

# **Increasing Conservation Authority capacity through Citizen Science: A citizen science nearshore monitoring project case study**

Debbie Balika, Water Quality Specialist, Kawartha Conservation  
In Partnership with Ontario Technical University

Erin Smith, PhD Candidate

Dr. Andrea Kirkwood



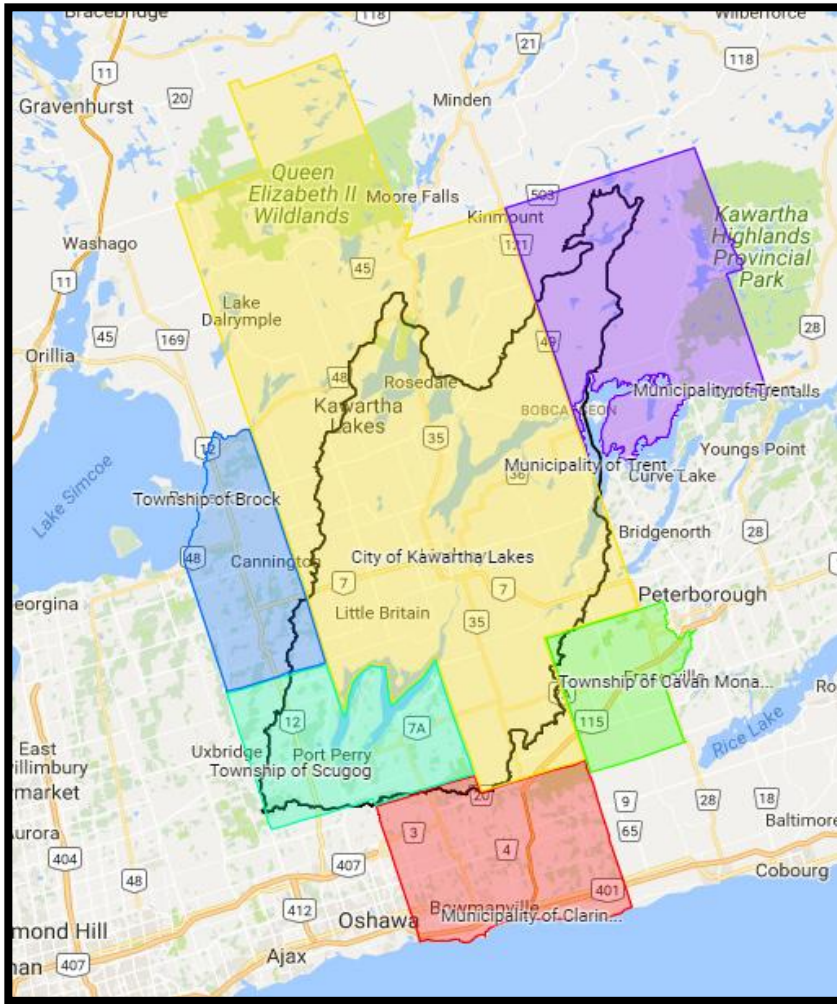
# Outline

- Kawartha Conservation- Who are we?
- Funding
- Citizen science overview
- Citizen Scientists in practice
  - Nearshore water quality citizen science monitoring program (2 models)
- Conclusion



