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## ***Filling in the Blanks: Developing Fire Scar Histories in the Southern and Eastern United States***

### **Management Implications**

- Previously unavailable fire chronologies for eastern and southern U.S. forests will help determine the historical role of fire on a regional scale.
- Empirically derived fire histories will help justify burning frequencies for restoration.
- Fire history data will be archived in a permanent database and contribute to a comprehensive, national model.

Forests of the eastern United States are changing for many reasons, including oak decline, insect damage, invasion of exotic species and fuel accumulation. Forest managers are trying to address these changes, maintain forest health, and implement forest ecosystem restoration projects. A vital component of many of these projects involves the use of prescribed fire.

A historical perspective of where, when and how fires burned prior to European settlement is important for understanding long term interactions between humans and their environment and how forests have developed. Fire history information aids in determining appropriate timing and frequency for prescribed fire use, and helps to justify ecosystem restoration efforts that employ prescribed burning. Detailed information about fire histories can be derived from the study of tree rings. Low to moderate intensity fires often injure or scar surviving trees, leaving a record of their passage in time.

Unfortunately, many regions of the eastern deciduous and southern subtropical forests of the United States are completely lacking long (250+ years) fire scar histories. Currently, there are no fire histories for North Carolina, South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana and several New England states. As a region the eastern U.S. has lagged behind the western U.S. in terms of historical fire research, partly because eastern fires of the last century have generally been much less severe than their western counterparts. However, wildfires during the last few years in Texas, Oklahoma, Florida, and Minnesota, as well as changes in vegetation and climate, have emphasized the need for fire history research across the entire country.

Time is running out for gathering fire-scar data, as the old trees that hold the information are reaching the end of their lifespan, and remnant wood is decaying. A quantitative assessment of this historic information is needed in order to help managers plan for the rapidly changing climate, land use patterns and human population densities emerging in this century.

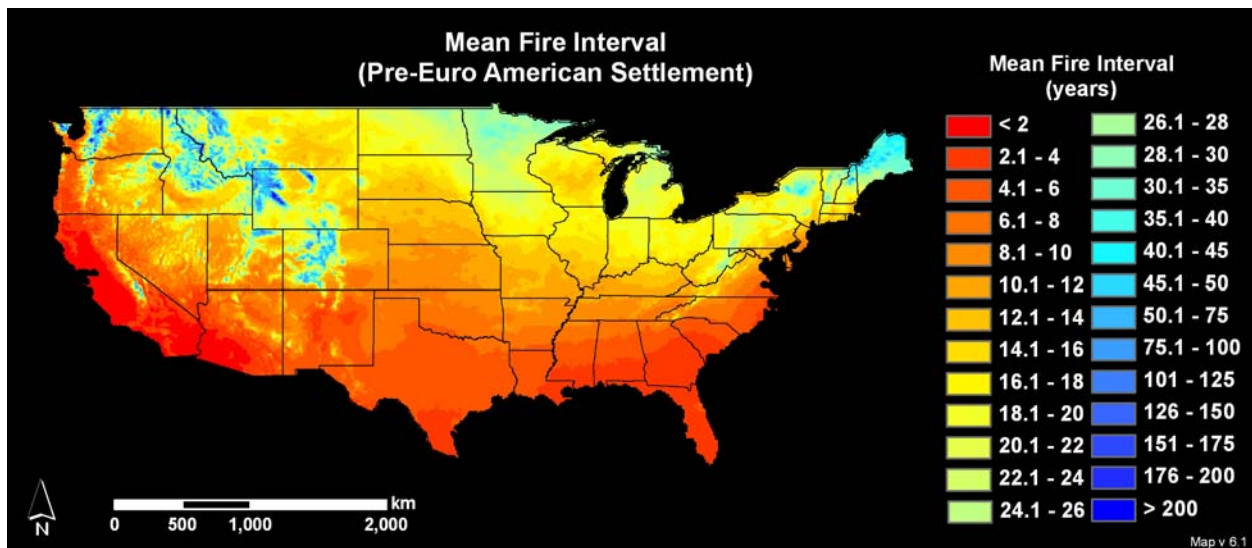
Dr. Richard Guyette, Dr. Daniel Dey and Michael Stambaugh of the University of Missouri-Columbia, (Missouri Tree-Ring Laboratory, USFS Northern Research Station) are working to fill these gaps in the national fire scar database. Currently they are locating reliable fire scar data sources using experience they've gained researching over 60 oak and pine sites in eastern North America.



Their primary objective is to gather data in eastern and southern deciduous and subtropical forests that lack empirically derived fire scar chronologies. Fire histories will then be reconstructed at seven to ten forested sites in regions of interest. Results will be submitted to NOAA's International Multiproxy Paleofire Database (IMPD) where they will be accessible for use by managers and scientists.

The future of this research involves incorporating the newly developed fire chronologies into a database of existing chronologies from other regions. The researchers are currently developing a North American Fire Interval Atlas (NAFIA) to generate improved estimates of average fire intervals at the national level. The atlas is derived from a model that uses relationships found between average fire intervals, temperature, precipitation and human population density to

map pre-European fire intervals. By 2008 NAFIA will be fully integrated into an interactive website where managers and scientists can click on an area and receive predicted fire interval values on several scales. More information about NAFIA is currently available from the Missouri Tree-Ring Laboratory website ([www.missouri.edu/~guyetter](http://www.missouri.edu/~guyetter)).



NAFIA Database

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