(CPCRW), located 50 km north of Fairbanks, Alaska. The three wildfires occurred in 1996, 1990, and during the 1920s. The hypotheses tested were the effects of wildfire (proportional to fire severity) are to increase the soil temperature (short- and long-term); increase the short-term soil moisture content; and decrease the long-term soil moisture content. At each burn area, two small pits were dug—one inside and one outside the burn area. Locations of the pits were selected to be as physically similar to each other as possible. Factors such as pre-wildfire vegetation, slope, aspect, elevation and proximity were considered in location selection. The total depth of the pits varied between 60 and 80 cm. In each pit, the temperature and soil moisture content were measured. Measurements were collected in the surface duff layer, in the organic soil, and at regular intervals through the mineral soil. A ground temperature profile was created between the burned and unburned sites. Shallow-surface (15–20 cm depth) temperature measurements were collected at 3 meter intervals using a thermocouple. A series of thermistors were also used to measure the (0–100 cm depth) ground temperature. Measurements were collected at 10–20 meter intervals with additional measurements made near the boundary of the burned and unburned areas.

The Use of "Tray Traps" for the Collection of Benthic Estuarine/Marine Organisms. Corrina Shapard (REU Student) and David E. Smith.

This study documents an innovative benthic sampling method in habitats where obstructions such as oyster bars and drift algae on adjacent mud flats result in the ineffective use of traditional methods (i.e., seines and gill nets). Samples were collected using tray traps made of 2x2 feet, heavy-duty, plastic crates lined with nylon screen. When these traps were submerged and secured on the sediment at low tide, benthic organisms would settle in the traps. This collection method was used to study the role of oyster bars as physical structure by comparing organismal densities on either side of intertidal oyster bars in Hog Island Bay, VA. The results are discussed in terms of oyster bar orientation and drift algae accumulation. Trawl surveys were also conducted on either side of these oyster bars at high tide. This data was compared with the data obtained from the tray trap method. Tray trap and trawling methods demonstrated that the largest organismal densities were collected from the side of the bars where larger densities of drift algae were also collected. The results indicate the physical role that the oyster bars play in this habitat due to their influence on water currents and therefore drift algae dispersal.

Comparisons of Stream Flow Response in Areas of Discontinuous Permafrost. William R. Bolton, Larry D. Hinzman, Kenji Yoshikawa and Douglas Kane.

Permafrost plays an important role in the hydrology of sub-arctic watersheds. Ice-rich conditions at the permafrost table do not allow significant surface infiltration, resulting in decreased response time to precipitation events (including snowmelt), limited subsurface storage, and low base flows between precipitation events compared to permafrost free areas. The Caribou-Poker Creeks Research Watershed (CPCRW), located 48 km north of Fairbanks, Alaska, is underlain by discontinuous permafrost along north trending slopes and valley bottoms. Soils free of permafrost are generally found on south to southwest facing slopes. The area of C2, C3, and C4 sub-watersheds of CPCRW is underlain, respectively, with 3.5, 53.2, and 18.8% permafrost. Hydrologic data from these watersheds have been collected over the past 30 years. Following precipitation events, the northeast draining C3 watershed displays faster response time, higher specific discharge peak flows, and longer recession periods compared to the south draining C2 and C4 sub-watersheds. The C3 sub-watershed also has a lower specific discharge baseflow compared to both the C2 and C4 watersheds between precipitation events.

Interactive effects of elevated CO@2@, nitrogen deposition, and decreased species diversity on plant disease. C. E. Mitchell, P. B. Reich, D. Tilman and J. V. Groth.

Decreased plant species diversity, increased nitrogen deposition, and elevated CO@2@ have been hypothesized to increase plant disease levels by, respectively, increasing species abundances, increasing tissue N concentrations, and increasing tissue water content, but experimental tests are few. In a field experiment simulating these three global changes, all three es significantly increased the disease severity (percent of leaf area in by fungal pathogens) of one or more groups of plants, and some c nations of changes interacted significantly to further increase disease severity. Disease severity across the entire plant community was significantly greater at lower plant species diversity— 78% greater in monocultures than plots planted with all 16 species. Nitrogen addition did not significantly alter disease severity across the entire plant community, but did significantly increase C4 grass disease severity by 66%. This effect was significantly greater at elevated CO@2@. Similarly, elevated CO@2@ did not significantly alter disease severity across the entire plant community, but did significantly increase C3 grass disease severity by 33%. This effect was significantly greater at lower species diversity. These results suggest that global change can dramatically increase plant disease severity, especially when multiple changes occur simultaneously. Increased disease severity could further impact ecosystem structure and functioning.

Seasonal Fluctuations in Environmental Harshness and its Affect on a Summer Barrier Island Tide Pond Fish Assemblage. J. Devin Herod (REU Student), Craig Layman and David E. Smith.

This study examines the effect of increased physiochemical stress in determining composition of summer tide pond fish assemblages of Hog Island, a barrier island at the Virginia Coast Reserve Long Term Ecological Research Site. Beginning in June 1998, Membras martinica, a surf zone fish previously found in the tide ponds, was unable to survive between 24 and 72 hours when transported from the surf zone. In prior spring observations, this species was commonly transported to the ponds by overwash from the surf zone and typically survived in the ponds. A series of field survivorship tests were conducted from June through mid-August in the ponds; less than 5% of representative surf zone fish transported survived a maximum of 72 hours while representatives of the marsh fish community exhibited an 80% or better survivorship. Physiochemical conditions (i.e., temperature and oxygen) were implicated in these observations. To test this we performed acute tolerance tests for dissolved oxygen and temperature with representative marsh and surf zone species. These findings indicate that the abiotic conditions working on differing physiological tolerances of each species are capable of altering the assemblage structure of these ponds on a short time scale in the summer barrier island tide ponds.

Developing Interactive Internet Mapping Capability For the H.J. Andrews Experimental Forest. Theresa Valentine and Dylan Keon.

Currently the HJ Andrews Experimental Forest Long Term Ecological Network (LTER) site operates an Internet site where visitors can obtain geographic data for the site. In addition, there is an application that allows the visitor to query a map displaying harvest units and receive reports from an associated database on harvest activities. The current information is displayed using images that are stored on the server. These images are static and the user does not have the capability to decide what features to display and the ability to make complex queries. NACSE and the US Forest Service are working together to build an interactive mapping application to replace the existing format. This application is being built with Arc Internet Map Server (ArcIMS) and is funded through a National Science Foundation grant entitled: "Web-Based Integration of Distributed Research Databases." Visitors will access the site through standard web browsers, be able to chose the themes they would like to view, and will be able to make complex queries such as buffering stream gage locations and determining what harvest units would be impacted. Future plans include using Spatial Data Engine (SDE) to link the non-spatial data in the harvest database with the harvest units and expanding the querying capability.

Spatial patterns of tundra vegetation characteristics within the Niwot Ridge Saddle Grid, Colorado. Steven V. Muller, T. Seastedt, K. Nash-Suding and D. Walker.

The Niwot Ridge Saddle Grid covers an area of 550 by 400 meters at approximately 3530 meters above mean sea level. The Saddle Grid covers a topographic gradient that ranges from mesic to xeric tundra plant communities. The saddle grid is defined by a series of points spaced 50 meters apart—for a total of 88 points. During the years 1990, 1995, and 1997,