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# Dendrochronologia

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## ORIGINAL ARTICLE

# Precision dating of Cook's Mill, a Civil War era structure in West Virginia

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## ARTICLE INFO

### Article history:

Received 31 August 2016  
Received in revised form 4 January 2017  
Accepted 6 January 2017  
Available online xxx

### Keywords:

American Civil War  
Historical dendroarchaeology  
White oak  
West Virginia  
Cultural heritage

## ABSTRACT

Dendroarchaeology can provide critical understanding of a structure built during key historic periods, such as the American Civil War (1861–1865), when historical documentation is likely to be sparse or incomplete. Cook's Mill is located in Greenville, West Virginia and extensive information derived from deeds, court records, wills, and oral history places the present mill's original construction in 1857. The American Civil War began shortly after its construction and military conflict in the area led to the burning of several key structures, one of which was an unknown mill in Greenville (formerly Centerville). Written history suggests the mill is original and survived the American Civil War, however we used dendroarchaeology to confirm its precise date of construction. We collected 46 samples from the mill and 6 cross sections from a nearby exhumed bridge for dendrochronological dating. The mill was constructed with white oak (*Quercus alba*) and tulip poplar (*Liriodendron tulipifera*) logs and the bridge samples were white oak. We visually and statistically crossdated 32 white oak samples from the mill and bridge by comparing them to a local chronology developed for this study and two regional oak chronologies from the International Tree-Ring Data Bank. Based on terminal ring attributes and cutting date years we were able to provide a suggested construction date of the spring or early summer of 1868. This date suggests Cook's Mill was the mill burned during military conflict in the area and that the current structure was subsequently rebuilt following the conclusion of the war.

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## 1. Introduction

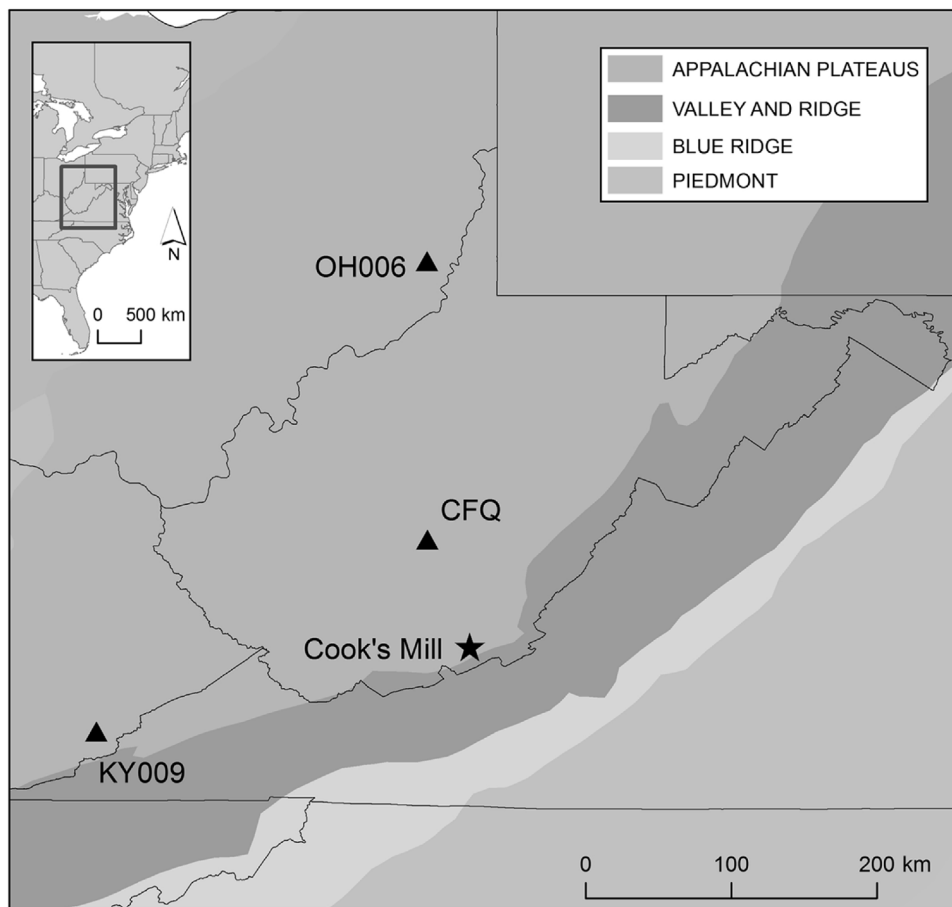
Establishing construction dates for historic structures is critical in preservation and restoration efforts and for placement on the National Park Service's National Register of Historic places (Harley et al., 2011). Often dates are concluded from documents gathered at local agencies and libraries. However, when documentation is sparse or unreliable, other methods are used to assign a construction date. Dendroarchaeology is one alternate method of dating historic structures and has been employed extensively in the south-west (Street, 2001; Towner and Creasman, 2010; de Graauw et al., 2014) and eastern (Stahle, 1979; Smith et al., 2005; Grissino-Mayer and van de Gevel, 2007; Harvey, 2012; Grissino-Mayer et al., 2013) United States (U.S.). As dendroarchaeology has become well established in the eastern U.S., owners frequently seek this method to precisely date their historic log structures.

