

# Not your grandmother's garden!

## Changes in the vegetation over the last 150 years in the Lac Lemery region of Gatineau Hills

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### Introduction

The purpose of this study is to investigate the history of the vegetation in the Lac Lemery region (Figure 1), to date the sediment core, and to determine the sedimentation rates in the lake. The core was 21 cm, which should span the past 150-200 years. The main focus was the taxon *Ambrosia* (ragweed) which was introduced into the region by European settlers. In addition to documenting changes in the vegetation caused by the arrival of European settlers, this study would provide a chronology for a paleolimnological study in the lake looking at the impact of eutrophication and the rehabilitation of the lake.

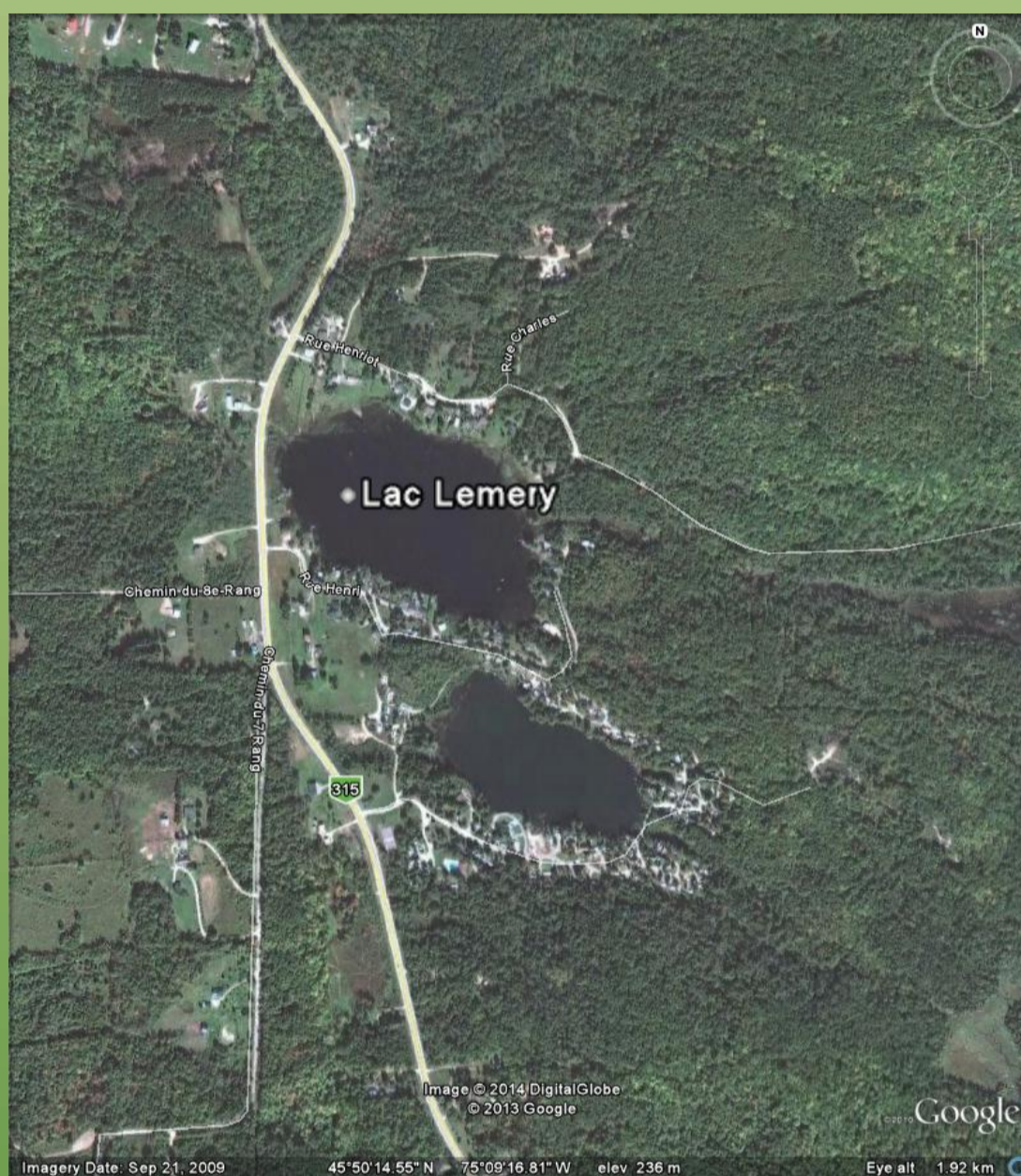


Figure 1. Lac Lemery, Quebec. From Google Earth



Grass pollen grains, Source: St Olaf College

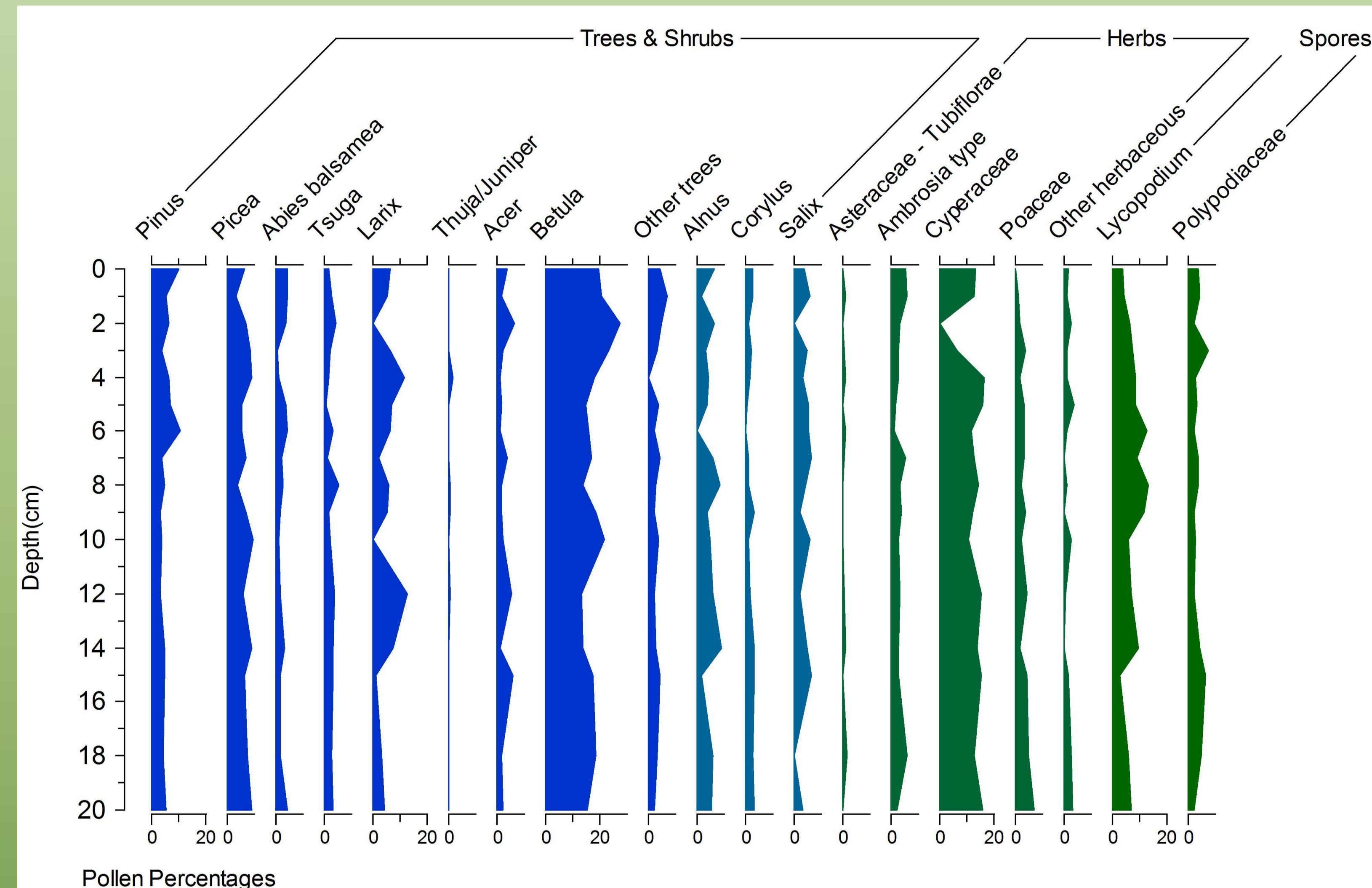
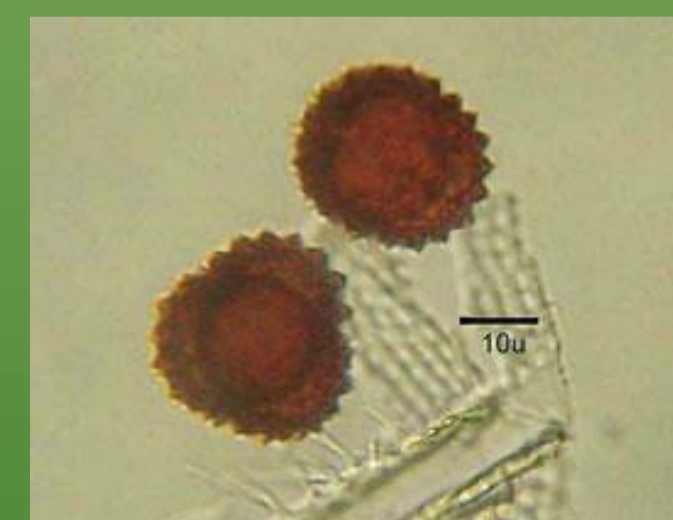


