



**Mount Allison
Dendrochronology Lab**

THE COBEQUID SLUICE, NOVA SCOTIA:
WOOD IDENTIFICATION AND RING MEASUREMENTS
AN INTERIM REPORT

André Robichaud and Colin P. Laroque

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Mount Allison University, Department of Geography and Environment
Mount Allison Dendrochronology Lab

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Abstract

The Colchester Historical Society possesses a section of a sluice taken from an Acadian aboiteau from the banks of the Salmon River in the vicinity of Truro, Nova Scotia. The Mount Allison Dendrochronology Laboratory sampled the sluice, measured the rings and identified the wood. Anatomical features indicate that it is eastern hemlock (*Tsuga canadensis*) and the ring count was determined to be 137. The series is of good quality and attempts will be made in the future to crossdate the measurements against regional master chronologies of eastern hemlock that are still in development by the MAD Lab.

Introduction

An Acadian aboiteau was found on the banks of the Salmon River outside of Truro in 2004. A portion of a sluice in good condition was apparent (Figure 1A) with pegs, clapper and top boards still present. The sluice was partially removed and brought back to the Colchester Historical Museum where it is now preserved (Figure 1B). Mrs. Elinor Maher, Program Committee Chair of the Colchester Historical Society, contacted the MAD Lab in June 2007 for a dendrochronological assessment. This interim report gives an account of the work that has been done so far to place the sluice in time.



Figure 1: (A) – The Cobequid sluice on the banks of the Salmon River. (B) - .The portion of the sluice that was brought back to the Colchester Historical Museum in Truro.

Analysis

Ring width measurements

On June 18th, 2007, a core sample was taken from the sluice using a manual increment borer. The extracted core was carefully placed in a plastic straw, labeled, and transported back to the lab for analysis. In the lab, the core was glued onto a grooved wooden mounting cane to facilitate sanding of the sample. It was then sanded with increasingly finer grained sandpaper to expose the annual ring-growth patterns and enhance the measurement precision.

The annual rings were measured using a 24 inch movable Velmex stage connected to a digital encoder which gave the measurements an accuracy of 1/1000 mm. Raw data was captured by J2X software and put into standard tree-ring decadal format. The measuring process established a 137 year series, which was then standardized using the software ARSTAN and then plotted on a graph (Figure 2). This data will serve in the crossdating procedure where master chronologies of the same species will be compared to the sluice series.

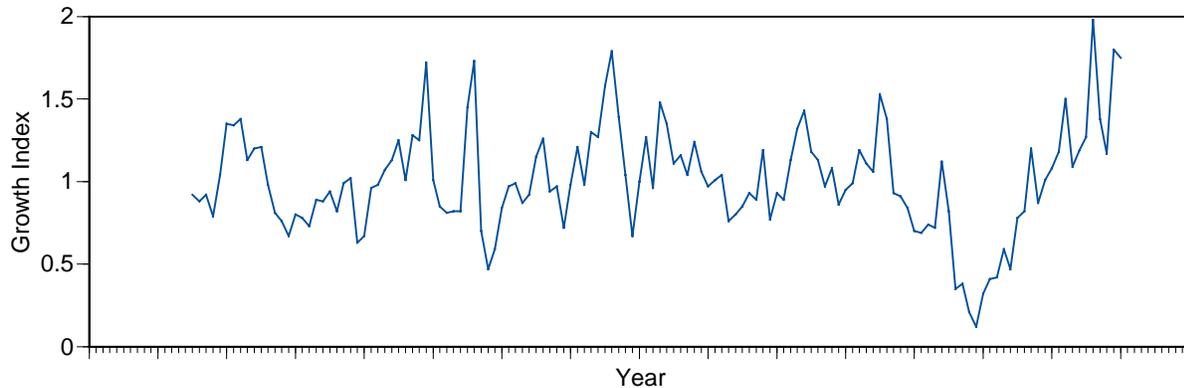


Figure 2: Mean standardized ring-width curve of the Cobequid sluice sample. The series has 137 rings, which should ensure crossdating of the sample, once a reference chronology of the same species can be established.

