



Bottom-up effects of geologic parent material through ecological interaction webs

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Community ecologists study the interactions between species to understand what controls the distribution and abundance of different populations. Communities are thus portrayed as “interaction webs”, in which different species exert reciprocal pressures on each other. In the case of one population being a resource for which another population is the consumer (i.e. food-web), reciprocal pressures are commonly referred to as “bottom-up” vs. “top-down” effects. The starting point for studying bottom-up effects is usually the vegetation (primary producers), and its end-point the decomposer community responsible for breaking down detrital matter from each trophic level. In my presentation, I will present results from three former graduate students, to argue that the starting point for studying bottom-up effects should be the geologic parent material (GPM), whose importance has often been overlooked by community ecologists. For example, our data show that GPM had a stronger effect on forest floor nutrient budgets than the identity or successional stage of the vegetation. Likewise, GPM had a strong effect on the structure of forest floor microbial communities, as well as their resistance to, and resilience from, disturbance. GPM also had a significant effect on the richness and diversity of understory plant communities from similar forest stands. Finally, we present evidence that soil fertility controls the resistance and tolerance of certain plant species to selective browsing, thereby affecting the composition of the dominant plant cover and the feeding patterns of large herbivores.