MAD Lab Report 2007-09

Dating the Lowden House

By

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Abstract

In the summer of 2007, the Mount Allison Dendrochronology Lab (MAD Lab) traveled to Habitant, Nova Scotia and sampled the Lowden House. The house was questioned as to the date of origin and a wood sample was extracted from the main central chimney in the basement. The sample was transported back to the MAD Lab. The sample was processed using standard dendrochronological procedures and it was determined that the log was made of red spruce (*Picea rubens*). Using a regional red spruce chronology available from Middleton, NS, the sample from the Lowden house was crossdated with a cut date established as 1772. As the sample came from a location that is central to the main structure, it is believed that the house was constructed in approximately 1773, allowing for the green timber to season after the final growth year of the tree in 1772.

Introduction

Dendrochronology is the overarching term for all tree-ring studies where the annual growth layers have been assigned to or assumed to be associated with specific calendar years. Dendroarchaeology is a subset of dendrochronology. It is the study of tree rings taken from beams in historical structures. Dendroarchaeological research often provides construction dates for historical structures. It also provides past radial-growth records that are otherwise unavailable in areas where trees are logged before they reached old-age.

The Mount Allison Dendrochronology Laboratory (MAD Lab) was contacted by Iain Taylor to come by to sample his property in Habitant, Nova Scotia, the Lowden House (Figure 1.0). The house was thought to be one of the oldest structures in the community and there was some question whether or not it was possibly of pre- or post-deportation heritage. With this task in mind, the Mad Lab set out to establish a date of construction for the building.

Figure 1.0: The Lowden House as sampled in the summer of 2007.

Results and Discussion

Only one viable sample was taken from the basement of the Lowden House (Figure 2.0). The sample was designated with the MAD Lab code #07CS001, and was a disc sample taken from the main chimney complex in the basement of the structure.

Figure 2.0: The end piece of a log (Mad Lab # 07CS001) built into the fireplace that was used in the analysis of the Lowden House.

The sample was labeled and transported back to the MAD Lab. It was surfaced using a bandsaw and then sanded with progressively finer sand paper. Paper grits of 40, 80, 120, 220, 320, and 400 were used in the shop and then the sample was hand polished

in the lab to a 600 grit. The rings of the cookie were measured using a 63X light microscope coupled to a Velmex stage measuring system which measures annual tree rings to a precision of 0.001mm. Prior to further analysis a small section of the cookie was taken and it was identified to species as red spruce (*Piecea rubens*) using a scanning electron microscope procedure.

Three paths on the sample were measured (Figure 3.0). Each path varied in age with one radii ending in bark. This is a key factor as the presence of bark establishes the outermost growth ring on a tree before it died. The ages of each radii were at least 50 years in length, which signified that the sample would be a good candidate to establish a viable crossdate against a known dated tree-ring series.

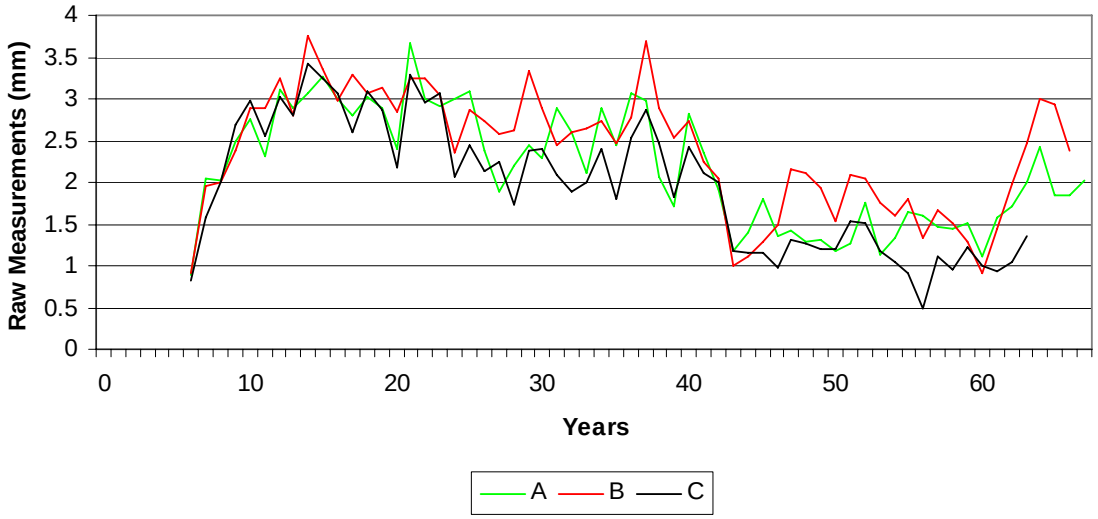

Figure 3.0: The raw measurements of the Mad Lab # 07CS001sample. Three active paths were able to be measured along the radius of the sample, with all three illustrating similar radial growth trends over an approximately 60 year period in time.

