A Dendroarchaeological Analysis of the Cormier House Sackville, New Brunswick

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Abstract

The Cormier family has lived in their home in Sackville, NB for the past decade and a half. Due to a long-standing disagreement between father and son with respect to the speculated age of their family home, the MAD Lab was contacted to assist in determining the year in which the structural timber was harvested. Ten samples were collected from log beams in the home's basement and were identified as red spruce (*Picea rubens*). These samples were then processed and crossdated to regional master chronologies of red spruce. Beams from the structure illustrated a probable construction period between 1810 and 1815, giving the house an approximate age of 200 years old. This date ultimately confirmed Perry Cormier (father)'s long-held estimation of the home's age.

Introduction

In the summer of 2011, Mount Allison University employee, Phil Cormier, shared that his father, Perry Cormier, had a continuing desire to find out the age of their family home. With estimates between 120 years and 200 years of age, the MAD Lab was employed to determine the age of the structure and settle the long-standing good-natured debate between father and son.

Methods

The Cormier residence is located at 113 Queens Road in Sackville, NB (Lat. 45^{o} 53' 16.7" N, Long. 64^{o} 22' 49.6" W). On June 28, 2011, the MAD Lab sent six of its workers to examine and sample the site. Ten cores were extracted from the home's basement, two from the two main beams adjacent to the staircase and eight from smaller supporting beams running perpendicular to the main beams (see Appendix I). To ease the process of crossdating the wood, samples were extracted from sections where the tree's original bark or wormwood was still intact. The samples were labeled with the MAD Lab code 11PL900 and the location and condition of each sample was noted.

Once in the lab, each of the samples were glued into slotted mounting boards and sanded evenly with increasingly finer sand paper (80-600 grit) and buffed in order to bring out the cellular structures and to make the annual rings more visible. A Velmex measuring system was then used to count the rings and to determine the width of each with an accuracy of 0.001mm.

Using the program COFECHA, each individual ring-width series was statistically analyzed and a floating time series was created. In this step, the samples were pattern matched to each other in order to create a chronology that was not yet attached to a specific time period. This floating chronology was then crossdated against a master red spruce chronology available from the MAD lab archive. Through this analysis, the radial growth patterns of the house samples are compared to the average growth patterns of other red spruce trees from the region in order to find the segment of time where the spruce trees used in the building's construction were growing. Following this step, cores that did not correlate in a significant way (their growth patterns did not have enough variance amongst the rings to match it to a particular time period from the master chronology) were removed from the analysis. A new chronology was created from the remaining four samples and standardized along with the regional red spruce master chronology to have a mean of one by using a negative exponential curve in the program ARSTAN (Holmes 1986). This standardization was completed to allow samples of different ages to be compared via a graph representing the growth patterns of the four samples in comparison to the master chronology for the growth period of the sample series.

Results and Discussion

Of the ten samples retrieved from the Cormier basement, only four had growth patterns with sufficient variance to accurately match them to the master chronology. The remaining six had relatively low correlations to the master chronology (0.331 and lower), meaning that growth sequence patterns represented in these samples did not have distinctive indicator rings in their pattern to enable them to be matched to corresponding regions in the master chronology.

Table 1. A crossdating COFECHA summary table for samples of acceptable correlation values. Note all samples with correlations above 0.3281 are significant above the 99% confidence interval.

COFECHA Correlations for Cormier House			
Series	Interval	Number of Years	Correlation
11PS902A	1770 – 1813	44	0.413
11PS904A	1768 - 1815	48	0.452
11PS905A	1767 - 1810	44	0.723
11PS910A	1733-1813	81	0.587

The four samples with acceptable correlation values (listed above) were then graphically compared to the red spruce master chronology for the period from 1730 to 1820 (Figure 1). In viewing the graph of the standardized growth of both the sample series and the regional master chronology (illustrated below), one can observe that the growth pattern of the four samples is well matched to the regional red spruce chronology.

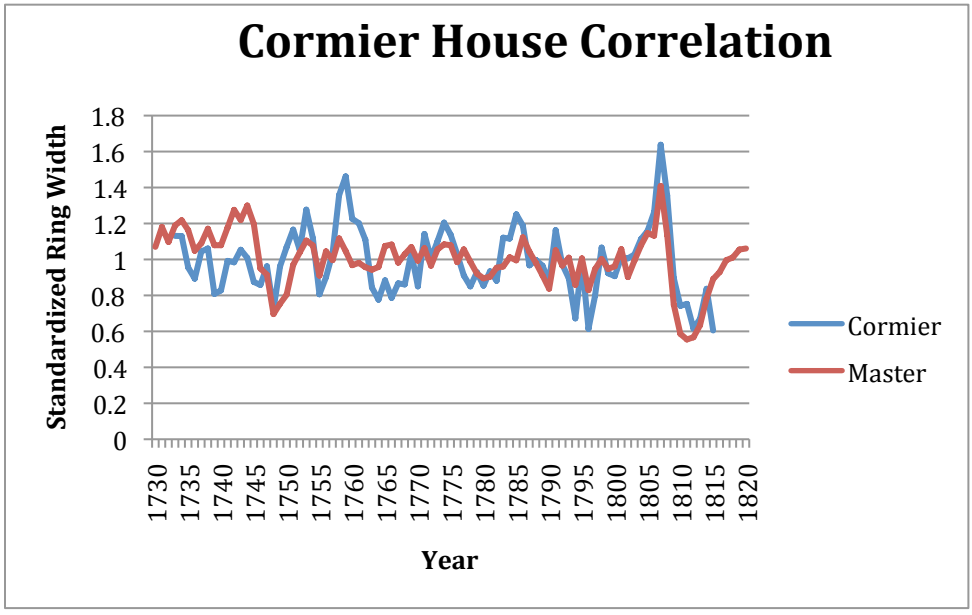

Figure 1. The standardized ARTSAN radial growth curve for the four highest correlating samples compared to the regional master chronology for red spruce.

The results produce a likely date of construction of between 1813 and 1815. It is possible that this range of logging dates exists because the home's original builder had material garnered from various projects or from a stockpile. Thus, wood used as main support beams in the basement is a mixture of new wood logged in 1815 and lumber left over from material cut during the previous few seasons and then used in the construction.

Conclusions

The analysis of ten red spruce samples retrieved from the basement of Perry Cormier's home produced wood with cut dates ranging from 1810 to 1815 with a probable construction date of the building being 1815.

References

Holmes, R.L., Adams, R.K., & Fritts, H.C. (1986). Users Manual for Program ARSTAN. In: *Tree-ring chronologies of western North America: California, eastern Oregon, and northern Great Basin* (eds R.L. Holmes, R.K. Adams & H.C. Fritts), pp. 50-65. Laboratory of Tree-Ring Research, University of Arizona, Tucson.

Appendix I - Floor plan for the basement of the Cormier House. The two larger main beams run parallel to the staircase, each intersected by cross-beams (all red spruce). The location of the ten samples are marked.