From: IN%"jvc@lternet.washington.edu" "John Vande Castle" 19-SEP-1990 17:53
To: allsci@lternet.washington.edu
Subj: Poster titles and abstracts for ALL SCI Meeting

Following is the current list of poster titles to be presented during
the LTER All Scientists meeting. All of these were sent by Email or
ftp - A list of about 20 titles from LUQ are now being entered as
well as one from Frank McCormick (also re LUQ).
If your mail system screen is 80 characters or smaller wide, it may not look too pretty..
These have not been reformated down to 80 characters - if your mail
system didn't change things you might want to just print it in
compressed mode. There will be a more complete list printed and
available at the meeting
The titles have not been sorted - the are mostly in order received.

-jvc

Watershed-Scale Responses to Ozone Events in a Pinus strobus L. Plantation.
W. T. Swank and J. M. Vose, USDA, Forest Service, Coweeta Hydrologic Laboratory, Otto, North Carolina 28763

High 0_3_ levels during the 1984 growing season in the southern Appalachian Mountains caused extensive damage to a 28-year-old white pine plantation on a 13.4 ha watershed at the Coweeta Hydrologic Laboratory. Ozone stress effects included premature senescence and loss of foliage, stimulation of pine seedling germination, reduced basal area increment, and small but measurable increases in N0_3__-_-N and K_+_ concentrations in stream water. There were no observable effects of 0_3_ damage on nutrient concentrations of stemwood and foliage but net nutrient accumulation was reduced due to lower stemwood production. Ozone injury did not predispose trees to root pathogens or bark beetle infestations.

Comparison of Chemistry for NADP, Bulk Precipitation, and Wet Plus Dry Collectors in the Southern Appalachians.
W. T. Swank, B. C. Reynolds, and Jon Padgham, USDA, Forest Service, Coweeta Hydrologic Laboratory, Otto, North Carolina 28763

We examined the differences in ionic concentrations between bulk and NADP precipitation chemistry collection systems for 1979 through 1988 at the Coweeta Hydrologic Laboratory. Chi-square tests were performed on log-transformed concentrations of NADP and bulk data. The statistical analyses for the 10 years showed that mean concentrations of all ions except S0_4_ were significantly different; i.e., higher for bulk than NADP collections. Seasonal analyses indicated the largest differences between sample methods tended to occur during the fall and spring. Annual estimates of ion deposition (flux) to a forest canopy during the 3-year period are compared using bulk vs. NADP data obtained by combining wet deposition with estimates of dry deposition velocities from meteorological and canopy structure data

INTERACTIONS BETWEEN THE FRACTAL GEOMETRY OF LANDSCAPES AND ALLOMETRIC HERBIVORY. Bruce T. Milne (SEV), Monica G. Turner (ORNL), John A. Wiens (CSU), and Alan R. Johnson (SEV)

The scale at which herbivorous mammals forage is determined in part by home range area, population density, metabolic rate, movement speed, transport costs, and ingestion rate. These ecological, behavioral, and physiological characteristics that vary with body mass constitute the notion of allometric herbivory. In fractal landscapes, forage density varies with the scale at which animals perceive the resource. Interactions between scale-dependent resource density and allometric herbivory were investigated by using remotely sensed imagery to simulate fragmented distributions of forage biomass in an 810 ha landscape, and then simulating allometric herbivory for 2-6 kg animals. Between years, changes in landscape geometry altered foraging success. Within years, resource depletion resulted in increased aggregation among foragers followed by sudden increases in mobility and dispersion. Portions of the forage remained after the foragers shifted from the aggregation phase to one of mass dispersal. Spatial patterns of resources may regulate resource uptake and depletion rates within the landscape, with potential implications for demographics, intra-specific competition, and community assembly.