Wood identification

A wood fragment also taken from the sluice was cut with a razor blade on a wooden block under a dissecting microscope to expose the tangential and radial sections of the wood (Figure 3). The best pieces obtained from the fragment were glued onto a metal stub and taken to the Mount Allison Digital Microscopy Facility (<http://www.mta.ca/dmf/>) where it was prepared for viewing under a Scanning Electron Microscope (SEM).

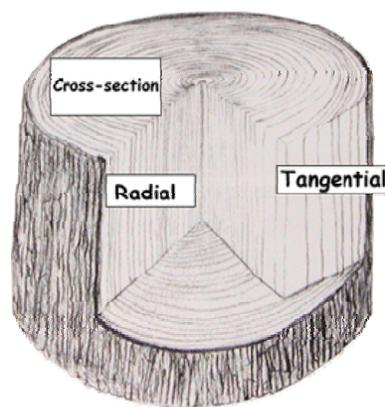


Figure 3: The different views considered in wood anatomy (<http://www.ups.gov>).

Observations of cell structures on the sample revealed anatomical characteristics typical of eastern hemlock (*Tsuga canadensis*). Rays were bordered by transverse tracheids and the parenchyma cells displayed cupressoid simple pits commonly found in hemlock (Figure 4A). Not shown here but observed on the radial section are double rows of bordered pits on axial tracheids that also help identify the species. Additionally, resin canals were absent from the tangential section (Figure 4B). The larger cross

section was examined on the sanded core and also illustrated that resin canals were absent along the length.

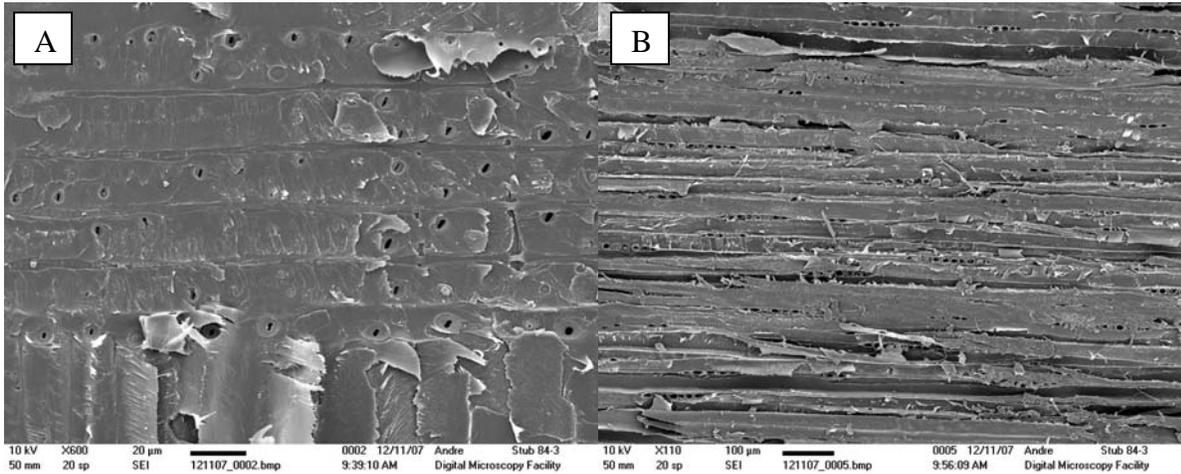


Figure 4: (A) – Radial view of the sluice sample showing transverse tracheids. (B) Tangential view. No resin canals were visible on the wood sample.

Conclusion

The sample from the Cobequid sluice was able to produce a good quality series of measurements with a relatively large number of rings (137). It should be possible to crossdate this series with a master chronology in the near future, as the MAD Lab is currently working on several long-lived eastern hemlock regional chronologies from Nova Scotia sites. The next step will be comparing the ring-width series of the sluice with the hemlock chronologies in development, to find a pattern match and lock the sluice chronology that is “floating” in time to that of a living series with a known date.