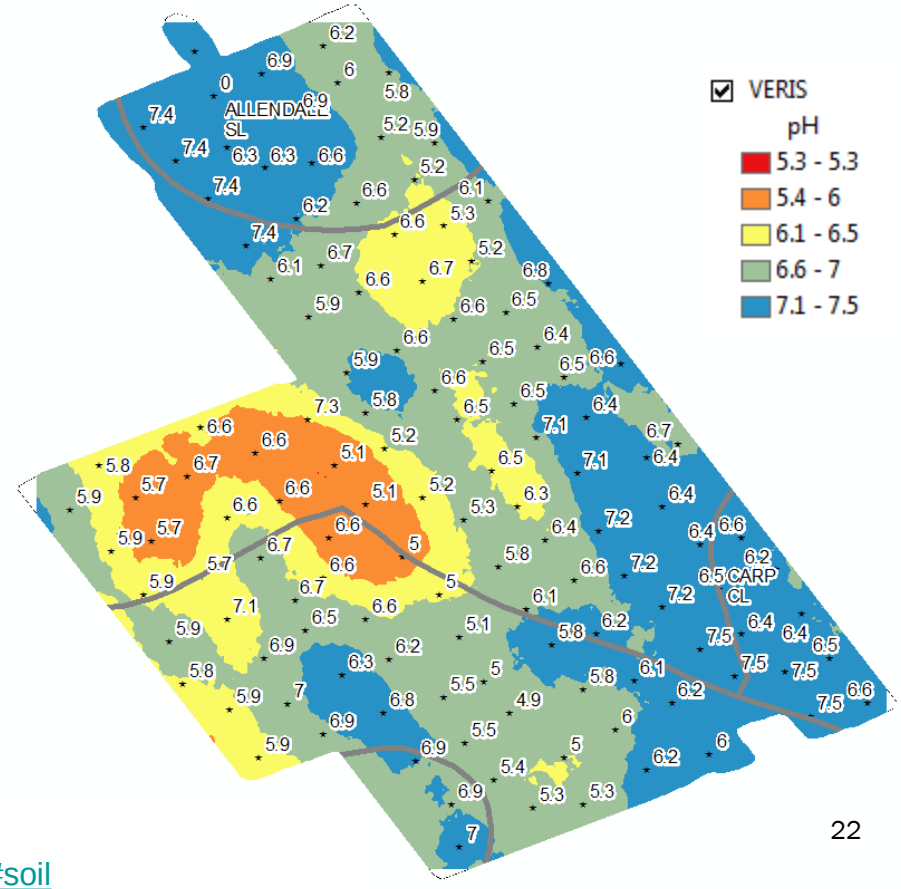


Table 9-2. Soil pH at Which Lime is Recommended for Ontario Crops

Crops	Soil pH Below Which Lime is Recommended	Target Soil pH[1]
Coarse and medium-textured mineral soils (sand, sandy loams, loams and silt loams)		
Perennial legumes, oat, barley, wheat, triticale, beans, peas, canola, flax, tomatoes, raspberries, strawberries, all other crops not listed below	6.1	6.5
Corn, soybeans, rye, grass, hay, pasture, tobacco	5.6	6.0
Potatoes	5.1	5.5
Fine-textured mineral soils (clays and clay loams)		
Alfalfa, cole crops, rutabagas	6.1	6.5
Other perennial legumes, oat, barley, wheat, triticale, soybeans, beans, peas, canola, flax, tomatoes, raspberries, all other crops not listed above or below	5.6	6.0
Corn, rye, grass hay, pasture	5.1	5.5
Organic soils (peats and mucks)		
All field and vegetable crops	5.1	5.5

[1] Where a crop is grown in rotation with other crops requiring a higher pH (for example, corn in



[Agronomy Guide Pub 811:](http://www.omafra.gov.on.ca/english/crops/pub811/9fertilizer.htm#soil)
http://www.omafra.gov.on.ca/english/crops/pub811/9fertilizer.htm#soil

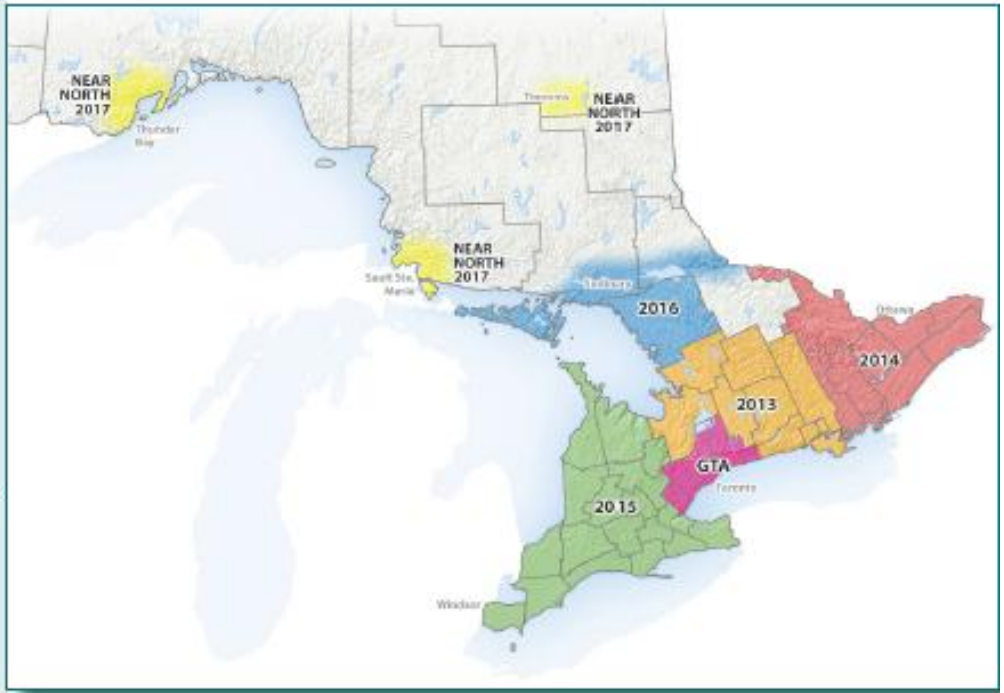
Ontario Imagery Acquisition Projects 2013-2017

Background

The Government of Ontario has a new imagery acquisition strategy to acquire and regularly update high-resolution imagery for Ontario. The strategy ensures there is long term, affordable approach to acquisition projects that will benefit public and private sector organizations.

A competitive contract was awarded to collect aerial imagery for the next five years across Ontario. The predefined acquisition areas range between 35,000 and 45,000 sq km.

Partnerships and a shared funding model are fundamental to the strategy.



A Map of the Five Year Acquisition Plan

Report Bugs to….

Email: omafra.gis@ontario.ca

Thank-you!
Questions?

ww.ontario.ca/agmaps

Nicole Rabe
OMAF and MRA
Land Resource Specialist
Environmental Management Branch
nicole.rabe@ontario.ca