A Dendroarcheological Analysis of the Trueman Barn, Aulac, New Brunswick

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Abstract

The Trueman Barn was taken down and replaced during the summer of 2008. Nineteen samples from the barn were sampled by the MAD Lab on July 30th, 2009, and given the MAD Lab code 08BSS00. Samples were determined to be red spruce (*Picea rubens*). Three age groupings were detected from the samples: 1797, 1840s and 1886. The large range of dates implies that the barn was built in 1797 and repaired over time, or that the barn was re-built in 1886 using recycled wood from previous barns.

Introduction

The Trueman family has a long history in the Tantramar marsh region of New Brunswick. The first Truemans in the area were William and Ann Trueman, who arrived on May 17, 1774 from Yorkshire, England (Hicklin, 2000). According to Howard Trueman (1902), who wrote about the settlers of the Chignecto isthmus, a new house (1799) and barn (1798) were built in the area near of end of the 18th century. Trueman describes the barn as "eighty feet long by thirty-three wide, with thirteen foot posts", stating also that a portion of the barn was still being used in 1902 as a stable (Trueman, 1902). During the summer of 2008, the Trueman barn was torn down in order to build a newer and more efficient barn. Aware of the MAD Lab's interest in the barn as a dendroarcheological resource, the Trueman family contacted the lab to offer samples for analysis.

Methods

The Trueman barn was located in Aulac, Westmoreland County, New Brunswick, along the Tantramar marsh (5° 54' 15.5" N, 64° 15' 21.4" E). The barn is believed to have been built initially in 1798, and underwent additions and repairs thereafter. The barn was torn down during the summer of 2008 and the wood was made available to the MAD Lab. Nineteen cross-sections were taken from the wood pile on July 30th, 2008. The Trueman barn wood was given a MAD Lab code of 08BSS00 and the condition of each piece was noted.

In the lab, samples were sanded with progressively finer sanding paper (80-400grit) to bring out the cellular structures and annual rings of the wood. Rings were counted and measured along two paths from the pith (middle) of each disc sample using a Velmex measuring system with an accuracy of 0.001mm. Measurement paths were run through the most structurally sound portions of the sample.

A time series of measurements from the barn samples were correlated to each other thereby creating floating chronologies (i.e. chronologies that are not attached to a specific period of time). The floating chronologies were then cross-dated to a previously-established master chronology from the area that has been locked in time. Cross-dating refers to the practice of taking the pattern of growth from one sample and comparing it to that of another (Figure 1).

To assist in the cross-dating procedure, the statistical cross-dating program COFECHA (Holmes, 1986a) was used. COFECHA uses correlation values to assist in the accurate dating of samples. Higher correlation values indicate that the floating chronology corresponds well to the master chronology. Lower correlation values can indicate, among other things, ecological or climatic variation from the norm or that the sample is inaccurately dated. The floating chronologies created from the barn samples were run against a red spruce (*Picea rubens*) master chronology available from the MAD Lab archive. This ensured that the patterns found in the floating samples could be referenced to one of the two chronologies locked in time.

Each of the floating and master chronologies was standardized to have a mean of one by using a negative exponential curve in the program ARSTAN (Holmes, 1986b). This standardization was completed to allow samples of different ages to be compared.