# Who are we?

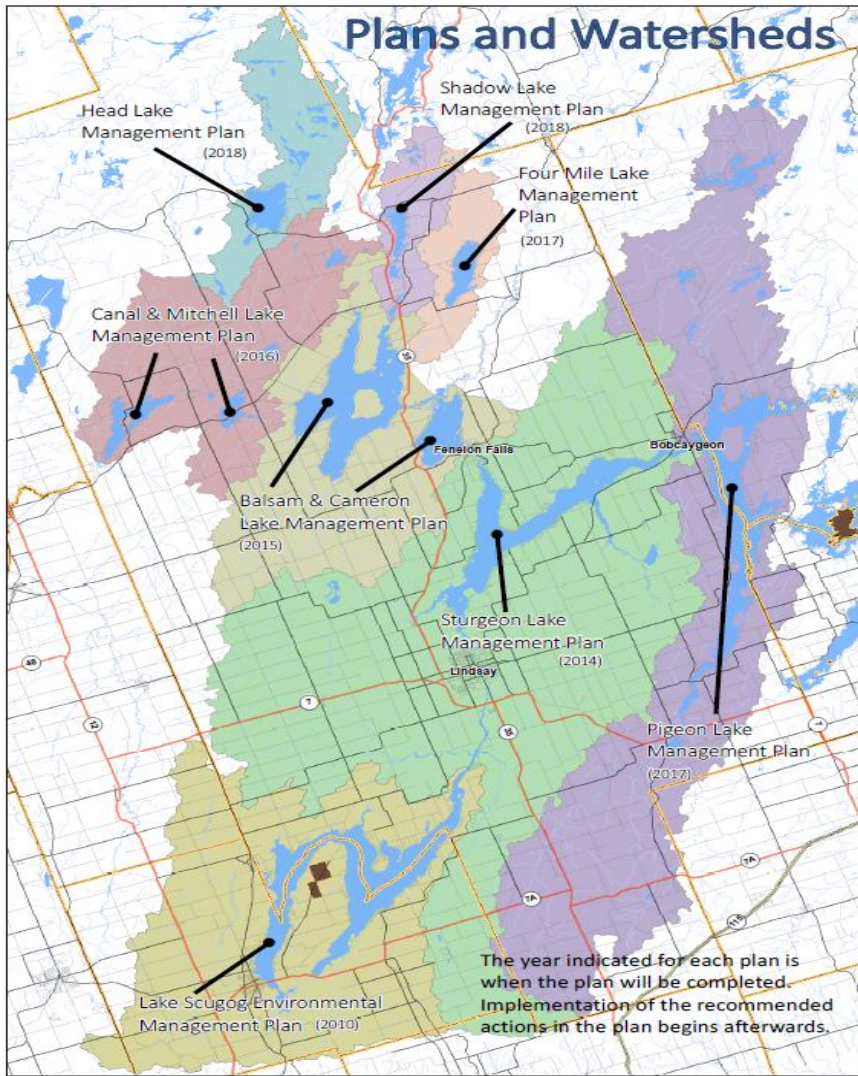




- 2800km<sup>2</sup>
- Lake based (5 lakes)
- 6 municipalities
- Part of Trent Severn Waterway
- Dual population
- Development pressures



## Plans and Watersheds



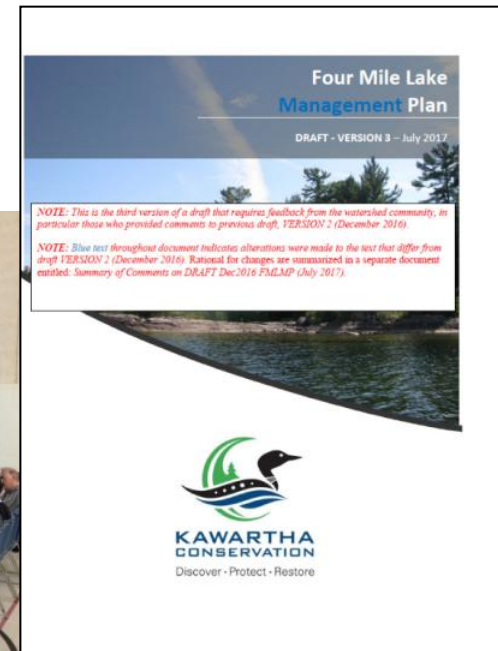
## Lake Management Planning Purpose:

Creating and implementing science-based Lake Management Plans for the major lakes within the City of Kawartha Lakes.

A process for understanding the pressures on our lakes and determining priorities for management activities to maintain their environmental health and economic sustainability.

Each plan provides a prescription of strategies - based on lake and watershed studies, and community input - that will result in a sustainable integration of land uses within each lake basin.

