



Spatially-explicit ecological dynamics in streams and rivers



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ABSTRACT:

Many organisms disperse in media possessing a net unidirectional flow. The systems these organisms inhabit, exemplified by streams and rivers, are also characterized by a high degree of multi-scale spatial and temporal environmental variability. Most conceptual frameworks describing ecological organization in streams and rivers prominently feature both upstream-downstream linkages and variability that occurs across spatial and temporal scales. I will discuss modeling studies where I have explored how the spatial distribution of organisms results from multi-scale spatial variability in systems with directionally-biased dispersal. I will begin by discussing spatial scales that characterize population responses near equilibrium. Then, I will discuss transient and non-equilibrium dynamics using metrics that are independent of initial conditions – resilience, reactivity, and the amplification envelope – and relate them to the spatial scale of the population perturbation. Current work aims to extend previous themes to branching river networks and the surrounding landscape. I will conclude with implications for conservation of instream populations

Host: Van Savage, Ph.D.

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