iorning xylem pressure potential was
f conductance started at about 0.10
noon, then remained level until light
sure potential was −10 to −15 bars;
ring the day to about 0.015 cm s^{-1}.
t of the previous year needles. When
ition in the crown, conductance was

ILLIAM H. MOIR. New Mexico State
Cruces, and USDA Forest Service,
co.
us and high mesas of northern New
classification of twenty major habitat
haracteristic vegetation, geographic
In addition, minor types in riparian
en identified.

s, Urbana. **Growth dynamics of *Abu-***
ifferent competitive regimes.
ition with undefoliated conspecifics,
son. Glasshouse-grown plants were
with undefoliated plants. Sequential
GR) of roots, stems and leaves over
p in RGR of roots and stems upon
Thus, despite maintenance of a high
liated:undefoliated plants decreased
insight into the responses of plants
s of growth analysis as a semi-phys-

mi University, Oxford, OH. **Seed bed**
west Ohio.
from a 100-m × 50-m portion within
d ranged along a successional age
Flats containing 3-cm layers of each
the amount and kind of buried seed.
e's (1967) technique. Results show
. The correlation between seed bed

.E, JR., and **D. L. STOLTZFUS.** James
n effects on patterns of secondary

theast facing slopes in Shenandoah
720 and 590 m. They include 24 40-
cover the Blue Ridge Mountains as
rences have resulted in a mosaic of
l model of community composition
anded along a time scale to include

Jniversity, Oxford, OH. **Phenological**
hio.
rs were collected for three growing
from the first growing season were
e herbaceous layer with micro- and
odal blooming pattern (with peaks in
f eastern North America. The bimodal
lated with regional air temperature,
asons are used to test this model.

IN R. GUNTENSPERGEN. University
nd composition in Shorewood, Wis-

s by lot location and land use in a
l sapling density, taxonomic diversity,

shrub volume, biomass and productivity. Shorewood is a savanna once dominated by American elm but shifting toward dominance by maple, elm and ash. Front and back yards (54% of the sample area) contain 61% of the trees, 66% of the saplings and 77% of the shrub volume. Lots with single and two-family residences (49% of the sample area) have 87% of the trees, 88% of the saplings and 90% of the shrub volume. Multifamily and commercial lots and side yards are often depauperate; adventive genera, such as *Ailanthus, Fraxinus,* and *Ulmus,* are most common. Size class distributions of most major tree species follow a J-shaped curve, indicating high reproduction and plantings by government and land owners.

10:00–11:30 **AIROLA, TEUVO M.** and **KENNETH BUCHHOLZ.** Rutgers University, New Brunswick, NJ. **Factors influencing the distribution of urban forest tree species.**

Residual forested tracts located within urbanized areas are an important natural resource. The planning and management of these areas must be related to their spatial distribution and the identification of factors influencing the distribution of forest tree species within them. Four sites located along the Palisade sill in northeastern New Jersey were selected for analysis. The distribution of the tree species present and their relative abundance will be discussed and related to a number of factors, including: the impact of human alteration, soil characteristics, air pollution and the relative degree of isolation from less disturbed forested sites.

10:00–11:30 **STEARNS, FOREST, JOHN DORNEY,** and **DAVID SHARPE.** University of Wisconsin, Milwaukee, University of Wisconsin, Milwaukee, and Southern Illinois University, Carbondale. **Changes in natural vegetation in Cadiz Township, Green County, Wisconsin: John Curtis updated.**

Curtis, in a well known paper (see "Man's role in changing the face of the earth" 1956) described woodlot losses in Cadiz Township from settlement to 1950. Based on that work, this paper examines recent changes and reasons for change in natural vegetation from 1937 to the present. The total wooded area in the township has stabilized at about 10 percent. Recently, non-farm residential development has increased. Wetland ecosystems continue to disappear while field abandonment is infrequent. A large proportion of the woodlots have occupied and continue to occupy soils no different from those converted to agriculture. However, there is some tendency for woodlots to occupy steeper slopes. Lowland forests are particularly sparse relative to their presettlement coverage.