James Gosz-Sevilleta LTER
"Broad-scale analyses of Ecosystem Processd Using Long-path FTIR and new Long-path Micrometeorological Instrumentation"

James Gosz-Sevilleta LTER
"Prediction of Precipitation Inputs from Lightning Strikes"

James Gosz-Sevilleta LTER
"Sevilleta National Wildlife Refuge LTER"

Characteristics of Drought-Induced Canopy Gaps in Oak Forests of the Coweeta Basin.
B. D. Clinton, L. R. Boring, University of Georgia, Athens, Georgia 30602, and W. T. Swank, USDA, Forest Service, Coweeta Hydrologic Laboratory, Otto, North Carolina 28763

Canopy gaps in Southern Appalachian mixed Quercus forests were characterized to assess the impact of the 1985-88 record drought on patterns of tree mortality relationships to topographic variables and changes in overstory composition. Using permanent transects, 68 canopy gaps were sampled within the Coweeta Basin. Among 1- to 5-year-old gaps, the most common gap type was the 1-year-old single-tree, standing dead snag, accounting for 49 percent of all gaps sampled. Of the gaps sampled, 65 percent occurred within 2 years following the 1986 drought. Average gap size was 239 m_2_ and ranged from approximately 40 to 850 m_2_. Canopy gaps were distributed evenly between north and south aspects and within watersheds. Analysis of 1988 color IR aerial imagery yielded a spatial frequency of 0.8 gaps/ha/year in mixed Quercus stands affecting 2 percent of the horizontally projected area in this forest type in 1988. The most frequent gap forming species were Quercus coccinea, Q. rubra, Q. velutina, Q. prinus, Q.

alba, and Carya spp., respectively. Permanent plot resampling revealed declines in basal area for most Quercus species since 1970. Evidence suggests that moisture stress brought on by severe drought increases the susceptibility of Quercus species to the shoe-string fungus Armillaria mellea. Consequently, the 1986 record drought and future episodic drought events of similar magnitude, will likely have long term effects upon the structure and processes of Quercus dominated forests in the Coweeta Basin, and perhaps the Southern Appalachians, in general

CLIMATOLOGICAL DATABASE FOR NIWOT RIDGE, EAST SLOPE, FRONT RANGE, COLORADO. Ingersoll, R.C., J.C. Halfpenny, M.V. Losleben, and D.E. Greenland. University of Colorado Long-Term Ecological Research Program, Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, CO 80309-0450.

The University of Colorado's Institute of Arctic and Alpine Research (INSTAAR) has conducted a program of environmental measurement on the east slope of the Front Range since October 1952. The program has included monitoring at up to 16 climate stations within 4 major ecosystems: lower montane forest (2195 m), upper montane forest, subalpine forest, and alpine tundra (3743 m). The duration of record and length of vertical transect of this database has no equal in North America. Thus, these data are an invaluable resource for detection of varying climatic episodes within the Colorado Rocky Mountains. Technological improvements in the manner in which the data are collected and stored were made in recent years. At present, data are gathered primarily through electronic means and radio telemetered to the Mountain Research Station. Recent development of an 'user-friendly' interactive database represents a level of accessibility previously unknown. These data are available through INSTAAR.

Effects of Chronic Nitrogen Additions to Forest Ecosystems at the Harvard Forest
Alison Magill, John Aber, Jerry Melillo, Paul Steudler, Rich Boone and Rich Bowden

Measurement of Nitrogen, Lignin and Cellulose in Plant Materials by Near Infrared Reflectance
Mary Martin, Toni McLellan and John Aber

VEGIE: a Model of Vegetation Effects on Geochemistry in Ecosystems
John Aber, Alice Cialella and Rich Boone

Nitrogen/Carbon interactions between foliage and forest floor within spruce-fir forests across a nitrogen deposition gradient in New England
Steve McNulty and John Aber

Haines, B. and R. Roecker. Botany Department and Institute of Ecology, University of Georgia, Athens, Ga. Light penetration through the forest canopy at the Luquillo Experimental Forest estimated by hemispherical photography

Image analysis of hemispherical photographs provides an economical method for quantifying changes in light penetration at large numbers of plots. Hemispherical photographs where taken on approximately 500 plots on the Luquillo Experimental Forest during October-December 1989. Equipment and software will be assembled and image analysis will begin during late 1990. This first set of photographs will provide a baseline for long term studies of changes in light penetration and for changes in canopy coverage following hurricane Hugo.

Haines, B. and J. B. Waide. Department of Botany and Institute of Ecology and U. S. Forest Service, Oxford, Mississippi. Changes in soil solution chemistry following clear-cutting of a Southern Appalachian hardwood forest at Coweeta.

Soil solutions were sampled before and after clear-cutting of a hardwood forest at the Coweeta Hydrologic Laboratory, Otto, NC.