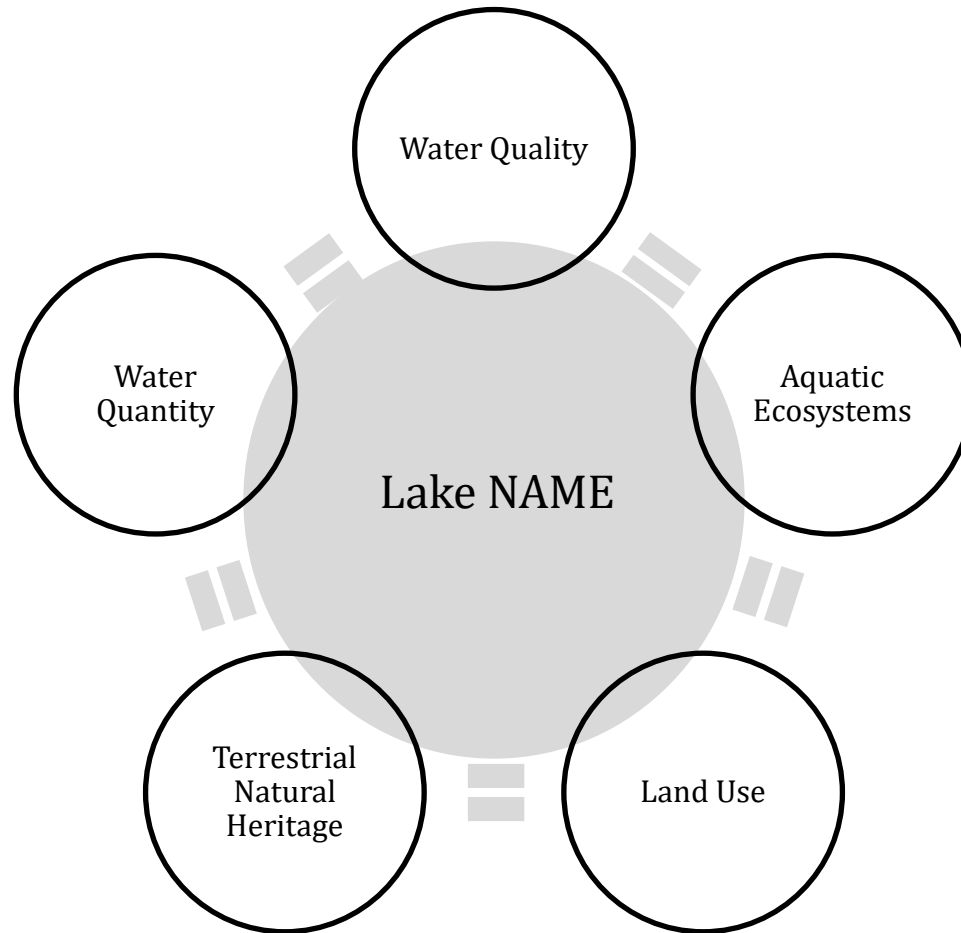
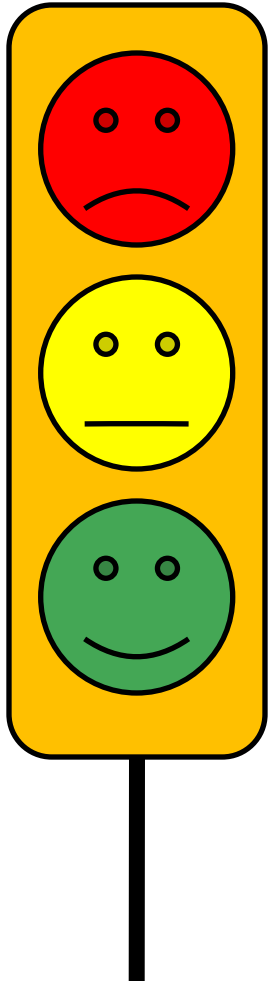
# Three key components:



