



PARENT SESSION

Tuesday, August 8, 8:00-11:30 am

COS 19 - Population dynamics II: animals

L-4, Lobby Level, Cook Convention Center

Presiders: J Maerz

Effects of long-term population fluctuations by a top predator on invertebrate communities in alpine ponds.

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ABSTRACT- At a remote cluster of subalpine ponds and wetlands in central Colorado, the population size of tiger salamanders (*Ambystoma tigrinum nebulosum*) has fluctuated cyclically over the past 20 years from fewer than 100 to over 5000 individuals. Comparative data between ponds with and without salamanders, and experimental studies suggest this salamander species is a keystone predator on benthic and planktonic prey communities. Here we present long-term community data that reveal taxon- and habitat-specific correlations between the population size of benthic and planktonic prey and fluctuations in salamander populations. In temporary habitats, changes in the abundance of planktonic, but not benthic invertebrates were correlated with fluctuations in the abundance of salamanders. In permanent ponds, we observed order-of-magnitude changes in benthic biomass that are negatively correlated with salamander abundance. Among the large-bodied and potentially most vulnerable benthic invertebrates (odonates, caddisflies, beetles, water bugs), several species exhibited negatively coupled cycles, but others fluctuated little or out of phase with changes in salamander abundance. The absence of major shifts in benthic community composition in permanent ponds is probably a result of conflicting predation pressures exerted by different year classes of salamanders. Salamander gut samples suggest that ontogenetic shifts in diet might explain why cyclic fluctuations in the abundance of this predator have only minor impacts on benthic community composition despite having major effects on invertebrate biomass.

Key words: population fluctuation, amphibian, alpine ponds