Before clear-cutting, lysimeters were placed in 16 plots and sampled for 13 intervals over a 15 month period. Following the clear-cut, lysimeters were re-installed at 12 locations on the watershed. Samples were collected 20 times over a 21 month period. Pre- and post-cut samples were analyzed for H, NH4, K, Na, NO3, Cl, SO4, PO4, and dissolved silica. After the clear-cut, concentrations of most elements were highest during the first 5 months and declined through the 21st month. Mean concentrations of all elements were lower during the 21 month post-cut period than during the 15 month pre-cut period. Sampling continued with porous cup lysimeters for 60 more months following the clear cutting. Decreasing concentrations of elements in the soil solution are attributed to element uptake by regenerating vegetation

Relative Effects of Long-Term and Interannual Snow Regime Variation on Phenology and Growth of Acomastylis rossii ssp. turbinata and Bistorta bistortoides

Marilyn D. Walker, Richard C. Ingersoll, Patrick J. Webber*, and Lillian G. Herger. Institute of Arctic and Alpine Research, University of Colorado, Boulder, CO, 80309-0450; *Kellogg Biological Station, Michigan State University, 3700 E. Gull Lake Dr., Hickory Corners, Michigan, 49060-9516.

Growth and flowering of alpine plants are controlled by factors that are (1) related to among-year climate variation and which vary on a daily, weekly, or annual basis, and (2) related to long-term patterns of snow-topography interactions and which are static on short temporal scales. These are represented respectively by among-year differences in key environmental variables and by landscape patterns of vegetation and soil. The quantity of winter and spring precipitation and timing of snowmelt influence both sets of factors. Thus, snow is an important alpine climate variable at both temporal scales.

Although the relationship between snowmelt and flowering phenology has been demonstrated for many common alpine species, but effects of phenological pattern on growth have not been examined. Because changes in global climate may modify alpine snow regimes, we evaluated the effects of snow on phenology, growth, and flowering of two alpine forbs, Acomastylis rossii and Bistorta bistortoides, in order to better understand what biotic responses we should expect from altered snow regimes.

We compared variation in growth, flowering, and phenology of these species among 6 years, representing short-term variation, and 6 plant communities, representing long-term microclimatic/hydrologic regimes. Although growth and flowering phenology of both species varied significantly among both years and plant communities, this did not translate into a change in growth amount. Leaf length, number of leaves, and number of flowers of A. rossii varied significantly among plant communities but not among years, suggesting a dominance of long-term controls over short-term controls. Among-year differences in leaf growth of A. rossii were strongly correlated with one or more short-term factors when each plant community was treated separately. Both leaf length and leaf number of Bistorta bistortoides varied significantly among both years and plant communities, and among-year variation in growth was attributed primarily to environmental conditions and growth success in the previous year rather than to conditions in the current year. These responses were attributed to different belowground morphologies in the two species. A. rossii copes with uncertain conditions by having a conservative growth strategy, whereas B. bistortoides depends more heavily on belowground carbohydrate reserves to get through unfavorable years.

The six years of measurement included a strong El Nino southern oscillation (ENSO) event, which produced the deepest snow recorded at the site in 35 years of measurement. We used this event to determine if a single severe climate year could produce a detectable biotic response. We did not detect a response in Acomastylis rossii, but the overall pattern that emerged for that species was that growth tended to be somewhat greater in deep snow years. Although Bistorta bistortoides exhibited significantly increased growth in 1983, this species is apparently mostly sensitive to conditions in the previous year. For both species the positive influence of snow in providing soil moisture is more important than the negative influence of shortened growing season. We conclude that the specific biotic responses to sustained climate change will vary depending on the type, direction, and degree of change, but that the greatest changes will come as a result of changes in long-term soil properties, which control most of the existing variation in growth. Specific morphological and physiological adaptations used by a species to withstand severe alpine conditions will define the manner in which that species responds to change.

Small-scale Spatial Variability of Nutrient Availability in an Agricultural Landscape. G. Philip Robertson, Kasey M. Klingensmith, Eldor A. Paul, and Michael J. Klug, Michigan State University.

Shifts in Plant Diversity in Response to Disturbance and Fertilizer in an Agroecosystem. Kay L. Gross, Lisa E. Huberty, Karen A. Renner, and Kurt S. Pregitzer, Michigan State University.

Nitrogen Allocation to Weeds and Crops in Response to Crop Density and Nitrogen Additions in an Agroecosytem. Kurt S. Pregitzer and Kay L. Gross, Michigan State University.