Science + Consultation = Recommendations



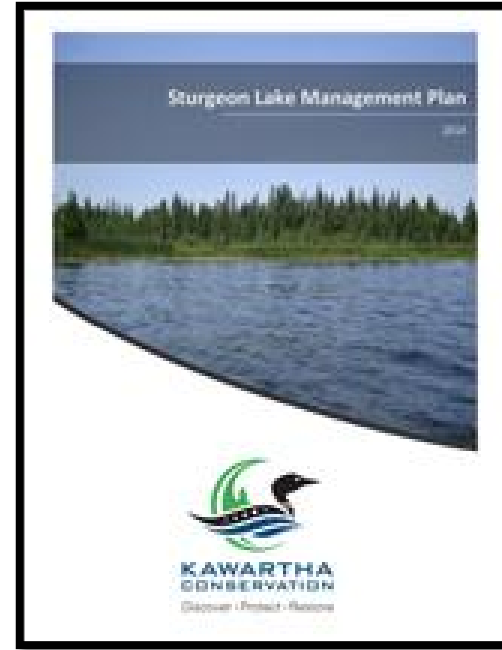
# Science-based findings



**Lake Management Plan  
recommendation:**

***Water Quality:***

**Lack of data in the nearshore area**

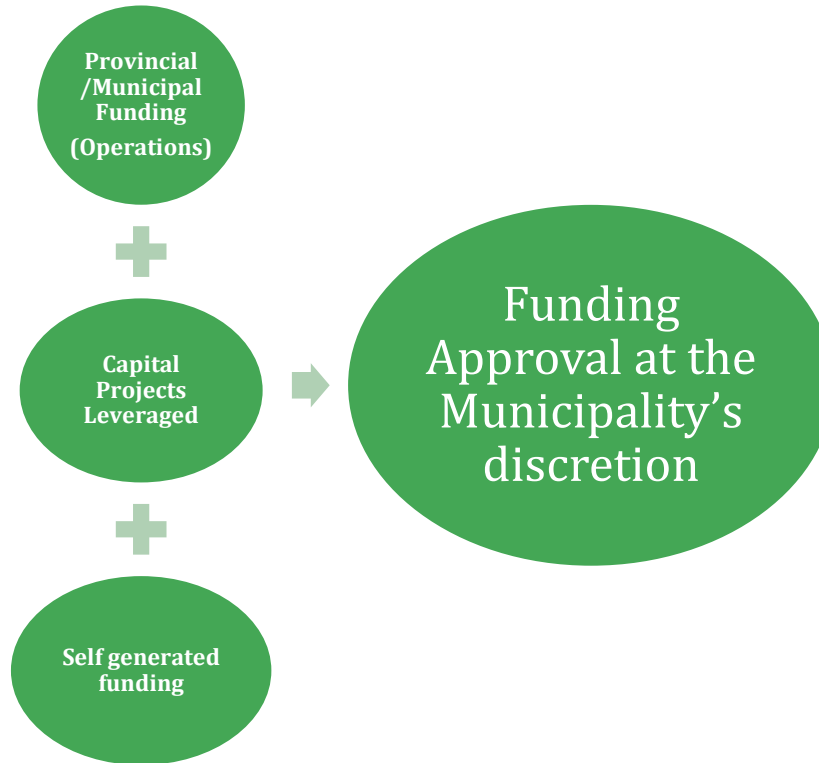


# Funding

- Or lack of ...



# Conservation Authority Funding model for environmental monitoring



# Funding augmentation: Citizen Science

- **What is citizen science?**

“...the practice of engaging the public in a scientific project- a project that produces reliable data and information useable by scientists, decision makers of the public and that is open to the same peer review that applies to conventional science”

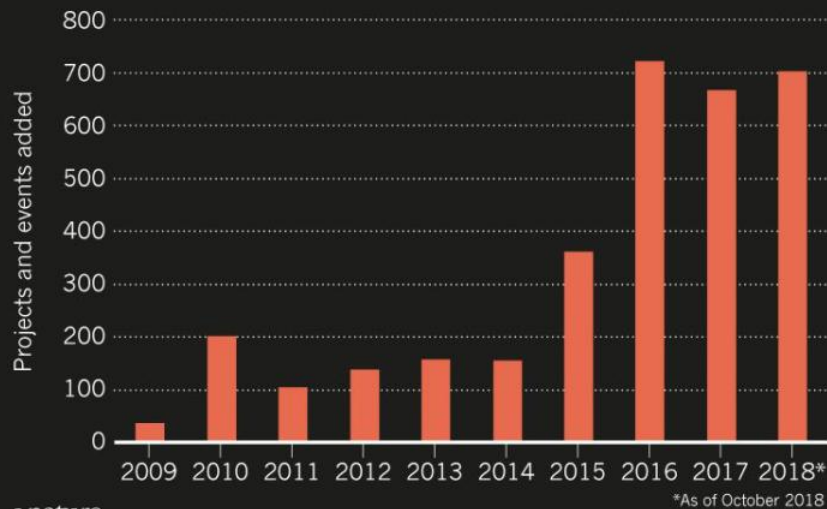
– McKinley et al, 2017



# Citizen science is growing.

## CROWD POWER

The SciStarter repository has been documenting the rise of citizen-science projects and events. The field is largely decentralized, which makes such efforts hard to track. Dates on this chart reflect the year in which the initiatives were added to SciStarter's records.



Arizona State University- Global Connections

- Water Rangers
- I Naturalist
- Lake Partner Program (MECP/FOCA)
- Ontario Invasive Species Watch (OFAH)
- Toronto Zoo (Turtle Tally, Clam Counter)
- E- Bird
- Tick observations



# Nearshore Water Quality monitoring Citizen Science Projects

- 2 lakes (Lake Scugog\* and Sturgeon Lake\*\*)
- Objectives:

- 1) Obtain a data baseline for near shore areas;
- 2) Compare with open water data;
- 3) Educate and encourage stewardship.



