

(55) 2010 Annual Meeting, Washington, DC



AAG
Association of American Geographers

[About AAG](#)[Membership](#)[Annual Meeting](#)[Jobs/Careers](#)[Education](#)[Publications](#)[Events](#)[Contact Us](#)

2010 Annual Meeting, Washington, DC Online Program

Abstract Title:

A Multi-Tree Perspective of the Tree-Ring Hurricane Record from Big Thicket National Preserve, Texas, USA

is part of the Paper Session:

[Hurricanes IV: Geomorphic and Ecologic Impacts/Paleotempestology](#)

scheduled on Thursday, 4/15/10 at 14:40 PM.

Author(s):

Daniel B. Lewis* - University Of Tennessee
David B Finkelstein - University of Tennessee
Henri D. Grissino-Mayer - University of Tennessee
Edmund Perfect - University of Tennessee
Claudia I. Mora - Los Alamos National Laboratory

Abstract:

Single-tree stable isotope chronologies used to characterize regional climate and tropical cyclone events may be problematic due to variability among individual trees in a stand. External factors such as soil water isotopic variability, soil heterogeneity, and/or stand disturbance will affect the isotopic composition of individual trees in a stand. Single-tree isotope chronologies should be tested against multiple-tree chronologies to determine whether individual trees sufficiently characterize regional climate and tropical cyclone variability. Eight individual trees were sampled from two sites at Big Thicket National Preserve, Texas. Oxygen isotope series were developed from 1982 to 2007 to characterize tropical cyclone events known to have produced rainfall near the sites. Individual trees did not always record the same tropical cyclone events. A composite tropical cyclone chronology from the eight trees detected 65% (8 of 12) of known tropical cyclone events. However, the composite chronology also detected 5 events not associated with a known tropical cyclone (false positive). Additionally, trees in the composite chronology missed known storms in four years. Three of the false positive events were coincident with extremely wet years following dry years, which mimicked the negative oxygen isotopic anomaly associated with tropical cyclones. Another false positive year was associated with a strong El Nino event. All four missed storms were coincident with late summer/fall drought, which masked the rainfall signal associated with tropical cyclones. The results indicate that the tree-ring hurricane record is complex, and that regional climate variability can alter the effectiveness of trees as tropical cyclone indicators.

Keywords:

[tree rings](#), [hurricanes](#), [oxygen isotopes](#)

New Query