Geophysical Research Abstracts,
Vol. 11, EGU2009-13111, 2009
EGU General Assembly 2009
© Author(s) 2009

An isotopic dendrochronological approach to understanding the multi-decadal-scale dynamics of forest-savannah boundaries in the tropics

C. V. Wood, M. I. Bird, and R. J. S. Wilson
University of St Andrews, School of Geography & Geosciences, Fife, United Kingdom

The question of the stability of tropical forests and forest-savannah ecotones in the face of global climate change is crucial. Climate and vegetation are closely linked in the tropics with the tropical climate strongly affecting land-cover, and the type of land-cover influencing the tropical climate (through albedo and evapotranspiration rates). Changes in vegetation cover and the resulting feedbacks could have significant implications not only on the local climate but global warming.

Advances in remote sensing have allowed the changes in the position of forest-savannah boundaries to be witnessed over the last few decades. Such information can be partly extended using historical observations, however, they are usually limited to temporal snapshots (e.g. from aerial photographs) often taken decades apart and only provide an indication of environmental change but little information about the timing and rate of change of the position of these forest-savannah ecotones in the tropics of the past.

Using available aerial photographs, two sites in Mbam Djerem National Park, Cameroon, were selected in a region where the forest has encroached upon the savannah throughout the 20th century. Wood samples from 20 living trees, consisting of 2 savannah species and 2 forest species, were collected in November 2007 from these transitional areas. Ring width measurement and traditional dendrochronological dating methods were attempted for each species, however due to a lack of distinct visible rings, this was mostly unsuccessful. It is hypothesised that changes in a forest-savannah boundary, which would result from variations in local/regional temperature, relative humidity, light etc., could be detectable in stable isotope measurements from trees growing in these transitional regions. Comparison of isotope records from trees that have been through a boundary change with those that are well outside this area will allow the effects of this transition to be studied.

In this presentation, we present preliminary results for the Mbam Djerem National Park region.