Despite this, dendroarchaeology has not yet reached its geographic potential, primarily because the need for absolute dating of structures far exceeds the resources available to do so (Grissino-Mayer, 2009). In West Virginia, for example, no historic log structures have been dated using tree-ring methods. A lack of long tree-ring chronologies for this topographically complex state makes dating of historic log structures challenging. However, a few old-growth forests still exist in West Virginia and long chronologies from these locations are essential for dating historic structures in the area.

Early settlement log structures still remain throughout West Virginia as landmarks of past historical events. Cook's Mill, in Greenville (formerly Centerville), WV, is one example whose construction coincides with the American Civil War (1861–1865). During widespread conflict, documentation can be sparse or missing, making it difficult to assign an accurate construction date from written records alone. Historical documentation of Cook's Mill indicates a precise construction date, however a historical account of a mill being burned suggests the current mill may be a post-American Civil War era building (Morton, 1974). Determining Cook's Mill's construction date will elaborate on the established regional his-

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**Fig. 1.** Location of Cook's Mill (star) and regional chronologies (triangles) within the Appalachian Plateau physiographic province.

tory, providing a more complete story of the events that unfolded during the interstate conflicts of the American Civil War.

As a response to the Grissino-Mayer (2009) call to action, we present the first dendroarchaeologically dated log structure in West Virginia. We had three objectives for this study: (1) construct a local reference chronology to facilitate dating of Cook's Mill, (2) use dendrochronological techniques to obtain the year and season in which trees were felled for construction of Cook's Mill, and (3) compare the historical documentation with the cutting dates of the logs to determine if Cook's Mill was rebuilt after burning.

### 1.1. Setting and historical background

Cook's Mill sits on an approximately 1 ha (ha) of private property near the border of the Appalachian Plateau and the Valley and Ridge physiographic regions of West Virginia (Fig. 1). The surrounding area is characterized by agricultural land and second growth deciduous forest dominated by oak (*Quercus* spp.) and tulip poplar (*Liriodendron tulipifera*). The mill is a three-story building constructed using hand-hewn logs for the structural framework and covered by clapboard siding (Fig. 2). Laurel Creek feeds into a mill pond east of the structure, before terminating at Indian Creek. In 2013, logs from a submerged bridge were exhumed from sediment of Laurel Creek ~60 m northeast of Cook's Mill, adjacent to the modern bridge, and were preserved for dendroarchaeological dating (Fig. 3).

The original tract of land where Cook's Mill was built was settled in 1774 by Valentine Cook, one of the first permanent settlers in the Trans-Allegheny region (Wells, 1989). In 1844 Valentine's grandson, Jacob A. Cook, inherited the mill from his father. Jacob A.

Cook, a dentist by trade, and his brother Riley B. Cook contracted James Humphreys in December of 1857 to build a new mill and in January 1859 the mill became operational. In 1860 J.A. Cook found himself financially overextended and placed his half ownership of the mill and surrounding property into a trust to secure the debt to his brother R.B. Cook (Wells, 1989).

In the late 1850s and early 1860s, tensions regarding slavery were reaching their apex between the North (Union) and the South (Confederacy), initiating the American Civil War in 1861.



**Fig. 2.** Cook's Mill, a three-story building, was constructed using hand-hewn logs for the structural framework and covered by clapboard siding. This view is of the northeast corner of the mill and the main entrance is located below the "Old Mill" sign. Laurel Creek, which powered the mill, flows parallel to the south wall.

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