SCHULTZ, PEGGY A. Duke University, Durham, NC 27708 USA. Structure and diversity of a community of arbuscular mycorrhizal fungi in an old field.

Arbuscular mycorrhizal (AM) fungal species in an old field in Durham, NC were surveyed repeatedly to evaluate determinants of the richness and composition of the AM fungal community. Fungal diversity was characterized through direct examination of spores extracted from field soil and by trap culturing on sorghum. Diversity estimates were enhanced when sampling regimes were combined.More than 30 AM fungal species have been found at this site, a fourth of which are undescribed. Fungal species richness and densities of individual species are autocorrelated within the field. Seasonal differences were seen in sporulation, implying that fungal species activity are partitioned seasonally. Fungal diversity is correlated to plant species diversity. These results suggest that climate, edaphic factors, and plant species diversity all are important determinants of fungal species diversity and distribution.

SCHULZ, KURT E., J. ROCKS, and S. TRAVELSTEAD. Southern Illinois University at Edwardsville, Edwardsville, IL 62026-1651, USA. Mississippi River lowland tree seedling recruitment in response to forest canopy openings created by the 1993 flood.

Prior to the 1993 flood; western Illinois floodplain forest canopies east of St. Louis, MO were characterized by a Populus deltoides overstory with subdominant Acer saccharinum. Flooding killed most Populus and the many mature Acer, producing a continuum of understory light conditions. We examined the role of understory light regimes in the demography of tree seedling establishment, growth, and survivorship. Seedling populations are overwhelmingly dominated by Acer saccharinum. Seedling Acer are most abundant under closed to partially closed canopy conditions. In large openings, competition from Bidens and lianas reduces the size and abundance of seedlings. Under closed canopies featuring surviving clumps of pole-sized Acer, seedlings are smaller. Depressions which ponded water during the spring of 1995 contained no surviving seedlings. Size and species specific patterns of canopy mortality will probably engender far greater structural complexity, but lower species diversity in the replacement canopy.

SCHUSTER, WILLIAM S. F. Black Rock Forest Consortium, Cornwall, NY 12518, USA. Differences in carbon storage rates over time on long-term (65-year) forest plots in southeastern New York.

Tree growth has been monitored on a series of ten paired plots in the Black Rock Forest in southeastern New York since 1930. All plots were clearcut in the late 1800Us and one member of each pair of plots was experimentally thinned in 1930. There has been no subsequent human disturbance. Red oak has become the dominant canopy tree with red maple dominating the understory. Diameter growth figures were converted to above-ground tree carbon data using allometric equations. Above-ground carbon storage in living trees ranges from 75 to 110 Mg C per hectare, varying with differences in successional age and soil depth among plots. Carbon storage rates on most plots began to decrease around 1965, from an average of nearly 1.5 Mg C per hectare per year down to less than 1.0 Mg C per year. However two plots continue to sequester carbon at a rapid rate. The data demonstrate how carbon storage rates in temperate deciduous forests can decrease over time, but that other factors may lead to enhanced carbon storage on a site-specific basis.

SCHWARTZ, MARK W., LOUIS R. IVERSON, and ANANTHA PRASAD. University of California, Davis, CA 95616 and U.S. Forest Service, Delaware, OH 43015. Projected tree distribution shifts under global climate change in the fragmented Ohio landscape.

Predictions of future global warming suggest northward shifts of up to 800 km in the equilibrium distributions of plant species during the next century. Historical data estimating the rates of tree distribution shifts (migration) in unfragmented habitats suggest that most species will not exceed 15-50 km per century. Our simulation model, using a hypothetical landscape, predicts maximum potential migration responses of only 1-10 km per century in regions with low habitat availability (10-30% forested). Using thematic mapper data from Ohio we have characterized habitat abundance in 1 km^2 grid cells. We then apply our simulation model to project migration during the next century for four species of trees (Pinus virginiana, Quercus falcata, Aesculus octandra and Diospyros virginiana) in this region. Two different initial conditions for these trees migration simulations are used: US Forest Service Forest Inventory plot data and atlas tree distributions. Results predict: 1) shifts in distribution will be modest, 2) migration will track regions of high habitat availability; and 3) distribution limits will become more diffuse. The implications for this lack of tree migration with respect to forest management and conservation will be discussed.