10:00–11:30 **WILKINSON, K.** and **E. A. JOHNSON.** University of Calgary, Calgary, Alberta, Canada. **Peace River grasslands and solonetzic soils.**

The first explorers and surveyors in the Peace River district of N.W. Alberta found extensive tracts of native grassland in what was otherwise boreal forest. Past studies of these grasslands were primarily descriptive and suggested the grasslands were relicts of past drier and warmer climates or due to fires and grazing. Our determination of the extent of these grasslands from early settlement land surveys indicate congruence with the present distribution of solonetzic soils. Analysis of 30 grassland and forest sites in the region showed higher, average soluble sodium (5.4 me/l)and exchangeable sodium percentage (11.8%) in grassland soils compared with average soluble sodium of 1.6 me/l and exchangeable sodium percentages of 4.2% in adjacent forest soils. The high sodium values result in compact B horizons with poor aeration, root and water penetration. These characteristics of solonetzic soils are unsuitable to tree growth and although trees do occur in some solonetzic soil areas of the region, they are largely confined to locations where the solonetzic characteristics are not as pronounced.

10:00–11:30 **LEOPOLD, DONALD J.** Purdue University, West Lafayette, IN. **The natural history and parasitism of *Pyrularia pubera*.**

A dearth of literature exists on the natural history and ecological relations of *Pyrularia pubera* Michx. (Santalaceae), a common shrub throughout the southern Appalachian Mountains. What has been written about *Pyrularia* often refers to its parasitic affinity to the roots of woody species that *Pyrularia* occurs with, though such parasitism has not been documented. Therefore, the possible parasitism of *Pyrularia pubera* was examined, as well as its morphology and anatomy, reproductive characteristics and phenological development. Little host specificity was shown in *Pyrularia*'s relationship with other vascular plants as the roots of over sixty tree, shrub and herbaceous species were parasitized to various degrees under field and controlled conditions. The morphology and anatomy of *Pyrularia*'s haustorium, which serves as the physiological one-way bridge from host to parasite, were also examined. Because of this parasitism and various reproductive characteristics, *Pyrularia* is common on diverse sites and is especially vigorous on sites subjected to perturbation.

10:00–11:30 **MCKEE, ARTHUR, DONALD ZOBEL,** and **FREDERICK BIERLMAIER.** Oregon State University, Blue River. **Variation in annual patterns of vegetation and reproductive phenology along an elevational gradient in the western Cascades of Oregon.**

The phenology of vegetative growth and reproduction was observed for commonly occurring tree, shrub and herb species over several years. Plots established in 16 different forest community types ranged from 400 to 1450 meters in elevation. Year to year variation in the initiation of growth and flowering of as much as two months has been observed at upper elevation sites. Photoperiod, temperature and snowpack duration interact to produce the year to year variation observed. A simple method of analysis

is presented which indicates the relative importance of temperature or photoperiod in regulation of the vegetative or reproductive phenology of a given species. The distribution of several species indicates the adaptive value of different phenological regulation mechanisms.

10:00–11:30 **PHILLIPS, DONALD L.** Emory University, Atlanta, GA. **Primary succession on granite outcrops: Changes in plant ecophysiological response.**

Granite outcrops in the southern Piedmont are locally arid environments characterized by high insolation, high summer temperatures and low water availability due to shallow soils. Soil depth increases during the course of primary succession. The water relations of *Viguiera porteri* were studied along a seral soil depth gradient to determine its effect on plant ecophysiological responses. Differences in soil depth affected mid-day plant water potentials during periods of drought. Some plants were able to survive water potentials of <-5.0 MPa. Stomatal resistance varied inversely with plant water potential in individual plants, but differences in transpiration rate between plants did not significantly affect leaf temperature. Seasonal and diurnal patterns were documented and related to microenvironmental conditions.

10:00–11:30 **REYNOLDS, P. E., W. R. PARROTT, JR., D. C. HAIN,** and **J. R. MAURER.** Columbia Gas System, Wilmington, DE and Stockton State College, Pomona, NJ. **Comparison of seasonal water table fluctuations for two swamp types along a southern New Jersey watershed.**

Beginning in April 1980, 65 wells were monitored twice weekly for a maple-gum swamp and an Atlantic cedar swamp located 1.6 km downstream, along a larger north-flowing stream ecosystem near Atlantic City, NJ. The hardwood swamp water table is highest in May and surface water is present. In early June the water table starts falling with surface water disappearing in early August. The water table reaches its lowest point in late September before beginning to rise in early October. The cedar swamp water table is highest in April and the swamp is flooded. The water table starts falling in early June with surface water, except that in the stream channel, disappearing in mid-July. The water table reaches its lowest point in early September before beginning to rise in mid-September. In early December 1980, the water table of both swamps began to fall in response to a drought affecting southern New Jersey. By mid-January 1981, the cedar swamp had declined below the lowest level observed in September 1980, while the hardwood swamp had not. The water table in the cedar swamp reaches its highest and lowest levels earlier in the year. However, the rate of rise or fall and the height or depth reached are greater in the hardwood swamp.

