Dating the Art McLaughlin House Using Dendroarchaeology

MAD Lab Report 2005-04

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Abstract

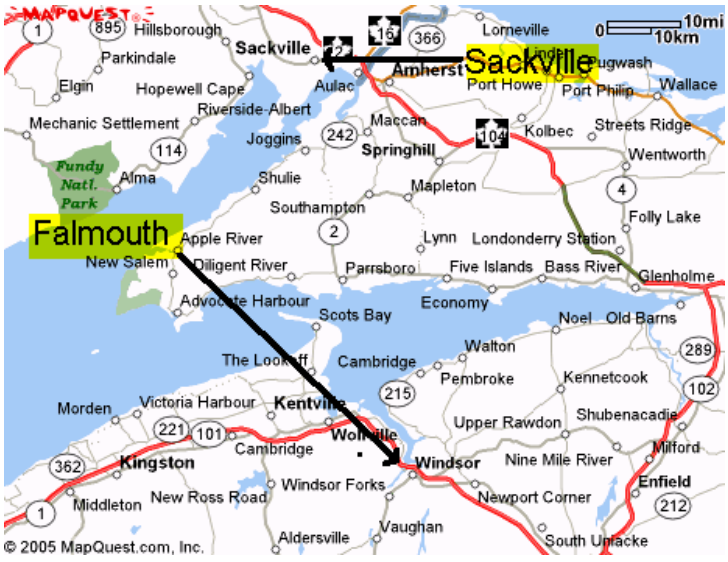
Art McLaughlin suggested that a house he owns in Falmouth may have been built during Acadian times. The goal of this project was to present the results of a dendroarchaeological study at the Art McLaughlin house in order to determine its age and if it is indeed an historical Acadian building.

From our dendrochronological analysis, it is clear that the Art McLaughlin house was constructed in either 1764 or 1765, one year after the cut date of the wood. This date is after the deportation of the Acadians so it is not an Acadian structure. However, some timber was pre-deportation probably salvaged from a nearby structure of Acadian construction or abandoned wood. Even though it is not an Acadian structure, this well preserved building is still a 240 year old dwelling and perhaps one of the oldest dated house in the Maritimes. It coincides with the early Planters settlement in the region and should be representative of the architecture of this period. Thus, the house is a historically important structure and is part of the heritage from the Falmouth-Windsor region.

Introduction

Dendroarchaeology is the application of tree ring analysis to the dating of old buildings made of wood. It has two great advantages: 1) it causes little damage to the structure since it consists of extracting a small core with an increment borer that leaves a hole only a few millimeters in diameter, and 2) it yields a date with a precision of 1 year, vastly superior than many assessments made through historical interpretation. It is a well known technique but has been hardly employed in the Atlantic provinces of Canada although many areas hold prominent historical buildings that have yet to be dated.

One such area is the former Acadian Pigiguit situated in the Falmouth/Windsor region, Nova Scotia. The first Acadians arrived in Pigiguit around 1685. They mainly immigrated from Port-Royal, where good farming land was becoming scarce. With the building of dykes and *aboiteaux*, they quickly drained the land around the Minas Basin for agriculture. In 1698, the Jesuit Louis de Thury founded the parish of *L'Assomption*, which would be divided twenty four years later in two parishes, one on each side of the Pigiguit River: *L'Assomption* (now known as Windsor) and *Sainte-Famille* (now Falmouth). In 1713, the land became British territory under the Treaty of Utrecht, but the Acadians were allowed to remain on their lands. The Deportation came later in1755, but not all Acadians from the Falmouth region were taken away. Indeed, there were not enough boats available at that time, and many people were held prisoner in Fort Edward or even might have been allowed to remain on their farms until more transport arrived. Perhaps 1500 Acadians stayed in the area between 1760 and 1768, many of which did not get deported.



settlers from Massachusetts and Rhode Island. They were given the name "Planters" and they greatly benefited from the infrastructures and well tended lands developed by the Acadians. A very good harvest in 1766 gave a boost to Falmouth's development (Duncanson, 1965). There is also evidence that the Acadian prisoners were forced to work for the new settlers, for example to repair the dykes and aboiteaux all over the Minas Basin that were destroyed by a hurricane in 1759. The residents of Falmouth and other towns even signed a petition in 1765 asking the Governor to allow the Acadians to stay with them for the reconstruction of the draining system (Duncanson, 1965). Later, some Acadians became tenants on Governor DesBarres's possessions.

