species composition data were collected at each of the 88 grid points. For 1993–1995 aboveground biomass data were also collected at each of the 88 grid points. In addition, a vegetation map of plant communities was created for the Saddle Grid using a combination of field data collection and visual interpretation of large-scale (small area, high resolution) aerial photographs. These data sets present an opportunity to analyze relationships between plant diversity and biomass as well as relationships between abundances of different species and environmental characteristics. This poster presents our first step in analyzing these relationships by mapping spatial patterns of variables representing plant diversity, aboveground biomass, and abundance of dominant plant species. The maps were created using correlation analysis and spatial interpolation methods in a geographic information system.

Air and Ground Temperature Models at Caribou-Poker Creeks Research Watershed. Kenji Yoshikawa, Larry D. Hinzman, Nobuyoshi Ishikawa, Charles M. Collins and Virgil Lunardini.

Caribou-Poker Creeks Research Watershed (CPCRW) is about 48 km north of Fairbanks. Many research studies have been conducted in CPCRW since 1969. Good quality air and ground temperature data have been collected by many previous and presently ongoing studies. The goal of this study is to develop methods of producing accurate spatially distributed estimates of air and ground temperatures throughout the year. The hourly ground surface temperature is affected by every component of the surface energy balance, and therefore its correlation to measurements of hourly air temperature is not particularly strong. The daily mean air and ground temperatures have been compared for each month. The r^2 of these linear correlation was highly variable (r^2 = 0.19 to 0.79). The winter months displayed particularly poor correlation because of temperature inversions, insulation by the snow, and sudden influx of cold air masses. To develop a valid method to predict surface temperature throughout the watershed for any day of the year, it is necessary to consider the effects of slope, aspect, and elevation. Data from five meteorological stations, including Caribou Peak (elevation = 710 m), Helmer's Ridge (elevation = 627 m), CT1600 (elevation = 490 m), CT2100 (elevation = 604 m), and CRREL (elevation = 217 m), were included in this analysis. The winter air temperature inversion occurred at an elevation between the CRREL and CT2100 station. We used the monthly air temperatures from three of these stations and digital elevation data to produce distributed air temperatures throughout the watershed each month. These monthly temperature estimates were then used to calculate the mean annual air temperature. During the warm season months, the adiabatic lapse rate was applied to adjust air temperatures for elevation. During periods of atmospheric inversion in winter, the air temperatures were adjusted for elevation by applying different measured correction factors above and below the inversion point (elevation = 640 m). Calculations of distributed ground surface temperature are improved further by incorporating information on slope and aspect in terms of the equivalent latitude. The predicted temperatures compare reasonably well with numerous measurement sites. The equivalent latitude model was adjusted to include the effects of elevation. This adjusted model had a better relationship with the mean annual surface temperature (r^2 = 0.79). The mean annual surface temperature also correlates well with the freezing index (r^2 = 0.97). In the watershed, the thawing index did not vary greatly from 1400°C*days. It appears that the freezing index at a site must be greater than 1400°C*days for permafrost to be preserved. Under this model, at least 2.1% of the permafrost in this watershed has disappeared in the last 90 years due to climate warming. It appeared that 1.2% of the permafrost in the watershed did not recover after forest fires early in this century. Still, 37.5% of the permafrost in Caribou-Poker Creeks Research Watershed is unstable or thawing.

Transition from Data Management to Information Management. Don Henshaw, Theresa Valentine and Gody Spycher.

Information Management plays a major role at the H.J. Andrews Experimental forest Long Term Ecological Research (LTER) site and information science is increasingly recognized as a valuable and necessary component of most ecological research programs. Increasing demands for information necessitate systems that allow the integration and synthesis of diverse types of information among research partners at the local, regional, national, and international scales. The importance of information management in the preservation and understanding of valuable ecological databases has been reinforced as students and researchers continue to examine and find secondary uses for the databases. Intensive forest ecosystem research conducted on the Andrews Forest has resulted in many diverse, long-term ecological databases. An information management system has been developed that supports the collection, quality control, searchable access, and long-term archival of collected data and is compatible with emerging national metadata standards. The Forest Science Data Bank (FSDB) features a metadata system designed to facilitate data access to information products and is capable of serving as a regional repository for ecological information. Currently, a web interface is being developed to permit searching for study databases and publications by personnel, as well as by place, taxonomic, and theme keywords.

Relationships between soil organic matter dynamics and disturbance regime, and applications to monitoring and modeling vegetation change. Jeffrey E. Herrick.

Soil organic matter is widely cited as a key ecosystem property which both affects and reflects water and nutrient storage and redistribution. Relationships between soil organic matter and soil structure in arid ecosystems, and the effects of soil biota and disturbance, are poorly understood. Our research is designed to develop an understanding of how interactions between plants, soil organic matter and soil biota affect patch-scale soil water infiltration and storage under different disturbance regimes, and how variability in these processes across the landscape contributes to resource redistribution and vegetation patterns. We are applying this understanding to the development of (1) a quantitative monitoring system for grassland, shrubland and savanna ecosystems (2) a spatially-interactive gap dynamics model (ECOTONE—see Peters and Herrick poster), and (3) ecologically-based remediation approaches for degraded rangeland. Our results show that termites, ants and microbiotic crusts contribute significantly to the spatial variability of water infiltration and runoff, and that the resistance and resilience of soil properties and processes are strongly dependent on both soil type and the soil biotic community. The monitoring system includes a suite of rapid soil and vegetation indicators selected and applied on a site-specific basis, and interpreted in a landscape context.

Multidisciplinary education and graduate training through a Knowledge Network to evaluate the relationship between biodiversity and ecosystem function. Elizabeth A. Sandlin, Sandy J. Andelman and Michael R. Willig.

Biocomplexity, an emergent property of biological systems, includes the various interactions among living organisms and their environment at all levels of organization. Thus, studying biocomplexity necessitates a holistic approach that can be achieved only by identifying, retrieving, and synthesizing data from distributed sources into a common database. The Knowledge Network for Biocomplexity project, a multi-institution collaborative venture, involves the creation of a prototype knowledge network (KN) for use by ecologists. The project also aims to develop a nationwide outreach program that trains graduate students how to use the KN to facilitate their own biocomplexity research. Beginning in Jan. 2001, we will coordinate a web-linked series of graduate student seminars focused on multi-scale patterns of species richness and biodiversity. Students will use the KN and ultra-modern computing systems to design and complete a research project. Seminars will culminate with collaborative meetings at NCEAS. By targeting students early in their careers, we hope to foster computer-based research skills that will enable them to tackle complex ecological questions. Scientists using the KN will (1) increase their research efficiency, (2) gain a better understanding of large-scale biological patterns and processes, (3) enjoy collaborations with distinguished ecologists, and (4) identify other areas ripe for research.

Comparative assessment of forest clear-cutting in the management of Lake Biwa watershed. Yuko Kaneko, Takao Kunimatsu, Yasuyuki Kagotani, Etsuji Hamabata, Takuo Nakajima, Shingo Kusaka, Masahiro Ochiai.

Long-term study is being conducted from 1994 with regard to the effects of forest management on 1) the quality of stream water, 2) the gas fluxes