Great Lakes Nearshore Framework, 2016, Conservation  
Ontario-Nearshore Monitoring Protocol, 2016

\*UOIT- Kirkwood Labs

\*\*Private lab-Caduceon

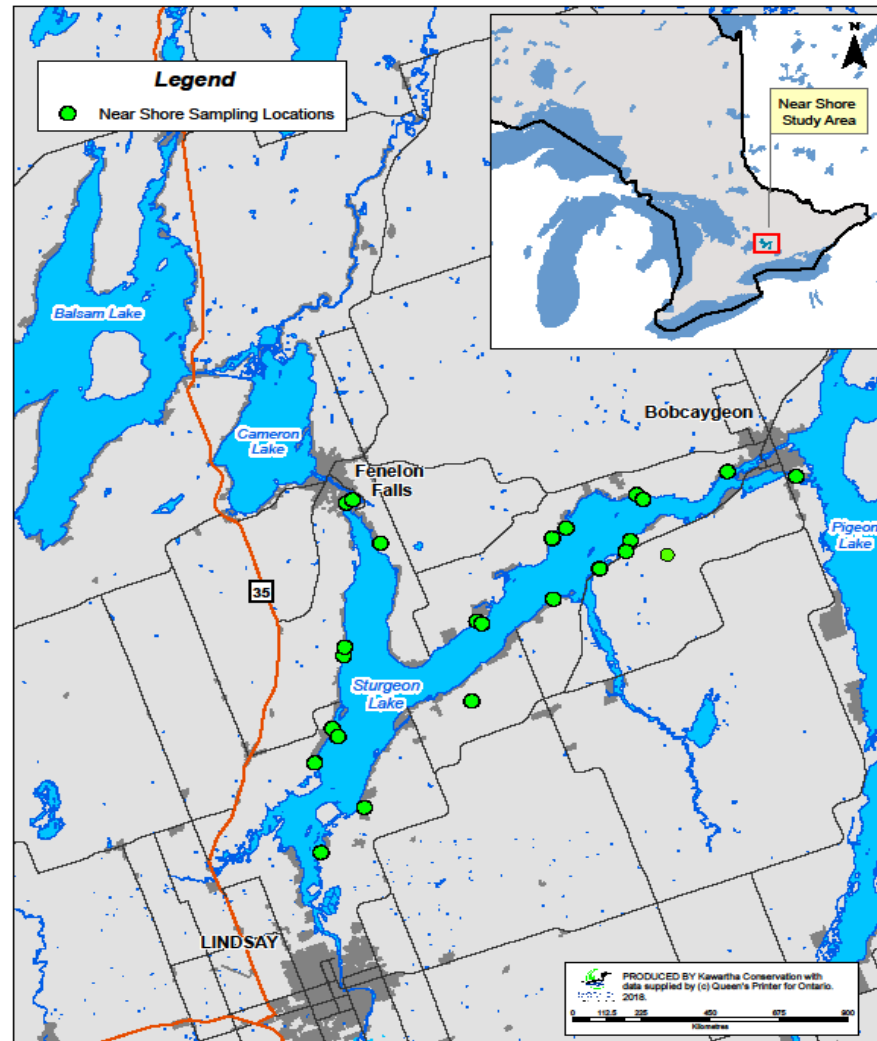


## Sturgeon Lake

- Shoreline 104km
- Surface area 45km<sup>2</sup>
- Triweekly

### Criteria:

- dock with minimum 1m depth
- Mandatory training

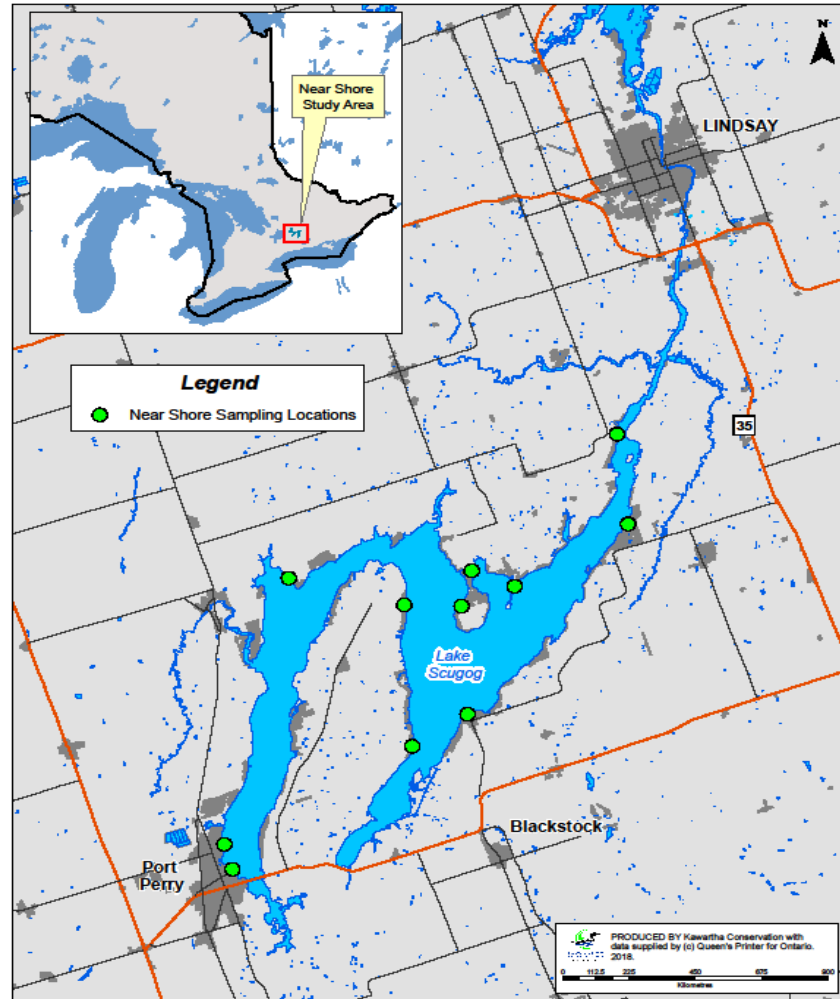


## Lake Scugog

- Shoreline 147km
- Surface area 68km<sup>2</sup>
- Biweekly collection

### Criteria:

- dock with minimum 1m depth
- Mandatory training



# 2 models of Citizen Science

	Lake Scugog	Sturgeon Lake
<b>Funding</b>	Multi partner	Municipality
<b>Recruitment</b>	Third party	Kawartha Conservation
<b>Training</b>	Informal	Formal- classroom
<b>Reporting</b>	Informal/formal	Formal- presentation/report
<b>Number of volunteers</b>	11	50
<b>Retention</b>	67%	83%