It has been known that most of the Acadian houses were burned during the Deportation to prevent them from coming back. Therefore, it is very difficult to find pre-deportation Acadian buildings today. Nevertheless, some documents suggest that several houses and barns were left standing in the Pigiguit area and distributed among the New England colonists (Bernard LeBlanc, personal communication). For example Brun (2005) mentions that in 1760 at one of the first meetings held at the Falmouth township "27 houses (including the mill house) and 22 barns, as well as a large quantity of beams and boards, were given to the new colonists free of charge".

Mr. Art McLaughlin suggested that a house he owns in Falmouth may have been built during Acadian times. The goal of this project is to present the results of a dendroarchaeological study at the Art McLaughlin house in order to determine its age and if it is indeed an historical Acadian building.

Fieldwork and methods

Sampling of the Art McLaughlin house, in Falmouth NS, was carried out on the 6th of March 2005. The research team took core samples from the basement (n=10), main floor (n=5) and attic (n=4) using manual increment borers. In addition, the property owner provided another two samples from a board and a beam taken from the house. As the samples were extracted, their position in the house was mapped, the samples were labeled and features of the beams they were extracted from observed, such as the presence of bark or burn marks. In total, the sampling process took roughly two hours. Once the samples were

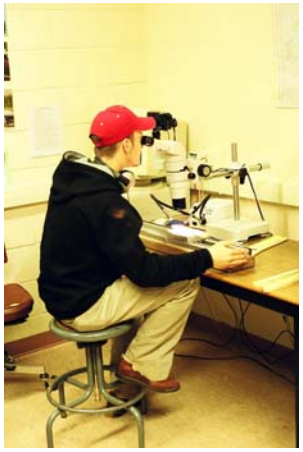
obtained, they were taken to the Mount Allison Dendrochronology Lab (MADLAB) for preparation and analysis.

The initial stage of preparation of the samples involved mounting the cores on grooved wooden mounting canes to facilitate sanding of the samples. The cores were glued into the canes with the cells aligned vertically to allow the best resolution of the annual growth rings. Once the mounted cores dried, the surfaces of the cores were progressively sanded with sandpaper of increasingly fine grain (up to 600) to expose the annual ring-growth patterns. Following sanding, the core samples were polished to further clarify the ring pattern.

During the mounting process any excess portions of the core samples were taken for wood identification using a scanning electron microscope (SEM) from the Mount Allison Digital Microscopy Facility. The SEM enables precise wood identification through the recognition of species-specific cell features and structures. Eight samples from the Art McLaughlin house were analyzed.

The identification of the wood is important because different species have different growth reactions to climatic variables. When the species is known, it allows samples to crossdate with a reference chronology of the same species with more accurate results.

The prepared core samples were measured using a 24 inch movable Velmex Stage hooked up to a digital encoder. The system is capable of measuring ring-widths to an accuracy of a thousandth of a millimetre. Raw data was captured by J2X software and put into standard tree-ring decadal format.

