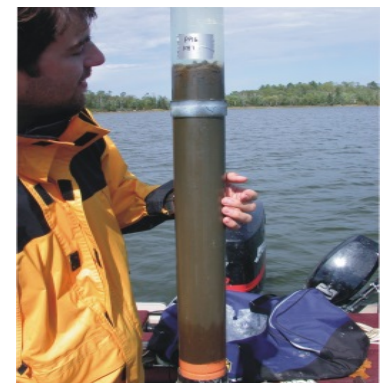




Kawartha Lake Stewards Association

**Kawartha Lakes Paleolimnological Study
Collection, Analysis and Age-dating of
Sediment Cores**

“Understanding the past to plan for the future”



Introduction



What is Paleolimnology?

the use of age dated sediment cores to reconstruct water quality histories and evaluate water quality trends.

Sediment core samples will provide a unique opportunity to determine historical trends and to provide insight on indices which could affect future quality trends. In the absence of long-term monitoring data, paleolimnology is used to reconstruct how nutrients and lake production have changed over time.

Purpose: to determine historical nutrient accumulation rates along the Kawartha Lake continuum

The Study will answer the following questions:

1. What is the range of variability in primary production and metals over the last 200 years i.e. what is the trend?
2. Is primary production increasing (and by how much) with corresponding human activities?

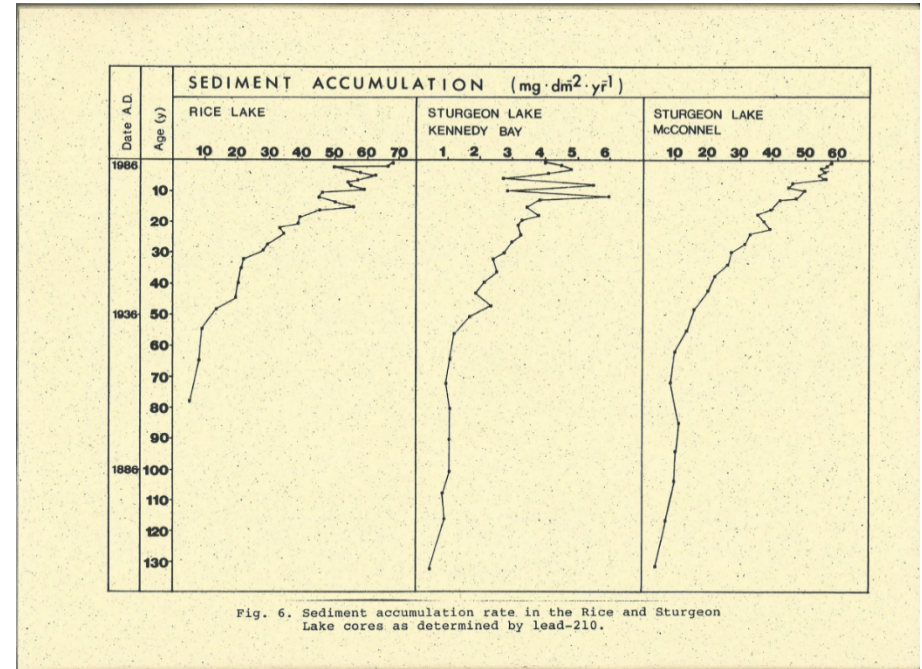
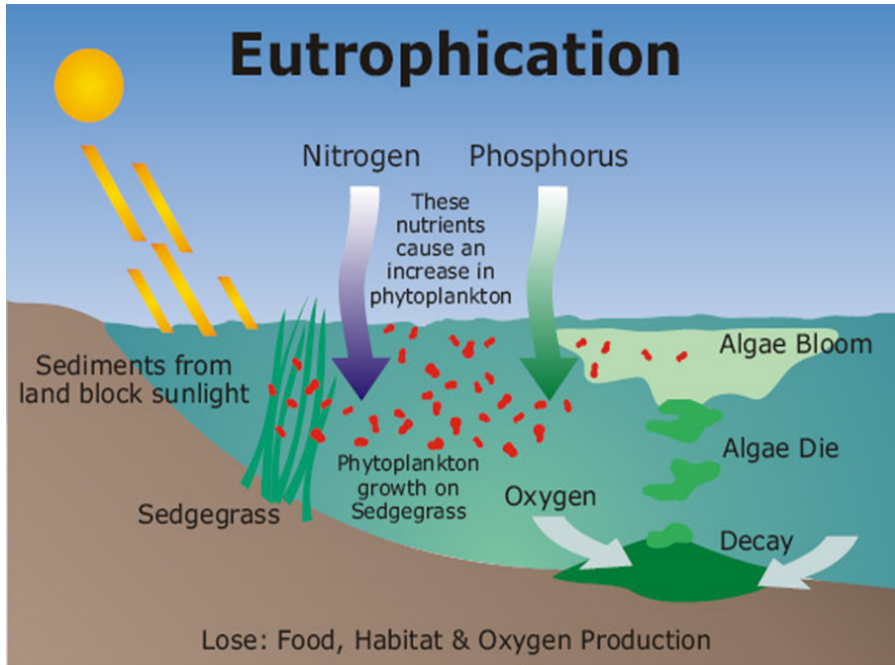
Study Utility

Lake managers can use information in setting realistic mitigation targets for aquatic systems.