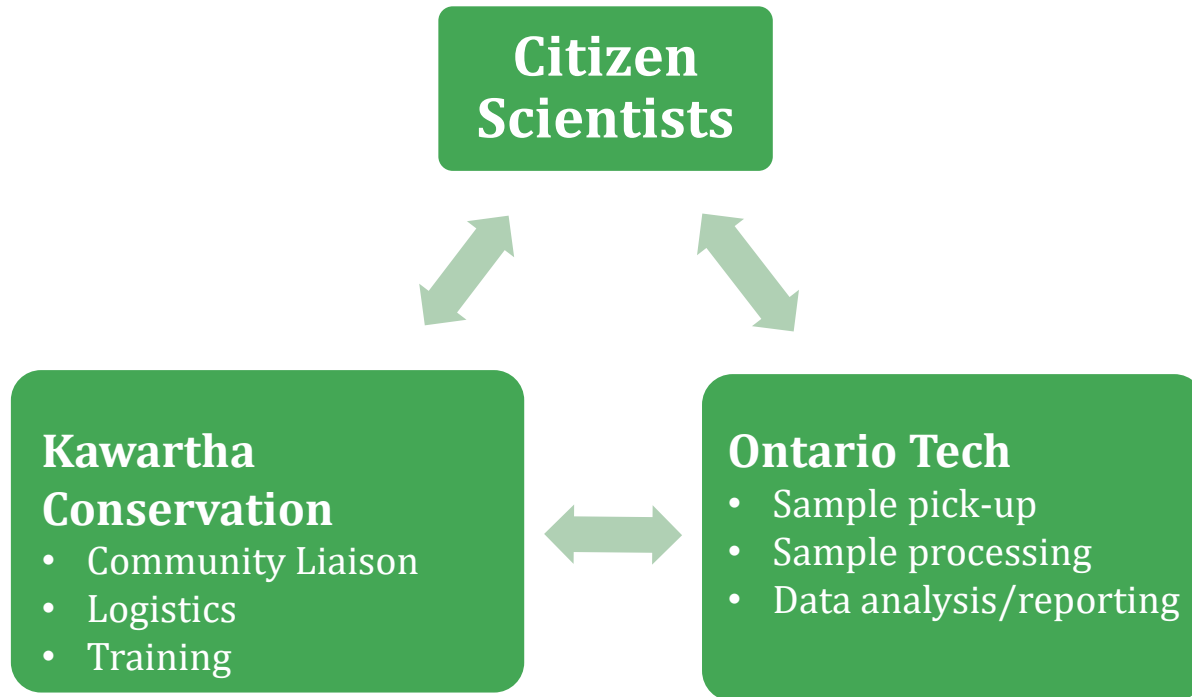


# Citizen Science measures of success

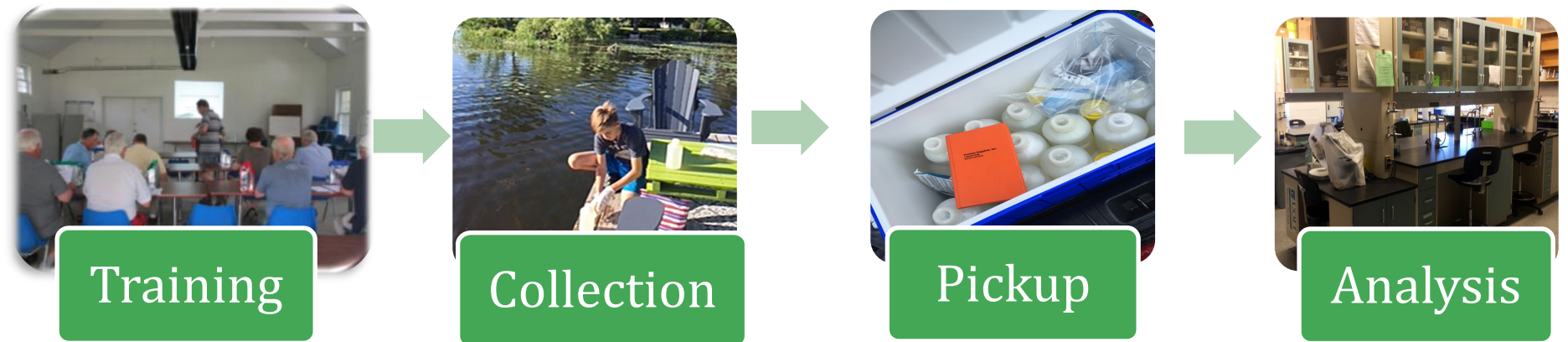
	Sturgeon Lake	Lake Scugog
Compliance	↑	↓
Volunteer retention	↑	↓
Data points (good data)	↑	↑
VALUE of project	↓	↑