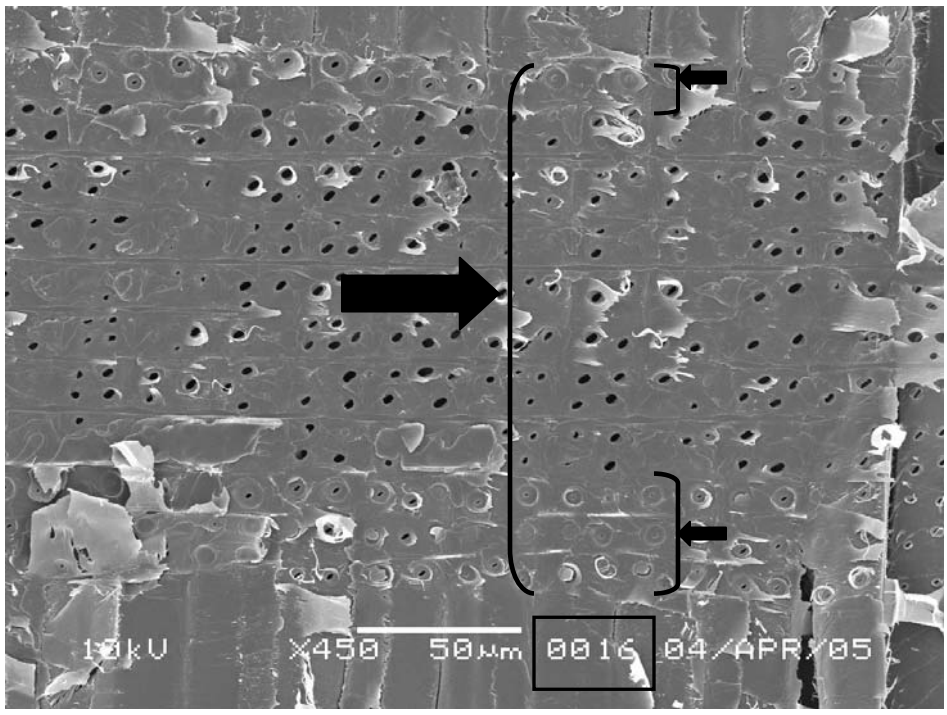


Once collected the raw tree-ring data used to create growth curves using a graphing software called DeltaGraph™. These were compared visually with reference curves of a known age by overlaying the graphs on a light table. The crossdating software COFECHA (Grissino-Mayer, 2001) was also used. Samples taken at Christ Church in Karsdale Nova Sotia (Robichaud et al., 2005) provided the reference chronology.

Results

Wood identification

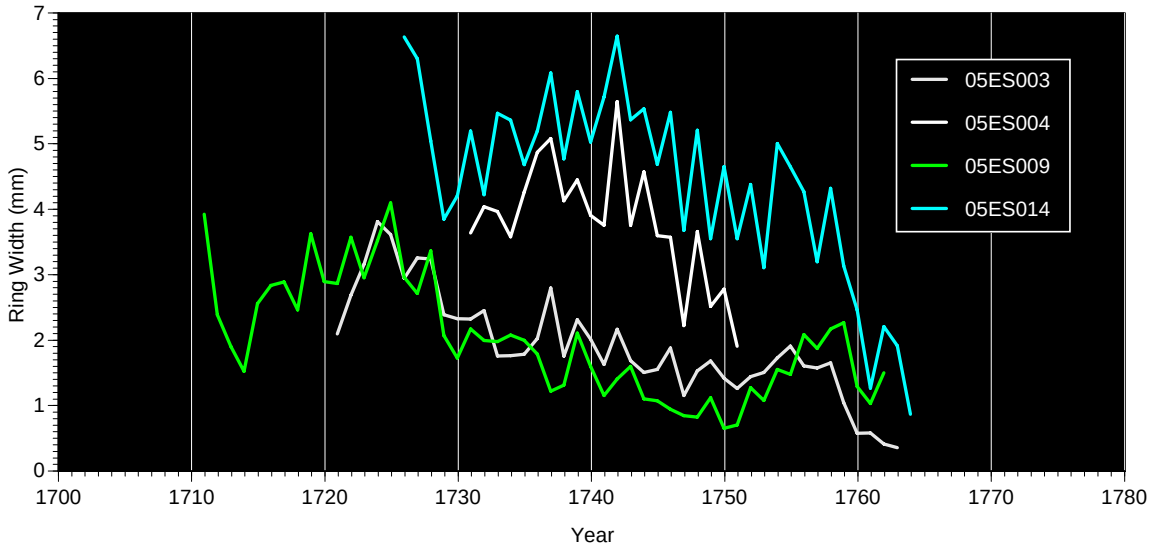
The SEM observations on core samples for the Art McLaughlin house indicate that the beams are most likely all from spruce trees, although we identified one sample that was white pine. Also, the other samples provided by Mr. McLaughlin were identified as white pine (the board) and as fir (the beam) (Appendix 1). In the image below we see a radial view of a ray (indicated by the large arrow) containing transverse tracheids at its margins (small arrows). The transverse tracheids can be



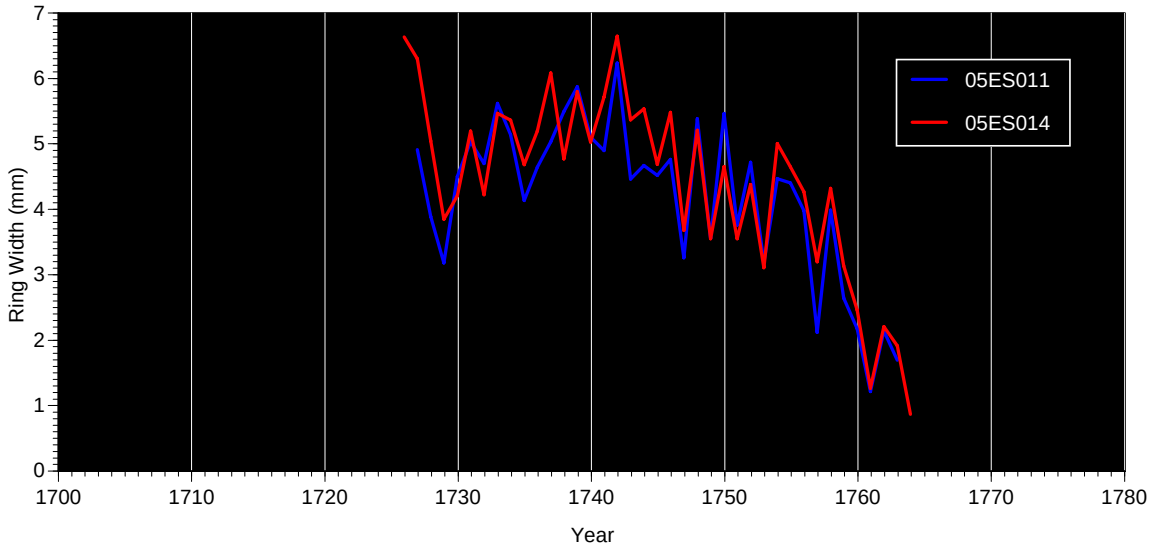
distinguished from the parenchyma cells by the distinct difference in pits. The transverse tracheid cells have bordered pits with small holes in the centre. In this case, the tracheids are arranged in up to three rows. The parenchyma cells growing in the centre part of the entire ray are punctuated by simple pits with much larger openings. This feature combined with the presence of resin ducts and a gradual transition in the earlywood/latewood in rings observed under the light microscope indicates that the sample is spruce.

