



Mount Allison
Dendrochronology Lab

MAD Lab Report 2007-07

THE VAL COMEAU CANOE:

Tree-Ring Measurements

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Abstract

The first step in establishing a white pine growth pattern analysis for the First Nation dugout canoe was to complete tree ring measurements at the Mount Allison Dendrochronology Laboratory. Two workable cores were taken from the canoe, dried, and were glued on support canes and sanded to a smooth polish. They were then measured using a Velmex system to a precision of 0.001 mm. The measurements were compiled and graphed to display the growth patterns from the two cores. The relatively long sequence of measurements from the samples will lead to an increased chance of eventually crossdating them into a living chronology.

Introduction

During the summer of 2003, a dugout canoe was discovered slightly buried on a beach in Val Comeau. It measured approximately 4.8m long and has been identified as one of the few large First Nation's artifacts to be found in New Brunswick. The canoe is now kept at the Provincial Museum where it is undergoing preservation techniques. The Museum has had the artifact dated through a radiocarbon dating process, and the age has been determined to be approximately 450 years \pm 50 years. The present challenge is to determine the exact age of the canoe, and to accomplish this goal, a dendrochronological analysis needs to be undertaken on the wooden structure.

The Mount Allison Dendrochronology Lab (MAD Lab) has been contacted to date the canoe using a master chronology of tree-ring growth that extends back in time to the period of the construction of the canoe. The lab will attempt to match the patterns of growth between the canoe and a master chronology to provide a more accurate date of when the wood was cut to build the canoe. The first step in the project was to retrieve samples from the canoe and to identify the wood species. This has been completed and the samples have been identified as eastern white pine (*Pinus strobus*). The second step was to measure the canoe core samples, the results of which are presented in this report.

The next phase will be to create a white pine master chronology by searching for living trees as well as structures made of white pine throughout New Brunswick and will be undertaken during the summer of 2007. If this can be accomplished, the final phase will be to crossdate (pattern match) the canoe core measurements against the New Brunswick white pine master chronology to retrieve a specific year of cutting of the wood.

Methods

Three cores were taken from the Val Comeau canoe (Figure 1). One of the cores was used to identify the wood species (Core #07A001), as presented in a previous report (MAD Lab Report 2007-01). The other two cores were glued into mounting canes, lining up the cell structure so that the radial sections were visible. The canes were then sanded through successive rounds at different sandpaper grades: 80, 120, 220, 320 and 600 grit. In the end, the samples were very smooth and the radial cell structures of the wood were easily visible under a microscope (Figure 2). The cores were then measured using a 63X light microscope coupled to a Velmex stage measuring system which measures annual tree rings to a precision of 0.001 mm. Each core was measured 5 times and an average measurement was calculated. The average measurements of each core were then graphed.



Figure 1- Sampling the canoe at the bow end using a 4.3mm increment borer.



Figure 2 – Image of mounted core (07A003) that has been prepared for measuring.

Results

The two Val Comeau canoe cores had an average ring width of 1.35 mm/year. Sample 07A002 had a span of 59 years and sample 07A003 had a span of 67 years. Put together, the core measurements covered a time frame of 75 years, as each core extended either backward or forward in time from the region of overlap. The measurements and overlap are illustrated in Figure 3. Figure 3 represents raw measurement data only, but the close similarity between measurements of the two cores taken at different positions on the artifact, indicates that a good overall representation of the growth pattern of the tree was collected.

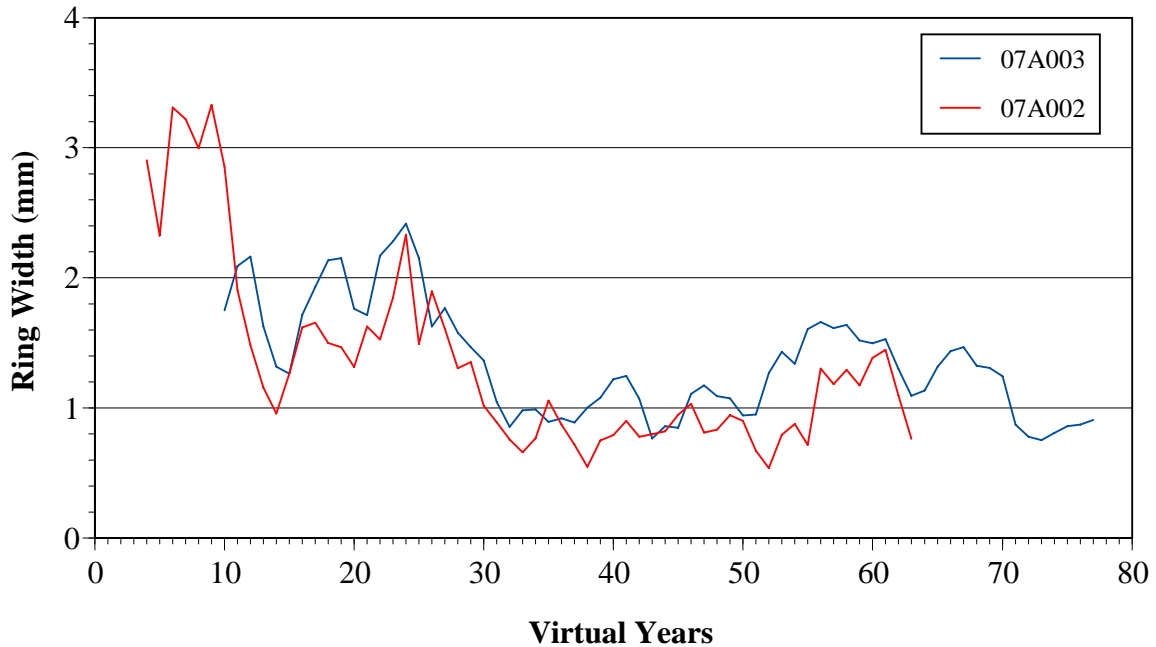


Figure 3 - Graph of Val Comeau canoe cores indicating the areas of overlap between the cores and a total span of 75 years. Both cores have a similar trend, which indicates a promising potential pattern to crossdate these samples into a live chronology.

Conclusions

Through measurements conducted by the Mount Allison Dendrochronology Lab, a radial growth pattern representing a 75 year span was established for the Val Comeau canoe core samples. This length of pattern should be sufficient to conduct further analysis, and should eventually allow a statistically significant crossdate to be formed against a live chronology. The white pine master chronology is currently being developed and it should eventually help determine the exact date of construction for the large artifact.