Once the radii were measured, an average was created between the three measured lengths. This average was used as the overall growth pattern for the individual log from the basement in subsequent analyses. Since the sample was determined to be red spruce, the MAD Lab archive was used to find a regional red spruce radial growth chronology. An excellent candidate was found that was made from wood harvested at Middleton, NS. The chronology was very long and easily extended over a wide time

frame that included all of the potential dates from which the wood in the Lowden house probably grew under.

A pattern match for the Lowden house floating chronology was established using the dated chronology from Middleton. The match was first established statistically using program COFECHA, and then checked visually by graphing methods (Figure 4.0). The two chronologies provide a good match between each other. The length of the Lowden House chronology is of sufficient length, that the fit does not match anywhere else in the last 350 years of red spruce growth in this region of Nova Scotia. This helps lend a degree of certainty to the overall chronology of the Lowden House, which ends up being fit in time from 1714 to1772.

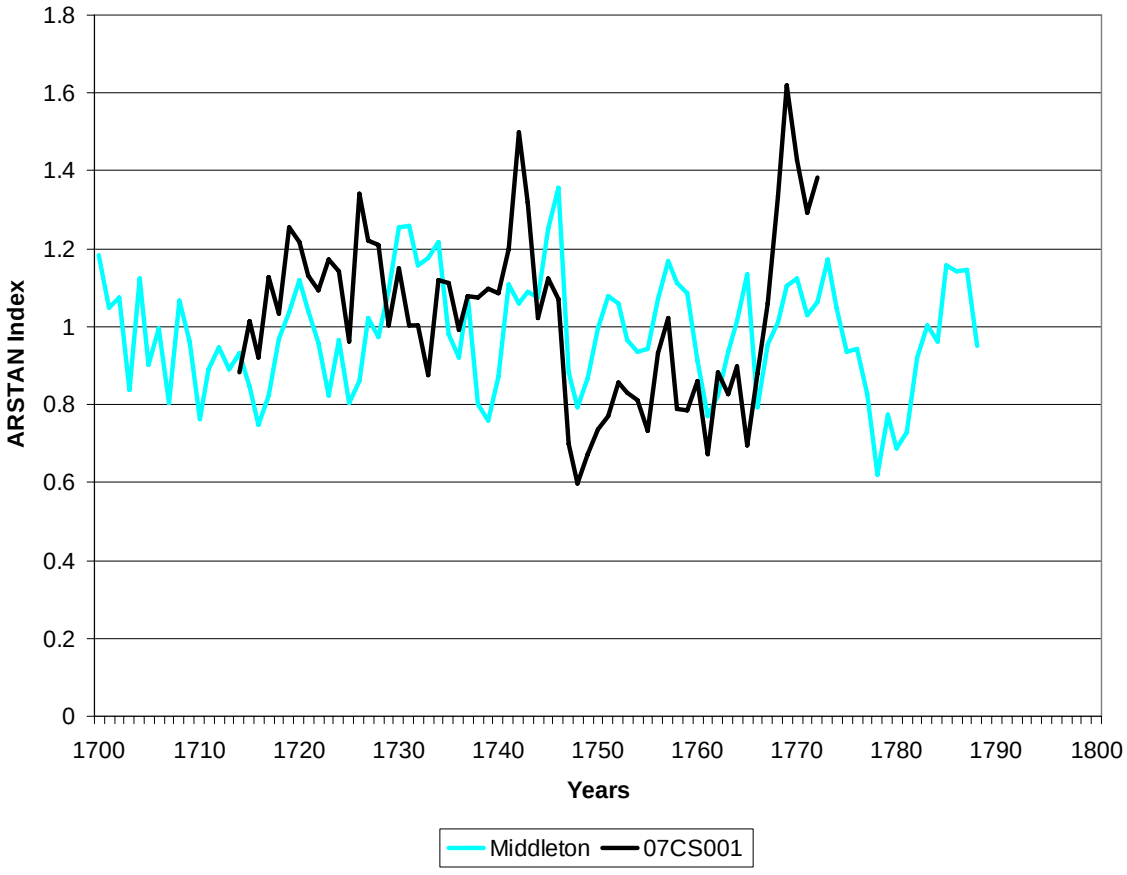

Figure 4.0: The average radial growth increments of the Lowden House sample matched against the Middleton red spruce chronology. The sample pattern matches (crossdates) well over the time frame of 1714 to1772.

Conclusion

The cut date of a log incorporated into the main chimney of the Lowden House has an end date of 1772. This date is clearly the cut date of the tree it was taken from, as bark was present on the sample. With the chimney structure being so central to the house construction, it is presumed that the remainder of the construction of the main structure was conducted at the same time as the chimney unit. A common construction practice at the time, was to cut and haul the wood in the fall/winter season when it was easier to move the wood by horse and sleigh. Once on site, the wood was often allowed to dry and season for a number of months before it was squared up and incorporated into a structure under construction. For some builders, this process also sometimes took two years from cut date to construction. It is our best guess therefore, that the Lowden House was constructed in the summer of 1773, with wood cut after the end of the growth season in 1772. This would make the structure date to the era of the Planters.