Dynamics of the Soil Organic Matter Active Fraction with Organic and Inorganic Nitrogen Inputs. Glenn.H. Harris, Eldor A. Paul, Oran B. Hesterman, Rhonda R. Janke, and S.E. Peters, Michigan State University and Rodale Research Center.

Modeling Ecosystem Process in Multi-species Crop Rotations under Multiple Tillage and Fertility Regimes. Keith Paustian, Joseph T. Ritchie, and G. Philip Robertson, Michigan State University.

Geostatistical Analysis of the Weed Seed Bank in an Agricultural Ecosystem Under Continuous Tillage. Sandra J. Halstead, Kay L. Gross, and Karen A. Renner. Michigan State University.

Above vs. Belowground Carbon and Nitrogen Allocation in a Cultivated Winter Annual Legume (Vicia villosa) as Related to Soil Nitrogen Status. Dana J. Barclay and G. Philip Robertson. Michigan State University.

Temporal Variation in Soil Structure Induced by Tillage. Francis J. Pierce and Delvon Reinert. Michigan State University.

Spatial and Temporal Dynamics of Predatory Coccinellidae in a Diverse Agricultural Landscape. Stuart H. Gage, Karim M. Maredia, and J. Mark Scriber. Michigan State University.

Fine Root Turnover and Soil Organic Matter Dynamics in Short-Rotation Populus Systems. William R. Horwath, Kurt S. Pregitzer, and Eldor A. Paul. Michigan State University.

Satellite Monitoring of Vegetation Change in the Conterminous U.S. - 1990
John Vande Castle, NET-LTER and Jeff Eidenshink, USGS-EROS Data Center

> Maximum normalized difference vegetation index (NDVI) composites derived from AVHRR data are useful for monitoring vegetation greenness. Compiling composites in weekly or biweekly intervals as a time series enables analysis of vegetation greenness over a growing season. These composites are in the form of image data files which are georectified to 1km ground resolution for the conterminous United States. Since the image files are really no different than standard data files, the vegetation index value can be extracted and compared with ground observations. Examples at several long-term study sites, are included.

Characteristics of Drought-Induced Canopy Gaps in Oak Forests of the Coweeta Basin. B. D. Clinton, L. R. Boring, University of Georgia, Athens, Georgia 30602, and W. T. Swank, USDA, Forest Service, Coweeta Hydrologic Laboratory,

Otto, North Carolina 28763

Canopy gaps in Southern Appalachian mixed Quercus forests were characterized to assess the impact of the 1985-88 record drought on patterns of tree mortality relationships to topographic variables and changes in overstory composition. Using permanent transects, 68 canopy gaps were sampled within the Coweeta Basin. Among 1- to 5-year-old gaps, the most common gap type was the 1-year-old single-tree, standing dead snag, accounting for 49 percent of all gaps sampled. Of the gaps sampled, 65 percent occurred within 2 years following the 1986 drought. Average gap size was 239 m_2_ and ranged from approximately 40 to 850 m_2_. Canopy gaps were distributed evenly between north and south aspects and within watersheds. Analysis of 1988 color IR aerial imagery yielded a spatial frequency of 0.8 gaps/ha/year in mixed Quercus stands affecting 2 percent of the horizontally projected area in this forest type in 1988. The most frequent gap forming species were Quercus coccinea, Q. rubra, Q. velutina, Q. prinus, Q. alba, and Carya spp., respectively. Permanent plot resampling revealed declines in basal area for most Quercus species since 1970. Evidence suggests that moisture stress brought on by severe drought increases the susceptibility of Quercus species to the shoe-string fungus Armillaria mellea. Consequently, the 1986 record drought and future episodic drought events of similar magnitude, will likely have long term effects upon the structure and processes of Quercus dominated forests in the Coweeta Basin, and perhaps the Southern Appalachians, in general

POSTERS FOR KONZA PRAIRIE RESEARCH NATURAL AREA

Topoedaphic controls on NPP in tallgrass prairie. T.L Benning, T.R. Seastedt, A.K. Knapp and D.S. Schimel

Mycorrhizal contribution to the prairie. S.P. Bentivinga and B.A.D. Hetrick.

Estimating net primary productivity in tallgrass prairie using remote sensing and GIS. J.M. Briggs and M.D. Nellis.

Richness and productivity in grasslands: Patterns in space and time. S.L. Collins and J.M. Briggs.

Approaches to error analysis in spatial models. G.M. Henebry.