10:00–11:30 **MOORE, CHARLES M.** and **WILLIAM G. CALE, JR.** University of Texas at Dallas, Richardson. **Model verification and field sampling: A case study.**

An important problem in ecological systems simulation is that of model verification. While no theoretic guidelines exist, the usual approach is to evaluate model performance against time series data which were not used for calibration. Constraints such as time and money often preclude such a comparison. This paper focuses on a sampling program which permits evaluation of simulated response using only one data set. Field data were collected over a two-year period in a relict blackland prairie. A process oriented model was developed to simulate the dynamics of biomass, carbon and nitrogen. Model performance is then evaluated using the statistical variability inherent in the measured data.

10:00–11:30 **RYKIEL, EDWARD J., JR., PETER J. H. SHARPE, HSIN-I WU,** and **DOUGLAS K. LOH.** Texas A&M University, College Station. **Simulation of disturbance effects on community growth form structure and dynamics.**

To assess potential disturbance effects on community dynamics, we constructed a simulation model of old-field succession and incorporated the capability of introducing disturbances of known characteristics during any year. Basic components are plant growth forms with generalized life histories. Biomass relations, age structure, litter and percent cover are simulated annually. Disturbances are fire, harvest, grazing and insect attack and are characterized by type, intensity, frequency and predominant effect. Simulation results suggest these points 1) structural and dynamic steady states can be induced by certain disturbances with specific characteristics, 2) knowledge of disturbance characteristics and history is essential to predict occurrence and properties of a site-specific steady state, 3) disturbances which appear infrequent from an observer's viewpoint can have major effects on community structure and dynamics, and 4) to explain ecosystem spatiotemporal behavior, it appears necessary to integrate information about species biology and community/ecosystem properties with information about disturbance characteristics and their effects.

10:00–11:30 **TITUS, KIMBERLY** and **JAMES A. MOSHER.** University of Maryland, Frostburg. **A chance corrected classification procedure for use in discriminant analysis.**

Discriminant analysis is commonly used by ecologists to classify species or groups according to some set of independent variables. The percent of cases correctly classified is usually interpreted as one measure of the strength of the variable set in achieving group discrimination. Chance alone correctly classifies some cases and the problem is magnified by unequal sample sizes typically encountered in ecological research. We present an explanation of a chance corrected procedure known as Cohen's Kappa. It is useful in interpreting the classification results of discriminant analysis when group sizes are unequal.

10:00–11:30 **KIL, BONG-SEOP.** Wor
Pinus densiflora.

10:00–11:30 **LORIMER, CRAIG G.** U
northeastern oak forests.

12 NOON **LUNCHEON: DUKE ECC**

12 NOON **LUNCHEON: PALEOEC**

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SESSION 35. Symposium: Large

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tribute to W. Frank Blair. Orgar
Houston, Houston, TX 77004 (1
Holcomb Research Building, 4
VID A. JAMESON, presiding.

1:00 **JAMESON, DAVID A.** Universit

1:10 **LUNDELIUS, ERNEST A.** Unive
American mammals.

1:50 **CATES, REX G.** University of N
community and ecosystem pr

2:30 **RECESS.**

2:40 **GILBERT, VERNON C.** and **WI**
Institute, Washington, DC and
biosphere reserve network un

3:20 **LOUCKS, ORIE L.** The Institute
tive 10 years later.

SESSION 36. Symposium: Plant-A

J. C. HICKMAN, Dept. of Botany,
presiding. **SWAIN 119.**

1:15 **LINCOLN, D. E.** University of So
***aurantiacus* in sun/shade envir**

1:45 **BERENBAUM, M. R.** University
furanocoumarins to insects.

2:15 **CHEW, F. S.** Tufts University, M
munities.

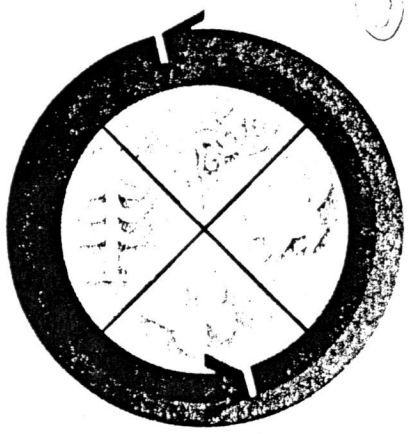
2:45 **RECESS.**

3:00 **THOMPSON, J. N.** Washington
conflicting selection pressures

3:30 **CATES, R. G.** University of New M
fir, stress physiology, and insec

4:00 **MCNAUGHTON, S. J., M. B. CC**
University, Syracuse, NY. **The rol**

4:30 **PANEL DISCUSSION.**



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Program Issue

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1981 Annual Meeting with AIBS
Indiana University, Bloomington, IN
August 16–20, 1981

