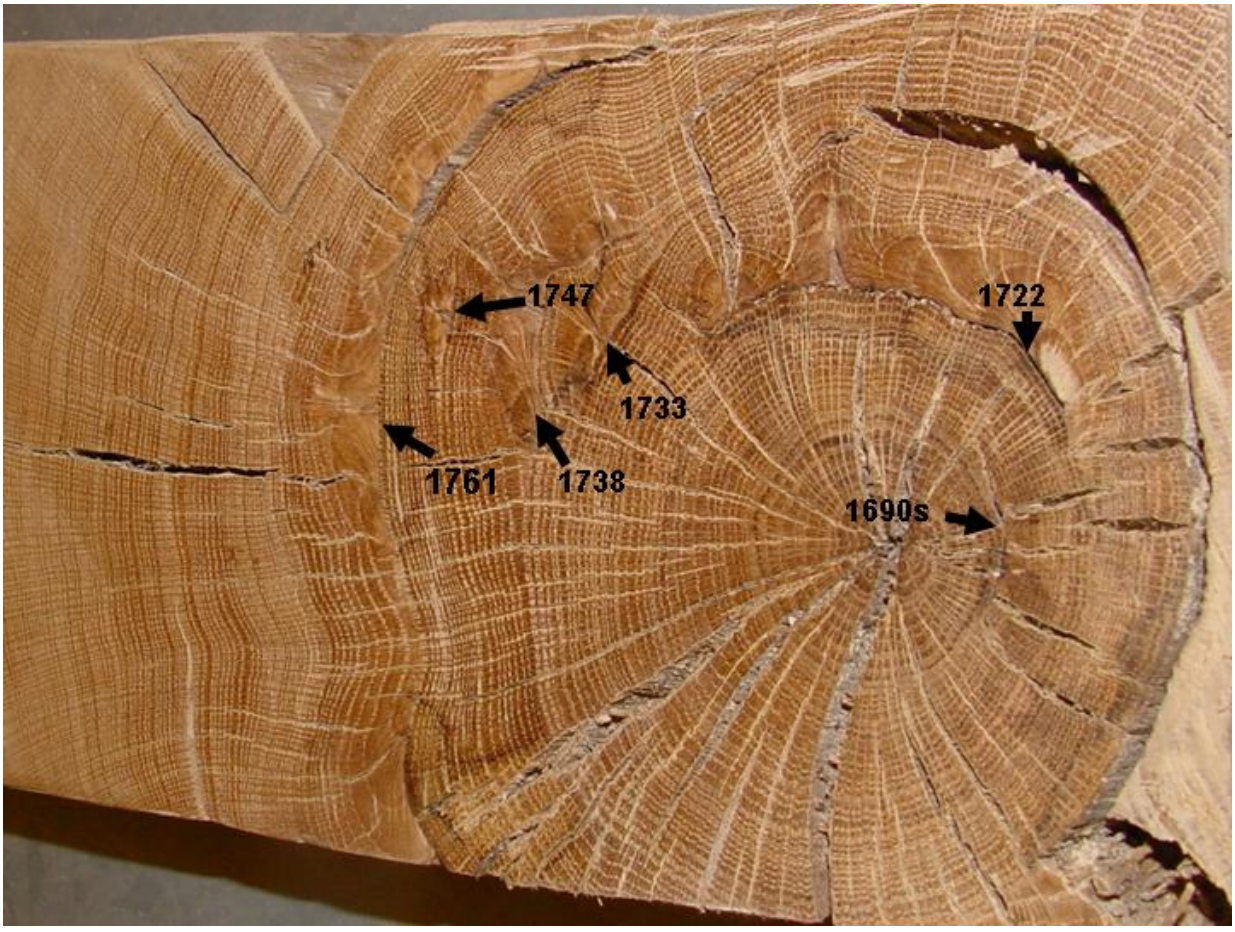
Understanding forest fire history can help keep forests healthy

July 5 2016



This is one of the tree ring segments from Tennessee studied by Stambaugh to determine when fires occurred in that area. Credit: MU News Bureau

For nearly a century, forest fires have been viewed by scientists and the public as dangerous and environmentally damaging disasters. However, recent research has shown that forest fires are vital to maintaining healthy forests. While people in the western portions of the U.S. experience forest fires often and know of their value, many people on the eastern side of the U.S. do not know of their importance. In a new study, University of Missouri researchers have studied tree rings throughout Oklahoma and Tennessee to determine the history of fires in those areas.

Michael Stambaugh, assistant research professor in the MU College of Agriculture, Food and Natural Resources, says understanding this history is important for managing and improving the ecology of forests in the future.

"Many forest ecosystems are fire-dependent, meaning that in order to maintain their health and vibrancy, they must be subjected to fire on a regular basis," said Stambaugh, who is a member of the Missouri Tree-Ring Laboratory at MU. "By understanding how fire has maintained forest ecosystems in the past, we can determine the best ways to use fire to maintain those forests in the future."

To study the history of fire in Oklahoma and Tennessee, Stambaugh examined tree rings from 332 trees in eight different sites throughout both states. Stambaugh found 843 different fire scars embedded within the tree rings and was able to determine when and how often each site experienced forest fires over the last 300 years. He found that despite having a wetter, cooler climate, forests in Tennessee experienced higher fire frequency than Oklahoma. He also found that fires existed in those areas long before Euro-American settlement, showing that fire has been important to those forests for centuries.

"The history of fire in America also is the history of humans on this

continent," Stambaugh said. "Humans have been here for more than 12,000 years and everywhere we see humans move, we see fires follow or be altered. This has been a constant for so long that forest ecology has become dependent on these fires, if they already weren't before humans arrived. However, many parts of the U.S., especially in the eastern half of the continent, have not experienced forest fires in more than 150 years because humans have worked hard to prevent those fires. Many of those forests are now suffering because of the lack of fire to help renew the ecology."

In order to understand the effects of fire around the U.S., Stambaugh and his fellow MU researchers are cataloging the history of fire by studying tree rings from trees throughout the entire country.

Provided by University of Missouri-Columbia