Distribution and abundance of small mammals in tallgrass prairie. D.W. Kaufman, G.A. Kaufman and E.J. Finck.

Microbial carbon and nitrogen dynamics of tallgrass prairie as affected by management. C.W. Rice and F.O. Garcia.

Biomass, N and P dynamics of grazed or mowed tallgrass prairie. C.L. Turner, T.R. Seastedt and M.I. Dyer.

Comparing burning effects on sediment loss and overland flow velocities on tallgrass prairie. J.K. Koelliker and B. Moore.

Effects of Temperature Change on the Hydrologic Budget of a Forested Catchment over a

Climatic Moisture Range J.A. Yeakley(1), W.T. Swank, J.M. Vose (2), G.M. Hornberger (1), B.P. Hayden (1)

(1) Department of Environmental Sciences, University of Virginia, Charlottesville, VA 22903
(2) Coweeta Hydrologic Laboratory, Southeastern Forest Experimental Station, Otto, NC 28763

During the past fifty-six years, temperature (T) records at the Coweeta Hydrologic Laboratory (CHL) in the southern Appalachian mountains indicate a decrease of up to 0.75C. Estimates of evapotranspiration (ET) from precipitation - runoff (P-RO) data indicate a decrease of approximately 10 cm over the same time span at several watersheds in the Coweeta Basin.

PROSPER, a lumped-parameter water-balance model, was calibrated for a mid-elevational mixed-oak watershed (WS 2) at CHL. Daily climatic model input data from both a "wet" and a "dry" year were used to examine the hydrologic response WS 2 over a climatic moisture range.

Results during the wet year showed that ET changed in direct proportion to changes in T; while during the growing season of the dry year ET changed inversely with T. Quantity of runoff proved sensitive to T changes during the wet year but insensitive to T changes during the dry year. Using a 0.75C annual temperature change on an annual climatic dataset with mean-adjusted P, a simulated change in annual ET of 11.5 cm resulted.

Plant/Soil Interaction Studies at the Fermilab National Environmental Research Park
R. M. Miller and J. D. Jastrow, Environmental Research Division, Argonne National Laboratory, Argonne, IL 60439

Symbiotic nitrogen fixation in an arid ecosystem measured by 15N natural abundance.
Gordon V. Johnson. Dept. of Biology, Univ. of New Mexico. Sevilleta LTER

Poster Titles from Lee Rogers, Battelle, PNL:
A Microcosm Level Gas Exchange Study on the Effects of Nitrogen and Water in a Bromus tectorum Dominated Old Field.

Predicting Evapotranspiration Over Arid Landscapes Using Satellite Imagery.

A Model for Annual Spatial and Temporal Change in the Alpine Landscape.
Halfpenny, J.C., N.A. Auerbach, and R.I. Beyerinck.
University of Colorado Long-Term Ecological Research (CULTER) Program, Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, CO 80309-0450.

Topographic position, weather, and snowpack are the principle driving forces for biological processes in the alpine tundra at the Long-Term Ecological Research site on Niwot Ridge, Colorado. Our spatial model links snowfall, snowpack depth, snow meltout, growing season weather, blooming, plant senescence, primary production, and mammal production for six plant communities on a 17.5-ha study area located at 3435 m. The model describes events and processes of an average summer season based on seven years of field data. Sensitivity analysis of driving variables or of phenological events may be accomplished for each plant community, or at 88 evenly spaced points. For example, at many points on the lee slope the

date of snow meltout is more sensitive to warming degree-days than to snowpack depth. Sensitivity of tundra to global climate change may also be tested. If, for example, mean summer temperatures were to decrease 2.4 C, a threshold effect would result in snow remaining on the ground through the entire summer. The model explores spatial and temporal patterns in the alpine tundra that might result from climate change.

The Colorado alpine: has global change already arrived?
Halfpenny, Jim and Nel Caine. University of Colorado Long-Term Ecological Research (CULTER) Program, Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, CO 80309-0450