# Model Improvement: Nearshore Water Quality monitoring using Citizen Science



# Nearshore Water Quality monitoring using Citizen Science



# BIOASSESSMENT using artificial substrates (PhD Student)



Deploy



Collect



Identify

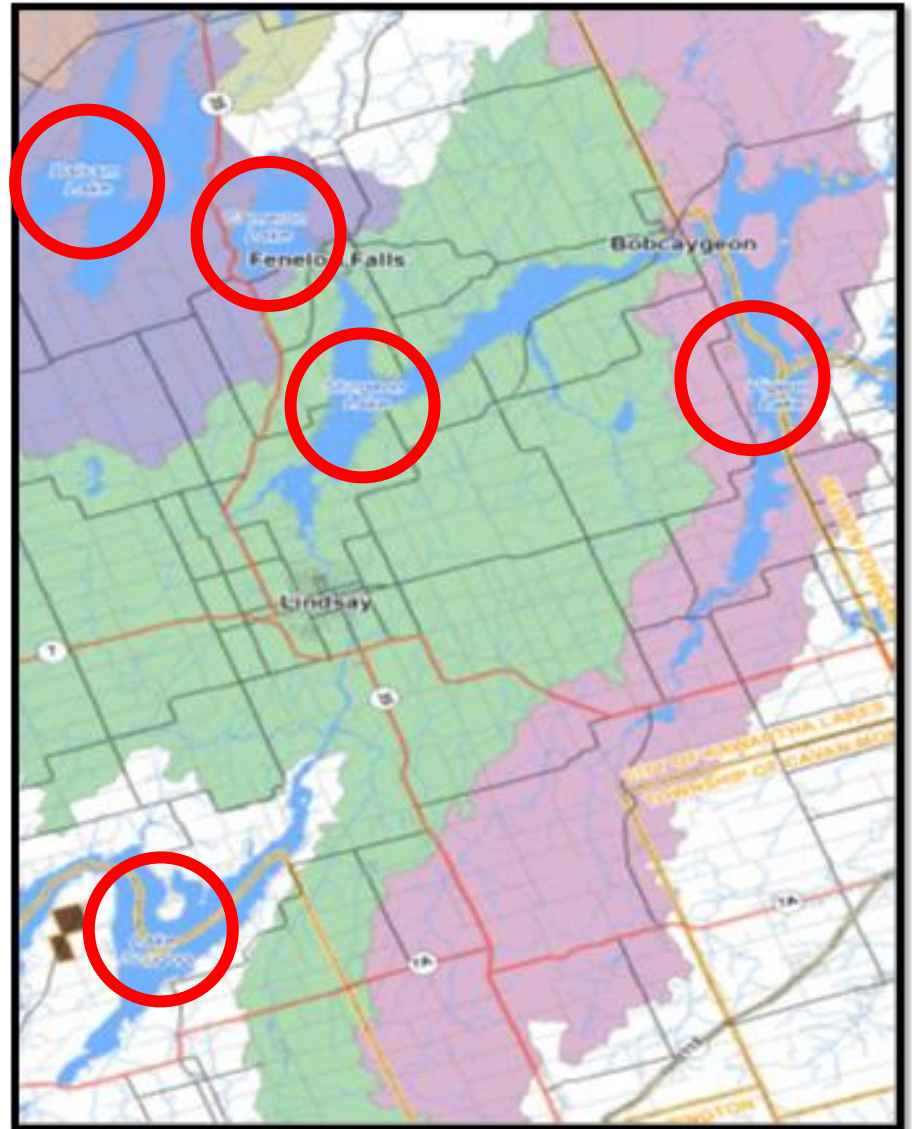


# MACROPHYTE SURVEYS (PhD candidate)



# Results

- 60 Citizen scientists collect data monthly (June to September)
- Lake leaders- logistics-reminders-liaison-Kawartha Conservation
- Sites on Lake Scugog\*, Balsam, Cameron, Pigeon and Sturgeon Lakes
- 7 parameters being tested (biological & chemical), such as nutrients, *E.coli* and chloride
- Year 1 of 3 completed



# Conclusion

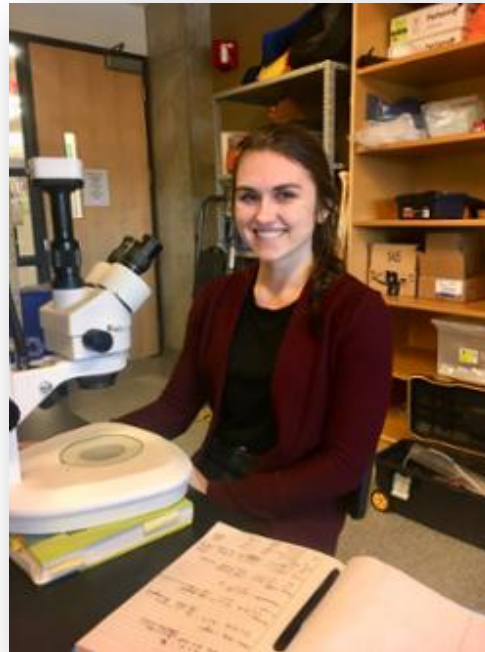
- Citizen Science is a valid and value added method to collecting good data
- Formal training, ongoing communication & reporting = good volunteer retention
- Partnership opportunities can enhance the project value (funding & examined parameters)
- Application of science
  - The **WHY & WHAT**
- **Strengthened CA & community relationships**



# Acknowledgements



**Dr. Andrea Kirkwood,**  
Associate Professor,  
Ontario Tech University



**Erin Smith,** Graduate student  
Ontario Tech University



Balsam Lake Association  
Scugog Lake Stewards  
Kawartha Lake Stewards  
Fenelon Falls Marine  
Rosedale Marina  
Citizen Scientists!

 **KirkwoodLab** [kawarthaconserv](#)

