LAJTHA, KATE,* JULIE SPEARS, SCOT HOLUB, YURIKO YANO and BRUCE CALDWELL. Oregon State University, Corvallis, OR. **Detrital controls on SOM and nutrient dynamics in an old-growth forest soil.**

Despite growing knowledge of short-term litter dynamics, we know relatively little about the role of plant litter in determining SOM content and nutrient cycling over time scales ranging from decades to centuries. To address this gap, we established long term manipulations at the H.J. Andrews Experimental Forest, OR, to assess how rates and sources of plant litter inputs control the accumulation and dynamics of organic matter and nutrients in forest soils. Manipulations include litter additions, litter removal, and root trenching. Initial data from lysimeters show increases in DIN leaching in trenched plots, indicating the importance of roots and/or root exudates in controlling N losses even in this very high C:N, unpolluted forest. Data also show increases in DOC leaching at depth in double wood and double needle plots, with decreases in nitrate leaching. This pattern may be an initial disturbance effect, or may indicate DOC control over N immobilization and retention. Gross N transformation data suggest strong differences in gross rates of N immobilization among plots. Although we hypothesized that DON:DIN would increase in double wood treatments due to control by secondary chemicals on leachate DON:DIN, this pattern has not emerged to date. We are following three groups of soil enzymes that are directly involved in processing the major SOM-C classes and expect increasing detrital quantity to increase overall enzyme activities, with higher quality inputs disproportionately increasing processing of o-alkyl-C.

LAMBERTI, GARY A.,[1]* DOMINIC T. CHALONER,[1] RICHARD W. MERRITT,[2] PEGGY O. OSTROM[2] and MARK S. WIPFLI.[3] [1] University of Notre Dame, Notre Dame, IN 46556; [2] Michigan State University, East Lansing, MI 48824; [3] Pacific Northwest Research Station, USDA Forest Service, Juneau, AK 99801. **Marine nutrients in freshwater ecosystems: role of salmon migrations in supporting stream food webs.**

Stream ecosystems are believed to import much of their energy from adjacent ecosystems and to export considerable energy downstream. A different paradigm, however, may exist in streams in which anadromous fishes spawn. In Southeast Alaska streams, we studied the ecological importance of marine-derived nutrients (MDN) transported into fresh waters by Pacific salmon (*Oncorhynchus* spp.) during spawning migrations. We predicted that dissolved nutrients released with salmon excretion during migration and decomposition after migration would stimulate primary production. In the presence of spawning salmon, concentrations of ammonium and soluble reactive phosphorus increased by 4x and net primary production increased by 0.5x. We also hypothesized that salmon carcasses, which can exceed 1 carcass per m^2 of streambed, would be a direct food resource for invertebrate consumers. Submerged carcasses increased the growth of detritivorous invertebrates by 70-100%. Benthic invertebrate abundance was not increased, however, possibly because of massive sediment disturbance by spawning activities and increased fish predation. Stable isotope analyses of nitrogen and carbon indicated that MDN permeated all major components of the stream food web, including juvenile salmon, which grew at faster rates in the presence of decomposing salmon. Our results suggest that MDN delivered by returning salmon can enhance freshwater productivity, but factors such as disturbance, retention, and size of salmon runs modulate the overall effect of MDN on stream food webs.

LANE, DIANA R.* and HORMOZ BASSIRIRAD. University of Illinois at Chicago, Chicago, IL 60607 USA. **Changes in net primary productivity and soil N status across a 25 year chronosequence of tallgrass prairie restoration sites.**