The alpine of the Front Range, Colorado may be particularly sensitive to climate change because its mean annual temperature is near or below freezing (depending on altitude). A 1.5xC increase in mean annual temperature would increase warming degree-days (degrees above a 0 C base) by about 25%. Since plants are only able to photosynthesize during the period when temperatures are above freezing, a 25% increase would provide considerable additional effective solar energy and resulting production would have cascading effects up the trophic pyramid. Environmental records are available through INSTAAR including lake cores (12,000 year records for sediments, pollen, beetles), tree rings (400 years), atmospheric chemistry (since 1968), weather data (since 1907 for one station, since 1952 for several stations), snowpack (since 1938), and since 1982 ice-out and snow meltoff, phenology, and plant and animal production. Atmospheric carbon dioxide as recorded on Niwot Ridge 3,456 m has increased markedly since 1968. Recent records suggest trends towards ameliorated environmental conditions. The date of ice out and snow melt has become progressive earlier since 1982. The pattern of flowering for mountain Avens (Acomastylis rossii) appears to have change to a state where a large proportion of the alpine is flowering longer each summer, while conception dates of pika (Ochotona princeps) also have become earlier over the same period. These nearly decade-long trends revealed by the CULTER program are obvious; could they signal the beginning of the Greenhouse Century (Schneider, 1990) or are they simply short-term trends?

Long-term spatial phenology of the alpine, Colorado.
Halfpenny, Jim. University of Colorado Long-Term Ecological Research (CULTER) Program, Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, CO 80309-0450

The flowering phenology of mountain avens (Acomastylis rossii) as been monitored since 1982. A 17.5-ha grid was mapped weekly to determine areas covered by snow, and areas supporting vegetative growth, plants in bloom, or senescent plants. All maps have been entered into geographic information system databases for analysis. Between plant community differences exist in reference to the date of snow meltout. Dates of snow meltout do not correspond well with plant community boundaries in dry communities but do so in wetter communities. Trends in meltout and blooming suggest changes towards an ameliorated environment in the last nine years. Biotic components appear to be responding to earlier snow melt by increased areas in bloom.

USING REMOTELY-SENSED DATA AND GIS TO MAP HURRICANE DAMAGE IN TROPICAL FORESTS

William T. Lawrence, Jr. (Luquillo Forest LTER, Center for Energy and Environment Research, Univ. of Puerto Rico, GPO Box 3682, San Juan, Puerto Rico 00936, USA - currently at NASA Goddard, Code 923, Greenbelt, MD 20771)

The impact of hurricanes on forest vegetation is a large scale phenomenon which has been difficult to assess without extensive ground and aerial surveys. This study uses multispectral data from the Landsat Thematic Mapper to derive maps of forest damage at the landscape scale. The area under study is the Luquillo Experimental Forest, one of the U.S. National Science Foundation's LTER (Long-Term Ecological Research) sites which is comprised of a mixture of secondary tropical forest communities distributed across a highly dissected topography with a steep elevational gradient. The spectrally-based damage assessment operates primarily on the loss of canopy foliage and its effect on the overall forest greeness or vegetation index. Landsat TM images from 4 years pre- and 3 weeks post-hurricane were used for change detection and the damage classification. Using a geographic information system approach the forest damage assessment was stratified by its landscape position in regards to slope, aspect, elevation, and community type and compared to ground observations of forest damage. Aspect proved to be the most powerful indicator of damage class with slopes facing the hurricane winds (north and northwest aspects) being the most highly damaged. GIS based damage assessment generally agreed with ground observations even though pixel size (30 X 30 m) strongly aggregated the diverse topography and vegetation structure of the site.

BACTERIAL-ALGAL RELALTIONSHIPS IN AUTOTROPHIC AND HETEROTROPHIC STREAMS IN THE HUBBARD BROOK EXPERIMENTAL FOREST

Stuart Findlay, Institute of Ecosystem Studies, Millbrook, NY

Epilithic bacterial abundances and growth rates were measured for two years in two streams with contrasting trophic bases at the Hubbard Brook Experimental Forest. The reference stream (Bear Brook) has high standing stocks of detrital organic matter and a closed canopy while a nearby stream in a clear-cut watershed experienced algal blooms in the early years following clear cutting. Chlorophyll a concentrations did not differ between streams, possibly indicating that algal abundance was limited by factors other than light availability. Bacteria were not consistently correlated with algal abundances in either stream. Bacterial abundance and growth did not differ between streams despite large differences in standing stock of detrital organic matter and rates of primary production. These results suggest that in neither stream was there a strong linkage between algae and bacteria. A shading experiment conducted in both streams was successful in reducing chlorophyll levels but there was only a weak response of bacterial abundance and growth rates. The lack of response of bacteria to localized changes in algal abundance may be because bacteria were nutrient- or grazer-limited in these streams, or because bacteria are actually using a carbon source which does not differ between streams.