Crossdating

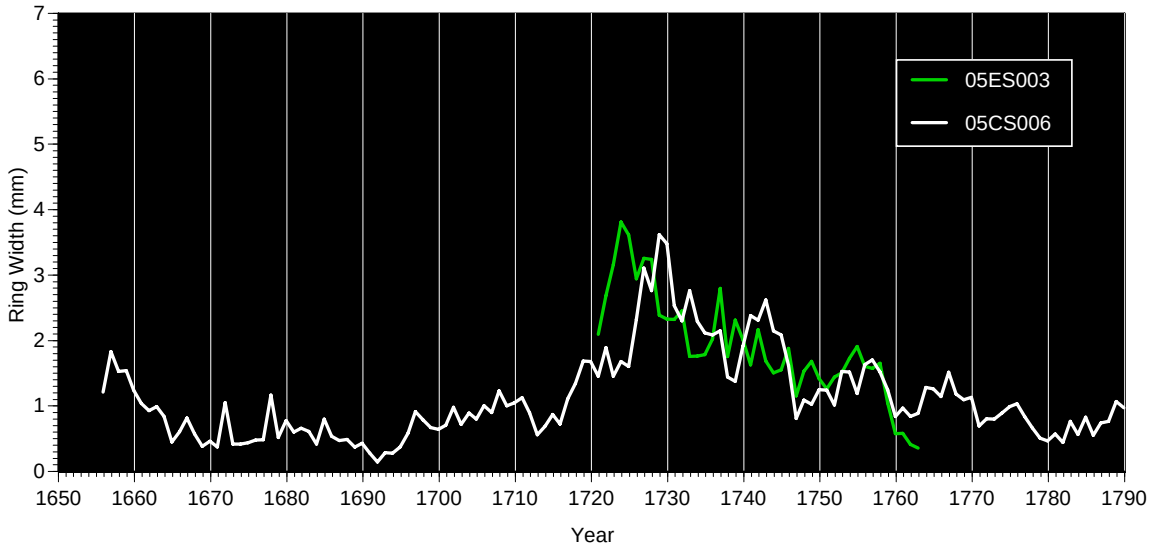
The wood samples from our reference chronologies were also spruce making crossdating possible. We first compared the graphic curves constructed from the Art McLaughlin core samples. Growth patterns were variable among the samples as exemplified in the graph below.