Study Partners

KLSA, Trent University (Dr. Frost), Queens University – PEARL (Dr. Cumming) and Kawartha Conservation*, Stony Lake Heritage Foundation*

Background



In 1986, MOE collected sediment cores in Sturgeon and Rice Lakes. The study concluded that in the 130 years shown in the core samples, the greatest sediment accumulation rates occurred during the last 50 years (1930s to 1980s). Nutrient loadings accounted for most of the additional accumulation, giving rise to accelerated eutrophication of the lakes.

Project Scope



- Three sampling sites will be selected based on bathymetric data, depositional characteristics and confirmation with a sub-bottom profiler.
- Two of the core samples will be analyzed. The third core will be preserved for later analyse when funds are available.
- PEARL will perform age dating analysis, diatom and *chlorophyll a* analysis. Trent University will undertake pigment analyses, TP, C, N and metals.
- PEARL - report on their analytical work and how the results compare with those from other provincial and national lakes. Trent University - describe how the core profiles link directly to past historical activities on the Kawartha Lakes, review the nutrient loadings and deposition rates in the three lakes sampled, provide a forecast on future trends and recommend any mitigative actions that may be required.
- KLSA and others - use the data to inform lake users on natural and human influences on the Kawartha Lake system. Recommendations to improve the lakes' ecosystem services and protect water quality.

Project Budget and Funding

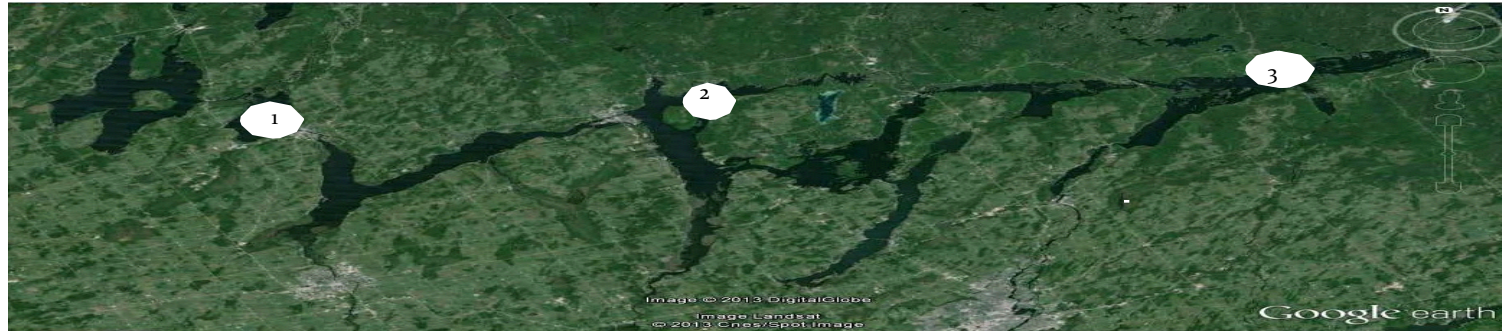


Cost Item	Estimate
PEARL Laboratory (Queens University): sample site selection, sample collection and preservation, radioactive gamma logging (for age dating), diatom analysis, LOI, <i>Chlorophyll analysis and metal scanning</i> .	\$30,000
Trent University: support for 1 st year for a Graduate Student - laboratory analysis, literature review, data collection, data interpretation and report preparation.	\$14,000 Yr 1 \$12,500 Yr 2
Public education	\$5,000
Total	\$61,500

- We currently have raised \$29,500 enough funds to analyse two cores and fund the first year of Trent University
- KLSA will continue to pursue further funding

**We are grateful to our funding Partners:
Stony Lake Heritage Foundation and Kawartha Conservation**

Sample Sites and Schedule



	Item	2016			2017			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Section	◇						
2	Sample Collection	◇						
3	Trent U graduate student starts		◇					
4	Sample preparation, splitting sectioning and drying		◇					
5	Age dating Pb-210, Cs-137			◇				
6	chlorophyll α analysis				◇			
7	Diatom analysis				◇			
8	Metal analysis				◇			
9	Laboratory Report - age dating				◇			
10	Laboratory Report - chlorophyll α analysis					◇		
11	Laboratory Report - diatom analysis					◇		
12	Laboratory Report metal analysis						◇	
13	PEARL Report							◇
14	Trent U interim report						◇	
15	Trent U Stony Report						◇	
16	Trent U Final Report							◇
17	Public Education and roll out of results		◇	◇	◇	◇	◇	◇



Thank You Donors