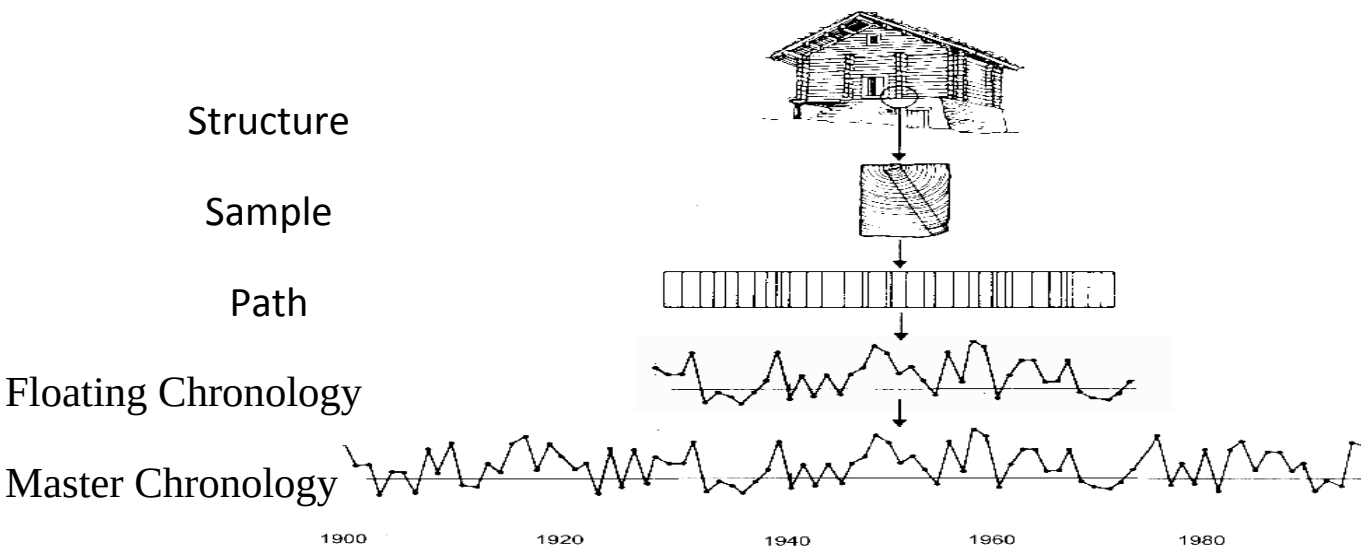

Figure 1 - Example of cross-dating by using patterns from a structure (floating chronology) compared to a master chronology.

Results and Discussion

All 19 of the samples were successfully cross-dated. The correlation of the floating chronology from the samples was .480 (Table 1). The floating chronology correlates significantly to the master red spruce chronology (.328, n=248) (Figure 2a). The floating chronology was locked into time from 1644 to 1914 against the master regional red spruce chronology. The red spruce master chronology is only slightly older than the Trueman barn samples, thus the addition of the samples to the master will increase the depth and reliability of the master chronology (Figure 2b).

The beams of the Trueman barn are constructed of red spruce. The Trueman barn appears to have been built in phases. The earliest beam is from 1797, which is the year before Howard Trueman states the barn was constructed (Trueman, 1902). A majority of the samples date back to the mid 1840s and to 1886 (Table 1). These dates lead to a number of different possibilities. The first is that the barn was built in the 1840s using recycled wood from a raised structure, with subsequent repairs being made in 1886. A second possibility is that the barn was built in 1886 using recycled wood from 1797 and the 1840s. A third possibility is that the barn was built in 1797 and underwent repairs in the 1840s and 1880s, and that a majority of the beams were replaced during these two phases of repair.

Table 1 – Sample identifier, path, time span, number of years in chronology, interseries correlation, presence of rot, worm holes in wood.

Sample	Path	Time Span	# of Years	Correlation	Rot	Worms
08BBS01	A	1702-1822	121	0.247	Little	
	B	1703-1824	122	0.204		
08BBS02	A	1753-1845	93	0.620	Little	Little
	B	1753-1842	90	0.715	Little	Little
08BBS03	A	1670-1797	128	0.289		Some
	B	1670-1797	128	0.451		Some
08BBS04	A	1748-1886	139	0.676	Lots	
08BBS05	A	1757-1832	76	0.381	Lots	
	B	1757-1832	76	0.479		Some
08BBS06	A	1776-1886	111	0.654		Some
	B	1776-1885	110	0.554	Some	Some
08BBS07	A	1744-1886	143	0.362		Lots
	B	1744-1886	143	0.078		Lots
08BBS08	A	1644-1847	204	0.470		Some
	B	1644-1847	204	0.425		Some
08BBS09	A	1851-1914	64	0.619	Some	
	B	1851-1914	64	0.550	Some	
08BBS10	A	1725-1847	123	0.387		Some
	B	1725-1847	123	0.274		Some
08BBS11	A	1768-1886	119	0.620	Little	
	B	1768-1886	119	0.685	Little	
08BBS12	A	1777-1886	110	0.659		Some
	B	1778-1884	107	0.421		Some
08BBS13	A	1780-1832	53	0.527		Some
	B	1780-1832	53	0.545		Some
08BBS14	A	1771-1837	67	0.615		Little
	B	1771-1837	67	0.638		Little
08BBS15	A	1733-1829	97	0.279	Some	Lots
	B	1733-1823	91	0.300	Some	Lots
08BBS16	A	1730-1886	157	0.645	Little	Some
	B	1730-1883	154	0.505	Little	Some
08BBS17	A	1764-1886	123	0.475	Some	Some
	B	1764-1882	119	0.516	Some	Some
08BBS18	A	1763-1886	124	0.676		Barely
	B	1763-1886	124	0.561		Barely
08BBS19	A	1725-1844	120	0.587	Little	Some
	B	1725-1845	121	0.436	Little	Some