BUSINESS MEETINGS AND SOCIAL FUNCTIONS

Sunday, August 16

ESA Executive Committee Meeting—10:00 AM (Distinguished Alumni Room, Union)
ESA Council Meeting—2:00 PM (Distinguished Alumni Room, Union)
ESA Editorial Board Meeting—8:00 PM (Union 300A)
Murray F. Buell Award Judges Meeting—8:00 PM (Jordan 239)

Monday, August 17

ESA Editorial Board Luncheon—12:00 Noon (Stateroom West, Union)
Physiological Ecology Section Business Meeting and Mixer—5:00 PM (Poplars Conference Center, Room C)

Tuesday, August 18

Wisconsin Ecologists' Breakfast—7:00 AM (Stateroom West, Union)
Aquatic Ecology Section Luncheon and Business Meeting—12:00 Noon (Stateroom East, Union)
Rutgers Ecologists' Luncheon—12:00 Noon (Stateroom West, Union)
International Affairs Section Meeting—4:00 PM (Distinguished Alumni Room, Union)
ESA Annual Mixer—6:00 PM (Jeremiah Sweeney's; bus transportation will leave from Reed Dormitory at 5:45 PM)
ESA Annual Banquet—7:30 PM (Dining Room, Wright Quadrangle on Campus; buses will leave from Jeremiah Sweeney's at 7:15 PM)

Wednesday, August 19

Duke Ecologists' Luncheon—12:00 Noon (Stateroom East, Union)
Paleoecology Section Luncheon and Business Meeting—12:00 Noon (Coronation Room, Union)
ESA Annual Business Meeting—4:30 PM (Woodburn 100)
Applied Ecology Section Mixer and Business Meeting—6:00 PM (Poplars Conference Center, Room A). Hosted by the School of Public and Environmental Affairs, Indiana University.
ESA Council Meeting—8:00 PM (Distinguished Alumni Room, Union)

Please Note

Members who are on the program but cannot attend due to unforeseen circumstances should notify the Program Chairman as soon as possible (Dennis H. Knight, Department of Botany, University of Wyoming, Laramie, WY 82071; Tel. 307/766-3291 or 2380). Alternate speakers are available.

Various ESA Officers will be available to discuss Society affairs from 10 AM–2 PM, Monday through Thursday, in the Sassafras Room of the Union.

Tickets for all meal functions listed above must be purchased in advance.

Slide previewing room: Persimmon A and B, Memorial Union (8 AM–5 PM, 7 PM–9 PM).

CC

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2. Symposium: Theoretical and Em
   p. 63)
3. Symposium: Endangered Specie
   the Puzzle for Globally Sustainat
4. Contributed Papers: Plant-Water I
5. Contributed Papers: Ecology of S
6. Contributed Papers: Woody Plant

M

7. Symposium: Changes in Structure
   (Woodburn 100; p. 73)
8. Symposium: Theoretical and Emp
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9. Symposium: Endangered Species
10. Contributed Papers: Vegetation Re
    015; p. 76)
11. Contributed Papers: Photosynthes
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13. Poster Session: Insect Ecology. (B
14. Poster Session: Nutrient Cycling a

Tu

15. Symposium: Ecology of Forest Unc
16. Symposium: Indicators of Ecosyste
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17. Symposium: Zooplankton Commun
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19. Contributed Papers: Mammalian
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21. Poster Session: Nutrient Cycling. (E

Tue

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25. Contributed Papers: Decomposition
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26. Contributed Papers: Ecology of Sha
27. Contributed Papers: Arthropod Ecol

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28. Symposium: Predator-Prey Relation
    burn 100; p. 122)
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30. Symposium: Dynamic Plant Ecology
    122; p. 125)
31. Symposium: Plant-Animal Interactio
32. Contributed Papers: Avian Ecology.
33. Contributed Papers: Nutrient Cycling
34. Poster Session: Plant Ecology. (Balla

Wedn

35. Symposium: Large Scale Ecology: R
36. Symposium: Plant-Animal Interactio
37. Forum: Options in Education and En
38. Contributed Papers: Biogeochemical
39. Contributed Papers: Revegetation of