Figure 2 Pollen percentage diagram for Lac Lemery, Gatineau region, Quebec

### Methods

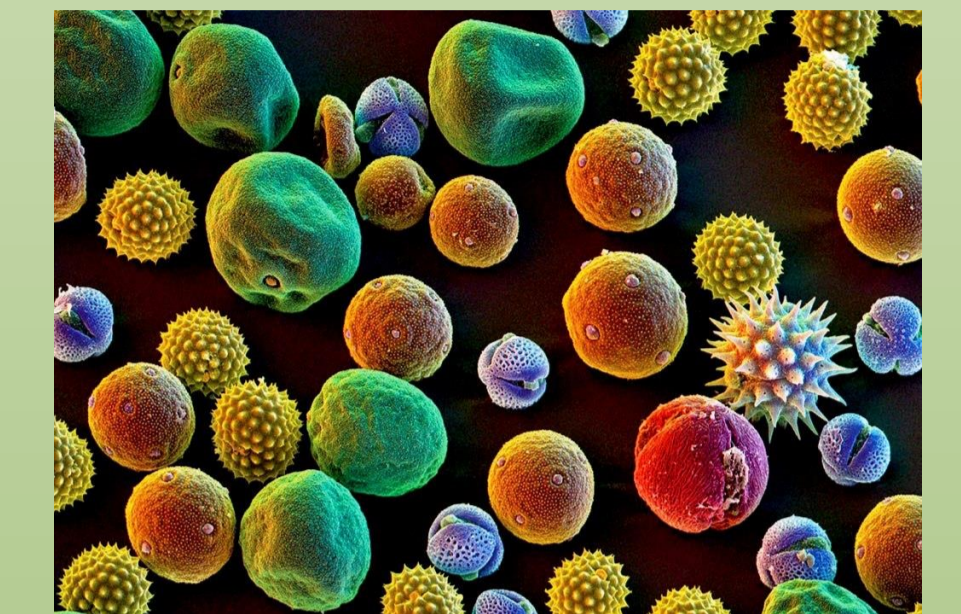
Twelve samples from a series of depths between 0-21 cm below the sediment water interface we processed to extract the pollen assemblages. A standard protocol, consisting of a series of washes with potassium hydroxide, hydrochloric acid, hydrofluoric acid and acetolysis solution was used to break down organic or non-organic debris other than the pollen. The slides were analysed under microscope at 400x, and all the pollen in 1-2 transects of each slide were counted and identified.



Ragweed pollen  
Source: allergyasthmasi.com

### Results

There was a low but constant level of *Ambrosia* type (ragweed), *Salix* (willow), *Corylus* (hazel), *Tsuga* (hemlock) and *Picea* (spruce) pollen, as well as high but stable levels of *Betula* (birch) and *Cyperaceae* (sedges) (Figure 2). *Pinus* (Pine) had fairly constant levels until about 7cm depth where it increased. *Acer* (maple) and *Larix* (Larch), both had several peaks at varying depths. Comparing the results to Paquette and Gajewski (2013)(Figure 3), we were able to date our lowest depth to after 150 years before present. Assuming a constant rate of sedimentation, we could estimate the rate for Lac Lemery at about 1.33mm/year.



Pollen grains. Source: keepingbee.org/

### Conclusions

Given the continuous deposition of *Ambrosia* pollen, we were able to conclude that the 21 section of the core postdates the European arrival into the area about 150 years ago. Compared to the pollen record of Lac Noir (Paquette and Gajewski 2013), we note that Lac Lemery had a slightly faster sedimentation rate, probably attributable to differences in lake morphometry and the local landscape. Although both lakes had similar composition in terms of trees and shrubs, the herbaceous composition differed. This would be due to local conditions, which could be explained by differences in human development around the lakes.



Figure 3. Location of Lac Lemery and Lac Noir, southwest Quebec, from Goggle Earth

### Acknowledgements

We would like to thank Dr Gajewski, for taking the time to mentor and see the project through, and to the UROP program, for funding the project and allowing it to happen in the first place.

### References

Paquette, N. & Gajewski, K. Climatic change causes abrupt changes in forest composition, inferred from a high-resolution pollen record, southwestern Quebec, Canada. *Quat. Sci. Rev.* **75**, 169-180 (2013)

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