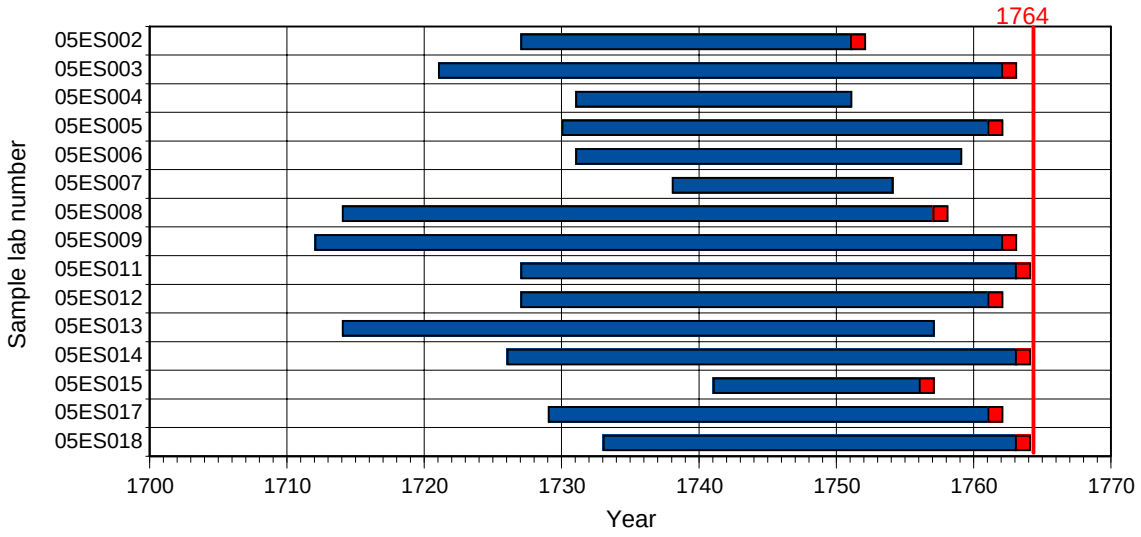
Samples 11 and 14 were peculiar. They came from two basement posts exhibiting severe scorching on one side. The curves were compared and the nearly perfect match (graph below) suggests the two pieces were cut from the same tree.



Growth variability in addition to the fact that most cores had few numbers of rings made them difficult to crossdate. Nevertheless, we dated almost all samples. The graph below shows an example of pattern matching of raw measurements between 05ES003 (from the Art McLaughlin House) and 05CS009 (from the Karsdale Church reference chronology). The end date of 05ES003 was determined to be 1763.



Dating results are summarized in a table (Appendix 1) and the age of each sample is displayed in the next graph. The cut date of some cores couldn't be established because they had missing rings at the bark end.



The graph shows that most of the cut dates are concentrated between 1762 and 1764. The construction of the house most likely took place shortly after. However, other wood pieces are dated earlier (1752 and 1757-58) and strongly suggest the use of recycled wood.

Conclusion

From our dendrochronological analysis, we can certify that the Art McLaughlin house was constructed in either 1764 or 1765, one year after the cut date. This is after the deportation of the Acadians so it is not an Acadian structure. However, some timber was pre-deportation probably salvaged from a nearby structure of Acadian construction or abandoned wood.

Even though it is not an Acadian structure, this well preserved building is still a 240 year old dwelling and perhaps one of the oldest dated house in the Maritimes. It coincides with the early Planters settlement in the region and should be representative of the architecture of this period. Thus, the house is a historically important structure and is part of the heritage from the Falmouth-Windsor region.

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Acknowledgments

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APPENDIX 1

Characteristics of the samples from the Art McLaughlin House: wood identification and dating results.

Lab number	**Species**	Position in house	Last ring status	Notes	Last ring date	**Cut date**
05ES001	**Red spruce**	Attic-roof 5th from left	unknown		1751	
05ES002	**Red spruce**	Attic-roof 1st from left	present		1752	**1752**
05ES003	**Red spruce**	Attic-roof 4th from left	present		1763	**1763**
05ES004	**Red spruce**	Attic-roof 5th from right	unknown		1751	
05ES005	**Red spruce**	First floor-ceiling #1	present		1762	**1762**
05ES006	**Red spruce**	First floor-ceiling #8	missing		1759	
05ES007	**Red spruce**	First floor-ceiling #13	missing		1754	
05ES008	**Red spruce**	First floor-above main door	present		1758	**1758**
05ES009	**Red spruce**	Basement-post	present		1763	**1763**
05ES010	**White pine**	Basement-ceiling long beam	present		1764?	
05ES011	**Red spruce**	Basement-post	1 missing ring	Same tree as 05ES014	1763	**1764**
05ES012	**Red spruce**	Basement-ceiling long beam	present	High growth rates	1762	**1762**
05ES013	**Red spruce**	Basement-ceiling short beam	missing	Poor correlation	1757	
05ES014	**Red spruce**	Basement-post	present	Same tree as 05ES011	1764	**1764**
05ES015	**Red spruce**	Basement-ceiling beam	present		1757	**1757**
05ES016	**Red spruce**	Basement-ceiling short beam	present	discarded (probably 1762)		
05ES017	**Red spruce**	Basement-ceiling short beam	present		1762	**1762**
05ES018	**Red spruce**	Basement-ceiling short beam	present	Poor correlation	1764	**1764**
05ES019	**Red spruce**	Basement-entrance	missing	discarded (probably 1762)		
05ES020	**White pine**	Board	present		1763?	
05ES021	**Fir**	Beam	present			