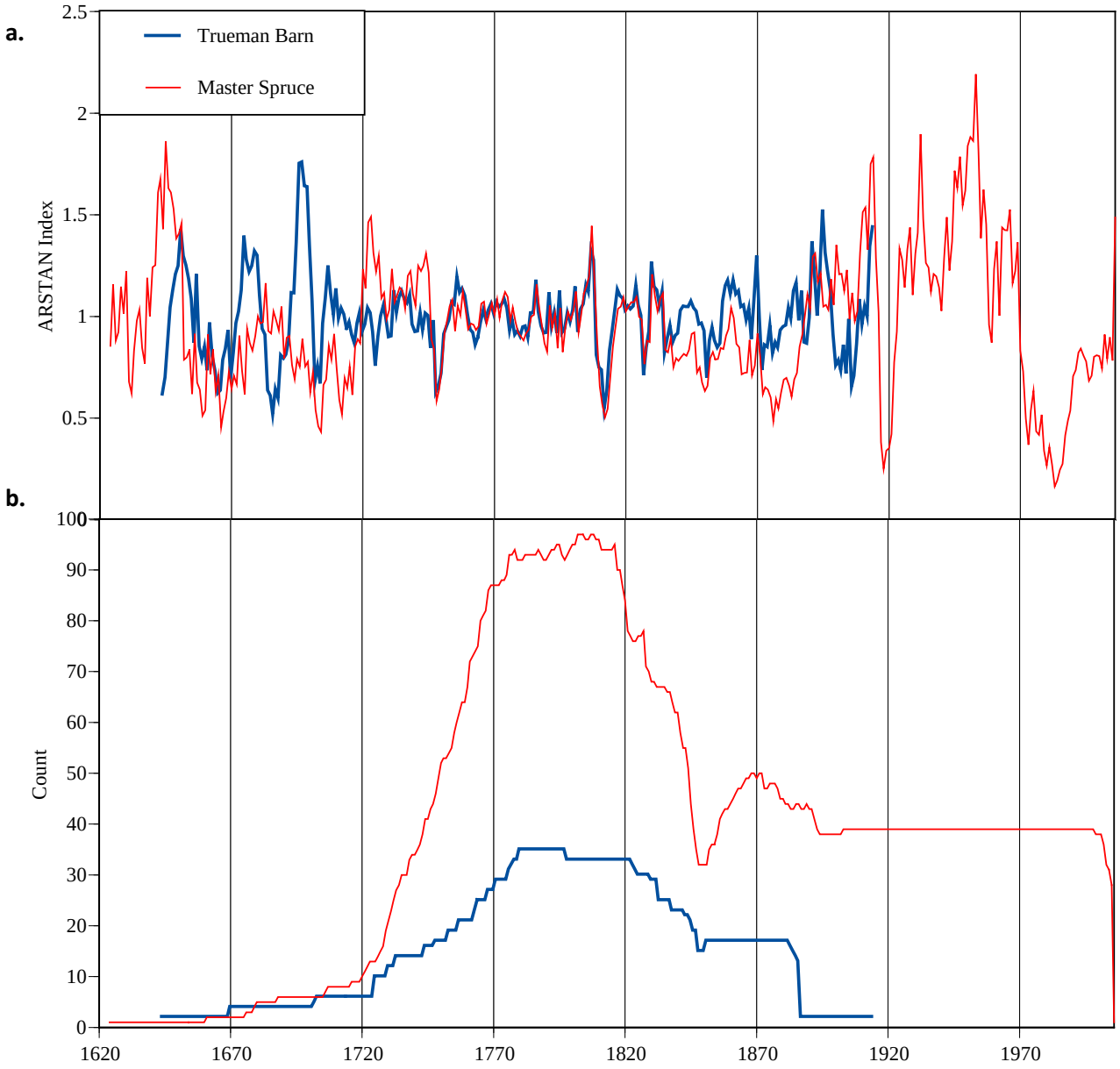

Figure 2 – (a) The standardized master red spruce chronology and the 08BSS000 chronology. –(b) Sample length and depth for both the master and the Trueman Barn chronologies.

Conclusion

The construction of the Trueman barn spans a long period of time. The three possible dates of construction range appear to occur in 1797, the 1840s and 1886. Each of these dates seems possible when considering that the barn would have either been repaired over time or built using recycled pieces of wood. Due to the large number of samples that date to 1886, it is highly likely that the building was constructed or largely repaired during this year. Additional information from the Trueman family may help to confirm the likelihood of these apparent periods of construction and/or repair.

References

Hicklin, Peter. 2000. http://heritage.tantramar.com/WFNewsletter_11.html (accessed March 29, 2009)

Holmes, R.L. (1986a). Users manual for program COFECHA. 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. 41-49. Laboratory of Tree-Ring Research, University of Arizona, Tucson.

Holmes, R.L., Adams, R.K., & Fritts, H.C. (1986b) 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.

Trueman, Howard. 1902. The Chignecto Isthmus and its first settlers. William Briggs, Toronto