

## **Spatial Continuity of Tree Attributes in Bottomland Hardwood Forests in the Southeastern United States**

**Luben D. Dimov, Jim L. Chambers, Brian Roy Lockhart. 2005** Abstract: Sustainable forest management and conservation require understanding of underlying basic structural and competitive relationships. To gain insight into these relationships, we analyzed spatial continuity of tree basal area (BA) and crown projection area (CPA) on twelve 0.64-ha plots in four mixed bottomland hardwood stands in Louisiana, Arkansas, and Mississippi. Variogram range indicated that BA spatial continuity of trees with dbh > 10.0 cm extended an average 4.5 m. This distance equaled the quadratic mean crown radius (QMCR) of the overstory trees. Overall, 95% of the variability in BA was accounted for by the spatially structured variance and could be modeled as spatial dependence. Removal of suppressed trees from the analyses reduced the variability in BA at small separation distances and increased the variogram range. The average spatial continuity of unsuppressed trees averaged 18.2 m and was 17.6, 18.5, and 18.5 m based on the BA variograms, CPA variograms, and cross-variograms, respectively. This distance corresponded to four times the QMCR of the overstory trees and extended far enough to encompass the first- and second-order neighbors. The results suggest an existence of complex competitive influences and confirm findings in non-woody vegetation that competitive effects can propagate beyond the direct neighbors. **FOR. SCI. 51(6):532-540.**