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Dendrochronological Analysis of White Oak Tree (*Quercus alba*) cores from the Mizer Log Cabin, Coshocton County, Ohio

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Report submitted to Dr. Nigel Brush.

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General Analysis: Three cores were taken from the Mizer Log Cabin in Coshocton County, Ohio and then processed and crossdated at the Wooster Tree Ring Lab using standard dendrochronological techniques (Stokes and Smiley, 1968.) These techniques include preparing the cores surfaces through hand sanding and machine sanding as well as counting the rings, and measuring and crossdating ring-widths. Ring-widths were measured to the nearest 0.001 mm and crossdating was performed using the computer program COFECHA (Holmes, 1983.)

The three samples consisting of 5-mm cores from white oak trees (Quercus alba) (Table 1, 2, 3,) were internally crossdated with one another to construct a floating ring-width series. This floating chronology from the Mizer Log Cabin was then absolutely dated against calendar-dated, living, ring-width chronologies from the region including Johnson Woods, Sigrist Woods, and Brown's Lake Bog (ITRDB, 2005: Wooster Tree Ring Lab, unpublished data, 2005). The floating ring-width chronology from the Mizer Log Cabin in Coshocton County spans 139 years and when adjusted to calendar dates range from AD 1693 to 1831.

Table 1 summarizes the calendar dates of each sample and lists the presence of an outer ring. Outer rings provide a calendar date for when the tree was cored or cut.

This chronology will contribute to tree-ring data in Northeast Ohio as well as be included in climate studies, especially those concerned with drought variability in the region and our efforts to date historical structures. All cores and data are archived at the Wooster Tree Ring Lab, which is housed in Scovel Hall in the Department of Geology at The College of Wooster. We would be happy to discuss the results with you; specific information can be found on the TRL website.

Table 1. Calendar-dated tree-rings series from the Mizer Log Cabin

Sample number	First Year of growth	Last Year of Growth	Total Years
MIZC1A	1693	1811	118
MIZC2A	1719	1830	111
MIZC3B	1728	1831	103

The Mizer Log Cabin was most likely built in between 1830 and 1831 because that is when the first people came to Ohio to settle. These first people must have cut down trees in order to build barns and houses to live in. In order to find out the year that a structure was built in, the last year of growth must be calculated. Since all of these samples are from long dead trees the last year on a sample is the last year of growth. The last year of growth can only really be accurate if the sample has bark present or an outer ring. Since all the Mizer samples are cores, the last year of growth could be inaccurate because none of the samples have an outer ring or bark present.

The pith or center of the sample is used in order to determine when the trees for these logs first started growing. If the pith or center is present it suggests that the sample doesn't have any missing rings and the first year is the same as the first year of growth. Since the Mizer samples are cores and do not have the pith present, the first year of growth does not have to be equivalent to when the trees first started growing. The first year of growth ranges between 1693 and 1719 AD based on the data from all three samples.

The total range of growth for the Mizer Log Cabin is from 1693-1831 AD. The date of 1831 is common as a last year of growth among many sites across Northeast Ohio, which suggests that it might be the year that the cabin was constructed.
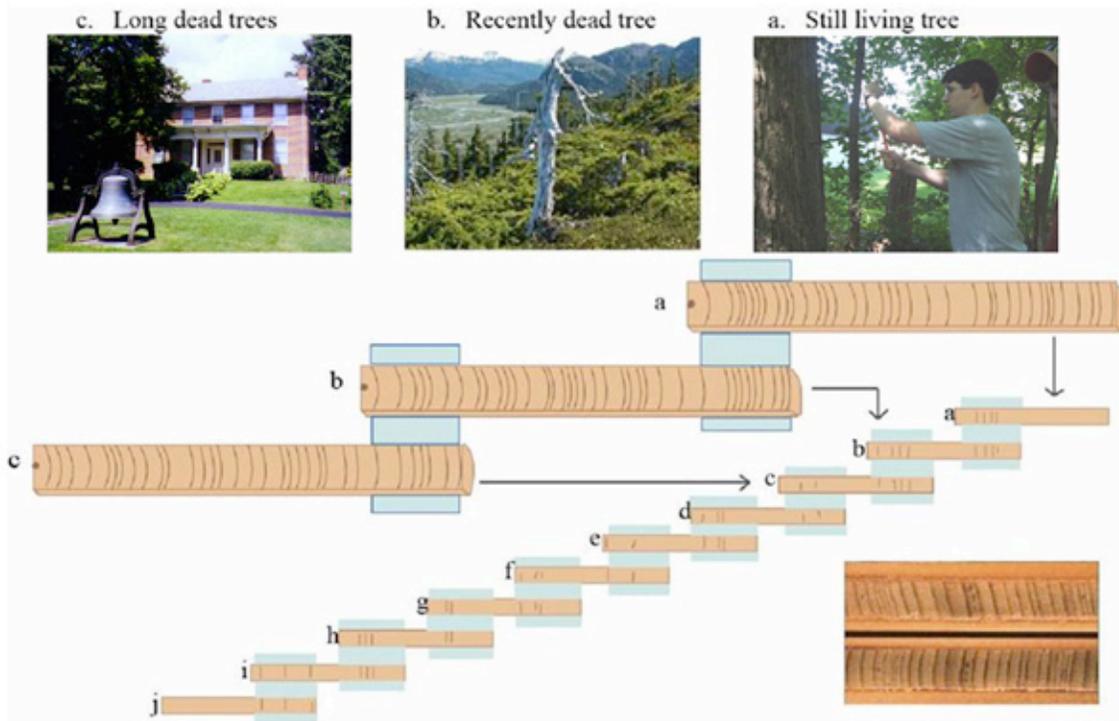
Figure 1: Tree-ring crossdating relies on matching overlapping ring-width patterns. If matches are made to living tree then calendar dates can be assigned to the outer rings of the tree.

References:
Holmes, R. L. 1983. Computer-assisted quality control in tree-ring dating and measurement. *Tree Ring Bulletin*, **43** (1), 69-78.
Stokes, M. A., and Smiley, T. L., 1968: *An Introduction to Tree-Ring Dating*. Chicago: University of Chicago Press. 73 pp.
International Tree-Ring Data Base (ITRDB), 2005,www.ncdc.noaa.gov/paleo/paleo.html.