

Public Abstract

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Title:EFFECTS OF SPATIAL SUBSIDIES AND CANOPY COVER ON POND COMMUNITIES AND MULTIPLE LIFE STAGES IN AMPHIBIANS

Spatial subsidies are resources that move from one ecosystem to another. In freshwater, tree canopy determines both light availability (necessary for plant growth) and subsidy input in the form of dead leaves (a source of nutrients). This phenomenon has been well studied in streams, and general patterns of ecosystem production, community structure, and the reciprocal export of animals have been discovered. I was interested in whether these patterns also occurred in ponds. I examined these patterns using artificial ponds and supported the results using an observational study of natural ponds. For the experiment, I placed artificial ponds along a tree canopy gradient and manipulated leaf input. I found a shift from decomposition in closed canopy mesocosms to a balance between decomposition and plant production in open canopy ponds. The invertebrate community structure responded to both tree canopy cover and leaf input. The biomass of collectors (animals that eat dead plant material) was highest in artificial ponds with leaf input and increased with tree canopy cover, a pattern also present in natural ponds. Finally, I found that plant input increased the export of amphibians compared to no input. Amphibians also decreased with increases in plant production. This research highlights the importance of spatial subsidies that connect different ecosystem types. Conserving these ecosystem connections will help maintain biodiversity and ecosystem function.