We took advantage of a unique chronosequence of prairie restoration sites at FermiLab outside of Chicago, IL to examine dynamic interactions between plant and soil characteristics. In particular, we were interested in assessing the potential coupling between productivity of different functional groups and soil N status. We measured aboveground net primary productivity (ANPP), total soil N, and *in situ* net N mineralization at five restoration plots ranging from 1 to 25 years old, at an old field site, and at a nearby prairie remnant. Within the restoration plots, total ANPP increased significantly ($r^2=0.32$, $p<0.001$) with increasing restoration age as did total soil N ($r^2=0.39$, $p<0.001$). ANPP and total soil N were positively correlated, but ANPP and net N mineralization were correlated only very weakly ($r^2=0.10$, $p = 0.03$). Compared to the oldest restoration site, the prairie remnant had lower ANPP but similar values of total N and N mineralization. C_3 grasses and ruderal forbs dominated the youngest restoration plots, but were replaced by C_4 grasses and native forbs between 4 and 7 years following planting. The emergence of C_4 grasses appears to drive the increase in total N with increasing restoration age. The preliminary results suggest that C_3 grasses and ruderal forbs are not well coupled to soil N status. In contrast, C_4 grasses play an important role in restoring soil organic matter and soil N that were depleted during cultivation.

LANGELLOTTO, GAIL A.* and ROBERT F. DENNO. University of Maryland. **Complex habitats moderate predator-predator interactions and dampen trophic cascades.**

That habitat structure is of primary importance in determining spider community structure and spider abundance has repeatedly been demonstrated by both correlative and experimental studies. Because spiders are generalist predators that often prey upon one another (intraguild predation), the extent to which these predators can coexist may strongly depend on their ability to move and hide within their environment. Complex habitats have the potential to provide refuge from predation, and thus may explain the positive association of spiders with structurally complex versus simple habitats. The potential of complex habitats to reduce intraguild predation was addressed in a pair of field experiments that used a guild of wolf spiders (*Pardosa littoralis* and *Hogna modesta*) that inhabit an intertidal marsh. The habitat component which we manipulated to create simple and complex habitats was leaf litter thatch. The first experiment assessed how thatch mediates cannibalism when low and high densities of *Pardosa* are offered alternative prey. The second experiment was a field assessment of how thatch mediates intraguild predation of *Pardosa* by *Hogna*. The results of the first experiment suggest that cannibalism is not a significant mortality factor in *Pardosa* wolf spiders. However, the results of the second experiment show that intraguild predation has the potential to significantly reduce *Pardosa* population size and that access to a complex, thatch-containing habitat significantly moderates agonistic predator-predator interactions. These results suggest that structurally complex habitats diminish the potential for trophic cascades by reducing the potential effect of higher order predators on lower trophic levels.

LANSING, JENNIFER L.,[1,]* MICHAEL F. ALLEN[2] and DOUGLAS DEUTSCHMAN.[1] [1] San Diego State University; [2] University of California, Riverside. **Ectomycorrhizal fungal diversity in four North American forests and the effect of nitrogen fertilization.**

The ectomycorrhizal (ECM) fungal communities of four North American forest vegetation types were assessed to gain basic knowledge of the belowground ECM community and diversity. A manipulative nitrogen fertilization field experiment on mature stands was performed to investigate the effects of fertilization. The four sites: balsam poplar (*Populus balsamifera*), AK; red oak (*Quercus rubra*), GA; red pine (*Pinus resinosa*), MI; and pinyon pine (*Pinus edulis*), NM were fertilized with 100kgN/ha/yr and the ECM community was assessed using a combination of morphotyping and RFLP analysis of the rDNA ITS (internal transcribed spacer) region. Each site had a greater richness of ECM fungi at the plot level than at the level of an individual soil core with each plot containing at least five times the number of ECM types. The site with the least richness was the red oak with an average plot richness of 20 ECM types and an average soil core richness of 5. At the pinyon pine site there was an average richness of 25 ECM types per plot and an average richness of 5 per tree. The balsam poplar and red pine sites had the greatest richness. At the balsam poplar site the average plot richness was 40 ECM types with an average soil core richness of 8. Red pine had 45 ECM types with an average of 8 types per soil core. Fertilization did not affect ECM richness but did result in community differences and shifts in the dominance of certain ECM species.

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